

UNDERSTANDING THE DICHOTOMY BETWEEN
INDUSTRIAL AGRICULTURE AND SUSTAINABLE
AGRICULTURE:

Types and Characteristics of Maine Farms*

by

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From the Cover

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Report Objective

The project “*Establish Integrated Systems Baseline and Educational and Mentoring Programs*” was administered by the Department of Resource Economics and Policy at the University of Maine and funded by the Northeast Sustainable Agriculture Research and Education (NESARE) program of USDA. It was guided by a project team composed of two sustainable agriculture farmers, a University of Maine researcher, an Extension educator, the director of the Maine Organic Farmers and Gardeners Association and a marketing specialist from the Maine Department of Agriculture, Food and Rural Resources. The project consists of four goal components: 1) to determine the character, degree and extent of sustainability of Maine agriculture, 2) to provide new farm-generated information on sustainable farm systems that will assist farmers to determine whether adopting more integrated practices makes sense on their farms, 3) to strengthen the Maine Sustainable Agriculture Society (MESAS), and 4) to establish a MESAS newsletter and mentoring program.

This report addresses the first two goal components: determining the character, degree and extent of sustainability of Maine agriculture, and providing new farm-generated information on sustainable farm systems that will assist farmers to determine whether adopting more integrated practices makes sense on their farms.

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Representative Farm Budgets

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SURVEY ANALYSIS AND FINDINGS

Introduction

The SARE Baseline Survey Analysis and Findings is part of the project to *Establish Integrated Systems Baseline and Educational and Mentoring Programs* administered by the Department of Resource Economics and Policy at the University of Maine and funded by the Northeast Sustainable Agriculture Research and Education (NESARE) program of USDA. The survey analysis discussed in this paper contributes to two goals of the project: (1) “(D)etermine the character, degree and extent of sustainability of Maine agriculture”, in short, “characterize (define) integrated sustainable systems in Maine”, and (2) “provide information that assists farmers in determining whether adopting more integrated practices makes sense on their farms”.

Definition, concepts and models of sustainable agriculture

Sustainable agriculture is the dominant organizational paradigm for a system that represents an alternative to industrial agriculture. Operational distinctions between sustainable and industrial (or conventional) agriculture have been observed and conceptual differences are reasonably recognized and established. Drawing from literature carefully selected from representatives of the two paradigms, Beus and Dunlap (1990) contrast six key elements, stated in ideal form, that distinguish the conventional agricultural paradigm from the alternative agricultural paradigm. Conventional agriculture promotes centralization compared to decentralization associated with alternative agriculture, dependence rather than independence, competition rather than community, dominance of nature rather than harmony with nature, specialization rather than diversity and exploitation rather than restraint. In this characterization, alternative agriculture, and its reconceptualized form of sustainable agriculture, represents a system that is decentralized, diverse, restrained, in harmony with nature, respectful of community and promotes independence.

In addition to a paradigm that is distinct from industrial agriculture, alternative agriculture is different in practice, especially regarding environmental and economic impacts. Painter (1991) found that converting to a low-input rotation reduces soil erosion and eliminates environmental pollution from agrochemicals. Roberts and Swinton (1996) found that although alternative systems may not have higher yields or profits they reduce contamination and improve soil and water quality. In a review of the literature, Crosson and Ostrov (1991) found that at the observed farm-level, sustainable systems are less profitable than conventional systems, but if organic premiums are considered and external pollution costs and government subsidies internalized, sustainable systems would be competitive. The conventional system achieved a 33% higher net return with government subsidies in a comparative analysis between an organic and conventional system on a Washington State farm. Without government subsidies, the conventional farm achieved only a 10% higher net return (Painter).

A conventional system in Pennsylvania was found more profitable because it required less family labor and management, even though yields of the alternative system were comparable (Hanson, Lichtenberg and Peters). Dobbs, Leedy and Smolik (1988) found that alternative system yields must be 5 to 10% more than conventional systems or chemical costs must increase

by 50% for equivalent net returns. A comparison of conventional and alternative cropping systems in Kansas found that the alternative system was less profitable in every instance (Diebel, Williams and Llewelyn).

Some studies have found certain alternative systems to be financially equivalent or superior. A 7-year comparison of alternative, conventional and reduced-till farming systems in South Dakota found that that an alternative system of row crops with an alfalfa rotation was most profitable (Smolik, Dobbs and Rickerl). A study of potato production systems by the University of Maine found that the reduced-input system had greater returns over variable costs than the conventional system (Gallandt et al.). An extended grazing systems with early spring grazing, a hay cutting and late fall grazing, was found more profitable than conventional feed-lot systems (D'Souza et al.).

Sustainable agriculture farmers often express different values and expectations. A study in South Dakota found that although an organic farm could not compete with a conventional system in net returns when organic premiums were not considered, their net income was sufficient to cover all family costs with a small profit (Dobbs, Leedy and Smolik). Comer et al. (1999) found that surveyed farmers in Tennessee that practice sustainable agriculture were more educated, adopted more practices and affiliated with different organizations than conventional farmers.

After the publication of *Our Common Future* in 1987, promoting sustainable development as a process in which equity and community are as important as a healthy environment and economy, the concept of sustainable agriculture increasingly incorporated notions of equity and community. Flora (1995) suggests that sustainable agriculture is associated with an increase in community social capital and case studies by Butler and Carkner (2001) demonstrate that sustainable agriculture farming can be a core component of the total community ecosystem.

Despite a recognition that sustainable farming is different from conventional farming, there has been less consensus about its definition and specification. When developing the early federal programs to support sustainable agriculture in the 1990 farm bill, the U.S. Congress had considerable difficulty agreeing upon a definition. According to Youngberg et al. (1993), the U.S. Senate debated the definition of sustainable agriculture extensively, finding advocates for both a narrow form focusing on reducing chemical use and a broader one recognizing a system that is “environmentally, agronomically, and economically sound over long and short periods.” The definition of sustainable agriculture, even as a production process, is still contested. According to Fairweather and Campbell (2003) two sustainable agriculture paradigms are now emerging, one based on biological activity and the other on a technology fix.

Even as the concept of sustainable agriculture broadens and its definition remains contestable, the sustainable agriculture movement continues to progress as more farmers adopt sustainable systems, however defined.

Methods

This project reflects the view that, despite its advancement as both a new paradigm and a movement, the definition and specification of sustainable agriculture, as well as its pathways, are still contested, but it is acknowledged to be different from conventional agriculture. Consequently, the project assumed little initial definition of sustainable agriculture other than a close association with integrated farming systems. The definition, or characterization, of sustainable agriculture in Maine is determined by the findings of the project.

The dual-stage survey process

This paper reports on the first two goal components (outlined in the “Overview” section of this report): determining the character, degree and extent of sustainable agriculture in Maine and providing adoption information to farmers. The analysis supporting these components used a dual-stage process. First, a group of farmers recognized to be practicing sustainable agriculture was surveyed. This first phase consisted of an initial written survey and thirty intensive face-to-face interviews. This first phase was designed to provide insights about the structure and processes of sustainable agriculture in Maine. Information from the first phase informed phase two, a general farm survey. The general survey represented the total Maine farm population and allowed for a comparison of industrial and sustainable agriculture farms.

For phase one, conducted in the Spring and Summer 2000, the Project Team (PT) selected a group of agricultural practitioners and professionals that represented a cross section of Maine agriculture. They were asked to identify farms they believed to “have integrated farming systems or be practicing sustainable agriculture.” No further description of integrated farming systems or sustainable agriculture was provided.

The contributing agricultural practitioners and professionals included representatives from the Maine Department of Agriculture, Food and Rural Resources, Cooperative Extension specialists and educators, and representatives from agricultural commodity associations, alternative agriculture associations, and Soil and Water Conservation Districts. These contributors nominated 226 farms that had deliverable mailing addresses. The PT designed an initial written survey to elicit information regarding the farm’s production, marketing and value-added practices, farm characteristics, and demographics of the farm family including education, farming experience, and family income levels. An initial mailing with one follow-up mailing resulted in a 70% response rate to the survey.

In addition to analyzing the survey responses, the PT selected thirty farms to participate in intensive interviews of two to three hours. Nineteen of these interviews were filmed to create two video presentations about sustainable agriculture, one directed to the general public and the other to agriculture professionals.¹

¹ “*Conversations with Farmers: Finding Sustainable Agriculture*” is a one-hour video featuring seven Maine farm families practicing sustainable agriculture. This video presents some underlying reasons for practicing sustainable agriculture and is suitable for viewers with no prior knowledge of sustainable agriculture. “*Elements of Sustainable Agriculture*” is a two-hour video with nineteen Maine farm families discussing the challenges of sustainable farming. It is organized into seven topic areas related to sustainable agriculture. This video is suitable for viewers

The thirty farms participating in the intensive interviews were selected by the PT using a ranking process based on the number of farming practices used. Responding farms were ranked by the number of listed farming practices they indicated using on their farms. Those with the most practices that also provided a general cross section of farms by size, farm income levels and geographical distribution across the State were selected. The 30th and final farm selected represented the 64th in terms of highest number of practices. It was assumed that this group of thirty farms would be a reasonable representation of farms practicing the greatest sustainability.

Information gained from the first-stage survey and the intensive interviews informed the construction of a general survey of a representative sample of the total farm population in Maine. The general survey (Appendix One) included most of the questions on the initial survey plus three sets of questions derived from primary findings from the first stage process. First, the important role of marketing choices resulted in increased attention directed to better identifying current and preferred marketing channels and practices (Question #3). Second, the intensive interviews suggested that sustainable farms are importantly embedded into their local communities. The general survey included questions regarding farm visitors and off-farm work by farm family members (Questions #4d and #5f thru 5j). Third, three types of farms were identified by the intensive interview process (Question #6).

The intensive interviews revealed three farm types, referred to here as *designers*, *evolvers* and *appenders*. The types are distinguished by the stated values of the interviewed farmers, their purpose for adopting sustainable practices and systems, their process for adopting those systems, the farming practices used, and the characteristics of the farms. These three types, along with an industrial farming construct, were described in the general survey and farmers were asked to indicate which description best fit their farm.

Designer farms are operated as holistic, integrated biological systems that the farmer intended (designed) from the beginning. Real property and equipment acquisitions are guided by that design. Designer systems are relatively small, generally complex with multiple enterprises, relying more on economies of scope than economies of scale, and selling into higher value niches, especially selling directly to consumers. These farms tend to be quite connected to the local community.

Evolver farms started as conventional commodity farms but are transitioning (evolving) to farms operated more as a biological whole. Since they were established on farms with a more industrial system, often one passed down from within the family, they tend to be larger than designer farms. Their enterprise choices are often influenced by the farm history, with their previously produced commodity often a larger proportion of the system than would be found on a designer farm. The evolver is in a transition from an industrial farm to a more integrated, holistic one.

who are somewhat familiar with agricultural practices. Both videos are available for sale (\$15 each) or for loan (contact Andrew Files at 5782 Winslow Hall, Orono, Maine 04469-5782 or (207)-581-3108 or andrew.files@umit.maine.edu).

Appender farms also started as industrial farms and the farmers intend to maintain a commodity focus. However, the appender has added farming practices consistent with sustainable agriculture, like micro-ecosystem management, organic production for part of the system, or direct sales to consumers for part of the production. While the sustainable practices contribute to the farming operation and add to the knowledge of the farmer, the farm is not being transitioned to a biological whole. The appended practices could be eliminated without fundamentally disrupting the farming operation, but the primary commodity enterprises could not be eliminated without such a fundamental disruption.

The initial survey also found that sustainable farms used a variety of marketing channels. In the general survey, descriptions of marketing channels were rearranged and questions about future preferences as well as current uses of marketing channels and specific marketing techniques were included. The general survey also included questions about the openness of the farm to the public and the extent of off-farm work.

Constructing the mailing list

Since a comprehensive list of farms was not available, the PT worked with the Maine Department of Agriculture, Food and Rural Resources (MDA) to construct a list. A number of lists representing various farming sectors were organized into a single list by eliminating duplications through a cleansing process that also eliminated marine aquaculture firms and greenhouse entities judged to be retailers without production capacity. Nurseries and greenhouses with production capacity were included. Farmers producing only blueberries were not included since a reasonably comprehensive list was not available. Likewise, large specialized egg producers were not included. The process resulted in a mailing list of 3,450 farms. This compares to the 1997 Census count of 5,810 farms that included 555 berry farms, most of which would have been blueberry farms, 704 “greenhouse, nursery, and floriculture” producers, 83 egg farms, and 30 animal aquaculture farms.² It compares with the National Agricultural Statistical Service’s estimate of 6,700 farms in 2001 encompassing all farm commodities including aquaculture and greenhouse and nursery production^{3,4}.

By selecting every other farm, surveys were mailed to 1,725 addresses in December, 2002. Using a modified Dillman procedure, 176 were returned as non-deliverable, 170 indicated they were no longer farming, and 570 usable responses were received, representing 41% of the potential responders.

Survey results were analyzed to identify relationships between farm type and farming practices, farm characteristics and farm family demographics. Mean or median values were calculated to compare the relationship between farm type and practices, characteristics and demographic variables. Chi-square tests were used to determine the statistical significance of the differences.

² Census farm type by North American Industry Classification System

³ Survey results indicate that the smaller farms were not fully represented in the survey. This is consistent with expectations since many smaller part-time farms are not on industry mailing lists used to construct the survey’s mailing list.

⁴ NASS generally reports higher farm numbers than Census. For the most recent Census reporting year, 1997, NASS estimates of Maine farm numbers were 20% higher than Census.

The same technique was used to compare selected combinations of farm characteristics, farm practices, and farm family demographics relationships not involving farm type.

Results

While labels were not applied to the description of farm types, farmers were asked to indicate whether they considered their farm to be one of four types, the three identified in phase one and a commodity type, as described below.

___ My farm specializes in the production of one or two commodities and I sell that production to high-volume buyers. The success of my farm depends on my being an efficient producer, which requires good farm management and increased production. (*Commodity*)

___ While the success of my farm depends on producing one or two commodities efficiently and in large volume, I also produce small volumes of high-value products. I minimize my use of purchased inputs, like fertilizer and chemicals, by intensively managing the farm ecosystem with crop rotations and/or by using locally-generated waste products. (*Appender*)

___ While I started with a conventional farm that specialized in one or two commodities, I am now in a transition to a farm that operates as a biological whole and produces several products. By diversifying my production, I am able to reduce the use of purchased inputs. The success of the farm will depend on finding high-value markets, since I cannot be a minimum cost producer for most commodities. (*Evolver*)

___ My farm has always operated as a biological whole. I designed it that way from the start. Its many enterprises complement one another but result in a complexity that is challenging to manage. Therefore the farm will probably stay smaller than a more conventional farm. Its success depends more on high-value niche markets than on efficiency gained through volume production. (*Designer*)

In this paper, commodity and appender farms are classified as industrial farms. They rely on the production of a few commodities produced in large volumes at low costs. They purchase and import substantial amounts of inputs and export substantial amounts of output. Designer and evolver farms are classified as sustainable farms. They rely on diversified and complex farming systems rather than high volumes of production of a few commodities.

A substantial majority of responders (81%) identify themselves as one the four types, indicating that the typology is comprehensible and meaningful. Of those indicating a type, 40% consider themselves commodity farms, 12% appender, 10% evolver and 38% designer. Thus, 52% consider themselves one of the two industrial types while 48% consider themselves one of the sustainable types.

While the four types spread across a continuum, they are quite distinct, at least in the ideal state, and for the most part have distinguishable characteristics recognized by farmers and researchers. The farm types tend to reside on a continuum with commodity on the industrial end to appender and then evolver and finally to designer on the sustainable end. For most relationships, measures of the characteristics of the four types generally follow a continuous function from commodity to designer. For brevity of presentation, the results below are often discussed in terms of the two end types, commodity and designer.

Practices and complexity

Sustainable farms are more complex than industrial farms. Sustainable farms have more enterprises, they produce a greater diversity of outputs, and they use more production and value-added techniques. The degree of complexity generally follows a continuum across all types from the commodity, the least complex, to designer, the most complex.

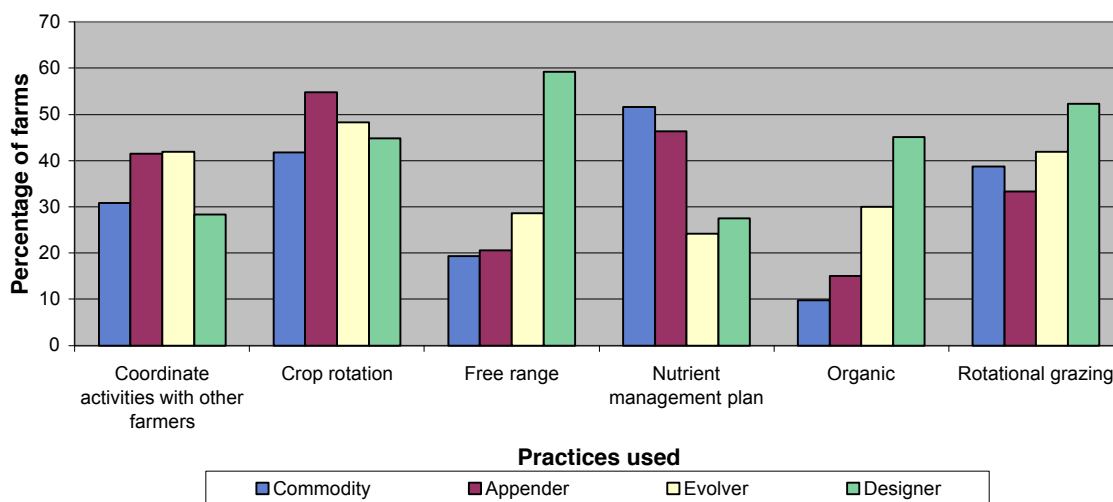
Farmers were asked if they used specific practices, generally associated with sustainable agriculture practices or responsible land stewardship. These included six livestock practices, eight cropping practices and five value-added practices (see Appendix 1, questions 1, 2 & 3). Commodity farmers indicate they use an average of 4 practices, appenders and evolvers 5 and designers 7 (Table A1). Some farms in all types use none of the specified practices, while the maximum number used range from 14 for commodity farms, 12 for appender farms, 16 for evolver farms to 20 for designer farms.

Table A1: Number of practices used by farm type

	Commodity	Appender	Evolver	Designer
Median	4	5	5	7
Maximum	14	12	15	20

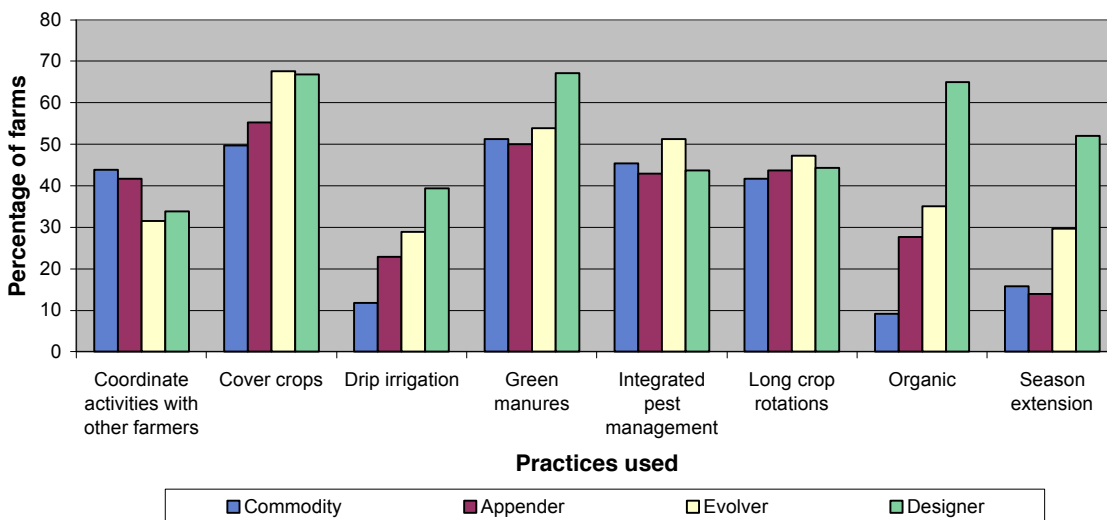
In addition to using fewer practices, industrial farms also use different practices. Commodity livestock farms use more nutrient management plans (52%) than designer farms (28%), but less free range and organic practices (19% and 10% compared to 59% and 45%). The first difference is likely influenced by state statute that mandates nutrient management plans for farms with 50 or more animal units, and commodity farms tend to have more animal units than designer farms. There appears to be no significant differences in the use of crop rotations, and while designers indicate somewhat greater use of intensive rotational grazing (52% v. 39%), the difference is statistically weak (Fig. 1).

Figure 1: Livestock practices used by farm type



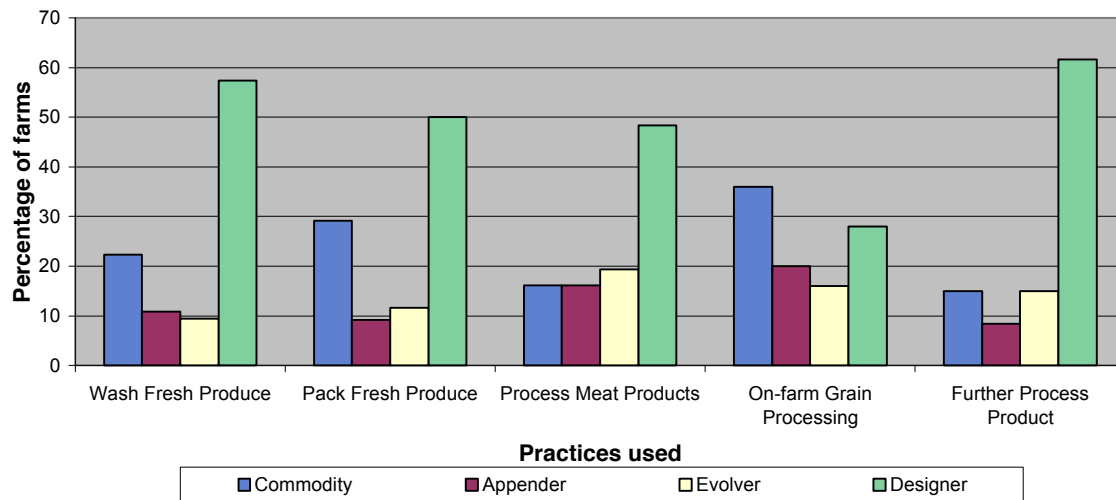
Designer crop farmers use significantly more drip irrigation (40%), organic production (65%) and season extension (52%) techniques than their commodity counterparts (12%, 9%, and 16% respectively). Designer farms also indicate using slightly more green manure and cover crops, but the differences are statistically weak (Fig. 2).

Figure 2: Cropping practices used by farm type



Designer farms use more value-added practices than commodity farms. For example, 57% wash produce compared to 22% for commodity farms, 50% pack produce compared to 29% for commodity farms, and 62% perform some value-added processing compared to 15% for commodity farms (Fig. 3).

Figure 3: Value-added practices used by farm type



Size

Farm size differences, whether measured by value of sales, crop acres or livestock numbers, indicate that commodity farms are the largest and designer farms the smallest. Mean farm receipts for commodity farms total \$171,000, about \$85,000 for appender, \$91,000 for evolver and less than \$48,000 for designer (Table A2). Since the number of farms is skewed toward the smaller sizes for all types, the median sales values are considerably lower at \$59,000, \$14,000, \$18,000, and \$4,000, respectively.

Table A2: Farm size by farm type

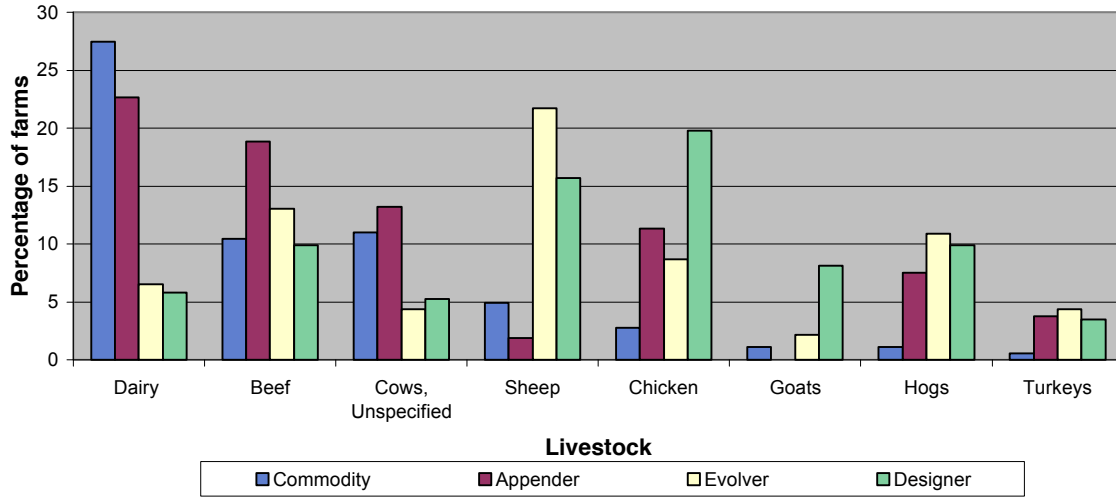
	Sales (\$000) Mean	Sales (\$000) Median	Crop Acres	Animal Units
Commodity	171	59	282	89
Appender	85	14	111	69
Evolver	91	18	43	13
Designer	48	4	24	6

Commodity livestock farms report 89 animal units⁵ per farm, while designers report 6, evolvers 13, and appenders 69 (Table 2). Livestock type is also different. The top choice of livestock for commodity and appender farms is dairy, with 28% and 23% of those livestock farms choosing dairy compared to about 6% for evolvers and designers. Chickens and sheep are the favorite

⁵ An animal unit is the equivalent of 1,000 pounds of livestock, regardless of species.

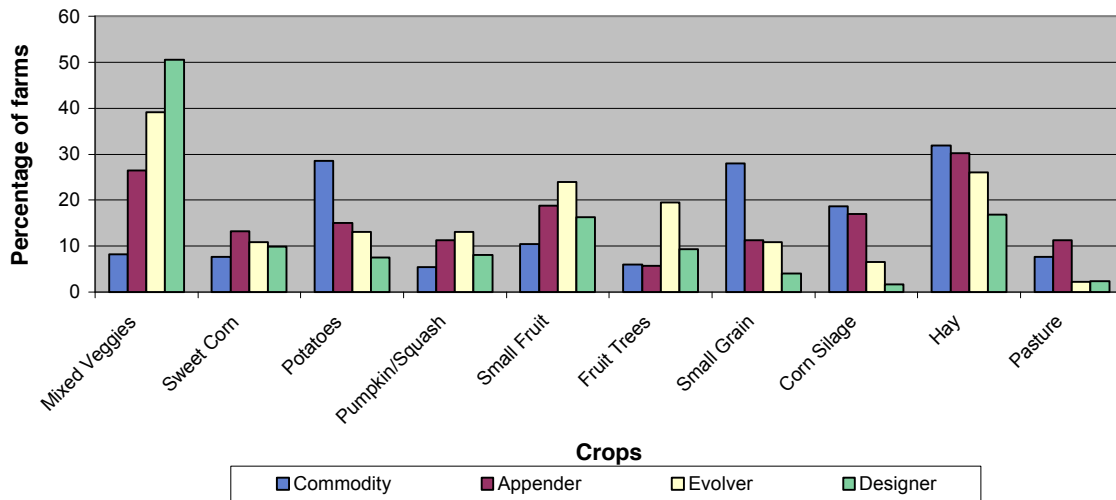
livestock choice of designers, with 20% and 16% of farms respectively, while evolver farms prefer sheep (22%), beef (13%), and hogs (11%) (Fig. 4).

Figure 4: Livestock choices by farm type



Commodity crop farms grow an average 282 acres of crops, while designers grow 24 acres (Table 2). Similar to livestock, crop choices also differ. Commodity crop farms tend to grow field crops, particularly hay (32%), potatoes (29%), small grain (28%), and corn silage (19%). Designer farms tend to grow more high-value crops of mixed vegetables (51%), with lesser amounts of small fruits (16%) and hay (17%) (Fig.5).

Figure 5: Crop choices by farm type



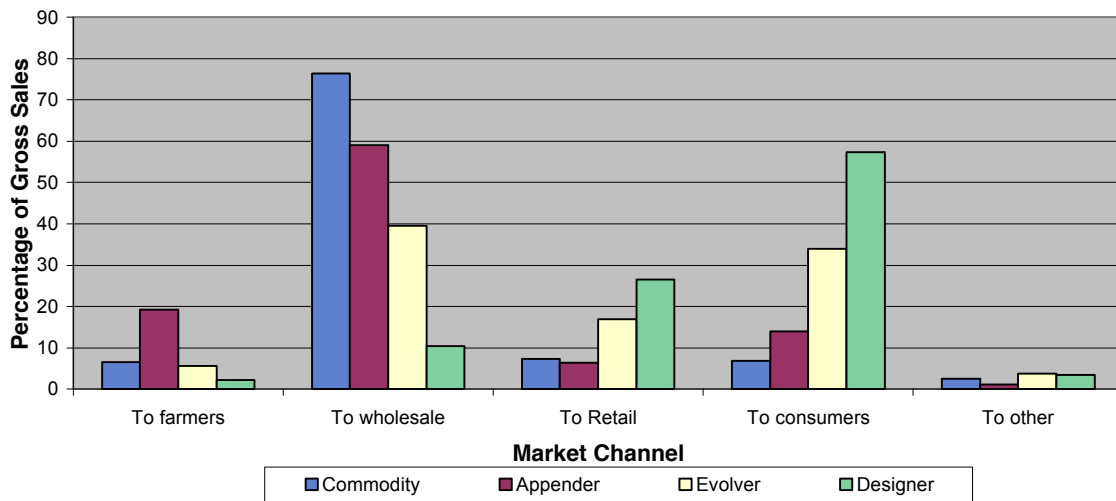
Generally, designer farms grow a smaller amount of crops and livestock than commodity farms, but their crop choices are of higher value per acre and their livestock tend to be of the smaller type, like poultry, pigs and sheep.

Marketing

Responders were asked to indicate the proportion of their output sold into five marketing channels and any preference they had for changing that proportion in the near future. The five channels include selling: to other farmers, to wholesale, to retail, to consumers, and to others. “To wholesale” includes sales to wholesalers, retail warehouses, and processors. “To retail” includes sales to restaurants, directly to retail stores, and to other resellers.

Commodity and designer farms focus on different market channels. While each group sells similar proportionate amounts to retail stores, including restaurants, and to other farmers, they sell very different proportions to wholesale and directly to consumers. Commodity farms sell 76% of their output into wholesale markets, including supermarket central warehouses and processors, compared to 10% for designer farms. On the other hand, designer farms sell 57% of their output directly to consumers compared to 7% for commodity farms (Fig. 6).

Figure 6: Market channels used by farm type



Direct sales to consumers represent 19% of all sales in the survey, surpassed only by wholesale markets at 60%. Larger farms use wholesale markets for a greater portion of their sales than smaller farms. The largest farms, those selling over \$500,000 annually, sell 70% of their output through wholesale channels and only 12% of their output directly to consumers. The smallest farms sell 9% of their output through wholesale and 65% through direct consumer sales (Table 3). While direct consumer sales represent a smaller proportional market for larger farms, in

absolute terms larger farms sell substantially more product directly to consumer, \$58,000 per farm for the largest farm size group, compared to less than \$2,000 for the smallest farm size group.

Table A3: Market channels by farm size

Sales Category	To farmers	To wholesale	To Retail	To consumers	To other
Up to \$9,999	7.7%	9.2%	12.6%	64.7%	5.8%
\$10K to \$24,999	11.6%	18.8%	11.7%	55.0%	3.0%
\$25K to \$49,999	5.9%	30.9%	9.5%	52.0%	1.8%
\$50K to \$99,999	2.9%	39.4%	16.6%	34.6%	6.5%
\$100K to \$249,999	7.7%	57.3%	8.7%	21.7%	4.5%
\$250K to \$499,999	5.8%	59.9%	15.1%	15.5%	3.8%
\$500K and over	8.1%	70.4%	9.3%	11.6%	0.7%
Total	6.9%	60.1%	11.5%	18.8%	2.7%

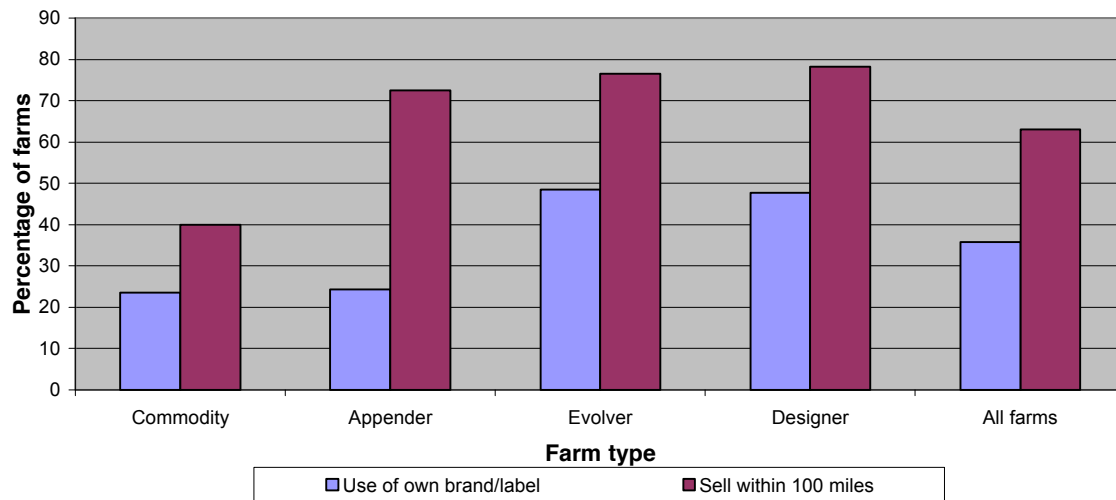
Since farm size and farm type are related, with commodity farms being larger than designer farms, the market channel for each farm type by farm size was investigated to determine if large designer farms market differently than large commodity farms. The pattern of differences between farm types proved consistent. Regardless of size, designer farms sell a larger portion of their output directly to consumers than do commodity farms. The two designer farms in the largest sized categories, those with sales over \$500,000, sold all of their product either directly to consumers, 65%, or to retail stores, 35%. The second largest cohort, seven farms with sales between \$250,000 and \$500,000, received 45% of their receipts directly from consumers, 30% from stores, and 16% from wholesale. This compares to conventional farms where the largest size group sold 7% of their sales directly to consumers and 80% to wholesale markets, and the second largest cohort, which sold 5% directly to consumers and 75% to wholesale markets (Table A4). Of the seven designer farms in the two largest sized categories, four are classified nursery/greenhouse while three are food producers.

Table A4: Market channel by type and size of farm

Designer					
Sales Category	To farmers	To wholesale	To retail	To consumers	To others
Up to \$9,999	4.3%	4.0%	11.1%	75.3%	5.3%
\$10K to \$24,999	3.5%	10.6%	6.3%	75.4%	4.2%
\$25K to \$49,999	0.1%	15.3%	10.7%	73.2%	0.8%
\$50K to \$99,999	3.6%	10.7%	28.5%	52.2%	5.0%
\$100K to \$249,999	4.2%	9.6%	23.3%	62.5%	0.5%
\$250K to \$499,999	1.4%	16.4%	30.0%	45.0%	7.1%
\$500K and over	0.0%	0.0%	35.0%	65.0%	0.0%
Total	2.2%	10.4%	26.5%	57.3%	3.5%
Commodity					
Sales Category	To farmers	To wholesale	To retail	To consumers	To others
Up to \$9,999	19.4%	21.1%	13.9%	32.9%	12.7%
\$10K to \$24,999	17.5%	33.1%	18.7%	29.7%	0.9%
\$25K to \$49,999	6.7%	47.1%	5.0%	40.1%	1.1%
\$50K to \$99,999	1.2%	64.3%	8.2%	15.7%	10.7%
\$100K to \$249,999	8.0%	81.7%	0.9%	3.2%	6.2%
\$250K to \$499,999	7.0%	74.7%	10.1%	4.7%	3.4%
\$500K and over	6.2%	79.9%	7.4%	6.6%	0.0%
Total	6.6%	76.4%	7.4%	7.0%	2.6%

Designer farms tend to use more product branding, 48% of their marketing compared to 23% for commodity farms, and designer farms believe more of their output goes to local consumers, 78% compared to 40% for commodity farms (Fig. 7). While this proportion appears high for commodity farms, about half of Maine produced milk is consumed in state. Dairy farms are a substantial component of the farms surveyed and many dairy farms likely identify themselves as commodity farms.

Figure 7: Marketing techniques by farm type



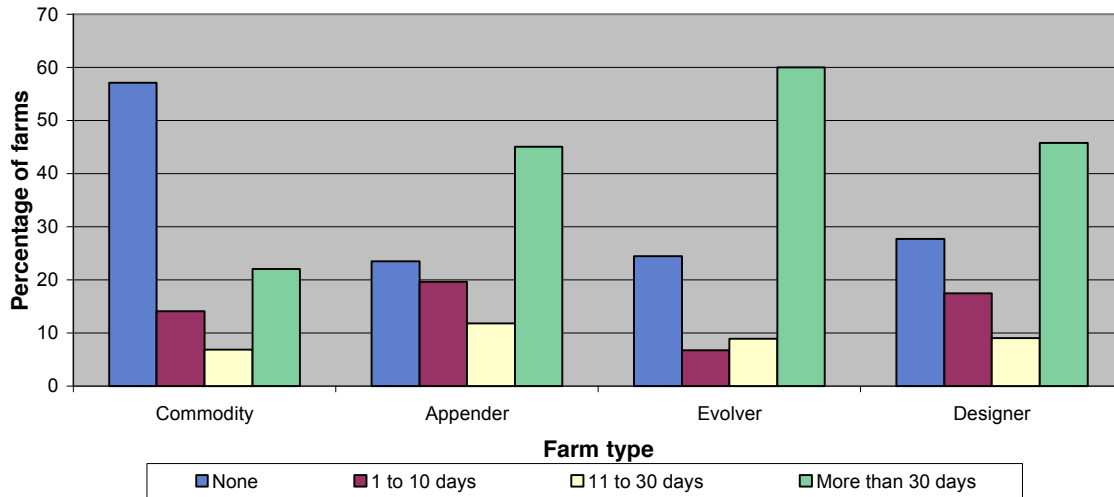
Farm operations and family demographics

Changing the farm operation. While designer farms are more complex and multifaceted than commodity farms, they apparently are as settled as commodity farms. About 42% of commodity farms indicate they made significant changes in their operations in the past three years, compared to 40% of designer farms and 43% of appender farms. Evolver farms indicate nearly 65% made such changes. The number of farms considering significant changes in the next three years appear similar, with 37% of commodity farms anticipating significant change, compared to 40% of appenders, 44% of designers, and 67% of evolvers.

Community connections. The intensive interviews suggested that sustainable farmers highly regard visits to their farms from community neighbors. On the other hand, it might be expected that commodity farmers who focus on minimizing production costs and marketing wholesale find it difficult to invite the public into the farming operation. The results of this survey support this proposition. A majority of commodity farms, 57%, are closed to the public, while only 28% of designer farms are closed. On the other hand, 46% of designer farms open their farm to the public in excess of 30 days per year, compared to 22% for commodity farms. Public access in this survey includes visits to farm stores, roadside stands and other marketing venues. Unlike

most characteristics, both evolvers and appenders are more consistent with designers than commodity farms regarding openness of their farm to the public (Fig. 8).

Figure 8: Days open to the public by farm type



While much of this access may focus on selling product to local consumers, it does suggest that sustainable agriculture farms are more closely linked to their communities than commodity farms.

Education of farm family members. By all measures, designer farmers and their spouses are better educated than their commodity counterparts, and the total farm population seems to be better educated than the general population. For the farm population generally, 56% have a post secondary degree, including 15% with professional or graduate school degrees. For the general population, 16% of Maine’s residents and 19% of national residents have post secondary degrees.

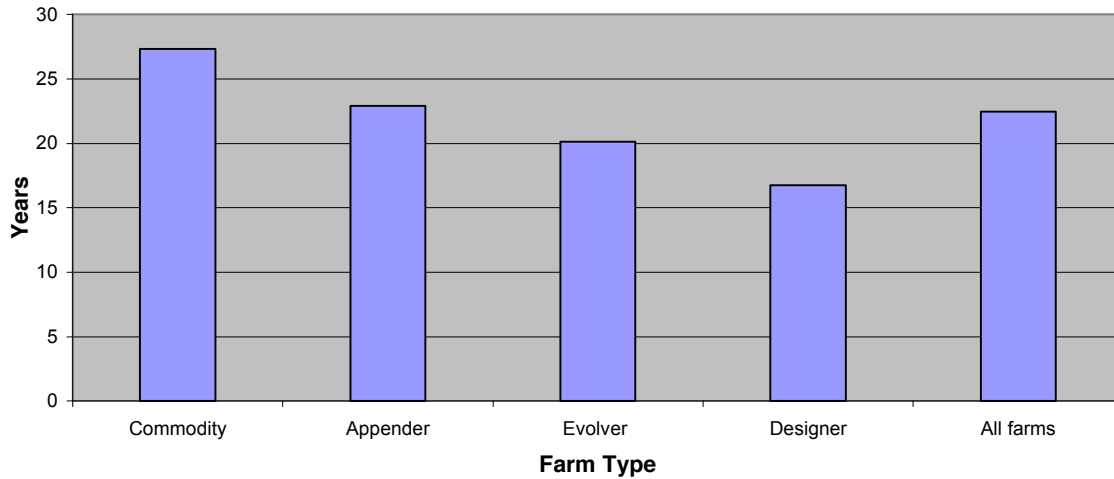
Nearly 84% of designer farmers and spouses have some post- secondary education, compared to 63% of commodity farms, 55% of appenders, and 78% of evolvers. Many more designer farmers and spouses than conventional farmers and spouses have graduate level educations, with 27% of designer farm members having attended a graduate or professional school compared to 13% for conventional farms (Table A5).

Table A5: Farm family education levels by farm type

Highest Level Attended	Commodity	Appender	Evolver	Designer
High school	36.6%	44.9%	22.1%	16.5%
College	50.5%	42.9%	51.9%	56.1%
Graduate school	12.9%	12.2%	26.0%	27.4%

Farming experience. While the survey did not ask for age, it did ask for years of farming experience and found substantial differences by farm type. For all farms, the average years of farming is 22.5, including 27 for commodity farmers, 23 for appenders, 20 for evolvers and 17 for designers. Assuming most farmers came into the vocation at the start of their working lives, it appears that sustainable agriculture farmers are considerably younger, on average, than industrial farmers (Fig. 9).

Figure 9: Average years farming by farm type

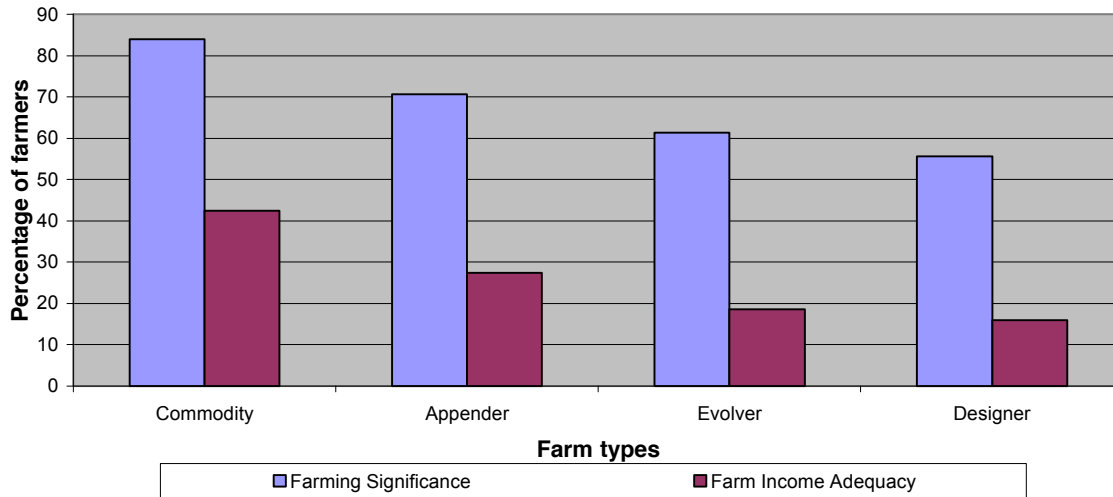


Farm income. Respondents were asked several questions regarding income and livelihood, including “Does farming account for a significant part of your livelihood?” and “Is your net farm income able to sustain the needs of you and your family?” The first question was designed to determine the importance of farming to the family, including providing the context for a desirable quality of life, even if farm income is not sufficient to support the financial needs of the family. The second question was designed to elicit the adequacy of farm income to provide the farm family with its financial needs.

In general, farming is a significant part of the livelihood of Maine farmers, even when farm income does not fully provide for the financial needs of the family. Nearly two-thirds, 64%, of all respondents report that farming is significant to their livelihood, while only 29% report that farm income sustains the financial needs of the family. The significance of farming for family livelihood varies by farm type, including 84% of commodity farms, 71% of appenders, 61% of

evolvers and 56% of designers. Farm income provides the family financial needs for 42% of commodity farms, 28% of appenders, 19% of evolvers and 16% of designers (Fig. 10).

Figure 10: Farming significance and farm income adequacy



Off-farm employment. With farm income providing adequate family income for less than one-third of the farm population, income from off-farm sources is an important component of family finances for many Maine farm families. Of the total surveyed population, 64% of farms have at least one member working off farm for income, and both farmer and spouse have off-farm jobs on 29% of surveyed farms. The amount of off-farm work differs significantly by type, with 35% of commodity farmers working off-farm compared to 53% of designer farmers and 46% of all farmers. The rate of farm spouses working off-farm is similar, with 38% of commodity farms, 55% of designer farms and 47% of all farms reporting that the spouse has off-farm work. Both farmer and spouse work off-farm on 20% of commodity farms and 36% of designer farms (Table A6).

Table A6: Off-farm work by farm type

	Commodity	Appender	Evolver	Designer	All Farms
Neither	47.0%	22.6%	40.0%	27.3%	35.9%
Farmer only	14.9%	20.8%	20.0%	17.4%	17.1%
Spouse only	17.7%	17.0%	15.6%	19.2%	18.0%
Both	20.4%	39.6%	24.4%	36.0%	29.0%

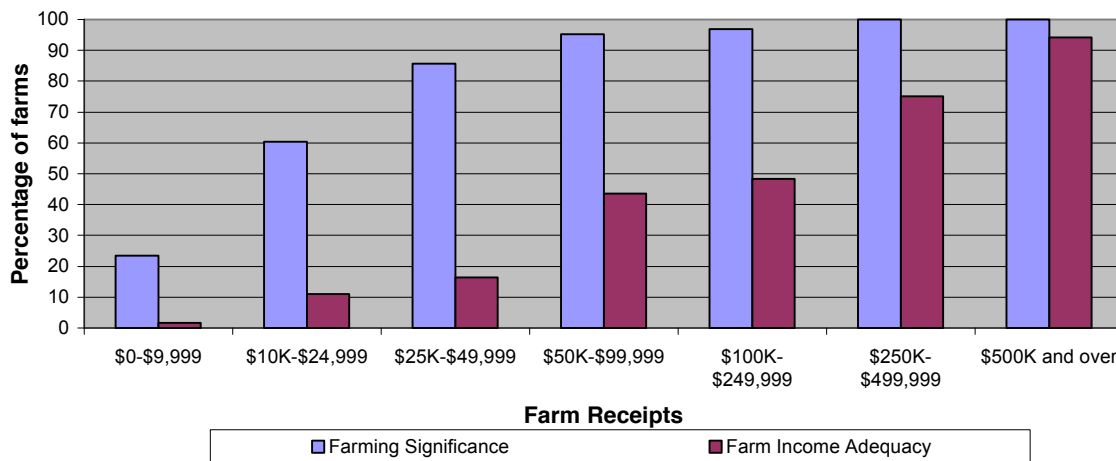
Off-farm employment contributes more than half the family income for 31% of the commodity farms, 56% of designer farms and 46% of all farms. In addition to income, health insurance is a major consideration for working off farm for 63% of farm families with off-farm employment.

Farm size and farm income. On a majority of farms with sales less than \$250,000, farm income does not provide fully for family financial needs. While substantial farm receipts and therefore farm size appear to be an important element for farm income sufficiency, it is not a guarantor of income sufficiency. Two farms in the largest category with sales over \$500,000 report that farm income is insufficient to meet family needs and one-quarter of those in the \$250,000-\$500,000 sales category report that farm income is insufficient.

At the other extreme, three farms in the smallest size categories, representing less than 2% of those with sales under \$10,000, report their farm income is able to sustain the family needs, while 11% of farms with sales between \$10,000 and \$25,000 report farm income is able to provide family needs (Fig. 11).

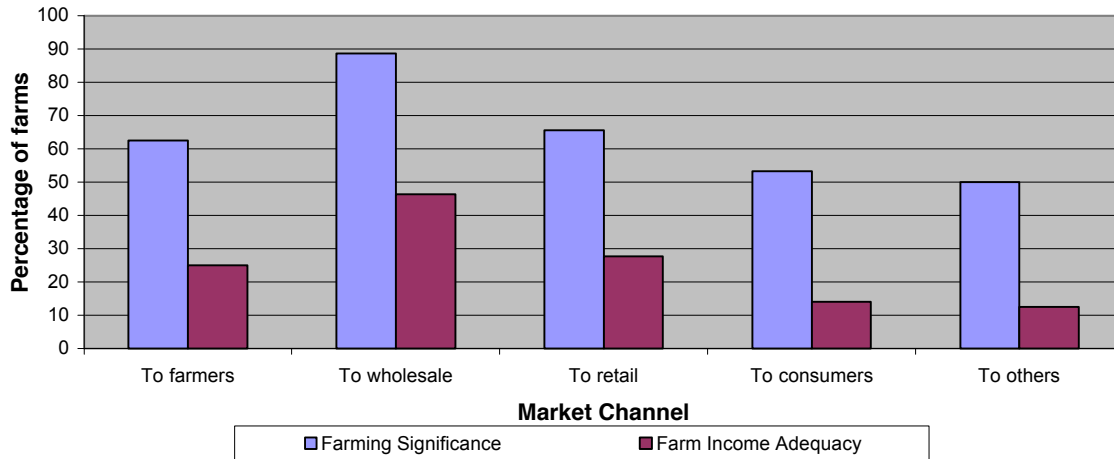
Over one-half of all farms with sales over \$10,000 report that farming plays a significant role in their livelihood, and over 95% report the same once sales surpass \$50,000. All of the 49 farms in the two highest sales brackets, those with sales exceeding \$250,000, report that farming is a significant component of their livelihood (Fig. 11).

Figure 11: Farming significance and farm income adequacy by farm receipts



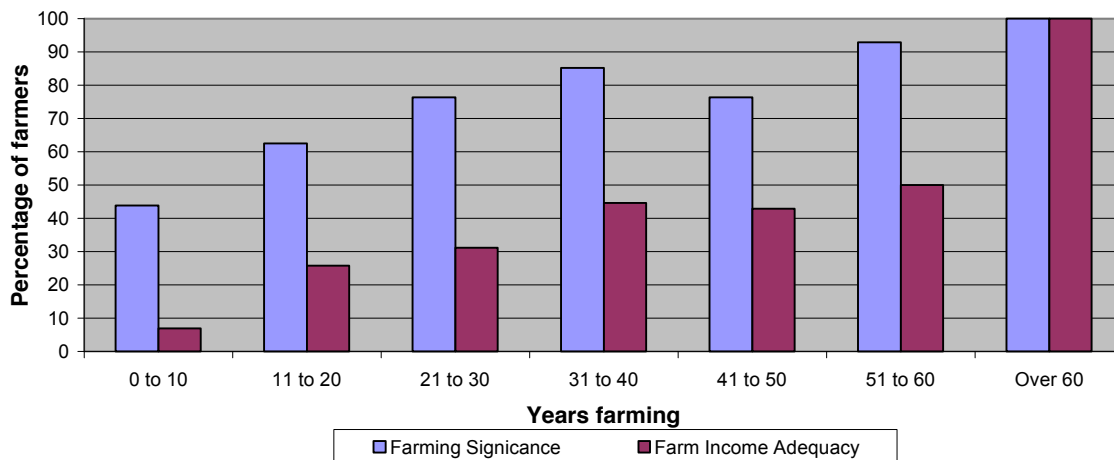
Farming significance and farm income adequacy are quite different for farms using different market channels. Those selling into wholesale markets, who tend to be larger and industrial, find farming plays a greater role in providing both livelihood and family income than those selling directly to consumers, who tend to be designers and smaller in size. For farmers selling primarily into wholesale markets, 89% indicate that farming is an important component of their family livelihood and 46% indicate that their farm income is sufficient to provide for their family needs. On the other hand, 53% of those selling primarily directly to consumers report that farming is a significant part of their livelihood and 14% indicate that their farm income is sufficient to meet their family needs (Fig. 12).

Figure 12: Farming significance and farm income adequacy by market channel



Farming longevity. Farming longevity increases the likelihood that farming provides significant family livelihood and income adequacy. The longer farmers are at it, the greater role farming plays in providing both livelihood and adequate family income. However, only farmers with over 50 years of farming experience report that all could meet family financial needs with farm income. Only 7% of those with less than 11 years of experience report that farm income meets their family needs. That proportion reaches 43% by the time farmers have over 30 years of experience (Fig 13).

Figure 13: Farming significance and farm income adequacy by years farming



Discussion

Two specific project tasks are addressed in this discussion: 1) Determine the character, degree and extent of sustainability of Maine agriculture, and 2) provide information that assists farmers in determining whether adopting more integrated practices makes sense on their farms. Relying primarily on the survey data, we first determine the character, degree and extent of sustainability in Maine agriculture, and then, using both the data analysis and intensive interviews, we discuss the appropriateness of adopting these systems by interested farmers.

Character, degree and extent of sustainable farming

The baseline survey demonstrates that farms practicing sustainable agriculture are distinct from farms practicing industrial agriculture. Using input from the initial survey of nominated sustainable farms and intensive interviews, we characterize sustainable agriculture farms as those that “operate as a biological whole...with many enterprises that complement one another...depending more on high-value niche markets than efficiency gained through volume production”. Industrial farms are characterized as “specializing in the production of one or two commodities sold to high-volume buyers... where success depends on being an efficient producer.”⁶

Farming characteristics

Farm types. The intensive interviews suggested and the general survey confirmed the existence of two sustainable agriculture farm types and two industrial agricultural farm types. *Designer* farms are sustainable farms that are designed as whole systems from the start; *evolver* farms are sustainable farms transitioning from industrial farms. Two industrial agriculture farm types are identified. *Commodity* farms are industrial farms that specialize in producing one or a few commodities and whose financial viability depends on being an efficient producer in a commodity market. *Appender* farms are industrial farms that rely on one or a few commodities, but have also adopted practices and enterprises associated with sustainable systems. However, they intend to remain an industrial farm. By most measures commodity farms are at one end of an industrial/sustainable continuum and designer farms at the other. Appender and evolver farms fall between them respectively.

Over 80% of respondents identified their farm type, with roughly an even split between industrial and sustainable. Commodity and appender farms, the industrial types, represent 52% of respondents, and designers and evolvers, the sustainable types, 48%. For Maine agriculture generally, sustainable farms likely outnumber industrial farms because small farms are under-

⁶ In this discussion farms characterized as practicing sustainable agriculture are referred to as sustainable farms, those using industrial systems are referred to as industrial farms. Sustainable farms include both designer and evolver farm types. Industrial farms include both commodity and appender farm types.

represented in the survey and sustainable farms represent a disproportionately high proportion of small farms⁷.

Commodity farms and designer farms, the end types, represent nearly 80% of the survey population. They seem to be destination types. Compared to evolver farms, fewer of these farms anticipate major changes. Evolver farms are in a transition from industrial to sustainable systems and report changing their operations more than the other types. Once established, operating a complex system, apparently, requires no more change than operating an industrial system and requires less change than moving from an industrial system to a sustainable system.

System vs. linear production. The differences between sustainable and industrial farming can be expressed as the distinction between operating a system in the case of the sustainable farm and operating a throughput process in the case of the industrial farm. This distinction between a **system** and an **input-output process** was prominent in the intensive interviews and was further validated by the survey. Sustainable farmers, both designers and evolvers, spoke of the importance of establishing and maintaining a system. The components of the system, whether a particular crop, livestock breed, or variety choice, seem less important than the holistic system. Most sustainable farmers talk about changing -- in some cases constantly experimenting with crop selection and placement, for example -- as a means of improving the performance of the system rather than the output of a particular crop.

The survey confirmed that industrial farmers, on the other hand, focus on reducing the cost of production of their output. This distinction suggests that farm management techniques and farm financial and economic models should be appropriately different. The more conventional economic models that view farm management decisions as choosing a set of outputs and inputs guided by production functions and prices may be appropriate for industrial farms, but sustainable farms would likely be better served by models based on complex systems concepts.

Farming practices and complexity. Sustainable farms are more complex than industrial farms. On average, sustainable farms implement significantly more production and value-added practices than industrial farms. They farm fewer acres but produce a higher proportion of high-value crops. They often integrate livestock into their cropping systems, but it is more apt to be chickens, sheep and beef than dairy. Commodity farms produce on more acres and focus on field crops with dairy their livestock of choice.

However, not all farms utilizing practices that are often associated with sustainable farming systems are sustainable farms. All farms in this survey, regardless of type, use crop rotations in about equal proportion. Sustainable farmers indicate that they use green manure crops, cover

⁷ Considering the survey list of 3,450 farms did not contain a list representing blueberry producers or larger scaled egg producers, it contained 1,692 fewer farms than the 1997 Agricultural Census indicated for Maine. According to the distribution of farm size by sales in both the survey and Census, all the under representation was in the smaller farms, those with sales less than \$50,000. Assuming little bias in the cohort of surveyed farms that responded, and considering that smaller farms tend to disproportionately belong to the sustainable farming category, the survey suggests that over half of all farms in the state are one of the two sustainable farming types.

crops and intensive rotational grazing somewhat more frequently than industrial farms, but the statistical relationships are weak. These three cropping practices represent sound soil management stewardship and can result in reduced purchased inputs, and sustainable and industrial farms use them in similar proportions. These soil management practices do not contribute well to distinguishing between sustainable farms and industrial farms in this survey. On the other hand, sustainable farms indicate they use significantly more drip irrigation, organic production and season extension techniques. These techniques are generally associated with higher valued crops and are better characteristics for distinguishing sustainable farms in this survey.

Of the four types of farms in the survey, designer farms are the most complex, evolvers and appenders somewhat less, and commodity farms the least complex. The results support the proposition that sustainable agriculture farms are more complex, better resembling a system, while commodity farms are less complex and more linear.

Marketing. Survey respondents indicate a fundamental difference in marketing strategy between industrial farms and sustainable farms. Industrial farms generally produce larger volumes of output, sell into commodity markets and compete on price. Production efficiency is key to their success.

Sustainable farms, on the other hand, operate complex systems with multiple outputs. They do not capture economies of scale, do not focus on producing at lowest cost and do not compete in commodity markets. Rather, their success depends on adding value to their production. The interviews and surveys suggest at least two strategies used for adding value. One is selling higher up the marketing chain, preferably directly to consumers, to capture financial returns for providing marketing services. The second strategy is to add value to the farm-produced commodity by processing, packaging, branding, etc. These strategies can contribute toward distinguishing sustainable farms from industrial farms.

In the general surveyed population, two thirds of sustainable farms rely on direct sales to consumers for most of their production, compared to less than 20% of industrial farms. On the other hand, 60% of industrial farms and only 5% of sustainable farms sell most of their production into wholesale markets. By marketing directly to consumers, sustainable farmers are providing marketing services for which they receive compensation. Consequently, they are competing with the non-farm marketing sector rather than with other farmers. The cost of producing product becomes less critical to their economic viability than the ability to add value to it. The provision of marketing services, rather than efficient production in a competitive environment, is key to their financial viability. The distinction between providing marketing services for which there is a financial return that represents a substantial component of the farm income stream and competing through pricing at the farm level seems to characterize one of the differences between sustainable and industrial farms.

While most sustainable farms are not capturing economies of scale, many are capturing economies of scope. Marketing a substantial number of products from numerous enterprises allow such capture. For example, while it would not be financially viable for most farms to take

only a single product to a farmers' market in Maine, a substantial number of farms in this survey find it profitable to offer numerous products at farmers' markets. One interviewed farmer describes his farmers' market offerings as "a veritable cornucopia". With substantial sales per customer achieved by selling an array of products, these farmers are capturing economies of scope in their marketing activities.

Another strategy for capturing higher returns from farm products is to embed value into the farm product. Surveyed farms did that in a number of ways. In some cases, farms build a reputation for quality and dependability that brings premiums from certain customers. One farm, for example, provides select restaurants with freshly harvested food products, especially greens. Over the years its reputation for freshness, quality, dependability, and localness has brought their products a premium over industrially produced products from the non-farm distribution system. Significantly more sustainable farms brand their product as a way to capture that value. In other cases, dairy farmers using sustainable systems produce organically certified milk, increasing the value over that for conventionally produced milk. In both cases, volumes produced are relatively small compared to commodity farms, prohibiting production efficiency gains from economies of scale. These marketing activity differences suggest that sustainable agriculture is as much about marketing as production, but the two are inexorably linked.

Direct marketing contributes to the integration of sustainable farming into the local community, but appears not to represent the totality of that integration. In contrast to industrial farms, only about 25% of sustainable farms are closed to the public and one half are open to the public for extensive periods of time. Much of this openness is likely a component of marketing farm products directly to consumers, but the intensive interviews suggest that sustainable farm families feel critically embedded into their community, even beyond selling to their neighbors. Being open to community members is one way to express this value; sustainable farmers seem to enjoy and respect local community.

While a greater proportion of designer farms tend to wash, pack and label their product, and sell a greater proportion directly to local consumers than commodity farms, it should be noted that commodity farms, in absolute terms, provide a greater quantity of output with these characteristics into these channels. Because commodity farms offer less diversity of output, they would be expected to rely more heavily on wholesale markets where volumes of purchases of single commodities would be greater than in direct consumer markets. Although this is the case for most of their output, 17% of responding industrial farms indicate they rely on direct consumer sales for a majority of their sales. Apparently, direct consumer sales represent a substantial market channel for many Maine farms regardless of type.

Farm family characteristics and the role of farm income

Education and age. The differences between sustainable farms and industrial farms extend to family characteristics that may be related to the choice of farming systems and markets. While the education level of Maine farmers and spouses are higher than the state population generally, the education level of sustainable farm families exceeds that of industrial farm families. Only 18% of sustainable farmers and spouses had no post secondary education, compared to 38% for industrial farms, and 27% of sustainable farmers and spouses have attended graduate or

professional school compared to 13% for industrial farm families. Sustainable farmers are more highly educated although the analysis does not explain the causal relationship.

In the past, smaller and more diversified farms have often been considered to be backward, having missed the pathway to the “modern farm”. Industrial farmers, on the other hand, were often associated with an agricultural college education. If those perceptions were ever true, they appear not to be correct in Maine at this time. Are sustainable farmers more educated because the complex systems require more education, or because the complex systems offer greater interest to those with more education, or because the smaller farms allow for more off-farm work that may require more education? Since sustainable farmers have been farming fewer years and therefore are probably younger, as noted below, it may be a greater likelihood that a younger farmer has a college education. Whatever the reason, there is a significant difference between the education level of sustainable farm families and industrial farm families.

Sustainable farmers in Maine, on average, have been farming about 60% as long as their industrial counterparts. While the question was not explicitly asked, it is likely they are also younger than industrial farmers. If sustainable farmers entered the vocation upon completion of college, the average age of sustainable farmers in Maine would be just under 40 years. Their most productive years would be ahead of them. This contrasts substantially from the average age of industrial farmers who would be in their mid-fifties.

Farm income and family livelihood. While farming is a significant component of the livelihood of over two-thirds of Maine farm families, only about one-quarter rely on it solely for their families’ financial needs. However, the sources and roles of the farm in supporting family livelihood and family income are significantly different between sustainable and industrial farms. Industrial farms rely on farm income to provide for the family’s financial needs to a much greater extent than sustainable farms. While farming is a significant part of family livelihood for a majority of sustainable farms (57%), it provides the sole family income support for only 17% of those farms compared to 39% of industrial farms. It should be noted, however, that although they rely on farm income to a greater extent than sustainable farms, well under half of industrial farms rely on farm income for all their family financial needs.

As expected, off-farm employment and income are more integral to sustainable farms than industrial farms. About 70% of sustainable farms have at least one member working off farm, and over one-half receive a majority of their family income from off-farm employment. While off-farm work contributes a substantial portion of income to meet the family needs of sustainable farms, health insurance is an important consideration for working off-farm for nearly two-thirds of those farm families with off-farm workers.

Advice to farmers considering sustainable farming

The intensive interviews provide advice from operating sustainable farmers to those considering entering or transitioning to sustainable farming. The advice reported here is included and

expanded in the video *Elements of Sustainable Agriculture* and is reflected in the case stories found in this publication.

While there are exceptions to the following advice, readers should find it quite consistent for the ideal designer and, where appropriate, evolver farm types. To be successful, generally, sustainable farmers must prefer to operate complex systems with moderate production goals rather than high volume throughput systems with a focus on production efficiency. Farmers considering a designer farm model should have modest income expectations, at least in the early years; should anticipate off-farm work as an integral part of the farming enterprise for at least one of the farming partners for a few years; should enjoy operating complex biological systems with diverse enterprises; should be comfortable integrating into the community; and should enjoy selling products directly to users, cooperating with other farmers that do so, or be able to add value to their farm production.

Interviewed farmers provide a number of specific recommendations for potential designer farmers. First, they emphasize that soil and location are critical attributes to the selection of a farm site. While good soils are critical to most farming operations, they are especially so for sustainable farms that depend substantially on their own resource base rather than on purchased inputs for fertility. Since marketing channel choices are an integral part of the sustainable farm, location is a second important farm selection choice criterion. For sustainable systems anticipating selling directly to consumers, consumer access becomes critical. If an on-farm market is anticipated, the farm should have access to substantial traffic, at least in the developing stage. Using farmers' markets is less location constraining, but here, too, prospective farmers will want to locate where farmers' markets that are appropriate for their operation can be efficiently accessed.

Second, interviewed farmers advise new farmers to start small and scale up. This advice is based on three considerations. First, minimizing debt reduces the possibility of failure. Interviewed sustainable farmers were quite insistent that debt loads need to be low, especially in the early years. Second, operating at a small scale while at the low end of the learning curve minimizes the costs of mistakes. While it appears the general designer model can be quite successful for many farmers, a specific designer model, unlike an industrial model, cannot be generally applied. The farmer will have to learn how best to implement a specific farming system in a specific context, and that learning will necessitate mistakes. Starting small helps minimize the costs of those mistakes. Three, enthusiasm for this vocation should be tested at a small scale. Most interviewed farmers believe that sustainable farmers can be successful only if they are passionate about their operations and that passion should be tested at a small scale. Several farmers suggest that the actual experience of sustainable farming can be quite different from the perception of it. Thus, it is wise to test the enthusiasm before committing substantial investments.

A third set of recommendations addresses the challenges of scaling up to a viable size. One suggestion is to start at farmers' markets. The entrance fee is relatively low and the capacity to grow with increasing demand for the farm's products is direct and obvious. Another farmer suggests starting with a few customers, in this case restaurants, and adjusting production as demand from those and from new customers grow. Another urges sustainable farmers to stay flexible, be opportunistic, and avoid locking the operation into a set of production practices that

are costly to change, since growth requires responding to market opportunities that may require production changes. Most interviewed farmers urge new farmers to grow out of profits rather than from debt and in the scaling up process to minimize capital expenditures where possible.

A fourth set of recommendations addresses designing and operating cropping and livestock systems. Livestock farmers are urged to adopt management intensive rotational grazing systems where possible, even if they have to be modified because of pasture constraints. The useful life of dairy cows can be extended, pastures will be more productive and animals, including poultry, can spread manure without requiring labor and equipment. One farmer advocates grazing multiple species to better utilize pasture production. Farmers are urged to integrate livestock into cropping systems. Animals produce manure that provides plant nutrients that replace purchased inputs. They can convert waste vegetable materials into a usable product. They can utilize otherwise underutilized pastures and they expand the product diversity of the farming operation.

Crop farmers are urged to use integrated pest management (IPM) techniques. They should consider setting action thresholds above those generally recommended for commodity farms, since many sustainable farms sell directly to consumers who can understand the need, at times, for some pest damage on products. Cover crops and green manure crops are recommended to add organic soil matter, especially with legumes that also can add nitrogen. It is also suggested that the best cropping systems for specific farming operations and specific sites will likely be discovered through a trial and error method.

Organic farmers, especially, caution about the importance of weed control, confirming the old adage that one year of weeds means seven years of seeds. Cultivation, often with Lely type weeders, is a critical operation in these systems. Flaming and hand weeding are sometimes used to provide adequate weed control. Crop rotations and placements are important elements of managing a number of pests.

The interviews provide some specific recommendations for potential evolver farmers. Transitioning a commodity farm to a sustainable farm is especially challenging. There is no single model to guide the transition since the transition process depends substantially on the parameters of the existing commodity farm as well as the desired sustainable farm. While many of the recommendations for establishing sustainable systems apply to evolvers as well as designers, interviewed evolver farmers did have some observations specific to the transition process. First, transitioning farmers will have to adjust their thinking about farming. They will be adopting a new system that requires downsizing production and scaling up selling. Several interviewed farmers indicate that this different way of thinking about farming is a fundamental change in the concept of farming and that some farmers have adopted this change readily while others require a longer period of adjustment.

Second, evolvers are advised to transition gradually to avoid costly errors and gradually trade underused assets from the commodity operation for those needed in the new enterprises. Evolvers should not keep assets that are not needed regularly just to have in case they are needed at some future time. Third, evolvers should add enterprises that complement other farm enterprises by season and by cycle. They should be mindful that the sustainable farm is a system and not simply a collection of enterprises. Fourth, evolvers should steadily and appropriately

shift production and sales from commodities to value-added products. Fifth, evolvers should coordinate the production diversification process with the value-adding process, especially selling products higher up the marketing chain, including direct sales to consumers.

Marketing is a critical component of sustainable agriculture. Interviewed farmers urge that markets be secured or known before production planning is done and that planting and other production activities be guided by identified market needs, including seasonal timing. To the extent appropriate, sustainable farmers are urged to cut out the middleman and market as directly as possible. In some cases, value should be added by further processing the raw agricultural commodity. If on-farm markets are an important channel, the farm family may need to develop promotional activities such as open houses, specific entertainment events or pet-a-pet facilities that draw customers to the farm. Diversified farm stores can be quite substantial and an important component of a sustainable farm, but they may need as much attention, or more, as the production process.

This advice may not be appropriate for every potential sustainable farm, but it seems quite reasonable for those farmers who want to adopt reasonably ideal designer and evolver models. As demonstrated in the survey, not all sustainable farms fit the ideal type. To the extent that some sustainable farms, for example, will be substantially larger than the ideals described here, the above advice needs to be modified accordingly. However, to the extent that potential farmers would like to adopt these more-or-less ideal types, the advice comes from farmers who are successfully operating such systems now. It should be sound.

Summary and conclusions

The interviews and surveys identify the characteristics of Maine's sustainable farms and farm families, at least as ideal types, and distinguish them from industrial farms. Sustainable farms include two types, designers who started with holistic systems and evolvers who are transitioning from a commodity system to a sustainable one. Industrial farms also include two types, commodity farms that specialize in producing one or two commodities at competitive prices and appenders who have appended sustainable practices to their commodity systems.

While recognizing there is considerable overlap between the types across the existing farming continuum, sustainable farms in Maine can be characterized as operating smaller but more complex production systems with a greater number of enterprises, selling higher valued products and being more connected to the local community. Sustainable farm families have higher levels of education and have been farming fewer years. While farming is a significant contributor to their family livelihood, off-farm employment is an integral part of the farming enterprise and family income.

Sustainable farms are operated as holistic systems rather than as linear input-output systems. This distinction suggests that farm management techniques and farm financial and economic models should be appropriately different. The more conventional economic models that view farm management decisions as choosing a set of outputs and inputs guided by production

functions and prices may be appropriate for industrial farms, but sustainable farms would likely be better served by models based on complex systems concepts.

There appear to be sustainable farming models in Maine that are economically, environmentally and community viable. Designer farms, especially, appear quite financially viable for appropriate beginning farmers. Generally, successful designer farmers are those who prefer to operate complex systems with moderate production goals rather than high volume throughput systems with a focus on production and efficiency. They should have modest income expectations in the early years, should integrate off-farm work as part of the farming enterprise for at least one of the farming partners for a few years, should be comfortable integrating into the community, and should enjoy selling products directly to users, cooperating with other farmers that do so, or be able to add value to their farm production. For those farmers, the designer model should work well.

Evolver farms can also be successful, including current commodity farms that are under financial stress. While requiring characteristics similar to designer farms, evolver farms have an additional challenge. They must fundamentally rethink the farming process, from one producing a commodity to one marketing products. Downsizing the production process and scaling up marketing services within a holistic biological system will be essential and will be most challenging to many farmers making the transition.

Despite the challenges, those farmers wanting to adopt designer and evolver farms will find a number of successful models in Maine, some of which are illustrated in the case stories in this report.

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Survey Analysis and Findings:

Appendix One

Agricultural Baseline Survey

1. Production Practices. Which of the following production practices do you use (please circle yes (Y) if you do use this practice or no (N) if you do **not** use this practice)

Livestock:

Coordinate activities with other farmers?	Y	N	
Crop Rotation?	Y	N	
Free-Range?	Y	N	
Nutrient Management Plan?	Y	N	
Organic?	Y	N	
Rotational Grazing?	Y	N	
Others? _____			

Crops:

Coordinate activities with other farmers?	Y	N	
Cover Crops?	Y	N	
Drip Irrigation?	Y	N	
Green Manures?	Y	N	
IPM?	Y	N	
Long Crop Rotations?	Y	N	
Organic?	Y	N	
Season Extension?	Y	N	
Others? _____			

2. Value-added Production Practices. Please circle yes (Y) if you use this practice or no (N) if you do **not** use this practice

Wash fresh produce?	Y	N	
Pack fresh produce?	Y	N	
Process meat products?	Y	N	
On-farm grain processing?	Y	N	
Further process product?	Y	N	
Other processing? _____			

3. Marketing Practices. We would like to know where you now market your output and in what proportions (**first column**) and would you like to make changes in the near future? (**second column**)

	% Sold Now (of 100%)	% Like to Sell (of 100%)
Percent you sell to other farmers?	_____%	_____%
Percent you sell to wholesale/bulk buyers? (For example, processors, insitutions, independent distributors, retail chain warehouses, etc.)	_____%	_____%
Percent you sell directly to retail stores? (For example, chain supermarket stores, independent grocery stores, restaurants, etc.)	_____%	_____%
Percent you sell directly to consumers? (For example, CSAs, Senior Farm Shar, farmers' markets, farm stands, Internet, mail order, etc.)	_____%	_____%
Percent you sell to other outlets?	_____%	_____%
Total:	100%	100%

We would like to know some of the marketing techniques you use.

	% Sold Now	% Like to Sell
Percent of your output you sell under contract?	_____%	_____%
Percent you sell with other farmers?	_____%	_____%
Percent sold through a farm cooperative?	_____%	_____%
Percent sold using your own brand/label?	_____%	_____%
Approximately what percent of your direct consumer sales are from tourists?	_____%	_____%
Approximately what percent of your output is sold to consumers within 100 miles of your farm?	_____%	_____%
In promoting your product, do you participate in any state or regional promotion programs? (such as labeling, advertising, signage, etc.)	Yes	No

If yes, which ones? _____

4. Operational Information

How many years have you farmed in total? _____

Have you significantly changed your operation in the past 3 years?
 (Please circle one) Y N

Do you anticipate significantly changing your operation in the next 3 years?
 (Please circle one) Y N

How many days per year is your farm open to the public including **farm stores** and other activities, such as **farm tours, open farm days, Maine Maple Sunday, etc.?**

(Please check one) 1 to 10 days per year
 11 to 30 days per year
 More than 30 days per year
 We are **not** open to the public

What crops do you raise (please include estimates of acreage)?

Crops	Acres	Crops	Acres
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

What livestock do you raise (please include number of head)?

Livestock	# of head	Livestock	# of head
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

5. Personal

We are interested in learning about the diversity of Maine farmers. With that in mind, please check the **one highest level** that applies for each person (if applicable).

	Me	My Spouse
I attended, but did not complete, high school	_____	_____
I completed high school	_____	_____
I attended, but did not complete, college/trades school	_____	_____
I completed college/trades school	_____	_____
I attended, but did not complete, graduate/professional school	_____	_____
I completed graduate/professional school	_____	_____

Does farming account for a significant part of your livelihood?
(Please circle one) Y N

Is your Net Farm Income able to sustain the needs of you and your family?
(Please circle one) Y N

What are your annual Gross Farm Receipts? Please check the range that applies.

Less than \$10,000 _____
\$10,000 - \$24,999 _____
\$25,000 - \$49,999 _____
\$50,000 - \$99,999 _____
\$100,000 - \$249,999 _____
\$250,000 - \$499,999 _____
\$500,000 or more _____

Do you or your spouse work off farm?
Farmer Y N
Spouse Y N

If yes to either the “Farmer” or the “Spouse”, please answer the next three questions.

Do you work **off-farm** more than 50% of your annual employed time?
Farmer Y N
Spouse (if applicable) Y N

Does **off-farm** employment contribute **more than 50%** of your family income?
Y N

Is the acquisition of health insurance a major consideration in working off-farm?
Y N

6. Farm Description

Please select the **one** description that best fits your farm.

_____ My farm specializes in the production of one or two commodities and I sell that production to high-volume buyers. The success of my farm depends on my being an efficient producer, which requires good farm management and increased production.

_____ While the success of my farm depends on producing one or two commodities efficiently and in large volume, I also produce small volumes of high-value products. I minimize my use of purchased inputs, like fertilizer and chemicals, by intensively managing the farm ecosystem with crop rotations and/or using locally-generated waste products.

_____ While I started with a farm that specialized in one or two commodities, I am now in a transition to a farm that operates as a biological whole and produces several products. By diversifying my production, I am able to reduce the use of purchased inputs. The success of the farm will depend on finding high-value markets, since I cannot be a minimum cost producer for most commodities.

_____ My farm has always operated as a biological whole. I designed it that way from the start. Its many enterprises complement one another but result in a complexity that is challenging to manage. Therefore the farm will probably stay smaller than a more conventional farm. Its success depends more on high-value niche markets than on efficiency gained through volume production.

7. Comments...We welcome any comments you may have regarding Maine agriculture, farming, or this survey. **Thank you for your participation.**

Survey Analysis and Findings:

Appendix Two

Table II.A: Figure 1 Data -- Livestock practices used by farm type
(percent of farms)

	Commodity	Appender	Evolver	Designer
Coordinate activities with other farmers	30.8	41.5	41.9	28.3
Crop rotation	41.7	54.8	48.3	44.9
Free range	19.3	20.5	28.6	59.3
Nutrient management plan	51.7	46.3	24.1	27.5
Organic	9.8	15.0	30.0	45.0
Rotational grazing	38.8	33.3	41.9	52.3

Table II.B: Figure 2 Data -- Cropping practices used by farm type
(percent of farms)

	Commodity	Appender	Evolver	Designer
Coordinate activities with other farmers	43.8	41.7	31.6	33.8
Cover crops	49.7	55.3	67.6	66.9
Drip irrigation	11.8	22.9	28.9	39.5
Green manures	51.3	50.0	53.8	67.1
Integrated pest management	45.3	42.9	51.3	43.7
Long crop rotations	41.7	43.8	47.2	44.4
Organic	9.2	27.7	35.0	65.0
Season extension	15.8	14.0	29.7	52.0

Table II.C: Figure 3 Data -- Value-added practices used by farm type
(percent of farms)

	Commodity	Appender	Evolver	Designer
Wash Fresh Produce	22.3	10.8	9.5	57.4
Pack Fresh Produce	29.2	9.2	11.7	50.0
Process Meat Products	16.1	16.1	19.4	48.4
On-farm Grain Processing	36.0	20.0	16.0	28.0
Further Process Product	15.0	8.3	15.0	61.7

Table II.D: Figure 4 Data -- Livestock choices by farm type
(percent of farms)

	Cows,							
	Dairy	Beef	Unspecified	Sheep	Chicken	Goats	Hogs	Turkeys
Commodity	27.5	10.4	11.0	4.9	2.7	1.1	1.1	0.5
Appender	22.6	18.9	13.2	1.9	11.3	-	7.5	3.8
Evolver	6.5	13.0	4.3	21.7	8.7	2.2	10.9	4.3
Designer	5.8	9.9	5.2	15.7	19.8	8.1	9.9	3.5

Table II.E: Figure 5 Data -- Crop choices by farm type
(percent of farms)

	Mixed Veggies	Sweet Corn	Potatoes	Pumpkin/Squash	Small Fruit
Commodity	8.2	7.7	28.6	5.5	10.4
Appender	26.4	13.2	15.1	11.3	18.9
Evolver	39.1	10.9	13.0	13.0	23.9
Designer	50.6	9.9	7.6	8.1	16.3
	Fruit Trees	Small Grain	Corn Silage	Hay	Pasture
Commodity	6.0	28.0	18.7	31.9	7.7
Appender	5.7	11.3	17.0	30.2	11.3
Evolver	19.6	10.9	6.5	26.1	2.2
Designer	9.3	4.1	1.7	16.9	2.3

Table II.F: Figure 6 Data -- Market channels used by farm type
(percent of gross sales)

	To farmers	To wholesale	To Retail	To consumers	To other
Commodity	6.6	76.4	7.4	7.0	2.6
Appender	19.3	59.0	6.5	14.1	1.2
Evolver	5.6	39.5	17.0	34.0	3.8
Designer	2.2	10.4	26.5	57.3	3.5

Table II.G: Figure 7 Data -- Marketing techniques by farm type
(percent of farms)

	Use of own brand/label	Sell within 100 miles
Commodity	23.4	40.0
Appender	24.3	72.5
Evolver	48.5	76.5
Designer	47.7	78.2
All farms	35.8	63.0

Table II.H: Figure 8 Data -- Days farm open to public by farm type
(percent of farms)

	Commodity	Appender	Evolver	Designer
None	57.1	23.5	24.4	27.7
1 to 10 days	14.1	19.6	6.7	17.5
11 to 30 days	6.8	11.8	8.9	9.0
More than 30 days	22.0	45.1	60.0	45.8

Table II.I: Figure 9 Data -- Average years farming by farm type
(mean values)

Commodity	27.3
Appender	22.9
Evolver	20.1
Designer	16.8
All farms	22.5

Table II.J: Figure 10 Data -- Farming significance and farm income adequacy by farm type
(percent of farms)

	Farming Significance	Income Adequacy
Commodity	83.9	42.4
Appender	70.6	27.5
Evolver	61.4	18.6
Designer	55.7	16.0

Table II.K: Figure 11 Data -- Farming significance and farm income adequacy by farm receipts
(percent of farms)

Farm Receipts	Farming Significance	Farm Income Adequacy
\$0-\$9,999	23.4	1.6
\$10K-\$24,999	60.3	11.0
\$25K-\$49,999	85.7	16.4
\$50K-\$99,999	95.2	43.5
\$100K-\$249,999	96.8	48.3
\$250K-\$499,999	100.0	75.0
\$500K and over	100.0	94.1

Table II.L: Figure 12 Data -- Farming significance and farm income adequacy by market
channel
(percent of farms)

	Farming Significance	Farm Income Adequacy
To farmers	62.5	25.0
To wholesale	88.6	46.2
To retail	65.5	27.6
To consumers	53.2	13.9
To others	50.0	12.5

Table II.M: Figure 13 Data -- Farming significance and farm income adequacy by years farming (percent of farms)

Years Farmed	Farming Significance	Farm Income Adequacy
0 to 10	44.0	7.0
11 to 20	62.6	25.8
21 to 30	76.5	31.3
31 to 40	85.3	44.6
41 to 50	76.4	42.9
51 to 60	92.9	50.0
Over 60	100.0	100.0

REPRESENTATIVE FARM BUDGETS

Overview

One component of the Northeast SARE project entitled “Establish Integrated Systems Baseline & Educational & Mentoring Programs” is “to provide information that assists farmers in determining whether adopting more integrated practices makes sense on their farms”. The following whole farm budgets were developed to provide part of that information. Readers interested in specific farms or potential farms can use the budgets by inserting their own specific values.

The budgets are based on the typologies developed during the project and include one “designer” budget and two “evolver” budgets. One evolver budget is for a farm transitioning from commodity potato production while the other is for a farm transitioning from commodity dairy production. The budgets represent representative types of sustainable Maine farms that were encountered in the survey and interview work rather than to any specific interviewed farm.

Budget Discussion

Each whole farm budget consists of gross revenues, variable costs for individual enterprises and costs of the whole farm that are not allocated by enterprise. The crop yield information is taken from a Maine seed company while the livestock yield figures are from Maine farmers and a Maine industry representative. The labor hours and material costs for each enterprise budget are from secondary sources. The prices for crops are taken from a phone interview of a broker of local Maine foods. The fixed costs for each whole farm budget are determined from phone interviews of individual farmers, town office personnel, and a banking official. The budgets that follow are presented with the whole farm budget first and the supporting enterprise budgets following.

Representative Farms

As indicated above, the whole farm budgets that follow are for representative farms – they do not represent any actual farm. The representative farms differ somewhat from observed farms in the enterprise mix. The number of crops grown is less than that observed in actual practice. For many farms it is not uncommon to grow 20 or 30 different crops. To simplify the budget presentation, the analyses were limited to nine crops and two livestock types for the “designer” farm, eleven crops and laying hens for the “potato-evolver” farm, and nine crops and a herd of dairy cows for the “dairy-evolver” farm. Since the number of crops is somewhat less than may actually be experienced, the acreage of each crop may be larger to reflect the appropriate farm size. While this accommodation should have little effect on the projected financial performance of the farm, an actual farm might have to have the larger number of enterprises to match local demand. Also, although not specifically indicated, the budgets do take into account, where applicable, multiple plantings of the same crop. Each whole farm budget includes both organic and conventional enterprises. This represents a number of farms in Maine and gives the reader the opportunity to compare both types of enterprises.

Farm Labor

In the following farm budgets, all operator labor is explicitly accounted for although the farm family provides much of that labor and receives the returns as net farm income rather than as paid labor. “Skilled” production labor and marketing labor were priced at \$15.00 per hour while “unskilled” production and marketing labor were priced at \$8.00 per hour. In actuality, for “designer” farms much of the unskilled labor is provided by interns who work for room and board, a minimal weekly stipend, and the opportunity to learn from experienced farmers. Based on telephone interviews, owners of “designer” farms tend to provide 55-60% of the annual labor needs whereas owners of “evolver” farms tend to provide 25-30% of the annual labor needs. Farm owners provide more of the “skilled” labor while hired help provide more of the “unskilled” labor.

Gross Revenue Minus Variable Costs

The whole-farm budgets in this report include whole-farm costs and enterprise budget costs. The whole-farm costs consist of both variable and fixed costs that are more appropriately assigned to the total farm operation than to individual enterprises. Whole-farm variable costs include certain building and equipment operating costs and marketing costs that would occur regardless of the particular enterprise mix. Whole-farm fixed costs are the normal ownership costs of the farming operation (i.e., land, buildings and equipment). Consequently, the “gross revenue minus variable costs” value in each enterprise budget includes only enterprise variable costs and is different from “return over variable costs”, which includes all variable costs, and which is widely used in economic research.

Designer Farm Budget

Net Farm Income

As seen in Table B2, and consistent with the farmer interviews and survey results from this project, net farm income for the representative designer farm is only \$654. This does not, however, represent the full contribution of the farm to the family livelihood. On a typical designer farm, the farm family receives about \$11,500 of the explicit labor costs as income, and they receive substantial non-cash benefits of housing and food. Since the fixed costs in these budgets include the farm residence and since the farm family gets much of its food from their own production, the non-cash contribution on the typical designer farm can be substantial. In addition to farm income, most designer farms have at least one family member working off-farm and contributing over half the cash income for the family. While the net farm income in this whole farm budget appears extremely modest, the farm's contribution to family livelihood is much greater and appears to be economically rational.

Assets Required

The asset base required to implement a representative designer farm operation consists of land, buildings, and equipment, and for a representative designer farm requires a capital expenditure of \$315,020. The costs of these items will vary depending on where in the state the farm is located, and in the condition of the equipment when it is purchased. (Table B1)

Table B1: Asset requirements for a designer farm

Asset Base	
Equipment Value	\$ 31,753
Buildings Value	\$ 168,775
Land Value	\$ 114,492
Total Asset Base	\$ 315,020

Table B2: Whole-farm budget, designer farm

	Price per Unit	Quantity	Units	Value	Acres
Gross Revenues					
Tomatoes -- Field (organic)	\$ 1.99	5,525	lbs	\$ 10,995	0.25
Tomatoes -- Greenhouse (organic)	\$ 2.50	4,496	lbs	\$ 11,241	0.037
Lettuce (organic)	\$ 1.49	2,304	head	\$ 3,433	0.2
Carrots (conventional)	\$ 1.00	9,000	lbs	\$ 9,000	0.3
Spinach (organic)	\$ 1.75	1,250	lbs	\$ 2,188	0.2
Green Beans (organic)	\$ 1.50	500	lbs	\$ 750	0.25
Broccoli (organic)	\$ 2.00	1,313	lbs	\$ 2,625	0.25
Muskmelons (conventional)	\$ 0.60	7,500	lbs	\$ 4,500	0.5
Sheep & Wool (conventional)		11	head	\$ 4,066	
Beef (conventional)	\$ 845.00	5	head	\$ 4,225	
Hay	n/a	21	tons	n/a	6.0
Total Gross Revenues				\$ 53,022	
Variable Costs					
Labor					
Production, Skilled Labor	\$ 4,552				
Production, Unskilled	\$ 6,099				
Marketing, Skilled Labor	\$ 6,000				
Marketing, Unskilled Labor	\$ 3,200				
Total Labor Costs	\$ 19,851				
Materials					
Seed	\$ 199				
Grafted plants	\$ 753				
Transplant production costs	\$ 109				
Potting mix	\$ 147				
Compost	\$ 495				
Fertilizer	\$ 287				
Insecticide/fungicides/herbicides	\$ 193				
Bees for pollination	\$ 157				
Utilities	\$ 575				
Row covers	\$ 146				
Plastic mulch	\$ 156				
Straw mulch	\$ 234				
Drip Irrigation	\$ 51				
Packing materials	\$ 233				
Cover crop seed	\$ 166				
Storage utilities	\$ 500				
Fencing	\$ 84				
Feed (barley and hay)	\$ 767				
Shearing costs	\$ 28				
Veterinarian costs	\$ 369				
Slaughter costs	\$ 1,300				
Equipment, fuel & maint	\$ 540				
Building, repair & maint	\$ 1,688				
Marketing materials	\$ 1,030				
Miscellaneous materials	\$ 1,044				
Total Material Costs	\$ 11,250				
Fixed Costs					
Interest, Buildings & Land	\$ 7,380				
Interest, Equipment	\$ 1,248				
Depreciation, Building	\$ 5,626				
Depreciation, Equipment	\$ 3,175				
Taxes, Insurance, Housing	\$ 1,270				
Taxes, Real Estate	\$ 2,568				
Total Fixed Costs	\$ 21,267				
Net Farm Income (Loss)					
	\$ 654				

Table B3: Fixed cost analysis, designer farm

		Dep. Yrs.	Annual Dep Cost
Asset Base			
Equipment Value	\$ 31,753	10	3,175
Buildings Value	\$ 168,775	30	5,626
Land Value	\$ 114,492		
Total Asset Base	\$ 315,020		
Property Tax Rate	\$ 15.21	per \$1,000	
Annual Fixed Costs			
Taxes, Real Estate	\$ 2,568		
Taxes, Insurance & Housing (Equipment)	\$ 1,270		
Depreciation, Buildings	\$ 5,626		
Depreciation, Equipment	\$ 3,175		
Interest, Buildings & Land	\$ 7,380		
Interest, Equipment	\$ 1,248		
Total Annual Fixed Costs	\$ 21,267		

Table B4: Marketing cost budget, designer farm

	Skilled Labor	Unskilled Labor
Labor		
Total Labor Hours	400.0	400.0
Total Labor Costs	\$ 6,000	\$ 3,200
Material Costs		
Tent	\$ 10.00	
Signage	\$ 25.00	
Market fees	\$ 400.00	
Packaging	\$ 400.00	
Scales	\$ 150.00	
Tables	\$ 20.00	
Coolers	\$ 25.00	
Total Material Costs	\$ 1,030.00	
Total Variable Costs	\$10,230.00	

Table B5: Organic field tomato enterprise budget, designer farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Tomatoes -- Field (organic)	22,100	0.25	5,525	lbs.	\$ 1.99	\$ 10,994.75
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor and Machinery						
Plow fields	0.5					
Spread manure	1.0					
Disk/harrow fields (3x)	0.8					
Seedling production						
Care for seedlings	3.8	5.0				
Transplant seedlings	2.0	2.0				
Direct seeding						
Laying plastic mulch	0.8	0.5				
Row coverings	0.8	1.0				
Cultivation	0.8					
Apply straw mulch		12.5				
Hand weed		3.8				
Fertilization						
Irrigate						
Pest control(4x)	1.0					
Harvest	25.0	37.5				
Wash, sort, etc.	25.0	50.0				
Plant cover crop						
Total Hours	61.3	112.3				
Total Costs	\$ 918.75	\$ 898.00				
	Cost					
Materials						
Seed	\$ 10.40					
Transplant production costs	\$ 109.20					
Compost	\$ 117.00					
Insecticide/fungicides	\$ 20.80					
Herbicides						
Greenhouse utilities						
Row covers						
Plastic mulch	\$ 52.00					
Straw mulch	\$ 234.00					
Drip irrigation						
Packing materials						
Misc. materials	\$ 208.00					
Cover crop seed						
Equipment, fuel & maint						
Building, repair & maint						
Storage utilities						
Total Materials Cost	\$ 751.40					
Total Variable Costs	\$ 2,568.15					
Gross Revenue Minus Variable Costs	\$ 8,426.60					

Table B6: Organic greenhouse tomato enterprise budget, designer farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Tomatoes -- Greenhouse (organic)	122,513	0.037	4,496	lbs.	\$ 2.50	\$ 11,240.52
		(1550 sq ft)				
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor and Machinery						
Bed preparation	10.1	40.2				
Seedling production						
Care for seedlings						
Transplant seedlings	10.1	40.2				
Direct seeding						
Row coverings						
Cultivation						
Hand weed, prune, etc.	55.3	251.4				
Fertilization						
Irrigate						
Pest control						
Harvest, grade, pack	23.1	50.3				
Clean up greenhouse	5.0	15.1				
Plant cover crop						
	Total Hours	103.6	397.2			
	Total Labor Cost	\$ 1,553.47	\$ 3,177.32			
	Cost					
Materials						
Grafted plants	\$ 752.90					
Potting mix						
Compost and fertilizer	\$ 342.63					
Insecticide/fungicides	\$ 130.71					
Bees for pollination	\$ 156.85					
Greenhouse utilities	\$ 365.99					
Propane for CO2	\$ 261.42					
String, hangars, and clips	\$ 120.26					
Plastic mulch	\$ 52.28					
Drip irrigation	\$ 26.14					
Packing materials						
Misc. materials	\$ 339.85					
Cover crop seed						
Equipment, fuel & maint						
Building, repair & maint						
Storage utilities						
	Total Materials Cost	\$ 2,549.05				
	Total Variable Costs	\$ 7,279.84				
	Gross Revenue Minus Variable Costs	\$ 3,960.69				

Table B7: Organic lettuce enterprise budget, designer farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Lettuce (organic)	11,520	0.2	2,304	Head	\$ 1.49	\$ 3,432.96
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor and Machinery						
Plow fields						
Spread manure						
Disk/harrow fields	0.4					
Seedling production						
Care for seedlings	2.0	4.0				
Transplant seedlings	4.0	12.0				
Direct seeding						
Row coverings						
Cultivation	0.8					
Hand weed	0.8	1.6				
Fertilization	0.4					
Irrigate		0.8				
Pest control						
Harvest (2x per wk; 12 wks)	4.8	33.6				
Plant cover crop (pre&post)	1.2					
Post-harvest handling	19.2	19.2				
Total Hours	33.6	71.2				
Total Labor Costs	\$ 504.00	\$ 569.60				
	Cost					
Materials						
Lettuce seed	\$ 16.22					
Potting mix	\$ 31.62					
Bagged fertilizer						
Seaweed or fish fertilizer	\$ 41.60					
Compost						
Insecticide/fungicides						
Herbicides						
Greenhouse utilities	\$ 8.32					
Row covers						
Plastic mulch						
Irrigation (20% = five years)	\$ 24.96					
Packing materials						
Misc. materials	\$ 11.23					
Cover crop seed	\$ 11.65					
Equipment, fuel & maint						
Building, repair & maint						
Storage utilities						
Total Material Costs	\$ 145.60					
Total Variable Costs	\$ 1,219.20					
Gross Revenue Minus Variable Costs	\$ 2,213.76					

Table B8: Conventional carrot enterprise budget, designer farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Carrots (conventional)	30,000	0.3	9,000	Lbs.	\$ 1.00	\$ 9,000.00
<hr/>						
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor and Machinery						
Plow fields	0.8					
Spread manure						
Disk/harrow fields						
Seedling production						
Care for seedlings						
Transplant seedlings						
Direct seeding	0.5					
Row coverings						
Cultivation (7x)	3.2					
Hand weed						
Fertilization	0.3					
Irrigate	0.5					
Pest control	0.3					
Harvest	6.6	10.8				
Post-harvest packing	7.2	35.4				
Plant cover crop	0.2					
Total Hours	19.4	46.2				
Total Labor Costs	\$ 290.25	\$ 369.60				
	Cost					
Materials						
Carrot seed	\$ 62.40					
Potting mix						
Bagged fertilizer	\$ 30.58					
Seaweed or fish fertilizer						
Compost						
Insecticide/fungicides						
Herbicides	\$ 2.18					
Greenhouse utilities						
Row covers						
Plastic mulch						
Drip irrigation						
Packing materials	\$ 152.26					
Misc. materials	\$ 39.94					
Cover crop seed	\$ 9.36					
Equipment, fuel & maint						
Building, repair & maint						
Storage utilities						
Total Materials Cost	\$ 296.71					
Total Variable Costs	\$ 956.56					
<hr/>						
Gross Revenue Minus Variable Costs	\$ 8,043.44					

Table B9: Organic spinach enterprise budget, designer farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Spinach (organic)	6,250	0.2	1,250	lbs	\$ 1.75	\$2,187.50
<hr/>						
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor and Machinery						
Plow fields						
Spread manure	0.4	1.0				
Disk/harrow fields	0.8					
Seedling production						
Care for seedlings						
Transplant seedlings						
Direct seeding (15x)	1.5					
Row coverings						
Cultivation	0.6					
Hand weed		0.2				
Fertilization						
Irrigate		1.0				
Pest control						
Harvest	6.0	20.0				
Plant cover crop		0.4				
Post-harvest handling	0.8	3.2				
Total Hours	10.1	25.8				
Total Labor Costs	\$ 151.50	\$ 206.40				
<hr/>						
	Cost					
Materials						
Spinach seed	\$ 13.52					
Potting mix						
Bagged fertilizer	\$ 10.40					
Seaweed or fish fertilizer						
Compost	\$ 14.56					
Insecticide/fungicides						
Herbicides						
Greenhouse utilities						
Row covers						
Plastic mulch						
Drip irrigation						
Packing materials	\$ 20.80					
Misc. materials	\$ 10.40					
Cover crop seed	\$ 12.48					
Equipment, fuel & maint						
Building, repair & maint						
Storage utilities						
Total Materials Cost	\$ 82.16					
<hr/>						
Total Variable Costs	\$ 440.06					
<hr/>						
Gross Revenue Minus Variable Costs	\$ 1,747.44					

Table B10: Organic green bean enterprise budget, designer farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Green Beans (organic)	2,000	0.25	500	lbs.	\$ 1.50	\$ 750.00
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor and Machinery						
Plow fields	0.3					
Spread manure						
Disk/harrow fields	0.1					
Seedling production						
Care for seedlings						
Transplant seedlings						
Direct seeding						
Row coverings						
Cultivation	1.1					
Hand weed	1.0	3.4				
Fertilization	0.4					
Irrigate						
Pest control						
Harvest	1.9					
Plant cover crop	0.3					
Post-harvest handling	2.5	7.5				
Total Hours	7.5	10.9				
Total Labor Costs	\$ 112.50	\$ 87.00				
	Cost					
Materials						
Green bean seed	\$ 22.10					
Potting mix						
Bagged fertilizer	\$ 14.30					
Seaweed or fish fertilizer	\$ 11.70					
Compost						
Insecticide/fungicides						
Herbicides						
Greenhouse utilities						
Row covers						
Plastic mulch						
Drip irrigation						
Packing materials	\$ 26.00					
Misc. materials						
Cover crop seed	\$ 2.60					
Equipment, fuel & maint						
Building, repair & maint						
Storage utilities						
Total Materials Cost	\$ 76.70					
Total Variable Costs	\$ 276.20					
Gross Revenue Minus Variable Costs	\$ 473.80					

Table B11: Organic broccoli enterprise budget, designer farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Broccoli (organic)	5,250	0.25	1,313	lbs	\$ 2.00	\$ 2,625.00
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor and Machinery						
Plow fields	0.9					
Spread manure						
Disk/harrow fields	0.3					
Seedling production						
Care for seedlings	0.8	1.5				
Transplant seedlings	1.0	2.0				
Direct seeding						
Row coverings						
Cultivation	1.0					
Hand weed	1.3	4.3				
Fertilization	0.2					
Irrigate						
Pest control	2.0					
Harvest (3x)	1.3	5.5				
Plant cover crop	0.1					
Total Hours	8.8	13.3				
Total Labor Costs	\$ 131.25	\$ 106.00				
	Cost					
Materials						
Broccoli seed	\$ 5.20					
Potting mix	\$ 11.70					
Bagged fertilizer	\$ 59.80					
Seaweed or fish fertilizer	\$ 7.80					
Compost						
Insecticide/fungicides	\$ 11.70					
Herbicides						
Greenhouse utilities						
Row covers						
Plastic mulch						
Drip irrigation						
Packing materials	\$ 33.54					
Misc. materials	\$ 53.04					
Cover crop seed	\$ 8.32					
Equipment, fuel & maint						
Building, repair & maint						
Storage utilities						
Total Materials Cost	\$ 191.10					
Total Variable Costs	\$ 428.35					
Gross Revenue Minus Variable Costs	\$ 2,196.65					

Table B12: Conventional muskmelon enterprise budget, designer farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Muskmelons (conventional)	15,000	0.5	7,500	lbs	\$ 0.60	\$ 4,500.00
Variable Costs						
	Skilled Labor Hrs	Unskilled Labor Hrs				
Labor and Machinery						
Plow fields	1.3					
Spread manure						
Disk/harrow fields	1.0					
Seedling production		4.7				
Care for seedlings		2.0				
Transplant seedlings	7.0	8.0				
Direct seeding	0.7					
Row coverings	1.3	2.7				
Cultivation	1.0					
Hand weed		3.3				
Fertilization						
Irrigate						
Pest control	2.0					
Harvest	13.3	60.0				
Plant cover crop		0.3				
Total Hours	28.0	80.7				
Total Labor Costs	\$ 420.00	\$ 645.33				
	Cost					
Materials						
Seed	\$ 69.33					
Potting mix	\$ 104.00					
Bagged fertilizer	\$ 34.67					
Seaweed or fish fertilizer	\$ 6.93					
Compost	\$ 20.80					
Insecticide/fungicides	\$ 27.73					
Herbicides						
Greenhouse utilities						
Row covers	\$ 145.60					
Plastic mulch	\$ 52.00					
Drip irrigation						
Packing materials						
Misc. materials						
Cover crop seed	\$ 121.33					
Equipment, fuel & maint						
Building, repair & maint						
Storage utilities						
Total Materials Cost	\$ 582.40					
Total Variable Costs	\$ 1,647.73					
Gross Revenue Minus Variable Costs						
	\$ 2,852.27					

Table B13: Sheep and wool enterprise budget, designer farm

	Head	Units per Head	Units	Price per Head	Total Revenue
Gross Revenues					
Ewe Lambs	10	100	lbs	\$ 200.00	\$ 2,000.00
Ram lambs	10	100	lbs	\$ 200.00	\$ 2,000.00
Fleece (from ewes and one ram)	11	10	lbs	\$ 6.00	\$ 66.00
					\$ 4,066.00
	Unskilled Labor Hrs				
Labor					
Hired Labor	5.0				
Labor Costs	\$ 40.00				
	Costs				
Other Variable Costs					
Feed ingredients	\$ 235.86				
Veterinarian and supplies	\$ 100.00				
Pasture management	\$ 12.00				
Slaughtering costs	\$ 1,300.00				
Shearing costs	\$ 27.50				
Total Other Variable Costs	\$ 1,675.36				
Gross Revenue Minus Variable Costs	\$ 2,350.64				

Table B14: Beef enterprise budget, designer farm

	Head	Units per Head	Units	Price per Unit	Total Revenue
Gross Revenues					
Beef Cows	5	725	lbs	\$ 845.00	\$ 4,225.00
Variable Costs					
	Costs				
Feed (Barley and Haylage)	\$ 2,551.61				
Veterinary and Medicine	\$ 269.09				
Fencing	\$ 72.10				
Utilities	\$ 200.21				
Variable Costs	\$ 3,093.00				
Gross Revenue Minus Variable Costs	\$ 1,132.00				

Table B15: Hay enterprise budget, designer farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Hay	3.5	6.0	21.0	tons	n/a	n/a
Labor Costs						
	Skilled Labor Hrs.					
Spread Fert.	0.9					
Mow 1st Cut	1.00					
Tead 1st Cut	0.75					
Rake 1st Cut	2.40					
Round Bale 1st Cut	2.40					
Truck 1st Cut	3.17					
Spread Liq.Manure	3.00					
Mow 2nd Cut	1.00					
Tead 2nd Cut	0.75					
Rake 2nd Cut	2.40					
Square Bale 2nd Cut	12.00					
Truck 2nd Cut	1.58					
Total Labor Hours	31.35					
Total Labor Costs	\$ 470.28					
Materials						
Fertilizer	\$ 69.00					
Total Material Costs	\$ 69.00					
Total Variable Costs	\$ 539.28					

Potato-Evolver Farm Budget

Net Farm Income

As seen in Table B17, and like the designer budget and consistent with the farmer interviews and survey results from this project, net farm income for the representative designer farm is a modest \$10,215. This does not, however, represent the full contribution of the farm to the family livelihood. On a typical designer farm, the farm family receives about \$16,000 of the explicit labor costs as income, and they receive substantial non-cash benefits of housing and food. Since the fixed costs in these budgets include the farm residence and since the farm family gets much of its food from their own production, the non-cash contribution on the typical designer farm can be substantial. In addition to farm income, most evolver farms have at least one family member working off-farm and contributing over half the cash income for the family. While the net farm income in this whole farm budget appears modest, the farm's contribution to family livelihood is much greater and appears to be economically rational.

Assets Required

The asset base required to implement a representative evolver farm operation consists of land, buildings, and equipment, and for a representative potato-evolver farm requires a capital expenditure of \$698,275. (Table B16) The costs of these items will vary depending on where in the state the farm is located, and in the condition of the equipment when it is purchased. Since the evolver already has a farm and equipment, the additional capital expenditures will be a proportion of the total capital needs. The intensive interviews revealed that most evolvers did not require large amounts of capital outlays. In some cases, practically all the newly required purchased items were financed from the sale of commodity specific equipment that had become redundant.

Table B16: Asset requirements for a potato-evolver farm

Asset Base	
Equipment Value	\$ 148,275
Buildings Value	\$ 361,487
Land Value	\$ 188,513
Total Asset Base	\$ 698,275

Table B17: Whole-farm budget, potato-evolver farm

	Price per Unit	Yield	Units	Value	Acres
Gross Revenue					
Tomatoes--Field (organic)	\$ 1.99	11,050	lbs	\$ 21,990	0.50
Tomatoes--Greenhouse (organic)	\$ 2.50	8,943	lbs	\$ 22,359	0.073
Lettuce (organic)	\$ 1.49	5,760	heads	\$ 8,582	0.50
Carrots (conventional)	\$ 1.00	30,000	lbs	\$ 30,000	1.00
Spinach (organic)	\$ 1.75	6,250	lbs	\$ 10,938	1.00
Green Beans (organic)	\$ 1.50	2,000	lbs	\$ 3,000	1.00
Broccoli (organic)	\$ 2.00	5,250	lbs	\$ 10,500	1.00
Muskmelons (conventional)	\$ 0.60	11,250	lbs	\$ 6,750	0.75
Potatoes (conventional)	\$ 16.00	1,250	cwt	\$ 20,000	5.00
Sweet Corn (conventional)	\$ 2.60	2,200	dozen	\$ 5,720	2.00
Layers (organic, housed)		50	layers	\$ 2,741	
Strawberries (conventional)	\$ 1.00	10,500	lbs	\$ 10,500	1.50
Total Revenue				\$ 153,079	
Variable Costs					
Labor		Costs			
Production, Skilled Labor	\$ 15,201				
Production, Unskilled Labor	\$ 20,144				
Marketing, Skilled Labor	\$ 12,000				
Marketing, Unskilled Labor	\$ 6,400				
Total Labor Costs	\$ 53,745				
Materials					
Seed/Plants	\$ 838				
Grafted plants	\$ 1,498				
Transplant production costs	\$ 218				
Potting mix	\$ 282				
Compost	\$ 681				
Fertilizer	\$ 799				
Bees for pollination	\$ 312				
Insecticide/fungicides/herbicides	\$ 1,888				
Greenhouse utilities	\$ 749				
Row covers	\$ 218				
Plastic mulch	\$ 286				
Straw mulch	\$ 738				
Drip irrigation	\$ 114				
Packing materials	\$ 1,764				
Cover crop seed	\$ 348				
Utilities	\$ 1,009				
Feed	\$ 692				
Pullets	\$ 168				
Equipment, fuel & maint	\$ 2,249				
Building, repair & maint	\$ 3,615				
Marketing materials	\$ 1,995				
Misc. materials	\$ 3,310				
Total Material Costs	\$ 23,772				
Fixed costs					
Interest, Buildings & Land	\$ 23,927				
Interest, Equipment	\$ 5,832				
Depreciation, Buildings	\$ 12,050				
Depreciation, Equipment	\$ 14,828				
Taxes, Insurance , Housing	\$ 5,931				
Taxes, Real Estate	\$ 2,781				
Total Fixed Costs	\$ 65,347				
Net Farm Income (Loss)					
	\$ 10,215				

Table B18: Fixed cost analysis, potato-evolver farm

		Dep. Yrs.	Annual Dep Cost
Asset Base			
Equipment Value	\$ 148,275	10	\$ 14,828
Buildings Value	\$ 361,487	30	\$ 12,050
Land Value	\$ 188,513		
Total Asset Base	\$ 698,275		
Property Tax Rate	14.75	per \$1,000	
Annual Fixed Costs			
Taxes, Real Estate	\$ 2,781		
Taxes, Insurance & Housing (Equipment)	\$ 5,931		
Depreciation, Buildings	\$ 12,050		
Depreciation, Equipment	\$ 14,828		
Interest, Buildings & Land	\$ 23,927		
Interest, Equipment	\$ 5,832		
Total Annual Fixed Costs	\$ 65,347		

Table B19: Marketing cost budget, potato-evolver farm

	Skilled Labor	Unskilled Labor
Labor		
Total Labor Hours	800.0	800.0
Total Labor Costs	\$ 12,000	\$ 6,400
Material Costs		
Tent	\$ 25.00	
Signage	\$ 25.00	
Market fees	\$ 800.00	
Packaging	\$ 800.00	
Scales	\$ 300.00	
Tables	\$ 20.00	
Coolers	\$ 25.00	
Miscellaneous	\$ 300.00	
Total Material Costs	\$ 1,995.00	
Total Variable Costs	\$ 20,395.00	

Table 20: Organic field tomato enterprise budget, potato-evolver farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Tomatoes -- Field (organic)	22,100	0.5	11,050	lbs.	\$ 1.99	\$ 21,989.50
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor						
Plow fields	1.0					
Spread manure	2.0					
Disk/harrow fields (3x)	1.5					
Seedling production						
Care for seedlings	7.5	10.0				
Transplant seedlings	4.0	4.0				
Direct seeding						
Laying plastic mulch	1.5	1.0				
Row coverings	1.5	2.0				
Cultivation	1.5					
Apply straw mulch		25.0				
Hand weed		7.5				
Fertilization						
Irrigate						
Pest control(4x)	2.0					
Harvest	50.0	75.0				
Wash, sort, etc.	50.0	100.0				
Plant cover crop						
	Total Hours	122.5	224.5			
	Total Costs	\$ 1,837.50	\$ 1,796.00			
	Cost					
Materials						
Seed	\$ 20.80					
Transplant production costs	\$ 218.40					
Compost	\$ 234.00					
Insecticide/fungicides	\$ 41.60					
Herbicides						
Greenhouse utilities						
Row covers						
Plastic mulch	\$ 104.00					
Straw mulch	\$ 468.00					
Drip irrigation						
Misc. materials	\$ 416.00					
Cover crop seed						
Equipment, fuel & maint						
Building, repair & maint						
	Total Materials Cost	\$ 1,502.80				
	Total Variable Costs	\$ 5,136.30				
	Gross Revenue Minus Variable Costs	\$ 16,853.20				

Table B21: Organic greenhouse tomato enterprise budget, potato-evolver farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Tomatoes -- Greenhouse (organic)	122,513	0.073	8,943	lbs.	\$ 2.50	\$ 22,358.53
		(3100 sq ft)				
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor						
Bed preparation	20.0	80.0				
Seedling production						
Care for seedlings						
Transplant seedlings	20.0	80.0				
Direct seeding						
Row coverings						
Cultivation						
Hand weed, prune, etc.	110.0	500.0				
Fertilization						
Irrigate						
Pest control						
Harvest, grade, pack	46.0	100.0				
Delivery and sales	150.0	50.0				
Clean up greenhouse	10.0	30.0				
Plant cover crop						
	Total Hours	356.0	840.0			
	Total Labor Cost	\$ 5,340.00	\$ 6,720.00			
	Cost					
Materials						
Grafted plants	\$ 1,497.60					
Potting mix						
Compost and fertilizer	\$ 342.63					
Insecticide/fungicides	\$ 260.00					
Bees for pollination	\$ 312.00					
Greenhouse utilities	\$ 728.00					
Propane for CO2	\$ 520.00					
String, hangars, and clips	\$ 239.20					
Plastic mulch	\$ 104.00					
Drip irrigation	\$ 52.00					
Misc. materials	\$ 676.00					
Cover crop seed						
Building, repair & maint						
	Total Materials Cost	\$ 4,731.43				
	Total Variable Costs	\$ 16,791.43				
	Gross Revenue Minus Variable Costs	\$ 5,567.10				

Table B22: Organic lettuce enterprise budget, potato-evolver farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Lettuce (organic)	11,520	0.5	5,760	Head	\$ 1.49	\$ 8,582.40
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor						
Plow fields						
Spread manure						
Disk/harrow fields	1.0					
Seedling production						
Care for seedlings	5.0	10.0				
Transplant seedlings	10.0	30.0				
Direct seeding						
Row coverings						
Cultivation	2.0					
Hand weed	2.0	4.0				
Fertilization	1.0					
Irrigate		2.0				
Pest control						
Harvest (2x per wk; 12 wks)	12.0	84.0				
Plant cover crop (pre&post)	3.0					
Post-harvest handling	48.0	48.0				
Orders/trucking (2x per wk)	12.0	36.0				
Total Hours	96.0	214.0				
Total Labor Costs	\$ 1,440.00	\$ 1,712.00				
	Cost					
Materials						
Lettuce seed	\$ 40.56					
Potting mix	\$ 79.04					
Bagged fertilizer						
Seaweed or fish fertilizer	\$ 104.00					
Compost						
Insecticide/fungicides						
Herbicides						
Greenhouse utilities	\$ 20.80					
Row covers						
Plastic mulch						
Irrigation (20% = five years)	\$ 62.40					
Misc. materials	\$ 28.08					
Cover crop seed	\$ 29.12					
Equipment, fuel & maint						
Building, repair & maint						
Total Material Costs	\$ 364.00					
Total Variable Costs	\$ 3,516.00					
Gross Revenue Minus Variable Costs	\$ 5,066.40					

Table B23: Conventional carrot enterprise budget, potato-evolver farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Carrots (conventional)	30,000	1	30,000	lbs	\$ 1.00	\$ 30,000.00
<hr/>						
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor						
Plow fields	2.5					
Spread manure						
Disk/harrow fields						
Seedling production						
Care for seedlings						
Transplant seedlings						
Direct seeding	1.5					
Row coverings						
Cultivation (7x)	10.5					
Hand weed						
Fertilization	1.0					
Irrigate	1.5					
Pest control	1.0					
Harvest	22.0	36.0				
Post-harvest packing	24.0	118.0				
Plant cover crop	0.5					
Marketing	13.0					
Total Hours	77.5	154.0				
Total Labor Costs	\$ 1,162.50	\$ 1,232.00				
	Cost					
Materials						
Carrot seed	\$ 208.00					
Potting mix						
Bagged fertilizer	\$ 101.92					
Seaweed or fish fertilizer						
Compost						
Insecticide/fungicides						
Herbicides	\$ 7.28					
Greenhouse utilities						
Row covers						
Plastic mulch						
Drip irrigation						
Packing materials	\$ 507.52					
Misc. materials	\$ 133.12					
Cover crop seed	\$ 31.20					
Equipment, fuel & maint						
Building, repair & maint						
Total Materials Cost	\$ 989.04					
Total Variable Costs	\$ 3,383.54					
<hr/>						
Gross Revenue Minus Variable Costs	\$ 26,616.46					

Table B24: Organic spinach enterprise budget, potato-evolver farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Spinach (organic)	6,250	1	6,250	lbs	\$ 1.75	\$10,937.50
<hr/>						
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor						
Plow fields						
Spread manure	2.0	5.0				
Disk/harrow fields	4.0					
Seedling production						
Care for seedlings						
Transplant seedlings						
Direct seeding (15x)	7.5					
Row coverings						
Cultivation	3.0					
Hand weed		1.0				
Fertilization						
Irrigate		5.0				
Pest control						
Harvest	30.0	100.0				
Plant cover crop		2.0				
Post-harvest handling	4.0	16.0				
Marketing	10.0					
Total Hours	60.5	129.0				
Total Labor Costs	\$ 907.50	\$ 1,032.00				
<hr/>						
	Cost					
Materials						
Spinach seed	\$ 67.60					
Potting mix						
Bagged fertilizer	\$ 52.00					
Seaweed or fish fertilizer						
Compost	\$ 72.80					
Insecticide/fungicides						
Herbicides						
Greenhouse utilities						
Row covers						
Plastic mulch						
Drip irrigation						
Packing materials	\$ 104.00					
Misc. materials	\$ 52.00					
Cover crop seed	\$ 62.40					
Equipment, fuel & maint						
Building, repair & maint						
Total Materials Cost	\$ 410.80					
Total Variable Costs	\$ 2,350.30					
<hr/>						
Gross Revenue Minus Variable Costs	\$ 8,587.20					

Table B25: Organic green bean enterprise budget, potato-evolver farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Green Beans (organic)	2,000	1	2,000	lbs	\$ 1.50	\$ 3,000.00
Variable Costs						
	Skilled Labor Hrs	Unskilled Labor Hrs				
Labor						
Plow fields	1.0					
Spread manure						
Disk/harrow fields	0.5					
Seedling production						
Care for seedlings						
Transplant seedlings						
Direct seeding						
Row coverings						
Cultivation	4.5					
Hand weed	4.0	13.5				
Fertilization	1.5					
Irrigate						
Pest control						
Harvest	7.5					
Plant cover crop	1.0					
Post-harvest handling	10.0	30.0				
Total Hours	30.0	43.5				
Total Labor Costs	\$ 450.00	\$ 348.00				
	Cost					
Materials						
Green bean seed	\$ 88.40					
Potting mix						
Bagged fertilizer	\$ 57.20					
Seaweed or fish fertilizer	\$ 46.80					
Compost						
Insecticide/fungicides						
Herbicides						
Greenhouse utilities						
Row covers						
Plastic mulch						
Drip irrigation						
Packing materials	\$ 104.00					
Misc. materials						
Cover crop seed	\$ 10.40					
Equipment, fuel & maint						
Building, repair & maint						
Total Materials Cost	\$ 306.80					
Total Variable Costs	\$ 1,104.80					
Gross Revenue Minus Variable Costs						
	\$ 1,895.20					

Table B26: Organic broccoli enterprise budget, potato-evolver farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Broccoli (organic)	5,250	1	5,250	lbs	\$ 2.00	\$10,500.00
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor						
Plow fields	3.8					
Spread manure						
Disk/harrow fields	1.0					
Seedling production						
Care for seedlings	3.0	6.0				
Transplant seedlings	4.0	8.0				
Direct seeding						
Row coverings						
Cultivation	4.0					
Hand weed	5.0	17.0				
Fertilization	0.8					
Irrigate						
Pest control	8.0					
Harvest (3x)	5.0	22.0				
Plant cover crop	0.5					
Total Hours	35.0	53.0				
Total Labor Costs	\$ 525.00	\$ 424.00				
	Cost					
Materials						
Broccoli seed	\$ 20.80					
Potting mix	\$ 46.80					
Bagged fertilizer	\$ 239.20					
Seaweed or fish fertilizer	\$ 31.20					
Compost						
Insecticide/fungicides	\$ 46.80					
Herbicides						
Greenhouse utilities						
Row covers						
Plastic mulch						
Drip irrigation						
Packing materials	\$ 134.16					
Misc. materials	\$ 212.16					
Cover crop seed	\$ 33.28					
Equipment, fuel & maint						
Building, repair & maint						
Total Materials Cost	\$ 764.40					
Total Variable Costs	\$ 1,713.40					
Gross Revenue Minus Variable Costs	\$ 8,786.60					

Table B27: Conventional muskmelon enterprise budget, potato-evolver farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Muskmelons (conventional)	15,000	0.75	11,250	lbs	\$ 0.60	\$ 6,750.00
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor						
Plow fields	2.0					
Spread manure						
Disk/harrow fields	1.5					
Seedling production		7.0				
Care for seedlings		3.0				
Transplant seedlings	10.5	12.0				
Direct seeding	1.0					
Row coverings	2.0	4.0				
Cultivation	1.5					
Hand weed		5.0				
Fertilization						
Irrigate						
Pest control	3.0					
Harvest	20.0	90.0				
Plant cover crop		0.5				
Total Hours	42.0	121.0				
Total Labor Costs	\$ 630.00	\$ 968.00				
	Cost					
Materials						
Seed	\$ 104.00					
Potting mix	\$ 156.00					
Bagged fertilizer	\$ 52.00					
Seaweed or fish fertilizer	\$ 10.40					
Compost	\$ 31.20					
Insecticide/fungicides	\$ 41.60					
Herbicides						
Greenhouse utilities						
Row covers	\$ 218.40					
Plastic mulch	\$ 78.00					
Drip irrigation						
Packing materials						
Misc. materials						
Cover crop seed	\$ 182.00					
Equipment, fuel & maint						
Building, repair & maint						
Total Materials Cost	\$ 873.60					
Total Variable Costs	\$ 2,471.60					
Gross Revenue Minus Variable Costs	\$ 4,278.40					

Table B28: Conventional potato enterprise budget, potato-evolver farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Potatoes (conventional)	250	5.00	1,250	cwt	\$ 16.00	\$ 20,000
Labor						
	\$ 981					
Skilled						
Unskilled						
Material Costs						
Fertilizer	\$ 692					
Pesticides	\$ 857					
Fuel	\$ 279					
Lube	\$ 42					
Seed	\$ 1,075					
Repairs & maint.	\$ 338					
Total Material Costs	\$ 3,283					
Total Variable Costs	\$ 4,264					
Gross Revenue Minus Variable Costs						
	\$ 15,736					

Table B29: Conventional sweet corn enterprise budget, potato-evolver farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenue						
Sweet Corn (conventional)	1,100	2.0	2,200	dozen	\$ 2.60	\$ 5,720.00
Labor Costs						
	Skilled Labor Hrs	Unskilled Labor Hrs				
Labor	8.0	32.0				
Total Labor Costs	\$ 240.00	\$ 512.00				
Material Costs						
Custom work	\$ 150.10					
Fertilizer	\$ 50.40					
Herbicides	\$ 18.86					
Insecticides	\$ 218.31					
Seed	\$ 112.00					
Total Material Costs	\$ 549.67					
Total Variable Costs	\$ 1,301.67					
Gross Revenue Minus Variable Costs						
	\$ 4,418.33					

Table B30: Organic egg production enterprise budget, potato-evolver farm

	Yield per Layer	Layers	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenue						
Layers (organic, housed)	21.93	50	1,097	dozen	\$ 2.50	\$2,741.25
Variable Costs						
Layer feed	\$ 692.00					
Pullets	\$ 167.50					
Utilities	\$ 9.25					
Miscellaneous	\$ 22.50					
Cartons and Packaging	\$ 164.45					
Total Variable Costs	\$ 1,055.70					
Gross Revenue Minus Variable Costs						
	\$ 1,685.55					

Table B31: Conventional strawberry enterprise budget, potato-evolver farm

	Skilled Labor Hrs	Unskilled Labor Hrs				
Labor Costs						
Hours	112.5	675.0				
Total Labor Costs	\$ 1,687.50	\$ 5,400.00				
Other Variable Costs						
Plants	\$ 175.50					
Fertilizer	\$ 54.00					
Pesticides	\$ 1,254.00					
Straw mulch	\$ 270.00					
Containers and Misc.	\$ 750.00					
Establishment Yr Costs	\$ 861.00					
Total Other Variable Costs	\$ 3,364.50					
Gross Revenue Minus Variable Costs						
	\$ 48.00					

Dairy-Evolver Farm Budget

Net Farm Income

As seen in Table B33, and consistent with the farmer interviews and survey results from this project, net farm income for the representative designer farm is only \$21,728. This does not, however, represent the full contribution of the farm to the family livelihood. On a typical designer farm, the farm family receives about \$27,000 of the explicit labor costs as income, and they receive substantial non-cash benefits of housing and food. Since the fixed costs in these budgets include the farm residence and since the farm family gets much of its food from their own production, the non-cash contribution on the typical designer farm can be substantial. In addition to farm income, most designer farms have at least one family member working off-farm and contributing over half the cash income for the family. While the net farm income in this whole farm budget appears extremely modest, the farm's contribution to family livelihood is much greater and appears to be economically rational.

Assets Required

The asset base required to implement a representative designer farm operation consists of land, buildings, and equipment, and for a representative dairy-evolver farm requires a capital investment of \$661,646. The costs of these items will vary depending on where in the state the farm is located, and in the condition of the equipment when it is purchased. The capital needs will also vary depending on how quickly the farmer intends to be at full capacity. Since the evolver already owns a farm and equipment, the additional capital expenditures will be a proportion of the total capital needs. The intensive interviews revealed that most evolvers did not require large amounts of capital outlays. In some cases, practically all the newly required purchased items were financed from the sale of commodity specific equipment that had become redundant. (Table B32)

Table B32: Asset requirements for a dairy-evolver farm

Asset Base	
Equipment Value	\$ 117,333
Building Value	\$ 283,658
Land Value	\$ 179,159
Herd Value	\$ 81,496
Total Asset Base	\$ 661,646

Table B33: Whole-farm budget, dairy-evolver farm

	Price per Unit	Yield	Units	Value	Acres
Gross Revenue					
Tomatoes--Field (organic)	\$ 1.99	11,050	lbs	\$ 21,990	0.50
Tomatoes--Greenhouse (organic)	\$ 2.50	8,943	lbs	\$ 22,359	0.073
Lettuce (organic)	\$ 1.49	5,760	heads	\$ 8,582	0.50
Carrots (conventional)	\$ 1.00	30,000	lbs	\$ 30,000	1.00
Spinach (organic)	\$ 1.75	6,250	lbs	\$ 10,938	1.00
Green Beans (organic)	\$ 1.50	2,000	lbs	\$ 3,000	1.00
Broccoli (organic)	\$ 2.00	5,250	lbs	\$ 10,500	1.00
Muskmelons (conventional)	\$ 0.60	11,250	lbs	\$ 6,750	0.75
Sweet Corn (conventional)	\$ 2.60	11,000	dozen	\$ 28,600	10.00
Dairy	\$ 15.00	6,611	cwt	\$ 99,172	
Dairy Livestock, Hay, etc.				\$ 6,967	
Total Revenue				\$ 241,890	
Variable Costs					
Labor	Costs				
Production, Skilled Labor	\$ 33,564				
Production, Unskilled Labor	\$ 36,863				
Marketing, Skilled Labor	\$ 12,000				
Marketing, Unskilled Labor	\$ 6,400				
Total Labor Costs	\$ 88,827				
Materials					
Seed	\$ 1,510				
Grafted plants	\$ 1,498				
Transplant production costs	\$ 218				
Potting mix	\$ 282				
Compost	\$ 681				
Fertilizer	\$ 2,795				
Bees for pollination	\$ 312				
Insecticide/fungicides/herbicides	\$ 1,057				
Greenhouse utilities	\$ 749				
Row covers	\$ 218				
Plastic mulch	\$ 286				
Straw mulch	\$ 468				
Drip irrigation	\$ 114				
Packing materials	\$ 850				
Cover crop seed	\$ 348				
Bedding	\$ 1,500				
Breeding fees	\$ 1,400				
Feed	\$ 24,000				
Vet & med services	\$ 2,583				
Utilities	\$ 4,386				
Equipment, fuel & maint	\$ 12,292				
Building, repair & maint	\$ 2,837				
Marketing costs & materials	\$ 3,439				
Misc. materials	\$ 2,677				
Total Material Costs	\$ 66,499				
Fixed costs					
Interest, Buildings & Land	\$ 16,880				
Interest, Equipment	\$ 8,443				
Depreciation, Buildings	\$ 9,455				
Depreciation, Equipment	\$ 11,733				
Depreciation & Interest, Livestock	\$ 10,988				
Taxes, Insurance & Housing	\$ 4,693				
Taxes, Real Estate	\$ 2,643				
Miscellaneous	\$ 4,500				
Total Fixed Costs	\$ 64,836				
Net Farm Income (Loss)	\$ 21,728				

Table B34: Fixed cost analysis, dairy-evolver farm

		Dep. Yrs.	Annual Dep Cost
Asset Base			
Equipment Value	\$ 117,333	10	\$ 11,733
Building Value	\$ 283,658	30	\$ 9,455
Land Value	\$ 179,159		
Herd Value	\$ 81,496		
Total Asset Base	\$ 661,646		
Property Tax Rate	\$ 14.75	per \$1,000	
Annual Fixed Costs			
Taxes, Real Estate	\$ 2,643		
Taxes, Insurance & Housing (Equipment)	\$ 4,693		
Depreciation, Buildings	\$ 9,455		
Depreciation, Equipment	\$ 11,733		
Depreciation & Interest, Livestock	\$ 10,988		
Interest, Buildings & Land	\$ 16,880		
Interest, Equipment	\$ 8,443		
Miscellaneous	\$ 4,500		
Total Fixed Costs	\$ 69,336		

Table B35: Marketing cost budget, dairy-evolver farm

	Skilled Labor	Unskilled Labor
Labor		
Total Labor Hours	800.0	800.0
Total Labor Costs	\$ 12,000	\$ 6,400
Material Costs		
Tent	\$ 25.00	
Signage	\$ 25.00	
Market fees	\$ 800.00	
Packaging	\$ 800.00	
Scales	\$ 300.00	
Tables	\$ 20.00	
Coolers	\$ 25.00	
Miscellaneous	\$ 300.00	
Total Material Costs	\$ 1,995.00	
Total Variable Costs	\$20,395.00	

Table B36: Organic field tomato enterprise budget, dairy-evolver farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Tomatoes -- Field (organic)	22,100	0.5	11,050	lbs.	\$ 1.99	\$ 21,989.50
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor						
Plow fields	1.0					
Spread manure	2.0					
Disk/harrow fields (3x)	1.5					
Seedling production						
Care for seedlings	7.5	10.0				
Transplant seedlings	4.0	4.0				
Direct seeding						
Laying plastic mulch	1.5	1.0				
Row coverings	1.5	2.0				
Cultivation	1.5					
Apply straw mulch		25.0				
Hand weed		7.5				
Fertilization						
Irrigate						
Pest control(4x)	2.0					
Harvest	50.0	75.0				
Wash, sort, etc.	50.0	100.0				
Plant cover crop						
	Total Hours	122.5	224.5			
	Total Costs	\$ 1,837.50	\$ 1,796.00			
	Cost					
Materials						
Seed	\$ 20.80					
Transplant production costs	\$ 218.40					
Compost	\$ 234.00					
Insecticide/fungicides	\$ 41.60					
Herbicides						
Greenhouse utilities						
Row covers						
Plastic mulch	\$ 104.00					
Straw mulch	\$ 468.00					
Drip irrigation						
Misc. materials	\$ 416.00					
Cover crop seed						
Equipment, fuel & maint						
Building, repair & maint						
	Total Materials Cost	\$ 1,502.80				
	Total Variable Costs	\$ 5,136.30				
	Gross Revenue Minus Variable Costs	\$ 16,853.20				

Table B37: Organic greenhouse tomato enterprise budget, dairy-evolver farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Tomatoes -- Greenhouse (organic)	122,513	0.073	8,943	lbs.	\$ 2.50	\$ 22,358.53
		(3100 sq ft)				
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor						
Bed preparation	20.0	80.0				
Seedling production						
Care for seedlings						
Transplant seedlings	20.0	80.0				
Direct seeding						
Row coverings						
Cultivation						
Hand weed, prune, etc.	110.0	500.0				
Fertilization						
Irrigate						
Pest control						
Harvest, grade, pack	46.0	100.0				
Delivery and sales	150.0	50.0				
Clean up greenhouse	10.0	30.0				
Plant cover crop						
	Total Hours	356.0	840.0			
	Total Labor Cost	\$ 5,340.00	\$ 6,720.00			
	Cost					
Materials						
Grafted plants	\$ 1,497.60					
Potting mix						
Compost and fertilizer	\$ 342.63					
Insecticide/fungicides	\$ 260.00					
Bees for pollination	\$ 312.00					
Greenhouse utilities	\$ 728.00					
Propane for CO2	\$ 520.00					
String, hangars, and clips	\$ 239.20					
Plastic mulch	\$ 104.00					
Drip irrigation	\$ 52.00					
Misc. materials	\$ 676.00					
Cover crop seed						
Building, repair & maint						
	Total Materials Cost	\$ 4,731.43				
	Total Variable Costs	\$ 16,791.43				
	Gross Revenue Minus Variable Costs	\$ 5,567.10				

Table B38: Organic lettuce enterprise budget, dairy-evolver farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Lettuce (organic)	11,520	0.5	5,760	Head	\$ 1.49	\$ 8,582.40
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor						
Plow fields						
Spread manure						
Disk/harrow fields	1.0					
Seedling production						
Care for seedlings	5.0	10.0				
Transplant seedlings	10.0	30.0				
Direct seeding						
Row coverings						
Cultivation	2.0					
Hand weed	2.0	4.0				
Fertilization	1.0					
Irrigate		2.0				
Pest control						
Harvest (2x per wk; 12 wks)	12.0	84.0				
Plant cover crop (pre&post)	3.0					
Post-harvest handling	48.0	48.0				
Orders/trucking (2x per wk)	12.0	36.0				
Total Hours	96.0	214.0				
Total Labor Costs	\$ 1,440.00	\$ 1,712.00				
	Cost					
Materials						
Lettuce seed	\$ 40.56					
Potting mix	\$ 79.04					
Bagged fertilizer						
Seaweed or fish fertilizer	\$ 104.00					
Compost						
Insecticide/fungicides						
Herbicides						
Greenhouse utilities	\$ 20.80					
Row covers						
Plastic mulch						
Irrigation (20% = five years)	\$ 62.40					
Misc. materials	\$ 28.08					
Cover crop seed	\$ 29.12					
Equipment, fuel & maint						
Building, repair & maint						
Total Material Costs	\$ 364.00					
Total Variable Costs	\$ 3,516.00					
Gross Revenue Minus Variable Costs	\$ 5,066.40					

Table B39: Conventional carrot enterprise budget, dairy-evolver farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Carrots (conventional)	30,000	1	30,000	lbs	\$ 1.00	\$ 30,000.00
<hr/>						
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor						
Plow fields	2.5					
Spread manure						
Disk/harrow fields						
Seedling production						
Care for seedlings						
Transplant seedlings						
Direct seeding	1.5					
Row coverings						
Cultivation (7x)	10.5					
Hand weed						
Fertilization	1.0					
Irrigate	1.5					
Pest control	1.0					
Harvest	22.0	36.0				
Post-harvest packing	24.0	118.0				
Plant cover crop	0.5					
Marketing	13.0					
Total Hours	77.5	154.0				
Total Labor Costs	\$ 1,162.50	\$ 1,232.00				
	Cost					
Materials						
Carrot seed	\$ 208.00					
Potting mix						
Bagged fertilizer	\$ 101.92					
Seaweed or fish fertilizer						
Compost						
Insecticide/fungicides						
Herbicides	\$ 7.28					
Greenhouse utilities						
Row covers						
Plastic mulch						
Drip irrigation						
Packing materials	\$ 507.52					
Misc. materials	\$ 133.12					
Cover crop seed	\$ 31.20					
Equipment, fuel & maint						
Building, repair & maint						
Total Materials Cost	\$ 989.04					
Total Variable Costs	\$ 3,383.54					
<hr/>						
Gross Revenue Minus Variable Costs	\$ 26,616.46					

Table B40: Organic spinach enterprise budget, dairy-evolver farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Spinach (organic)	6,250	1	6,250	lbs	\$ 1.75	\$ 10,937.50
Variable Costs						
	Skilled Labor Hrs	Unskilled Labor Hrs				
Labor						
Plow fields						
Spread manure	2.0	5.0				
Disk/harrow fields	4.0					
Seedling production						
Care for seedlings						
Transplant seedlings						
Direct seeding (15x)	7.5					
Row coverings						
Cultivation	3.0					
Hand weed		1.0				
Fertilization						
Irrigate		5.0				
Pest control						
Harvest	30.0	100.0				
Plant cover crop		2.0				
Post-harvest handling	4.0	16.0				
Marketing	10.0					
Total Hours	60.5	129.0				
Total Labor Costs	\$ 907.50	\$ 1,032.00				
	Cost					
Materials						
Spinach seed	\$ 67.60					
Potting mix						
Bagged fertilizer	\$ 52.00					
Seaweed or fish fertilizer						
Compost	\$ 72.80					
Insecticide/fungicides						
Herbicides						
Greenhouse utilities						
Row covers						
Plastic mulch						
Drip irrigation						
Packing materials	\$ 104.00					
Misc. materials	\$ 52.00					
Cover crop seed	\$ 62.40					
Equipment, fuel & maint						
Building, repair & maint						
Total Materials Cost	\$ 410.80					
Total Variable Costs	\$ 2,350.30					
Gross Revenue Minus Variable Costs						
	\$ 8,587.20					

Table B41: Organic green bean enterprise budget, dairy-evolver farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Green Beans (organic)	2,000	1	2,000	lbs	\$ 1.50	\$ 3,000.00
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor						
Plow fields	1.0					
Spread manure						
Disk/harrow fields	0.5					
Seedling production						
Care for seedlings						
Transplant seedlings						
Direct seeding						
Row coverings						
Cultivation	4.5					
Hand weed	4.0	13.5				
Fertilization	1.5					
Irrigate						
Pest control						
Harvest	7.5					
Plant cover crop	1.0					
Post-harvest handling	10.0	30.0				
Total Hours	30.0	43.5				
Total Labor Costs	\$ 450.00	\$ 348.00				
	Cost					
Materials						
Green bean seed	\$ 88.40					
Potting mix						
Bagged fertilizer	\$ 57.20					
Seaweed or fish fertilizer	\$ 46.80					
Compost						
Insecticide/fungicides						
Herbicides						
Greenhouse utilities						
Row covers						
Plastic mulch						
Drip irrigation						
Packing materials	\$ 104.00					
Misc. materials						
Cover crop seed	\$ 10.40					
Equipment, fuel & maint						
Building, repair & maint						
Total Materials Cost	\$ 306.80					
Total Variable Costs	\$ 1,104.80					
Gross Revenue Minus Variable Costs	\$ 1,895.20					

Table B42: Organic broccoli enterprise budget, dairy-evolver farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Broccoli (organic)	5,250	1	5,250	lbs	\$ 2.00	\$10,500.00
	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor						
Plow fields	3.8					
Spread manure						
Disk/harrow fields	1.0					
Seedling production						
Care for seedlings	3.0	6.0				
Transplant seedlings	4.0	8.0				
Direct seeding						
Row coverings						
Cultivation	4.0					
Hand weed	5.0	17.0				
Fertilization	0.8					
Irrigate						
Pest control	8.0					
Harvest (3x)	5.0	22.0				
Plant cover crop	0.5					
Total Hours	35.0	53.0				
Total Labor Costs	\$ 525.00	\$ 424.00				
	Cost					
Materials						
Broccoli seed	\$ 20.80					
Potting mix	\$ 46.80					
Bagged fertilizer	\$ 239.20					
Seaweed or fish fertilizer	\$ 31.20					
Compost						
Insecticide/fungicides	\$ 46.80					
Herbicides						
Greenhouse utilities						
Row covers						
Plastic mulch						
Drip irrigation						
Packing materials	\$ 134.16					
Misc. materials	\$ 212.16					
Cover crop seed	\$ 33.28					
Equipment, fuel & maint						
Building, repair & maint						
Total Materials Cost	\$ 764.40					
Total Variable Costs	\$ 1,713.40					
Gross Revenue Minus Variable Costs	\$ 8,786.60					

Table B43: Conventional muskmelon enterprise budget, dairy-evolver farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenues						
Muskmelons (conventional)	15,000	0.75	11,250	lbs	\$ 0.60	\$ 6,750.00
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	Skilled Labor Hrs	Unskilled Labor Hrs				
Variable Costs						
Labor						
Plow fields	2.0					
Spread manure						
Disk/harrow fields	1.5					
Seedling production		7.0				
Care for seedlings		3.0				
Transplant seedlings	10.5	12.0				
Direct seeding	1.0					
Row coverings	2.0	4.0				
Cultivation	1.5					
Hand weed		5.0				
Fertilization						
Irrigate						
Pest control	3.0					
Harvest	20.0	90.0				
Plant cover crop		0.5				
Total Hours	42.0	121.0				
Total Labor Costs	\$ 630.00	\$ 968.00				
<hr/>						
	Cost					
Materials						
Seed	\$ 104.00					
Potting mix	\$ 156.00					
Bagged fertilizer	\$ 52.00					
Seaweed or fish fertilizer	\$ 10.40					
Compost	\$ 31.20					
Insecticide/fungicides	\$ 41.60					
Herbicides						
Greenhouse utilities						
Row covers	\$ 218.40					
Plastic mulch	\$ 78.00					
Drip irrigation						
Packing materials						
Misc. materials						
Cover crop seed	\$ 182.00					
Equipment, fuel & maint						
Building, repair & maint						
Total Materials Cost	\$ 873.60					
Total Variable Costs	\$ 2,471.60					
<hr/>						
Gross Revenue Minus Variable Costs	\$ 4,278.40					

Table B44: Conventional sweet corn enterprise budget, dairy-evolver farm

	Yield per Acre	Acres	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenue						
Sweet Corn (conventional)	1,100	10.0	11,000	dozen	\$ 2.60	\$ 28,600.00
	Skilled Labor Hrs	Unskilled Labor Hrs				
Labor Costs						
Labor	8.0	32.0				
Total Labor Costs	\$ 1,200.00	\$ 2,560.00				
Material Costs						
Custom work	\$ 150.10					
Fertilizer	\$ 50.40					
Herbicides	\$ 18.86					
Insecticides	\$ 218.31					
Seed	\$ 112.00					
Total Material Costs	\$ 549.67					
Total Variable Costs	\$ 4,309.67					
Gross Revenue Minus Variable Costs	\$ 24,290.33					

Table B45: Conventional dairy enterprise budget, dairy-evolver farm

	Yield per Head (cwt)	Head	Total Yield	Units	Price per Unit	Total Revenue
Gross Revenue						
Dairy						
Milk Revenue	150	44	6,611	cwt	\$ 15.00	\$ 99,172
Livestock Revenue						\$ 4,316
Crop and Hay Revenue						\$ 2,651
Total Gross Revenue						\$ 106,139
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Labor Costs						
Family Labor						\$ 40,142
Total Labor Costs						
<hr/>						
Other Variable Costs						
Milk Hauling	\$ 4,430					
Vet & Med	\$ 2,583					
Fertilizer	\$ 1,500					
Lime	\$ 600					
Miscellaneous	\$ 400					
Milk Marketing	\$ 1,444					
Fuel, Oil and Lube	\$ 3,200					
Machinery Repair	\$ 6,843					
Utilities	\$ 4,386					
Seeds	\$ 960					
Chemicals	\$ 660					
Concentrates	\$ 24,000					
Breeding Fees	\$ 1,400					
Bedding	\$ 1,500					
Total Other Variable Costs						\$ 53,906
Total Variable Costs						\$ 94,048
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Gross Revenue Minus Variable Costs						\$ 12,091

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CASE STORIES

Introduction

As part of a multi-year USDA/Northeast Sustainable Agriculture Research and Education (NESARE) project, the Department of Resource Economics and Policy at the University of Maine surveyed 228 Maine farmers. These farmers had been identified by agricultural groups and agricultural service providers as employing sustainable agriculture practices. Of the 225 surveys mailed, 153 were completed for a response rate of 68%.

Of these, thirty were chosen, based on a number of criteria, for in-depth, on-farm interviews. Nineteen of the interviews were videotaped, while the remaining eleven were audio-taped. Videos, one for the general public and one for agricultural-support personnel, were produced using the interview material and are available by contacting Andrew Files by phone at (207)-581-3108, by e-mail at andrew.files@umit.maine.edu or by U.S. Postal Service mail at 5782 Winslow Hall, Orono, Maine 04469-5782.

The in-depth interviews were conducted during Summer 2000. Twenty-eight of the interviews were transcribed and from each transcription, and follow-up phone calls to the farmer, a case story was written. These case stories are presented in the following pages.

The stories help the reader to understand sustainable agriculture and the farmers that practice it. These farmers are using complex farming systems to manage pests and supply plant nutrients. Many integrate livestock into their farming system. Most are an integral part of their community and community members are often invited to the farm. Marketing tends to be more directly to consumers and encompasses diverse activities (e.g., farm stands, farmers' markets, community support agriculture, and seasonal activities). The stories also discuss some of the challenges of developing and managing these complex systems and suggest that this type of farming will continue to grow in Maine.

Two Loons Farm
Spencer Aitel and Paige Tyson
China, Maine

Spencer Aitel and Paige Tyson were “suburban kids” with no farming background when they came to Maine in the early 70s as students at Colby College. By 1978, with a struggling construction business and a desire to produce their own food, they purchased their 65-acre farm on the banks of China Lake. They grew the farm gradually purchasing equipment and adding livestock little by little until they were milking 50 farm-bred Jersey cows and selling milk through West Lynn Creamery.

By 1997 they had teamed up with several “potential” organic dairy farmers to bring a wholesale certified organic milk market, Vermont Organic Cow, into Maine. That same year they purchased a neighboring farm, expanded their operation and began the transition to organic.

Today they are milking 80 cows, shipping 6000 pounds every other day, and receiving the organic premium price, which, depending on fluctuating conventional milk prices, may be twice what conventional farmers receive. They also raise chickens, pigs, and turkeys and sell straw, eggs and grain seed.

Sustainability

Long before going organic, Two Loons had incorporated sustainable agriculture practices primarily focused on reducing purchased inputs, utilizing rotational grazing, recycling everything, generally thinking of their farm system as an integrated whole, and not relying on the farm as their sole source of income—all measures which Spencer thinks would “pay any farmer” organic or otherwise.

Two Loons rotational grazing system is “not yet as intensive” as they would like (they need more fenced pasture), but Spencer believes it’s the fresh air, exercise and natural grazing that has nearly eliminated reproductive problems, foot and leg problems, and, of course, vet bills. Pushing a ruminant’s digestion system, which is designed to take roughage feeds, by feeding high protein grain is “hard on the animal,” says Spencer, “and the harder you push them the sooner they wear out.” Two Loons is content with 12,000 to 13,000 pound production and a herd so healthy that it’s hard to cull. Fully half of their heifers are for sale.

Also contributing to sustainability are improvements in soil organic matter levels that result in “better nutrient balance, especially in the micro-nutrients.” Improving their management system such that labor time per unit of production “is dropping dramatically,” says Spencer, also plays a role in sustainability “and our production is coming up as we get a better handle on feeding organically.”

Transition to Organic

Prior to going organic, Two Loons was not using chemicals but they were feeding conventional grain and using antibiotics. Because organic dairy certification requires that animals be managed organically for three years before certification is granted, the transition was “expensive.” They

had to pay the organic premium to purchase organic feed before they could receive the organic premium for their product. The organic milk market, however, promises “a stable contract price for a substantial number of years,” says Spencer, “and that’s made all the difference in the world as far as being able to afford to upgrade our farm and go more full-time.”

The other half of their rationale for going organic, says Paige, “is the belief that chemical farming isn’t sustainable.” Even if conventional methods had been financially viable, they would not have used those methods. Organic certification standards are “really not that hard to meet,” says Spencer and the yearly paperwork is less difficult than that required to comply with Maine’s Nutrient Management law.

Finding Financing and Information

“It’s difficult to capitalize a farm,” says Spencer, “without some off-farm income,” which is how they got the capital to grow incrementally. “We never had to borrow money for operating expenses,” he says. “We raised our own cows and grew our own herd.” While they aren’t shy about financing real estate, they have been “lucky” to find owner-financing without “all the paraphernalia of a bank loan...Your neighbors will sell you stuff,” says Spencer, “if they believe in what you’re doing, which they do in our case.”

A philosophy of “making do and fixing up” has kept operating and equipment costs down and leaves some money to experiment with different tools later on. Building their own milking parlor, a New Zealand style swing parlor, was “cheap,” says Spencer, but finding out how to do it was tricky. They used pictures from magazines, a land grant university article, their local extension agent, and a neighbor who helped with the stainless steel work. The original \$10,000 structure, (they have since built a second one), replaced the old flat parlor and reduced milking time significantly. The swing parlor admits two rows of cows and has a single pipeline down the middle. There are no hind gates to interrupt the cow flow. When the first row is finished the units are swung to the second row. By the time the second row is finished, the first row is ready to go again. With this system they milk 35 cows an hour compared to the 2-1/2 hours to milk 50 cows with the old parlor.

Spencer alludes to an “information gap” with regard to specific information on organic dairy management. Asking “a lot of questions,” especially of other farmers, has been of “great benefit” as have publications such as *New Farm*; *Acre U.S.A.*; and the *Small Farmers Journal* which support the thinking that “you can do something different, and you can make it work.”

Satisfaction and Future Plans

The couple is well satisfied with the system they have worked out over the years. “Two people can take care of 160 to 175 cows everyday,” says Paige, “it must work pretty well.” Paige is on the farm full time, while Spencer’s carpentry and construction business still contributes off-farm income. They continue to improve and fence more pasture acreage, are replacing older equipment, and trying to purchase the land they are still renting. They have no children to pass the farm on to, and though the “future looks sustainable right now” they know they must work to increase local marketing and perhaps add value-added products such as cheese, although, new ventures at the age of 50 look a little more difficult than they did at 25. They would also

welcome some relief from the day to day pressure of milking by hiring full time help, which leads them to the bigger topic of globalization and government policy.

Farmers are unable to compete with other businesses in paying a good salary and benefits for good help, a situation “caused in part,” says Spencer, “by the U.S. cheap food policy subsidies paid to commodity farmers which work to the detriment of those farmers and landowners who are unable to receive those subsidies. It’s the wrong way to go,” he says. “Food should be priced according to how good it is to eat and how good it is for the land it was grown on—it would be far better for everybody concerned.” Including the American food consumer, who “in the long run, says Paige, “would pay the same price. Instead of taxpayer money going out in payments to farmers you might as well pay the producer in the first place and get rid of some of the bureaucracy.”

“Globalization and the commodity system,” says Spencer, “affects us by consistently placing downward pressure on pricing and farmers” which in turn shrinks the agricultural infrastructure. A better way to go, he heard from a keynote speaker at the Agricultural Trades Show would be to “take those unprofitable commodity-based farms and make them produce crops and services and livestock for the local economy and then they make money.” This would require farmers to work together instead of “fracturing into special interest groups.” It would also require that consumers recognize that buying locally provides benefits that extend beyond the farm to the quality of the food they eat, the water they drink, the open space they enjoy, and therefore, says Spencer, “they are going to have to pay more” for the food if they want those other benefits.

Advice to New Farmers

First on their list of advice about how to get started in dairy farming is to “make sure there’s a team—you can’t really do this by yourself.” They suggest young people work on a farm or do their own farm part-time to see how it suits them especially in terms of their ability to make decisions and take responsibility if things don’t go well. If you can’t do that, “then you’re not going to make it.” He also believes starting out big is “not a good idea unless you have the backing of a large extended family system.”

Bailey Hill Farms
Konrad, Shirley, and Michele Bailey and John Bell
Farmington, Maine

The Bailey family has been farming on Bailey Hill for 207 years. The farm was a conventional dairy farm when Konrad Bailey's father took it over in 1953 and made significant improvements including re-building the barn. When the barn burned down, and economic pressures were falling hard on farmers during the 60s and 70s, Bailey's father went to work with the National Farmers Organization to try to organize farmers to fight for parity, a system in place in the early 1900s which gave farmers a rate of return on an indexed par with that received by industry. "When my dad realized that it wasn't going to happen, because of the farmer's independence and basically stubbornness, he decided he'd better come back and take care of his own farm." That was 1983.

Bailey's father increased his land base, cleared more land, and moved stone walls to enlarge fields to accommodate modern equipment. He also bucked the opposition and taboo against selling raw milk by meeting the requirements, obtaining a license from the State, and setting up a door-to-door delivery system that gave him some control over the prices he received. He packed milk into the trunk of his car, covered it with blankets, and traveled back and forth to town several times to keep it fresh. "He stuck his nose out there and just went for it," says Bailey. "He knew it was going to be an up-hill battle, but he figured it was the only opportunity he had at the time."

Bailey Hill Farms is now a conglomerate of what was originally seven small family farms settled by Revolutionary War veterans on bonus land they received for their service. It consists of 400 acres with 120 tillable and the rest in woodland. Twenty acres are in alfalfa, 40 in corn and 175 in hay. The farm milks 40 cows and has 60 replacements and three bulls. They also sell dairy cows, heifers, firewood, pulpwood, logs and ground beef and have two full-time employees (Bailey and his nephew) and five part-time employees including his wife Michele and mother Shirley.

Sustainability via Direct Marketing and Value-Added Processing

Bailey Hill Farms ships some milk but their main business is still door-to-door delivery, not only raw milk but also pasteurized homogenized milk (whole, 1% and skim) and other dairy products now processed on the farm. They deliver milk, butter, cream, eggs, ice cream and ground beef to restaurants, stores and individuals. They drive 500 miles a week in a rural area to deliver four days each week. Processing takes place six days a week from 4:00 in the morning until 11:00 at night. "It's probably about a two-man, full-time job," says Bailey, "but we do it with about one... We are a service-oriented business, and we deliver to whoever it is even if they take a half gallon or a quart a week."

Bailey "wins customers" not with pricing but with a quality product that his customers buy out of loyalty "because they believe in what we do," says Bailey. "They're buying the future of their community. They're presenting an opportunity for a business to thrive, where they can come

and bring their grandkids or their children or themselves and come out and look and see what we're doing to try to sustain agriculture in southern Franklin County, Maine.”

“Eliminating the middleman” through on-farm processing and direct delivery of a product that “hasn't been polluted with hormones or excessive pesticides or commercial fertilizers” is part of what Bailey thinks of as sustainable agriculture. “With the retail outlet that we have,” he says, “we are not under the same thumb that most of the farmers out there are. We do have some opportunity to decide what we get for our product.”

Sustainability via Crop and Livestock Management

Contented, comfortable well-bred cows are Bailey's other big focus for sustainability. “We don't believe in pushing the cow past her limits,” asserts Bailey, who hasn't bought a dairy cow or replacement animal since 1983. One cow that lived for 16 years calved only bulls for 10 years—a death sentence on most dairy farms—and then she had heifers that are “excellent” and worth waiting for.

Cows are on a rotational grazing system and fed for good reproduction, not peak milk production, on first lactation. Dry hay is fed twice a day to keep fiber levels up and slow down the digestive process for greater protein absorption and high butter fat content. Breeding for “nice udders,” Bailey says, “is the biggest key for longevity.” He gets 12000 or 14000 pounds of milk from first lactation and a 3000 to 5000 pound increase on every subsequent lactation. His rolling herd average is between 17000 and 18000 pounds. “When you have cows that last from seven to eight to ten lactations, in the long run they pay off.”

Forage corn is rotated back into grass or alfalfa every five years or so to control weeds and allow the soil to “build back up.” Alfalfa plantings last five years on average, depending on the winter, and strip cropping is practiced to prevent erosion.

Sustainable Farming Philosophy

When asked what drove his father and now him to stay in farming, Konrad Bailey expresses a broader concept of sustainability. “The sole purpose, probably, for us to continue in agriculture as a family is our commitment to this country and to our children. We made a commitment to God. For the fact is that we believe there is a proper way to sustain agriculture or the communities or our families. It's also a loyalty to our heritage and to the people that have done things before us.

“My father personally cleared and burnt brush and worked for hours and hours until late at night. And some of the fields that he helped reclaim—I get to reap the benefits of what he did. I can mow those fields today at 7 or 8 miles an hour, and he never got that opportunity. But he did that for me. So I do things for my son, things that I will never capitalize on, but he or my nephew can. That's why I do it. Is it economically sound? In a sense, no. But is it proper or is it right? Yes, because it's for the next generation. It's not always dollars and cents that build this country.”

Sustainability via Risk Management

Bailey thinks farming, in general, is more risky than it used to be. He notes “immense” changes in support services and infrastructure. “When my father took over there were three equipment dealers in the town of Farmington, and now there are zero,” so farmers need to be more diversified in their abilities especially in regard to equipment. He believes his operation is less risky than conventional dairy farms because it’s more self-contained, and he thinks lenders appreciate that fact.

Bailey manages risk by keeping debt per cow low, by having retail outlets that afford some control over prices received, and by doing “whatever we do in-house...from electrical to construction, to mechanical and welding. So we are not at the mercy of everybody else.”

Incremental improvements keep debt and risk down. Their \$25,000 delivery van could be improved, says Bailey “but we have to do it in steps because if you over-extend yourself you’re going to be doomed...Just like my dad always said ‘do your work as if you’re going to be here forever, and complete it as if you’re leaving tomorrow.’” That way the farm can be ongoing by the next generation.

Information

Bailey also follows his father’s advice about information—gather all that you can through magazines, other farmers, other farm operations, wherever you can and then evaluate carefully and within context. Does the operation have other income from a trust fund, or a big gravel pit, or borrowed income? Is there a family labor force? “You have to evaluate contextually,” says Bailey, before stepping into something new like labor-intensive processing. “We asked all kinds of different people that were involved in it. We weighed the cost and decided whether we were going to make these cows pay for themselves, or cut wood for the rest of our lives, or whatever, to support our farm...You try to use principles...my uncle’s famous saying is ‘the principle, the process and the product’...the principle is the key. If it’s the wrong principle, you’re going to end up with the wrong product. If it’s the wrong process, you’re going to get the wrong product. If you violate any one of those three, you’re doomed.”

Globalization and Programs to Help Farmers

“We are in a globalized world now,” says Bailey. “We are no longer a sovereign country. I think that is really detrimental to us in agriculture.” Globalized specialized agriculture that concentrates food production in certain areas or countries is a recipe for trouble with droughts, flooding or other disasters. “The reason we survived the world wars,” says Bailey, “is because we were a sustainable country within itself, and because we could feed ourselves.”

Going off the parity system was also detrimental to farmers Bailey believes. “They told us ‘don’t worry, produce it for less, borrow against the equity of your assets, and in the future someday you’ll sell it [the farm] for a profit.’ That was a lie,” says Bailey. “They forgot to tell you that [after paying off the debt] you’re going to pay capital gains on it, and inheritance tax, and you are going to be bankrupt in the end. That’s how they are bankrupting American agriculture...Most farmers can’t stop if they wanted to,” says Bailey, a predicament he has carefully avoided.

The biggest help for small operations like his, and for everybody in agriculture, Bailey believes, would be for the government to break up the monopolistic conglomerates that “own two-thirds of the dairy market...Whoever has to go after them, that’s what has to be done,” asserts Bailey, because farmers can’t compete with corporate monopolies, and Bailey doesn’t try to.

His own customers already pay a little more, and at least half are willing to pay even more, and some do, on their own accord. “They understand,” says Bailey, “that there isn’t always going to be someone like us unless people are willing to make a commitment to help us.” He thinks nationwide only 10 percent understand the need to make that commitment and that organizations like the Maine Sustainable Agriculture Society could help the people who want “the rural look, the open fields and forests” to understand that “it takes labor—profitable labor—to sustain that,” says Bailey. “We need to have people that can go out there in full-time jobs to sustain that land and to maintain it.”

Bailey thinks farmers also need to learn a thing or two, about the business aspect of farming, about the value of the work they do, about the fact that farming, contrary to popular belief, is the oldest profession. Bailey figures he’s got his finger in a lot of professions. “I have to be a soil scientist, a mechanic, a carpenter, an electrician. I have to be a mason, a veterinarian. I have to be a people person, manage my employees, be an accountant. We are professionals,” asserts Bailey, “and we should get paid like professionals...We are just as important as a dentist or doctor, more important than lawyers” because without those who produce the food what can the others be?”

Bailey acknowledges that farming as a profession is more rewarding than punching a time clock, which he did for seven years, starting at the bottom, working up to a millwright, and then leaving with just a lunch box. Now he has more than a lunch box at the end of the day and something to pass on to his children when he retires—something they can pass on to their children, even if he doesn’t actually own it. But he doesn’t think farmers should be satisfied with thinking “well, I do make a little bit of a living and I get to decide when I get up in the morning even if it’s five minutes late and I’m all messed up for the day.” He thinks farmers like other professionals should have vacations, a few toys, maybe a camp on the lake, or a cruise, and a few years of retirement to relax.

Spear Farm and Greenhouse

Jeff and Laurie Bellmore

Warren, Maine

The Farm in Evolution

Jeff Bellmore didn't plan to be a farmer, but he's been market gardening for 23 years. "We were in the back-to-the-land movement," says Jeff looking back on the late 70s when he and his wife Laurie (both Maine natives) bought 40 acres of fields and forest at the end of a dirt road in Waldoboro. They built a house and raised livestock and vegetables for their own use until they began selling excess garden produce to offset the high cost of livestock feed. "It sort of evolved from a too-big garden that was more than we could eat," says Jeff. "We checked into farmer's markets and joined one, and kind of liked the interaction, and joined another one.... and then more acreage and more acreage," a trend which continued until five years ago when he reduced his acreage by two-thirds.

"Back in the early days," Jeff recalls, "we had what was called Four Farmers down in Boothbay Harbor, with four vegetable growers...It was a mini co-op, you might say...we had a couple of acres of vegetables up to as much as 40, 50 or 60 acres, as time went on... we made a lot of money." But two of the farmers went out of business, "big overhead, big loans," says Jeff, who kept on farming and expanding.

In 1985 the Bellmores sold their homestead and moved to a 140-acre leased farm in Warren on heavily traveled Route 1. The new location facilitated farmstand and pick-your-own sales, and put them closer to manure supplies and the additional 40 leased acres of good cropland. Jeff was planting 100 acres of produce, wholesaling to the big chain warehouses and continuing to do well financially.

Responding to Changes

By the mid-90s, the agricultural climate had changed and the Bellmores changed with it. In addition to labor issues, their profit margin was narrowing and they "weren't having much fun anymore." Instead of neighbors and high school student hires, up to six migrant laborers were now on the payroll. The year the migrants threatened to quit in the midst of strawberry season if they didn't get a \$1 an hour raise, Jeff stormed back to the house to cool down, returned to the field, fired them all and got a new crew.

The wholesale marketing atmosphere had also changed. Produce buyers he'd worked with for years had no loyalty to their growers, they just "went for the cheapest." With globalization and the Free Trade Act -- which Jeff thinks is "the worst thing that ever happened" for the producer -- the cheapest might be from Canada or anywhere in the world. Having to wait 60 days for payment from the big stores meant trips to the bank for loans just to meet payroll and bills.

The pace of the operation had intensified to where Jeff worked 16 to 18 hour days for 180 days straight for two years with no break and no time for family. One year he fell asleep on the tractor spraying sweet corn at 2:00 in the morning. When the tractor hit the hedgerow trees it jarred him awake and into thinking it was time to regroup. In Jeff's words, "one day I said, 'I'm

not gonna do this no more. There's gotta be a change. I like what I do, but this is really crazy'...It was ag burnout, that's what I used to tell people. You had very little time to think about anything other than today."

His decision to down-size from 100 to 35 acres was "the best decision" he ever made, and labor was a major consideration, not migrant versus local labor. Rather they were depending too much on other people's labor because they were doing more than they could do themselves. "You've got money in growing it," Jeff admits, "but the growing is the cheap part today. It's the labor that's the killer."

Now most of the field work is done by Jeff and one Mexican worker who has been with him for nine years. Laurie and the three Bellmore daughters are in charge of the greenhouses and do most of the selling.

Marketing

Ninety-five percent of what they grow is sold directly to customers through the farmstand and four farmers' markets. The remaining five percent is sold wholesale or swapped with other farmers in a cooperative effort to fill in supply shortfalls among them. In addition to about 30 different vegetables, they grow raspberries, blackberries, and several acres of strawberries. With increased retail selling, more intensive planting, improved customer service, and a smaller payroll, they are making the same net income with 35 acres as they did with 100.

Sustainability

What is Jeff's concept of sustainable agriculture? It's "coming up with a farm that is growing good vegetables, fruit, livestock, timber," says Jeff, "whatever it happens to be, in an economically and environmentally appropriate manner. And getting a return for the farmer who is doing the work...I think I've been doing that for 20 years in a lot of respects...We've made a living and we've raised three kids."

"You can't wear one hat in sustainable agriculture, as I see it," says Jeff. "You've got to do more, you've got to get all you can out of the resource you have...to keep the farm and open space." Jeff plows snow and cuts wood in the winter. They start the greenhouses in the spring, begin field work in April, sell bedding plants and plant crops in May, and vegetables sales dominate the summer. In the fall Jeff dons his Maine-Guide hat for hunting season. For Christmas it's wreaths and Christmas trees. When January comes they start in all over again.

Sustainable practices extend to crop management as well. Jeff participated in Extension's integrated pest management program during the mid-80s and has continued to fine-tune insect scouting on his own. Cultivation and IPM have reduced insecticide and herbicide applications significantly, which has been good for the bottom line and for the environment. His operation lacks an on-farm manure source that a livestock component would afford, but he gets all the manure he can spread for free from a neighbor who is a chicken farmer. "He has to get rid of it," says Jeff, "and I use it up. So, it works out real well for both of us."

Most of Jeff's produce is organic but will never be certified because he uses some fertilizer on some crops and he wouldn't hesitate to spray if pest levels exceeded the economic threshold. He admires certified organic growers, but he gets the same price for his produce and, at least with some crops like sweet corn, he thinks the organic growers have "worked ten times harder" than he has. His customers perceive him as a "good steward of the land and the environment," which he feels is a real plus on the marketing side.

Plans for the Future

Jeff is looking forward to retiring -- making a "voluntary career change" -- selling out to "some young farmer" five years from now, when his youngest daughter graduates from high school, and helping the new owners make a living. The new owners won't be the Bellmore's own children; they don't want to work as hard as their parents have worked, and Jeff doesn't want them to either.

Advice to New Farmers

These days, Jeff believes, "either you've got to be a small farm, which is what I think we are now, or you gotta be a big farm. I was there [in the middle] and I didn't see any benefit to it...at one time there was...the more you plant, the more you make...well, I don't think that is the case anymore." The wholesale marketing niche for mid-sized farmers is gone, he thinks. The grocery store chains want only big producers. Mid-size Maine farmers have to compete with sweet corn from Florida, with new-crop strawberries from Canada, even small farms like Bellmore's take a share. "The guy in the middle gets it on both ends," says Jeff

Jeff estimates that with no off-farm income, a family would have to gross \$100,000 in farm sales to make a living. Because he thinks it would be more difficult financially to start out in farming today than it was 25 years ago, he wouldn't advise anyone to do it. "Today it is real hard to make a living farming," says Jeff, "and the biggest reason is the margin. You're competing against the world," he says. A good business plan is a must for anyone starting out today, Jeff believes, and if he had to do it all over again, he'd do it with business plan in hand and "jump in with both feet," write the check, whatever it takes. He wouldn't do it piecemeal again.

Policies and Programs to Assist Farmers

Because Jeff doubts that small farms will fill the production gap or preserve the land, to his mind, losing mid-size farms translates to losing farmland and open space to development and houses, a loss that will change the character of Maine and negatively impact the tourist trade. "Tourists want to see farms and tractors and cows in the field and crops growing," says Jeff. Laws against development on good farm land and programs for buying development rights at a price that makes sense for the farmer -- even in areas where there is no development pressure yet -- are things Jeff thinks ought to be thought about for the future.

Some changes he thinks would help small and new farmers include a return to the old Extension, which provided excellent services when he started out, an in-state central marketing system run by a non-profit organization selling on consignment, some control over land prices, and professional affordable assistance with a personalized agricultural business plan. Sharing resources and equipment and working with, not against, one's competition is an attitude that has

helped the Bellmores. “You have to work amongst your competition, in a sense,” says Jeff. “And that’s how it’s supposed to be to survive. If none of us survive, or if a very few of us survive, none of us are going to survive in the end...The more prosperity there is in agriculture, the more prosperity there will be.”

New Leaf Farm
Dave and Chris Colson
Durham, Maine

New Leaf Farm was founded in 1982 on a 100-acre retired dairy farm in Durham, Maine, located in the more densely populated southern coastal region of the State. The original big barn was gone, leaving the house, a small attached barn and a 40-foot x 80-foot metal equipment building. The fields were still being mowed for hay when Dave Colson jumped into the business of farming.

Dave's parents contributed start-up equity for equipment and purchase of the farm. They also had business know-how and were actively involved in the marketing end in the early years. Dave, who was 27 at the time, had a passion for the environment, a degree in biological agriculture, and several years experience working on farms. His vision was of an organic vegetable farm based on green manures and rotations for fertility and weed control -- a system he felt was "do-able" though perhaps not well modeled.

New Leaf now has nine acres of cultivated fields, 1/6 acre under commercial hoop houses heated with propane (which permits double cropping), another 1/2 acre of mixed vegetable gardens, 1/2 acre of fruit trees, and a homemade 32 by 40 foot passive solar greenhouse with oil back-up heat. High-value field crops are fitted with homemade plastic tunnels that are removed during the warm summer months.

Developing the System

Fields were initially opened up with the input of poultry manure to jump-start fertility for a year or two of sorghum-sudan grass cover crop followed by a fall planting of rye to defeat the witch grass and prepare the land for vegetables. Four 2-1/4 acre fields are now in a four-year rotation. Each year one field is in vegetables, two are in clover green manures and one is in grains. The addition of grains to the system not only provides a marketable crop but also high carbon straw, which when incorporated back into the ground and followed with two years of clover gives a good carbon to nitrogen balance for the following crop. The only purchased fertility inputs are rock powders.

Livestock, the most recent addition to the system, was added as a source of on-farm manure for compost used in the hoop houses and on smaller gardens where green manuring is inconvenient. The two Holstein bull calves purchased each spring spend their first winter in the barn and are rotational grazed the following summer on land that would otherwise be of no economic benefit. This year's animals will be certified organic, and part of the grain they consume is New Leaf barley.

Fine-tuning his farming system is something Dave never tires of, and it's happened over a long period of time. "We really did a lot of trial-and error work," says Dave. We tried different types of green manure crops...different kinds of grains...I think it's a matter of trying things, seeing how they grow and trying to figure out how that incorporates into your own system."

“What drove me in this direction,” says Dave, “was a sense of trying to integrate the farm as a biological system and to understand how that fit into the greater environment and the greater ecology. Also, my own personal values were ...of a farm that was manageable by family members and maybe some hired help [two MOFGA apprentices and two part-time workers]. But basically, not growing beyond where we were able to generate all the products -- economic, fertility and crop-wise -- that we needed to make the farm successful...While we definitely had our doubts in the early years -- like any small business it takes two or three years to really get from the red into the black -- we did make it, and the farm has been generating a positive income ever since then.”

Making Ends Meet

That positive return provides a modest annual income for Dave, Chris and their three children. “We are now netting enough on the farm to supply our family’s needs,” says Dave. “It isn’t [a lot] but it’s satisfactory for us....If all Chris and I wanted out of life were to make a lot of money then we probably shouldn’t be farming.”

Like most farm families, the Colsons find benefits to farm life that are not measured in dollars and cents. “Dave and I probably have a mutual satisfaction in working on this farm,” says Chris, “working the land, being able to be home, to be here with our children, to see our son grow up romping around the fields and watching daddy on the tractor and eventually driving the tractor himself. And I think we each have our own individual reasons for wanting to be on the farm. Dave really thrives on the production end of things. He likes to think through the mystery of growing the plants and tweaking the system so that it works better without doing so at the expense of the environment. I have great satisfaction in knowing that the food we eat, the food I serve to my family, is very nourishing, it’s very fresh, that we can be outdoors and get fresh air, that our children can see the work that we do.”

Marketing

New Leaf specializes in salad greens, broccoli, summer and winter squash, tomatoes, herbs, and small amounts of other crops. But, says Dave, “if there is a question in terms of time and labor, we know where our major income is coming from and we put the energy into those crops.” Years ago head lettuce was half the farm’s business and was used as a base crop for assigning a “kind of field cost” to determine comparative profitability of other crops. Head lettuce has been eliminated since, as Chris says, “mixed greens bring us much, much higher income and profits than head lettuce ever could come close to” and on less acreage.

New Leaf produce is marketed through six upscale local restaurants, two natural food stores, and a 20-person “buying club.” Marketing begins the first of April and ends the first of December, except for winter squash and onion sales, which extend until Christmas.

“We have not done farmers’ markets since our first year of marketing,” says Dave, “and we have never had a farm stand on the farm...We meet with our customers over the winter and get a sense of what they’re interested in getting from us.”

“The relationship between the farmer and the customer is a very important piece of marketing,” says Chris. “After a while you get to know your customers...and the process is quite simple. Our week is organized so that we have two harvest days and two delivery days.” The day before harvest Dave lists the crops that are ready, Chris tells customers what is available and asks how much they want. Orders are delivered in a large van.

New Leaf’s buying club was begun at the request of neighbors. Twenty members purchase a bulk mixture of vegetables each week, pay the retail price at the time of pick-up, divvy up the produce among themselves, and the particular mixture each week is New Leaf’s choice. This simplifies the process for New Leaf, they’re able to sell produce that “otherwise would be sitting on the farm,” and they don’t have to wait for payment or feedback.

Sustainable and Integrated Systems

“A sustainable farm,” says Dave, “is the combination of practices that sustain and renew the land and also provide an economic benefit to the farmer.” He cites New Leaf’s “sustainable practices” of green manuring, crop rotation, a livestock component, composting, diverse crops, and niche marketing. He also cites as sustainable the successful integration of the different components “so that waste from one part of the system provides fertilizer for another part. Or growing one crop cuts down on weeds or pests in another part.” “In the long run,” says Dave, “the farm becomes more economically viable by the closing of the circles....And that’s really what we try to do on our farm -- look at the farm as a whole organism....supply nutrients and needs from within the system...not go outside of the farm and have to purchase those things.”

But Dave also recognizes that a sustainable farm does not stand alone. “It needs to be supported by a sustainable community,” says Dave. “We need a thriving rural community around us that is demanding our product in order for the farm to be very viable...Right now, the increased globalization of markets and the increased urbanization of our culture is slowly pushing the family farm out.”

Future of the Farm and Farming

Now in their late 40s the Colsons are beginning to wonder whether the farm will provide for their needs as they get older. Chris, who has a degree in environmental science is working toward a teacher’s certificate. She is concerned about the high cost of health insurance, which has forced them to carry only a catastrophic policy with premiums ever on the rise, especially for individual policies. “Most farmers have no insurance,” she says. “I would love it if the State could provide some kind of small farm group health insurance for all farmers.”

Dave doesn’t see expanding the farm as an income solution. More acreage would increase gross receipts but require more hired help, which would do little to improve net income. Dave is also concerned about certain pesticide and health regulations, which “probably make sense for larger scale farming, but create fairly large burdens for small family farms.” He cites apple cider pasteurization, which is pushing the small producer “out of business,” and the 12-hour waiting period after pesticide spraying before workers can be allowed back into the field, which applies even to organic growers. With only one field, Dave has to spray late afternoon to meet the 12-hour wait time by morning even though a morning spray would be more effective.

Programs or policies that the Colsons think could help sustain small farming and viable communities include consumer education so those who buy food are aware of where it's coming from and what effect their purchasing choices have on the communities they live in. More education for farmers is also needed, information about alternatives, possibilities and types of systems. As banks have trended toward regional and national, lending for small farms has tightened and Dave sees a need for alternative sources, perhaps through the State.

Another suggestion was offered by the Colsons' dairy farmer friend, who Dave describes as "over 70, very conservative, passionate about what he does, and always outspoken for the working masses." This farmer told Dave last summer, "You know, it's tough getting older and trying to make a living selling hay or milk at \$2 a gallon, and I was wondering whether I could possibly figure out a way to legally grow medical marijuana." He's certainly right about it being a high-value crop, and certainly -- when lawmakers figure out how to regulate it -- there will be a need for good farmers to grow high quality, organic medical marijuana. Who those farmers might be -- big or small, corporate or family, remains to be seen.

Skylandia Organic Farm
Jim, Kate and the five Cook children
Grand Isle, Maine

Six years ago, Jim and Kate Cook and their five school age children relocated from southern Maine to a 500-acre farm with no barn and no equipment in Aroostook County's St. John Valley. They wanted a business the whole family could be a part of; they "wanted to be an organic farm and make it pay." They had visited every county in Maine as part of the kids' home schooling curriculum and chose Aroostook County because of the "hospitality and good will of the people there."

"We had a plan to get here," says Jim, "but not a plan of what we were going to do or how it would be profitable...If I had stopped to evaluate what I'd need to be a successful farmer, it would have taken another five years to make the jump." It was passion for doing it that got them there and it has been lots of hard work and a faith "that this is the right place for all of us" that has kept them there. The farm now produces 12 acres of certified organic diversified root crops, including seven acres of 12 varieties of potatoes and a linear mile of raspberry brambles. "We're sort of seeing that we're breaking even," says Jim, but for the Cooks "it's never been about money."

In the beginning Kate worked off the farm, and the kids attended public school, but eventually Kate decided "there's no such thing as a part-time farmer." She left her teaching job, returned to home-schooling the children and alternated one day of school with one day of farming, which helped everyone stay more focused.

Daughter Marada, who runs the small farm stand and wants to be a farmer for the rest of her life is apprenticing on working farms. Marada's twin sister Rivera, who keeps two sheep for her spinning and weaving and wants to be an artist, went off to college this fall. Daughter Leah is planting the next apple orchard with her brother and a friend from Madawaska. The boys did the parsnip and carrot fields this year.

Marketing and Sales

The first year Jim headed south to the Portland/Boston area seeking markets for his crops; he found much more demand than he could possibly supply. He and several other farmers formed the Crown O' Maine Organic Cooperative with Jim as their sales representative. Last year they sold 400,000 pounds of product grown on 75 to 100 acres. Their goal is a million pounds and to ship more into supermarkets through distributors to further reduce marketing and distribution costs. Jim spends much of the off season "knocking on doors to get accounts" but also promoting their product. "If you're doing something different, or you're doing a high quality item," says Jim, "education awareness is a key factor."

"One of the big problems for farmers," says Jim, "is nobody's teaching anybody how to sell anything...they hide behind this term 'marketing', which is kind of a glorified term for sitting in an office and dreaming up strategies. Yes, you need to identify your market, but then you need to go out and sell your product. Selling is really quite an exciting process of educating and

helping people come to a decision and giving them an experience they really appreciate. We have found selling indispensable. It helps make it all work.”

“That’s what we do better than most,” says Kate. “We don’t farm better than most, but we do sell better than most...Sales is a family thing.” The Cooks also sell at the farmers’ market, their small roadside stand and through mail order. Kate says the kids use sales skills in other parts of their lives, as when Marada got a farm exchange placement with a New Zealand family who had vowed never to take another American. Or when Rivera won a full college scholarship. Or when the boys talked their way into courses at the technical college before they reached admission age.

Sustainability and Integrated Systems

Jim supports what is coming to be known as sustainable agriculture because it leads to “judicial and limited use of chemicals in farming. Then, you still have the issue of making it pay. Sustainability, I think, has both of these connotations—one is environmental and one is economic.”

The classic notion of integrated farming systems, says Jim, “means that you are raising animals to provide manure to go back to the soil to raise crops to feed the animals to provide manure to go back to the soil to raise crops...We’re not set up to do that...What I try and do is work with the natural resources available to me [like fish scale and fish meal] to make my system complete.

Crop diversity also contributes to sustainability by buffering price volatility and reducing the impact of a single crop failure. In addition to potatoes and root crops there are also raspberries, strawberries and eggs to sell locally. Diverse markets are also part of the sustainability package.

Financing

“Keeping the passion about farming alive helps you get things done in the absence of big financing,” says Jim. “In lieu of spending money we spend time.” Having no equipment the first year, they hired a neighbor to plow and did absolutely everything else, in both field and packing shed, by hand. The next year when Jim came home with a tractor (owner-financed) and later a potato digger, they all “thought he was a hero.” Because the work got easier each year, Kate’s job of keeping the kids enthused and willing got easier too.

“Financing a farm is next to impossible,” says Jim. “We’re taking it one year at a time and we’re using creative financing and community good will.” The farmer who sold them the place agreed to owner-finance for two years. During that time they, with their extended families, set up a family trust. “The land is actually a trust that belongs to the families,” says Jim, and though he and Kate have payments to make they haven’t yet borrowed commercially, or prepared a business plan.

Future Changes

With the kids now pursuing their own interests—Marada is off to work and apprentice at other farms, Rivera is away at college—and though all of the children have some interest in continuing to participate in the farm operation at some level, they are no longer a labor force that can be

relied on forever. Jim and Kate are considering increased mechanization—a potato sizer, another brusher—to ease the transition.

Rather than expanding production, or altering marketing strategies, or hiring workers, the changes they are planning include a learning center and a barn of another sort. The barn will house livestock, a packing shed for coop members and a communal licensed kitchen where organic farmers “could do added-value products.” Kate envisions a “more fully utilized farm” bringing “a constant flow of people who want to work.” There would be more chickens, ducks and turkeys, and a flock of sheep with movable fencing. People of all ages and whole families could come and “try out farming, learn respect for the diversity in farming and see that farming is “not just the same old, same old...I’m scared to death that if we don’t raise another generation of people who want to take care of the earth, we won’t have an earth to take care of.”

Kate would use the diverse landscape of grassland, mixed forest, diverse cropland, and beaver ponds to teach about the varied ecosystems. She anticipates that in five or ten years the farm will be thriving and profitable so the children won’t ever feel obliged to come back to work on the farm “just so the farm can make it.”

Advice

Jim’s advice to anyone wanting to farm is to “do it if you’re passionate about it, but understand where you’re going a little bit. It’s like the advice I give for having kids, ‘Don’t wait till you’re ready, but know what you’re jumping into.’ And work like hell.” He tells farmers who ask what they ought to grow to make a profit, “grow what you’re interested in growing and then you’ll grow it well and you’ll have a good crop.”

“I’d suggest that they all go and live on a farm first,” says Kate, and she stresses the importance of family unity and involvement. “We’re making it,” she says, “because seven of us agreed to be here to do what we are doing. We’re a diversified farm so that each of us can find some crop or some season that is our forte...It’s not one person earning the money for the rest. It’s seven of us working together or seven of us failing together. That’s the strength and that’s what they would need if they were going to start farming.”

Information

Neighbors and farmers have been sources of information, as has Extension and the publicly funded Appropriate Transfer of Technology to Rural Areas program which searches the research, does special projects for individual farms and has an 800 number, but “the biggest resource I think we have,” says Kate, “is the land itself. It’s very forgiving, but it’s an incredible teacher.”

Programs that Help Farmers

“Aroostook County is a sleeping giant,” says Jim, with its hundreds of thousands of acres that can be grown organically or sustainably, and the consumers that want those products are increasing every year. Cheap land prices are attracting new small farmers to the area, established farmers are beginning to diversify, contract growers wanting to scale back are looking into growing organically. There is a real need for a “sustainable” label, which Jim thinks would “justify a 50 percent price increase.” Also needed are programs that promote the sustainable

label, what it stands for, and who stands behind it; a USDA-approved slaughter house for the County, programs like Get Real Get Maine (with fewer budgetary constraints); programs that foster the collective power of cooperatives; a university system that takes students out of book learning and into working farms of all types to instill a “passion about farming or agriculture.”

Satisfaction

Marada compares life on the farm to the “virtual world” of computers and office jobs. “We think that just going outside and doing something worthwhile all day is worth a lot more than some of the more material things...satisfaction is worth a lot more than people think sometimes.”

“In the balance,” says Kate, “I have five teenagers who love to read books, who spend their time with their family, who have a passion for learning and a passion for experiences. They are easy to please and we’re a solid family...If the price I have to pay is financial, it’s worth it, absolutely worth it. If I had to do it all over again, I would go back and do it all over again.”

Jim says people often ask how they get the kids to work, “I guess we’re a little incredulous with the question because—no choice—we all have things we need to do in the morning and afternoon and evenings that make us get out there and look like we’re working. But in reality we’re just being part of our environment. It’s a satisfying thing... love my overall job which is to be a farmer in the summer time and a salesman in the winter months...I can’t think of anything else I would want to be doing at this point in my life.”

Blueberry Ledge Farm
Rudd and Elizabeth Douglass
East Pittston, Maine

Rudd and Elizabeth Douglass were raising animals on their three-acre Connecticut homestead before they relocated to Maine in 1982 with their bevy of livestock and two teenage children. They “fell in love immediately” with what is now Blueberry Ledge Farm. It had a house they liked, it was on a quiet dirt road, they got a “good deal” on it, and they were able to purchase the five acres across the road so no one would build there.

The owners financed the sale until they got a bank loan, and a Farmer’s Home mortgage came through after they had been farming for a year and prepared a farm plan and financial statement. Elizabeth worked as a paralegal and still does, and Rudd taught part-time at Kennebec Valley and Central Maine technical colleges, work which he retired from in 1990 when he switched from wholesale to retail farm sales. Except for the 300 laying hens, Elizabeth’s two pleasure horses are the only remaining livestock at Blueberry Ledge. Disenchantment with livestock grew out of Rudd’s frustration over constant breakdown of haying equipment and a thin profit margin. Rudd now cites two important things he learned the first couple of years. “The less equipment and the fewer animals you have, the better off you are.”

The farm consists of 88 acres, most is woodlot used for their own firewood, and most, although sloping, is poorly drained, which limits rotations and precludes green manuring. In production are 27 acres of blueberries (including 7 leased acres), 10 acres of mixed vegetables, and an acre of field-grown perennials and shrubs. Container growing is now used for perennials and shrubs, and includes three approximately 17 by 50-foot poly-tunnel greenhouses which cuts down on the work involved. One half of a 28 by 96 foot aluminum frame greenhouse is minimally heated for germination and vegetable seedling production.

Rudd’s guiding light in nearly all decisions made about the farm operation is KISS--keep-it-simple-stupid. Rudd always wanted to have his own business, and still remembers his dad, who was a supervisor at GE, saying, “If you really want to do what you want to do, you’re going to have to be your own boss.” But Rudd never wanted a “big” or monocrop farm because, as he says of himself, “I get bored doing one thing.”

One big lesson he learned early on, in a series of seminars sponsored by the Maine Small Farm Association, suited him just fine. “All through the seminars,” Rudd recalls, “all I heard was ‘if you want to be successful in a small farm in Maine, you’ve got to diversify’...There were a lot of other things going on there, but that’s what really stuck in my mind...I never really perceived any risk other than if I’m a one-crop farmer, I ain’t gonna make it. And if I’m going to do produce I better do many different things, because I know I’m not going to have everything be successful every year.”

Another choice Rudd made was to go the organic route, which, at the time, was in line with his keep-it-simple philosophy and his bent for practicality. “I just didn’t want to have to get involved with having to worry about chemicals,” says Rudd, “getting certified every year to use

these chemicals. And also having spent my graduate school days [and working as an oyster pathologist] in a histology lab breathing fumes of xylene, toluene and benzene. I just decided I didn't need anymore chemical insults to my body."

Blueberry Ledge Farm's vegetables and some of the blueberries are MOFGA-certified organic, but Rudd suspects he may not seek certification for his vegetables next year. His conflict with organic certification regulations began during his years on MOFGA's certification committee when he felt that some regulations were based more on philosophical beliefs than scientific grounds. The organic regulation looming for next year is a requirement that all manure be composted and turned for a specified period of time at specified temperatures to prevent bacterial contamination of the final product.

The problem this manure treatment requirement presents for Rudd is that chicken manure from his own hens (not from a commercial operation) is the foundation of his fertility regime and, in keeping with his KISS guidepost, chickens make money and provide nutrients for the gardens "with the least amount of work." Manure processing takes place in the hen house, not in a time-consuming, equipment-requiring composting facility. Even the horse manure is delivered to the hen house where it's scratched around into an easily applied consistency. The only purchased input is chicken feed. Eggs are sold at the farmer's market, and Rudd estimates they get "about a 25 percent return on the investment" not including the value of the manure. To his amazement, the biggest portion of profit comes from the sale of all but 50 hens in the Fall to folks who come from as far away as northern Maine wanting laying hens.

Another problem Rudd has with organic regulations is the requirement to remove plastic mulch at the end of the season. Leaving the plastic on through the winter retards erosion on one of his sloping fields, especially in the spring. In years when he's removed the plastic in the Fall, says Rudd, "I wind up with a lot of the good soil at the bottom [of the slope] and a lot of rocky stuff at the top." This year he planted annual clover between the rows of plastic hoping the roots "will hold onto the soil so we don't get little gullies down between the rows." The clover successfully suppressed pigweed and annual grasses, but maintaining the weekly mowing schedule proved difficult during the busy blueberry season and the clover grew up and fell over on top of pepper plants, retarding growth a bit but not the harvest.

Marketing

Rudd thinks that the demand for fresh produce and farmers' markets is increasing--there are more in Maine every year. And yet competition among markets and vendors is decreasing mostly because "it's too much work." He thinks farmers' markets offer an opportunity "for somebody who wants to figure out what people want and produce it...I don't think there's ever going to be enough people producing."

Since getting out of wholesaling in 1988--mostly because customers did not reliably purchase what they'd indicated at the start of the season--nearly all Blueberry Ledge products are sold at the Brunswick farmer's market two days a week. It was the market's selling season--from May through October--that got him into perennials. He needed plant material to sell in May. At the time, says Rudd "I didn't have a greenhouse so perennials seemed like the best thing to do,

because I could do them in the ground.” His original 10 or 15 varieties have mushroomed into 500 with 30 or 40 new varieties each season taking 50 or 60 to each market. The perennial market, says Rudd, “really began taking off in 1996 or ‘97...people are really getting interested in perennials. I don’t know how long it’s going to continue to rise, but even if this reaches a plateau, that’ll be fine.” About one-third of the farm’s income is derived from perennial flowers, roses, and small shrubs grown from seeds or bare root stock, purchases he finances on the credit card which the blueberries pay off.

Blueberries provide another third of farm income and “have been good” to him over the years, but his early stint with the Maine Organic Blueberry Co-op fizzled out over two issues. First, organic management left him with “fields of weeds,” so he had to go to Velpar on most fields, a job he hires out. Second, the Co-op was selling ten-pound boxes or quarts at a time when Rudd heard the message loud and clear, at a Trades Show presentation by Aurora Farm, that pints were much more profitable. “I was very upset at the co-op,” says Rudd, “because they didn’t want to move to pints. Every time you do a quart, you lose 50 cents to a dollar...We process a real clean product and we only do it in pints,” about two to two-and-a-half tons of pints. He still does 10-pound boxes, but no quarts, and he stretches the season to eight to ten weeks by hand-picking or selectively raking as soon berries begin to ripen. He has five or six wholesale store and farmstand customers for his berries.

Rudd has adhered to the diversity strategy, not only through his three main crops--blueberries, vegetables and perennials, but he attributes much of his success at farmers’ market with having great diversity within those categories. Of the 19 vendors at the market, says Rudd, “I try to have more perennials and plants...and more different types of produce than anybody.” This year he had 26 varieties of potatoes, and his 20 to 30 varieties of determinant tomatoes not only provide early and late harvests but also reduce risk due to disease since there are few good organic sprays for tomato diseases.

Rudd’s objective with farmers’ market sales has always been “to get the best, but fairest, price for his products” as he could, and he gets his ideas for what he should be doing from his customers. So, although he tends to be quiet and a bit of a loner otherwise, he dons his “gregarious” market persona twice a week. “I try to talk with all the customers,” says Rudd. “They are the people paying the money; those are the people you want to please.” In fact, identifying one’s market first, before deciding what to grow, is Rudd’s first line of advice for new farmers.

Future for the Farm

Rudd’s objective with the entire farm operation has been to get as much out of it financially in five months as possible with as little work as possible and to keep it as simple as possible with minimum equipment for as long as possible. He says, “it’s basically a one-person operation,” and he doesn’t want to work at night, or 24 hours a day -- 14 is enough -- and he wants his work day to start at 4:00 a.m. and to end by 6:00 p.m.. He starts the greenhouse in March, does marketing from May through October, spends November getting things ship-shape and then takes some time off to catch up on reading the farm publications he subscribes to. “We’re never going to get rich here,” says Rudd, “but I don’t have to work in the winter, yet... don’t mind

working real hard as long as I can have some time off...and as long as I have enough money to do what I want to do, I'm happy." He hires kids to help, and his daughter works for him from May to September running the greenhouse business, keeping the crews busy and organized, as well as whatever else is needed.

At age 55, Rudd notices that he "doesn't have the energy" he used to. So he's easing toward changes he thinks will reduce the work load. "I'm heading, I hope," says Rudd, "toward almost everything we generate here being sold from the farm...I think we will be a mini garden center." Although the location is poor for a farm stand, with a little advertising for the first time this year, their on-farm sales of perennials doubled. Rudd is excited about his plans for perennial "show gardens all over the place," an idea he got from his customers. For the vegetables he's thinking a CSA might be the way he'll have to go in order to draw customers to the farm.

Wood Prairie Farm
Jim and Megan Gerritsen
Bridgewater, Maine

Jim and Megan Gerritsen have been perfecting their certified organic farm system in Aroostook County potato country for 24 years. Their product line includes winter-stored vegetables, grains, and 16 different varieties of potatoes. Two-thirds of their income is from seed potatoes sold to both home and market gardeners. Grains are cleaned and milled on the farm into flour or raw grain and processed further into packaged bread mixes. Their catalog is mailed out on request to 30,000 customers.

Of the farm's 110 acres, 40 acres are in a four-year rotation of 10 acres of potatoes, 10 acres of grain interplanted with clover and 20 acres of clover. "The grain and clover are for building the soil up so we can grow a good quality potato crop," says Jim. The farm's only livestock component is a family milk cow, a couple of calves, a pet donkey, and some chickens. Manure is composted to make compost tea in 55-gallon drums, which is sprayed on the potato crop.

The Gerritsen's decision to farm was a lifestyle choice, not driven by economics, but by the desire, says Jim, "to develop an independent lifestyle to where it's based within the natural cycles of working with nature. And also being in an environment where we are integrated between doing our daily work to earn a living, to raise the family, and to be members of the community that we're a part of. It seems to me that farming offers the greatest opportunity when those are the values that are important."

Likewise their decision to farm organically was more a lifestyle than economic choice. They didn't want dangerous chemicals around. "We can take our kids right out into the field with us," says Megan, "and we don't have to put on suits to make sure that we don't get pesticide exposure."

Marketing

For 10 years starting in 1988, Wood Prairie produced mixed vegetables sold at local farmers' markets until the closing of Loring Air Force Base in 1994 reduced the retail customer pool and forced a change. They saw an unmet need for organic potatoes and focused on mail order sales. "We have to maximize what we get from our crops," says Jim, "and that requires a real attention to the marketing side to make sure we get close to the consumer dollars and cut out as many of the middlemen as possible from our sales." Direct marketing reduces the risk inherent in relying on wholesale prices which Jim thinks are "at least as volatile and beyond the farmer's control as the weather."

Wholesale sales go through the Crown O' Maine Organic Cooperative, which the Gerritsens helped organize, and to mail order seed houses. "The plan we have in place now," says Jim, "is to maximize the growth of mail order and as a result the wholesale part of the business will continue to shrink in size."

Marketing consumes 70 percent of their time. Jim, Megan and a crew of five work five or six days a week for seven or eight months marketing 150,000 to 200,000 pounds of 16 different

varieties of potatoes in one-, five-, and ten-pound packages. The crew is kept on through the summer to provide fulltime employment.

“We’re not just selling potatoes,” says Megan. “We’re selling special varieties that are especially good tasting and well suited to organic...16 highly flavored varieties good for 16 different purposes, 16 different little market niches...one is good for soup, one is good roasting, so it’s real specialty marketing.”

“We try not only to sell the potatoes,” says Jim, “but enhance their value by providing top-notch customer service both before and after the sale...Our belief is that the secret of success is to produce the highest quality that you possibly can and to rely upon repeat sales.” Their loyal customers help insulate them from the negative effects of globalized industrial agriculture.

“Another part of the secret of our success,” says Jim, “has been experimentation with different varieties. We pick the varieties that excel as culinary varieties, and let go of those that are just mediocre in quality. We try to appeal to people looking for a high-quality product.” They grow heirloom varieties, as well as more modern types such as the Butte russet bred in Idaho 20 years ago that give high yields with 57 percent more Vitamin C and 20 percent higher protein than the standard Burbank russet. “We’re one of the few growers in the United States that raises Butte as certified seed,” says Jim.

Financing

Wood Prairie’s slow and steady growth during the early learning years was by design, and, like their marketing strategy, allowed them to minimize both capital needs and risk. “We started out doing everything for ourselves,” says Megan, “and I think that’s a very sane way to grow a business...you get a better chance to correct your mistakes if they are small ones.” Not until 10 years ago did they obtain outside financing through the Potato Marketing Improvement Fund, which provided favorable lending rates for upgrading potato storage. They used the PMIF program again for a major storage addition last year. “But so far our experience with lenders has not been extensive, and we hope it remains that way,” says Jim.

Information

Both Megan and Jim worked on farms in the area learning from local growers, and they continue to learn from the locals. “There’s a tremendous wealth of potato knowledge in Aroostook County,” says Jim, “so we’re pretty quick to ask questions about how does something get done and why does it go that way and why should you do that.” Some of the advice they got was “impossible to do” and “some was right.” Other advice was “based on tradition” like the belief that you can’t make hay before the 4th of July, when, in fact, hay ought to be cut around the 15th of June, which allows a second cutting in early August. The traditional wisdom evolved, Jim thinks, because potatoes have been “king” for generations and farmers preferred not to rig up for haying until the potato hoeing was done around the 4th of July.

As for information specific to organic farming, Jim notes that organics is about 80 percent good farming and 20 percent specific to organics. In that respect, he thinks “Extension has been helpful but not as much as it should be.” He thinks land grant universities are chronically underfunded by their legislatures, and research is overly influenced by chemical companies seeking

chemical solutions. Research dollars for sustainable or organic agriculture are “just a drop in the bucket” at a time when the organic market is growing at 15 to 20 percent a year and acreage is doubling every five years. “The State would benefit the sustainability of agriculture by redirecting their resources toward research that comes up with biologically-based solutions,” says Jim, which would benefit all farmers, whereas chemical solutions are of little or no benefit to organic farmers and many sustainable ag farmers.

Sustainability versus Industrial Agriculture and Globalization

“The answer to sustainability is the farmer and not the farm,” says Jim. “It’s in the family farmer’s best self-interest to sustain the farm ecologically because an ecologically sustainable farm is a more reliable producer of crops and steady income...A family-size operation knows that treating the soil right will sustain them over the long-term, and society benefits when decisions are made for the long-term good. Profiteers benefit when decisions are made for the short-term good...Maybe one appeal to chemical agriculture is the promise of short-term lower costs/higher profits. If you externalize enough costs in any production system, almost any system can be profitable.

“The liquidation of family farmers that’s been occurring for 40 years—and globalization is a part of that trend—is a disaster waiting to happen,” says Jim. When production and land ownership are concentrated and centralized in profit-minded corporations, profit is maximized and quality takes a back seat. “Large corporations work not only at cross-purposes to individual consumers,” says Jim, “but I think they work at cross-purposes to the continuation of democracy...Ultimately consumers that want good nutritious food will end up getting what the corporations offer and it won’t be top quality...The best system possible is one based in family ownership of the land and family production of the crops...Democracy is going to be sustained where you’ve got good land ownership by the middle class.”

Satisfaction and Advice to New Farmers

“I think we’ve got a good farm system here,” says Jim. “Without exception, every year we learn more and more and grow a better quality crop. Usually we have a higher yield than the year before. What we’re trying to do at this point is focus on enhancing production with higher quality, higher yields, a better mix of varieties...Rather than focusing on expansion, we’re focusing on refining what we’re doing.” They have no plans to expand production or markets unless their children choose to partner with them in the farm operation.

“Farming appeals to a lot of people,” says Jim, “but the appeal is not economic...There is no quick money in organic agriculture, its strength is long-term gain.” The Gerritsens are willing to “live simply” in order to enjoy the “privilege” of farming, the privilege of working the land. “It’s a gift,” says Megan, “but it’s not without its price.”

Kennebec Flower Farm
Charles and Linda Gill
Bowdoinham, Maine

In 1990, Charles and Linda Gill purchased 110 acres of land in Bowdoinham with money saved from their previous jobs in Chicago and Connecticut. They obtained 2-year degrees in plant and soil technology from Southern Maine Technical College and worked locally at greenhouse and nursery operations while they built their house and barn and built up their farm slowly and without debt. It took three or four years until the farm occupied them full time and two more years until the business was a truly viable operation.

They now produce an acre or two of certified organic melons and winter squash, two acres of specialty cut flowers and 100 varieties of potted herbs. They have 7200 square feet of plastic greenhouse space in five separate houses, two of which are equipped with permanent heat and ventilation. They have one full time seasonal employee from March until October.

Marketing

Farmers' markets are the primary sales outlet. During the spring season they spend four days a week at the Portland and Brunswick farmers' markets, two days a week in late summer. They have a dozen wholesale accounts for herbs, but with cut flowers, mixing wholesale with retail found them pulling things they knew they could sell retail over to the wholesale. "Because you want to make sure the order is big enough," says Charles "It was difficult to do the two, so we decided not to."

Sustainable Practices

"I'm not sure what [sustainable] means in respect to practices," says Charles. "One of the most important aspects is respect for the land and being able to produce your crops on your piece of land in perpetuity—not to have herbicide or disease build-up—and I think the sustainable part of it is the economic part."

Charles views his mulch layer as part of a sustainable practice "I can lay a mile of plastic in a couple of hours," says Charles, eliminating herbicides and hand weeding. He is approaching a two-year rotation for his crops, which will help control weeds and disease and insect problems.

His soil is only two percent organic matter. It has proven "virtually impossible" to raise the organic content with grass and clover green manures. If off-farm bio-mass sources were not scarce in his area, he'd "probably use them." He uses "regular commercial fertilizer" and organic complete fertilizers to supplement green manure nutrient residue.

In every other aspect of production and sale, Kennebec Flower Farm has "99 percent control... You don't have any control over quality," says Charles, "unless you're doing the whole thing by yourself... I produce all of my transplants... I propagate my own plants. I'm not relying on anybody else." This is how he sees his farm as being an "integrated" system."

Sustainable Agriculture Movement

“I’m not sure what [the sustainable agriculture movement] is,” says Charles. “I’m not sure anyone really does know. It’s someone who isn’t organic but they’re not super conventional. So it’s kind of a middle ground...a kind of hybrid between the two. I know plenty of organic growers that I wouldn’t want to eat anything they produce...Just because you have rotenone doesn’t mean you should use it all the time...I’d rather spray once with something that’s effective and breaks down quickly...And fertilizer too, a little bit of nitrogen here and there does a pretty good job.” Sustainability is also aided by crop diversity.

Evolution and Change

The Gills began with a 100 percent cut flower operation. Linda quit her outside job their first year in business and they had added some perennials and annuals when Charles “jumped in full time.” To expand their marketing season beyond eight weeks, they tried cut flower plugs, which proved “not very economically viable...People want colored plants,” Charles learned. Their experiment with herbs, however, was “a hit,” that “kind of exploded on us” and now comprises 25 percent of their income. “It dovetailed really well” with the rest of their operation. The expanded season meant a more “viable job” for an employee.

Sources of Finance and Information

With a mortgage, which is now paid off, and careful management of savings and household budgets, the Gills managed with no outside financing beyond an equipment loan through John Deere for their tractor. They have developed their “high return crop on small acreage” into an enterprise grossing less than \$100,000 that enables them to make a living for a family of four.

The International Association of Specialty Cut Flower Growers has been a “tremendous source of information” for the Gills. They attend the conventions every other year and communicate via the Internet, all over the world, with growers “doing the exact same thing—small-scale production and cut flowers.” Locally, the Gills talk with other farmers at the farmers’ markets—“just watching, working and asking questions.”

Satisfaction and Future Plans

Charles is “pretty satisfied” with his current farming system and his objective now is to “do a better job of everything...keep the weeds down better...and make it more family friendly...The biggest change over the last three or four years,” says Charles, “is having children and trying not to work on Sundays, but it’s hard during the summer...I’d like to change that...I would love to find someone who could really be a right hand man. He could earn some money, plus I could teach him to share the responsibilities. You can’t go anywhere from February on. You’re married to the stuff...Another option is selling out of potted plant material by mid-July or early July...I’m tracking my sales a little better to know exactly how much money I’m making with herbs [in late summer]. I bought a cash register so I have a written receipt to tally instead of counting the pots at the end of the day.”

With regard to income, says Charles, “One of the dilemmas I face every year is how much? How do you put a cap on how much you want to make? I just make as much as I can, even though I know I may not need to make that much.

Charles expects to improve profitability by improving efficiency without purchasing expensive equipment. Kennebec Flower Farm “certainly won’t be less profitable,” declares Charles. “I won’t allow that.”

Globalization and Industrial Agriculture

“I do feel that people could be more knowledgeable and more aware of what is produced locally and try to purchase locally...I think that would be much better for everybody...Unfortunately I don’t see it changing a whole lot...I’m not very optimistic.”

Charles thinks globalization and industrialization are having a detrimental effect on small local economies and small farmers. “It’s like the Wal-Mart thing; everybody complains about Wal-Mart, but everybody shops there.”

Programs for Farmers

Charles thinks the Department of Agriculture’s marketing initiatives are helpful in developing product identity, but more so for larger than smaller producers dealing with local customers. He thinks the Maine Sustainable Agriculture Society or the state could help farmers with cooperative orders and with insurance—anything that helps farmers save money. “It’s great to be able to go on tours in a van or bus so you can talk to other people.” The problem is finding the time.

Goranson Farm
Jan Goranson and Rob Johanson
Dresden, Maine

In 1984, Jan Goranson and Rob Johanson began transitioning the 160-acre Goranson Farm, where Jan grew up, from commercial potato production to a diversified vegetable and berry operation. The farm has 36 acres of stone-free, fine sandy loam suitable for vegetables and 20 acres suitable for hay production. Another 18 acres rented from a neighboring farmer who recently retired is allowing longer rotations and expanded green manuring.

“We’re trying,” says Rob, “to reduce [purchased] farm inputs...reduce our dependency on petroleum products [fertilizers and pesticides] and garner the nutrients we require through green manure and legume crops...We’re trying to put more of the food dollar in our pocket.” After 15 years, Rob says, “I think we’re about to hit our stride in many ways...we’re on to the next level in learning about what we’re doing and getting better at it.”

“It’s a remarkable evolution that our farm has gone through,” says Jan, who returned to the farm to help her ill father and ended up staying. When the couple met, Rob was growing cantaloupe in North Whitefield with drip irrigation and black plastic, and the two began experimenting with more technologies and more crops, and Jan joined the Damariscotta farmers’ market. “I think the enthusiasm of the customers for our crops,” says Jan, “helped to expand our confidence that we could actually grow other kinds of crops” and meet the demands of the marketplace. They knew the retail dollar “meant a whole lot” to them.

The farm now has eight acres in potatoes, six in sweet corn, two in peas, an acre each of pumpkin, winter squash, beans, greens and strawberries, plus ½acre of melons and 4.5 acres of mixed vegetables. There are 20 pigs and 600 chickens and a sugar house that produces 250 gallons of syrup-- “the first crop of the year”--from 800 taps on roadside trees.

“I’m glad that we recognized,” says Jan, “that it [potato production] wasn’t something we needed to abandon, but we needed to change it.” Changes in the potato industry were squeezing the small farm. Small distributors had disappeared, production costs had increased, but the farm price for potatoes had not kept pace.

“We started to recognize,” says Jan, “that the wholesale potato market wasn’t a safe place for us to be.” Last year’s drought-caused “disastrous potato crop” was a reminder that mono-culture is not safe either. “If we had nothing but potatoes in the ground on all 36 acres,” says Rob, “we’d have been thrashed severely.”

Marketing

Goranson Farm sells 85 percent of their products retail and 15 percent wholesale to restaurants. Half of retail sales go through the farmstand, which is open seven days a week from mid-May through October. The other half goes through four farmers’ markets. “The cornucopia of stuff that Jan brings to those markets,” says Rob, “it’s fabulous! And the people line up in two lines, 12 to 15-deep.”

An important marketing tool is the farm's community supported agriculture program (CSA), which is one of the largest in the State. One hundred seventy-five families participate during the growing season and another 55 families buy into the winter CSA for their monthly supply of storage crops kept in the old potato cellar. Three membership levels allow families of different sizes "to show support for the farm. It makes them feel good," says Jan, "and it helps us a great deal...it provides us with funds so that we don't have to go to the bank every spring for operating money." The interest that isn't paid to the bank is passed on to customers--the \$370 level receives \$400 in credit, the \$97 level receives \$100. Credit can be used at any one of the farmers' markets or at the farm stand.

Financing

Financing in general has been done without "financial institutions," says Rob. "We've done it little by little by little and we've basically financed the transition ourselves...So we didn't put ourselves in a lot of debt...To learn all that we've learned in the past 15 years in one or two growing seasons [with a bank on their back], I don't know that we could have done it that way." Jan's mother, who "wanted to see the farm continue," has been helpful in charging low rent. Without that support, says Rob, "we probably would have gone to the bank."

Livestock Component -- Pigs and Chickens

Pigs became a part of the system when the couple realized that "shabby" produce, which they were reluctant to throw away, didn't belong in market displays. Now they add value to waste by recycling all of "the seconds" through the pigs, which saves "a tremendous amount" on the grain bill. Pigs are sold whole or in half and most sales are to repeat customers. The farms' rotational grazing system for 600 meat birds raised in portable pens saves on feed costs and gives "a better tasting bird."

Extending the Season

Four greenhouses enable the farm to get top dollar at market. One house is for germinating and seedling production, another for hardening transplants. The other two are for tomatoes. The 30 by 90-foot structure houses tomatoes started in January grown in farm compost in buckets with drip feeding and drip irrigation that are ready for market during strawberry season and bring as much as \$3 a pound in the early market. The tunnel house in the field brings a second high-value crop in early July before field tomatoes come in.

Insect and Weed Control

Goranson Farm switched from herbicides to cultivation early on because grouping crops together according to what herbicide could be used, rather than according to harvest and cover crop schedules, proved an inefficient "management nightmare," says Jan. "The chemical approach wasn't working for a farm our size." The tine weeder, one of the few pieces of equipment purchased new, along with "timing, timing, timing," now keeps large-seeded crops "clean as a whistle" and frees workers to focus on picking and the market "because that's what's going to pay the bills."

Their approach to pesticides in general has been "pretty conservative," says Rob, who recognizes that pesticides "are not necessarily good for people and/or the environment." Jan, who grew up with chemicals all around the farm, looks back now understanding that "these chemicals can

really kill people.” So they aim to reduce family and worker exposure as well as contamination of customers’ food.

Theirs was one of the first farms to participate in Extension’s sweet corn IPM program, which began in 1985 and has been a state-wide learning process. “We sustain damage sometimes,” says Rob, “because they don’t know enough yet.” The year the corn ear worm arrived two weeks early and damaged 90 percent of the crop, they posted a sign explaining to customers what had happened, cut the tops off the infested ears and “people bought it anyway,” which wouldn’t have been the case in the wholesale market.

Goranson Farm also participates in on-farm research studies such as that with the University of Massachusetts on biological controls for corn ear worm, and the Colorado potato beetle study with Dr. Ellie Groden at the University of Maine, both three-year studies. Potato beetles, which had been “eating the plants down as fast as they were coming up out of the ground” are now controlled “organically...using *Bacillus thuringiensis* and *Beauveria bassiana* fungus, and in some years flaming with a propane burner gives adequate control. Organisms that prey on the beetle are now flourishing and “it’s not the pest that it once was.”

Raising soil organic matter with cover crops like sorghum/sudan grass and producing sufficient nitrogen (100 pounds per acre) for heavy feeders using nitrogen fixing green manures has been an on-going process on the farm’s potato-worm soil. It’s the final step in establishing the kind of “complex systems” which “we find in Nature,” says Rob. “All this integration, this complexity...the diversity we find in Nature, it’s sustainable...complex systems are less likely to crash...have greater long-term survivability...We try to incorporate Nature into our farming so that we are more stable...The challenge is in keeping a lot of balls in the air and doing a reasonably good job at everything,” and labor is a “huge problem” in that respect.

Labor

In Jan’s opinion labor is the “least sustainable” aspect of their farm operation. Mechanical weed control reduces labor needs, but, says Rob, “there’s a lot of hand labor involved with doing a market presentation like Jan does...and farm laborers are not abundant...They’ve got to be bright, they’ve got to be motivated, they’ve got to want to understand the process and what it means to make a farm like this survive.”

The farm generally has three or four student apprentices every year, but when they leave in August, during peak marketing season, the resulting labor crunch means many of Rob’s field operations don’t get done in a timely fashion. They are “fortunate” to have two employees who are “professionals in the field of agriculture,” a Cambodian woman and Ramiro, who has worked for them for 10 years. Since Americans “don’t want to do this kind of work,” says Rob, and Ramiro has family willing to work but unable to get work papers, Rob thinks migrant labor policies suitable for small farms could help a lot. The current program has too much paper work and “is prohibitively expensive,” says Rob. “It costs \$800 per worker...up front, and if the guy doesn’t work out you don’t get your money back...We don’t have that kind of money to fool around with.”

Information

“Probably the biggest challenge” in learning to run a diversified sustainable farm, says Rob, “is to find out who’s out there and who knows what.” He finds a “whole raft of information” available through research and conferences, but applying the results from a 10 by 10 research plot to 35 acres of diverse crops “leaves a lot of questions,” says Rob, “and that’s where I think the [Extension] system falls down. We just don’t have enough hands-on people that can [come to the farm] and help the farmer work out those details,” or link farmers up with others who are doing it.

With the exception of MOFGA’s Farmer-to-Farmer conferences, which are “consistently helpful” because ample time is allowed for discussions among growers, Rob prefers to read conference proceedings and then “find someone who’s doing it and call them on the phone.”

Diversified or transitioning farmers also could use some help with infrastructure. Rob cites regional grain storage facilities as an example, which would help farms like his link into a grain market like Borealis Breads with a marketable crop and a high-carbon residue source for the soil.

Future and Advice

The couple is satisfied with where they are and the way they got there. Their advice to new or transitioning farmers is to start small, concentrate on high-value crops, set up a CSA to get that “guaranteed market,” and don’t go deep in debt.

“Our mission,” says Rob, “is to keep farming, to keep the land productive.” At age 52 his pie-in-the-sky hope for the future is that the value of food will go up so he can pay decent wages for good help. If that fails, he says, “my thought is that we’ll get smaller, do more for ourselves, sell more at the farm stand and less at the farmers’ markets...The bottom line is that we still want to be able to farm.”

Goughan's Berry Farm
Mark and Gloria Goughan
Caribou, Maine

Mark and Gloria Goughan started farming conventionally in 1972, after taking over Mark's family's farm, producing commodity crops for the wholesale market. Ten years later, with 450 acres of potatoes and rotation crops, they were feeling "very uncomfortable" with the "management and debt" their system required. They were "at the mercy of the broker" who was buying cheap and selling expensive. They were competing with subsidized Canadian farmers and with their own neighbors and the winner was the one who could sell at the lowest price. "I've never really been able to understand how that system helps the farmer," says Mark.

People advised them to get out of farming while they still could, but Mark and Gloria didn't want to leave the farm or farm life. So in 1982 they re-designed the farm and the land base, downsizing to the present 550 acres. Now they have 100 acres of crops, rent 200 acres to a neighboring farmer and maintain 250 acres of woodland. They are still doing some wholesaling but with products and in markets over which they have more control.

"We decided to develop a family farm dedicated to the local population," says Mark, which included the 3000 families six miles down the road at Loring Air Force Base. With the theme of "inviting the public to our farm" they drew up a five-year plan for a retail operation with products and attractions for every season including a petting zoo and kiddy rides. The farm's playground, like McDonald's playground, would keep the kids coming and bringing their parents along. Diversification would allow them to do a variety of things they enjoyed, and customers, especially children, would learn "to associate the farm with its seasonal food and what they eat."

Seven years later when Loring AFB announced it would close in 1992 "it was very devastating," says Gloria. "It was like someone pulled the rug right out from under you." They used the three years between the announcement and the actual closing to crunch numbers, look for ways to cut costs on the expense side and focus on the parts of their business which would be least impacted by the loss of the Loring customer base. Having already developed many of the farm's assets and "the fact that we're diversified," says Mark, "is what is enabling us to stay here." He doesn't expect the income side to be as good as it was, but their plan is "starting to take hold...and we can see the light at the end of the tunnel....we work a lot harder than when we were farming the other way...we do it because we enjoy it." They liken it to "a hobby" they are "trying to make a living" at.

The farm's parade of activities begins in March with maple syrup from taps in their own maple stand, which they carved out of the woodlot. Mark and his dad built the rather elegant sugar house from the softwood log "thinnings" that released the maples. The building is a multi-purpose focus of the farm, is attached to the retail store, and was built with amphitheater-style seating from retired school buses.. It's used throughout the season for "fun and education." It's where the tours for school kids begin and where birthday parties are held. "We tell them a little story," says Mark, "and have a great time...We relate how we think about farming and how things evolve on a farm....Children today, even in Aroostook County, don't truly know what a farm is, don't realize what goes into a farm." Customers also learn, for example, that a worm or

two in the sweet corn is the trade off for keeping costs down by not spraying corn with pesticides.

The Sugar Shack and maple syrup is “a great way to advertise your farm for the whole year,” says Mark. Following maple season they are busy with the 8000 square foot greenhouse in April, May and June; 20 acres of strawberries in June and July; 3000 square feet of greenhouse tomatoes in June, July and August; three acres of raspberries in July and August; the apple orchard kicks in in August and September; there are hayrides and 5 acres of pumpkins through September and October; 350 mail order Christmas wreaths and Christmas trees (from the 7-acre stand) in November and December; and the saw mill produces about 15,000 board feet of lumber in January and February mostly for their own use. Fourteen acres of vegetables supply the farm stand. Gloria’s production of ice cream flavored with in-season fruits from the farm is up to 375 gallons per year. Even with all these activities, says Mark, “this operation is minuscule compared to what I was doing before.”

Several part time employees work at the farm, usually women who work in the greenhouses and make wreaths and high school students who help with harvesting and irrigation. “It’s not hard to find labor,” says Mark. The difficult part is finding people with the ability to “greet the public” and who are willing to work for the \$6 per hour rate he is able to pay.

Information and Financing

The Goughans had help getting their new start. There were “friends, people who became friends, and parents” who helped with financing, advice, encouragement and steering them through the downsizing process. “We were told not to be afraid to dream,” recalls Mark, “and that’s what we did...We just knew that our debt was going to be small enough that it was something we were at ease about.”

Mark notes significant changes in the banking industry from the days when a farm’s equity and assets counted more with lenders than income, and just paying the interest during down years was enough. Now “you have to make money on your tax returns” and lenders treat agriculture the same as any other business despite its inherent ups and downs due to weather and prices.

For how-to information, the Goughans visit other farms and attend conferences and events throughout New England and on trips to Arizona to visit parents. They talk with people they meet about the pros and cons of what they are doing and how they did it. “I would say that talking to other farmers was the key,” says Mark, “and “you do turn to your extension agent” and to financial institutions. “There’s nothing new here,” he says. “All I’ve done is take other people’s ideas and modify them in a way that fits our system.”

Satisfaction, Advice and Plans for the Future

The Goughans are proud of what they’ve accomplished, though some people thought they were crazy to take on so much work. When visitors like what they see and say “this is just what I want to do, this is so neat, this is what we’re going to do,” Mark doesn’t discourage them but he “wouldn’t advise them to do it.” Farming takes a lot of commitment and certain abilities to, for example, “plant a crop [he’s referring to strawberries] and see it totally ruined during the winter and get up that spring and meet your customers like nothing ever happened.”

The couple continues to develop their “agricultural theme park” to attract not only local people but also tourists. They think they might add a campground site in the future. For right now, says Mark, “we just want to make it until tomorrow...We believe in the five-year plan. We believe in setting goals...We will not sell the farm. We will not make a gravel pit. I will not let loggers come in and cut my wood lot. I might sink, but at least I’ll sink under my own terms. The farm is our retirement. Our goal is to pay off our debt, and that’s not an unrealistic goal.”

Sustainability

The definition of sustainable agriculture, thinks Mark, varies with the location and the people involved. For the Goughans it’s as much about values and quality of life as it is about methodology. Their life style doesn’t require a new car and their children grew up at home not in day care. “We’re just doing what I think a lot of small family farmers are doing,” says Mark. “We’re just staying on the farm and being willing to do without” within a government supported system of industrialized agriculture which is “not necessarily environmentally sound” and “wasn’t designed for the small family farmer.”

The Goughans have seen agriculture change from the time when 75 acres was enough to maintain a family farm and there were 15 or 20 farms on a ten mile stretch of road in Aroostook County. Now there might be one farmer on that road, and they think in 20 years “there’ll be one farmer on five county roads.” They are the only non-conventional diversified family farm in their area that is trying to make a living at it.

Mark thinks government policies devised in Washington aim for a uniform umbrella system under which all farmers must try to operate, and “it’s obviously not working.” Instead regional strategies are needed to secure the viability of farms in regions as different as the Midwest and New England. In Maine different strategies are needed to help farmers in the north deal with Canadian competition while southern Maine farmers face struggles with problems related to “encroachment of the city.”

There are 20-year old studies, he says, which prove that the current system doesn’t work, and there were “great ideas in these reports” made up with input from the grass roots. But these solutions aren’t being implemented because they “don’t fit the system.” And then there’s the guy at the bar who paid \$3.75 for the whisky and water he’s drinking “and he’s bitching about paying \$2.50 for a gallon of milk” complaining about milk pricing regulations that help farmers. “I can’t understand it...There’s those kinds of issues,” says Mark, “and you just sit there and scratch your head and say I just don’t understand how people can’t see...and you just get discouraged.”

Although Cooperative Extension, soil conservation and universities are resources the small family farmer can tap into and use they aren’t getting the support they need. For example, having several Extension potato specialists located in Aroostook County isn’t the answer when a farmer like him needs a small fruit and vegetable specialist and “they cut his funding to the point where he can’t make trips up here,” or he can make only one.

To stay in the business of farming, says Mark, “you’ve got to be positive, and here’s how you tell if you’re a farmer. I don’t care how old you are. I don’t care what trouble you’re in. When that sun comes up the first of March and you know spring is right around the corner, if you don’t think you’ve got the world by the...you haven’t got it. You’re not a farmer. Because anything is possible at the beginning of the year. You can conquer the world.”

Wolfe's Neck Farm
Erick Jensen, Farm Manager
Freeport, Maine

This saltwater farm was purchased by Lawrence and Eleanor Smith in 1946 who raised organic Black Angus beef sold under the Wolfe's Neck label. In 1985 Mrs. Smith, who wanted the farm to continue as a model of alternative agriculture after her death, gifted it to the University of Southern Maine. Four years ago, when the farm was losing money and USM was making budget cuts, it was transferred to the Wolfe's Neck Farm Foundation, which makes it a non-profit farm.

"We basically had to rebuild the farm," says farm manager Erick Jensen who works with a 12-member board of directors. Foundation monies helped rebuild the beef herd and historical buildings, but the ultimate objective was to bring the entire operation to the point of supporting itself. Wolfe's Neck has diversified production into pork, lamb, pumpkins and vegetables to draw customers to the farm and to generate cash.

Located in Freeport 30 miles north of Portland, the gateway to the Eastern market, the farm consists of 700 acres on a spit of land jutting into greater Casco Bay. There are five separate divisions of operation; two production divisions (live cattle sales and retail meat) and three education and recreation divisions that take advantage of the farm's beauty and five miles of coastline with a 50-acre campground, the Friends of the Farm membership program, and extensive education and day camp programs for young people. "Literally tens of thousands of kids come to the farm each year," says Erick. "It's very gratifying to me to see a youngster see a calf or a lamb born for the first time...they're just in complete awe and amazement."

As a "showcase of "what's good about agriculture" the farm counters negative news about corporate agriculture, packing houses, chickens kept in cages, etc. which have caused problems for agriculture in general, but does not tell the whole story. "For every one thing that's bad," says Erick, "there's 20 things that are good" but aren't considered newsworthy. "Whether you're a non-profit education farm or a private farm," he says, "exposing the public to your operation is a key that can do so much to undo the bad reputation that agriculture has received... We're in such a defensive mode right now—we've got to be offensive and show people what it is that we're doing and how we're producing and that we're stewards of the land and that we want to take care of things."

Marketing

On the production side the farm is driven by economic and environmental sustainability and by the desire to help Maine farmers, especially those in Aroostook County where the economy once thrived. Erick and the board of directors "believe that agriculture in Maine can really thrive again," and toward that end Wolfe's Neck has launched a bold new marketing venture which integrates the greater production capacity up north with Wolfe's Neck's greater marketing capacity down south in a "win-win situation."

Wolfe's Neck markets 300 steers a year but only 80 are produced at the farm. To make up the difference Wolfe's Neck contracts with two Aroostook County feeder operations, which produce to Wolfe's Neck standards—no antibiotics or hormones for the life of the animal and no animal

by-product feeds. Marketing what would otherwise be a commodity under the Wolfe's Neck label yields a named product that commands a higher price. "It's Wolfe's Neck natural beef," says Erick, "and [producers] are paid five to ten percent more than the market price."

"The concept is not new," says Erick. "The model has already been established...and it works." Oakhurst and McCain's have contracted for years with dairy and potato producers who work under a specified production system and "get extra money for that...I think farmers [traditionally independent-minded] understand that if they don't change their practices, in 10 years they're not going to be in practice or be producing." Unlike a for-profit firm, Wolfe's Neck's financial books are open to viewing by producers or any one else interested in the economics of the farm and the marketing model. "We want this farm to be a model that can be replicated by other farmers in the state," says Erick. "That's part of our mission."

The operation "really is all market driven," says Erick. Rather than forcing products on the market, Erick is "looking at the markets and then finding a way to produce for those markets." The farm itself markets 15 percent of its products through mail order, the farm store, and a delivery route from Bar Harbor to Boston. The rest is handled by two New England distributors Erick met up with at the Portland Public Market.

Erick describes his experience at the Portland Public Market as both a success and a failure. Economically they were "losing a great deal of money...because the costs were too high." Long market hours pushed labor costs up and processing was \$200 per steer more than one would pay in the Midwest. On the positive side, the exposure to both consumers and trades people "was a blessing." Erick estimates that similar exposure through other channels would have cost ten times as much. "People came from all over New England and we've been able to use that [exposure] to expand in the markets throughout New England."

Producers were shielded from the higher than expected marketing costs incurred in Portland, Erick says, "because we locked in a price with our producers and we stuck to it regardless of how we were doing." Building that trust keeps producers on board for expansion of the marketing model that Erick anticipates. "Instead of several hundred steers", projects Erick, "we may be utilizing several thousand throughout the State...We're going into Boston, Philadelphia, and Hartford, where incomes are high, and a lot of natural beef is coming from Montana and Colorado. I think beef from Maine is going to be much more marketable in Boston than beef from Montana."

Wolfe's Neck has no sales staff other than the distributors so trusting relationships are important. Distributors pick up at the farm and sell in 22 states to food co-ops and natural food stores. The farm also sells calves in the fall and yearlings to producers for finishing.

Production

Wolfe's Neck has been "considered organic for years and years," says Erick, and was certified until standards were tightened to require 100 percent organic feed, up from the previous 80 to 90 percent. The farm's wet, heavy clay soil "does a very nice job of producing grass" but is not suitable for grain production, and purchased organic grain is too costly to "make the numbers

work...In the market place we're in," says Erick, "consumers don't really understand the difference between organic and natural and would not be willing to pay the price." He expects production will increase and the price will decrease in time. For now 10 to 20 percent of feed (grain and barley) used at the farm is non-organic, but the farm uses no antibiotics, hormones, chemical fertilizers or pesticides.

"Essentially we sell grass here," says Erick, "and we're utilizing the cattle to do that. They're producing manure, and we're putting the manure right back onto the grass again and that's a complete [sustainable] cycle." The intensive rotational grazing system divides pastures into small paddocks through which the cows are moved every 3 to 5 days. Combined with soil testing and frost seeding of clover for high protein, the system maximizes grass production, allows more consistent nutrition and more even grazing and manure deposit, which in turn makes "healthier cows that might not need some of the other inputs."

Sustainable Strategy

The sustainable agriculture movement is "long overdue," says Erick, who thinks the many definitions of sustainable agriculture all involve utilizing farm resources in a sustainable manner so that "the next farm manager will have all the resources available." Economic sustainability and environmental sustainability go hand in hand, but management decisions are ruled by economics first because if it doesn't pay for itself there's no sense in doing it. "We've been very flexible and very opportunistic," says Erick. "We've been willing to take risks...We've utilized the farm's resources in a sustainable manner, and that's really our strategic plan."

Financing, Information and Help for Farmers

Although the foundation financed rebuilding and absorbed early losses, future funds will be obtained through conventional lenders. Erick anticipates that "a private bank certainly would lend money for the expanded beef operation because the economics are there" in the business plan. He "goes to great lengths" to show in the budget exactly where money comes from and where it is spent. The books isolate the farming enterprise from other divisions, and Erick will gladly walk anyone through the numbers. He thinks beef producers might replicate the production model and a non-profit or cooperative might replicate the marketing model.

Sources of information have included magazines, books, the Internet and people including Extension agents and trade associations which have provided credible support for business plan projections. The Maine Beef Industry Council, an affiliate of the National Cattlemen's Association, is a marketing association which receives \$100 for every beef animal sold. The Maine Beef Producers, a 100-member statewide group, is a source of contacts and networking. All of these people, says Erick, "are willing to sit down and talk to you and they're excited about the opportunity. That's what they are there for."

He thinks the best thing the University, the Maine Department of Agriculture and groups like the Maine Sustainable Agriculture Society can do to help farmers is to "get exposure for the producers...help us market...and set up a network whereby the producers can work with each other...They don't know who is out there," says Erick. Who is doing similar things? Who has distribution capabilities? What can we utilize that other producers are growing? What can we

do to help other producers? “Getting that network established would be fantastic for sustainable agriculture,” says Erick, who knows networking is critical for Wolfe’s Neck’s marketing model.

Future

The current operation has developed rapidly from the few cows and no people of three years ago, and Erick is pleased with the way it is going and with having more time to attend to production. Looking toward the future he thinks the expanded beef operation “is an exciting opportunity to not only Wolfe’s Neck Farm but the State of Maine. The potential is there to really economically stimulate Aroostook County and the Maine beef industry.”

Checkerberry Farm
Jason and Barbara Kafka
Parkman, Maine

The Farm

From a 40-acre 1860s farm that hadn't been used much since the 1940s, Barbara and Jason Kafka built Checkerberry Farm. Located in Parkman, Maine, population 700, the farm purchase was a quality of life decision and an affordable find--no big 30-year mortgage--when the Massachusetts couple began homesteading in 1981, reclaiming overgrown fields for dairy goats and Barbara's garden. The garden got bigger and bigger, Jason helped more and more, cover crops went in, and their first produce (dry beans, potatoes, onions and garlic) went to market at the Common Ground Fair in 1990. Those sales paid the property taxes that year.

Checkerberry now produces 12 acres of MOFGA-certified organic mixed vegetables in an area where the low concentration of agriculture creates a critical mass problem in terms of equipment dealers and friendly collaborations with other farmers. Because of the extremely rural location and distance from markets, the farm still focuses on fall crops that hold well--potatoes, dry beans, onions, garlic and squash.

Labor

This year the couple has help from two reliable high school boys, a 28-year old musician who works full-time during the growing season, and two apprentices through the MOFGA Apprenticeship Program. The boys are good workers, perhaps because Jason includes them in the whole operation so "they are not just a cog." The apprentices receive free room and board and though they return to classes in the fall, they arranged to work on the farm through October.

"This year's crew is the most competent crew we've had," says Jason. "Were having a lot of fun. Sometimes it's almost like a Monty Python troop out there as far as the conversation, but the work's getting done at a reasonable pace."

Soil Maintenance and Irrigation

Because Checkerberry land is sloping and of various soil types, there are lots of little fields, raised beds and cover crops to deter erosion. White clover between rows and beds, and plastic mulch left in place through the winter, are further erosion deterrents, as are the grassed waterways that Jason has put in.

Fertility is maintained with organic supplements. Manure from a dairy farm neighbor, which Jason exchanges for vegetables, is composted with rock powders and the farm's vegetable wastes. Compost is covered with a tarp for the winter to prevent leaching and applied in the spring. Rotations vary, but twenty percent of the ground is in green manure (some peas/oats/vetch) every year. Such efforts to "vitalize" the soil have raised soil organic matter content to between 8 and 10 percent. "The benefits are just amazing," says Jason, "it's wonderful ground." Foliar feeding is done with compost tea and fish emulsion.

Checkerberry's evolution away from livestock (they had a few head of beef cattle at one point) released haying time for vegetable crop care and has allowed more ground to be opened every year as pastures and hay land became vegetable production ground. But it has also made Checkerberry dependent on an outside source of manure. Should this source dry up, the Kafkas could use "penitentiary" poultry manure from DeCoster Egg Farms and still meet organic standards. But because of the drugs fed to the chickens, they would prefer other options, such as opening up even more land to allow more green manuring and cover crops, scrounging compostable materials from their hillsides and neighbors, adopting Rudolph Steiner's biodynamic methods of production, and maybe buying a chopper.

Irrigation water from a stream on the property is pumped up through a 2-inch line to reels of one-inch former propane delivery hoses on pallets that are moved with the tractor. One small water cannon on a home-built frame on bicycle rims makes moving a snap compared to the previous system of three large impulse heads. The cannon moves more water, delivering about 1/2 inch in two hours in a 150-foot circle and easily covers an acre a day. The small Honda pump with a 5.5 HP gas engine runs for two to 2.5 hours on a tank of gas.

Crops

Checkerberry's acre of onions (on a three year rotation) is tribute to the richness and vitality of the soil, and to good management practices. In some years onions have averaged "over a pound and a half," reaching as much as three pounds and exceeding five or six inches in diameter, and fetching a premium price of \$1 per pound. Common Ground Country Fair food vendors are a major outlet for Checkerberry's onion harvest, and, in some years, to hurry the finishing for mid-September harvest, onion tops are rolled with a lawn roller dragged behind the tractor.

Checkerberry is decreasing potato acreage, increasing onion acreage, and doubling garlic plantings every year. Garlic for table and seed stock is air-dried in the old hay barn utilizing its design for good air flow. Table stock cleaning "with thumbs and toothbrushes," adds at least \$1/pound to the price. One-half acre of garlic can potentially gross \$16,000-\$20,000, onions \$5,000 per half acre, but production and handling costs are much higher with these crops than for Checkerberry's 1/2 acre of winter squash (a seed crop for Johnny's Selected Seeds) that brings in \$4,000 with only \$300 or \$400 in expenses. Here the farm's isolated location is an advantage, since seed purity requires a mile separation from other squashes. Two gardening neighbors within that distance have agreed not to grow squash, instead Jason gives them all they can use. Johnny's does the processing and frost damage is an advantage.

Dry beans, says Jason, "work good in rotation with onions," so bean acreage (now 2 acres) increases as onion acreage increases, and there's no worry about shelf life with beans. He doubled his bean plantings this year, and though he still picks them over with a treadle type picker, he's buying a combine this year.

Hoop Houses

Three galvanized pipe-frame 17' x 48' hoop houses, with wood boarded end walls and no supplemental heat, extend the growing season for Checkerberry's cucumbers, peppers and

tomatoes, and each of the buildings has paid for itself in the first year of use. Drip irrigation, black plastic, and straw between the rows ensure adequate soil moisture. Seedlings are started in another greenhouse and transplanted to beds in the beginning of May. Cucumbers climb on string, there are 10 varieties of peppers, and the tomato house has four beds with 165 greenhouse variety plants, also on string. In a good warm year, the tomato house yields a dozen bushels a week on eight-foot plants, and these firm varieties ship well in half-bushel boxes on the 60-mile trip to market. The straw between the rows is a clean resting place for harvested fruits as pickers crawl through backwards picking and then walk through with baskets and crates collecting. When the beds are roto-tilled in October, winter rye is planted and tilled in with compost in the spring. The sides are rolled up and secured to the peak of the house for the winter to avoid winter damage.

Marketing

Checkerberry's rural location limits retail sales opportunities, but providing "food with a face," as direct marketing has been coined, is Jason's cup of tea. "It's a circus," he says of the three farmers' markets he attends in Dover-Foxcroft, Orono and Brewer. "You have a lot of stuff, so you have a good show at market, and, I guess, I'm the character with the show...it's community. It's a social activity."

Checkerberry's Common Ground Fair booth and sales to fair vendors is a big outlet for onions, which they never have enough of. For a small freight charge, some wholesale produce is shipped weekly to the Portland Public Market.

Off-farm Income

Barbara, with a degree in psychology, now teaches school full-time and helps on the farm in the summer, overseeing the squash and garlic harvests and the commercial flower gardens, with the latter including 300 row feet of Sweet Annie Artemesia, which they sell "bales" of at the Common Ground Fair. To allow more time for farm work and family, in 1994 Jason reduced his full-time truck driving job to winter months only.

Sources of Financing and Information

Financing for Checkerberry has been pay as you go, utilizing low- or no-interest introductory credit card offers as swing money, a pre-approved line of bank credit should they need it, and a one-time small equipment loan through Coastal Enterprises, Inc., which forced Jason to prepare a business plan. Jason admits that farm revenue doesn't yet pay for his labor, but it covers production costs and improvements to land and buildings. The farm operation supports their lifestyle, they like what they are doing, and they farm the way they do because "it feels good." Part of that good feeling is Jason's belief that it is simpler and less arrogant to work with the eons-old biological system--vitalize the soil and let the soil feed the plants--than to try to outsmart it or find a substitute for it.

After using Extension's information resources during their start-up phase, the Kafkas got most of their remaining information from the Maine Organic Farmers and Gardeners Association's excellent library and "extension agent," Eric Sideman. The Farmer-to-Farmer conference and just talking with other farmers has also proved a valuable educational tool.

Globalization

Jason believes that globalization is favorable for the big corporations but a “threat” to small farmers. “From my perspective,” says Jason, “the more aware and educated the consumer, the better. Whereas, these big corporations, whether it’s Kellogg’s or Archer Daniels Midland, the less informed the consumer the better. It reminds me of some science fiction stories I read when I was in college. It seemed like a far distant future then, but now it’s here.”

Plans for the Future

Checkerberry’s plans for the future include refurbishing the 1878 barn and adding a storage room for onions and a packing line for bigger bulk items. But work on the barn, and the 13,000 board feet of lumber sawed out of the woodlot for the job, may have to wait until the 1890 house well, which is showing signs of failure, is attended to.

In terms of marketing, and tied in with the storage room and packing line plan, and influenced by their distance from retail markets, is Checkerberry’s goal to lighten up on farmer’s markets and increase wholesale sales. Jason would continue with two days a week at the nearby Dover market--which covers his weekly expenses--and use wholesale and fall crops as “the big payoff.” The market for organics is increasing every year.

Programs and Policies

The Kafkas would welcome a little assistance with the barn project, as through the Barn Again program, but Checkerberry hasn’t had much luck with assistance programs. “The times I have applied for cost-share,” says Jason, “I’ve been turned down either because I don’t have enough cows, or I’m not big enough...we have to do it on our own...in hindsight, that’s probably just as well because then I’d have to tow their line, and that doesn’t work for us.”

The Kafkas think public support for small farms, not just for large industrial farms, makes sense. Small farms utilize resources more efficiently, are healthier for the farmer and the consumer, are aesthetically more appealing, provide more employment, and keep local money circulating in the local economy.

Advice to New Farmers

For anyone wanting to farm the way Checkerberry does, the Kafkas suggest that you’ve got to have people and machine skills, put on a good display at market, don’t take your culls to market, hire good workers, have a healthy attitude, and realize that “this is agriculture and failure is part of it.” Diversification for risk control is also important, as is flexibility. “If you’re farming,” says Jason, “and you are not flexible, you are in trouble.” Their creed: “Blessed are the flexible, for they shan’t get bent out of shape.”

King Hill Farm
Jo Barrett and Dennis King
Penobscot, Maine

Dennis King grew up on a “mixed farm” in the Midwest. He was a “commuting bureaucrat” in Toronto when his younger brother bought the “run down” Maine farm that had been idle for 20 years. “The whole farm,” says King, “was either 30 to 40-year old aspen/birch woodland, or blueberries, hard hack and alders.” The land is close enough to the ocean to benefit from frost protection and high enough to get up out of the fog. King Hill Farm was certified organic before there was much of a market for organic produce.

Growing up on a farm is an advantage, King thinks, “because it gives you confidence that you can do almost anything...you get a chance to do most anything as a kid.” But he admits it wasn’t so much that he and his brother knew how to farm, “we just didn’t know that we couldn’t.” His brother is now “retired” from the operation. His son who is in the computer business and only half his age earns as much in a year as King will earn his “whole life.” Dennis and his wife Jo Barrett now run the farm with help from MOFGA apprentices.

The Farm Today

Bringing the farm back to life required “all kinds of combinations” of materials and practices to improve the land, which was not the most desirable quality to begin with. Although 20 acres of permanent pasture are “completely untillable,” the animals were integral in the early days to help improve the soil in the pasture and on tillable land through grazing green manures.

The farm’s 30 ewes now produce lambs for freezer sales, the 3 or 4 beef cows produce calves which are raised for beef sales, and the 4 to 5 acres of vegetables, including one acre of winter root crops, are “the major source of income.” The milk cow, turkeys, and chickens are for their own use. There are 30 acres of hay and ten acres of small grains for home use and animal feed.

“We are in large part an over-grown homestead,” says King, “because we place the highest value on producing our own stuff,” a practice which significantly reduces the amount of money the farm has to earn. “In order to be farmers and do what we’ve done,” says King, “your number one characteristic is thrift.” His advice to new farmers is not to “worry about the profit and the bottom line so much.... supply your own needs first and...keep doing things that you like to do, because if you don’t like to do it, you’re never going to succeed in it...The way everybody else defines the economy, you’re completely different.” His approach, he says, is to “keep the cash coming in as fast as it goes out, which is about the best you can do in farming.”

Jo is a part-time school teacher who “took a 30 percent pay cut” to get “the perfect teaching job” she has now. Prior to her marriage to Dennis, she had a small homestead and sold pork and beef to her neighbors. She concentrates on the homestead part of the farm, and Dennis focuses on the income-producing end of things, although he doesn’t do any more record keeping than is necessary, because, he says, “You can’t put a price on the satisfaction...there’s too many things you can’t even measure.”

Marketing

King first got into the vegetable business by “making the home garden bigger and bigger” and going to farmers’ markets for five years. For the next seven years he and a friend ran a farm stand in Blue Hill, and he wholesaled to farm stands and restaurants. They’re still at the Blue Hill farm stand, but for the past five years it’s been a co-operative with a hired manager--the Hancock Organic Farmer’s Co-op. All five to seven members are small growers with less than five acres of produce. Seventy to 80 percent of King Hill Farm’s summer crops are sold at the stand and to a couple of restaurants and stores in Castine. During the winter, King makes a trip every two weeks to distribute root crops. The Whole Grocer store in Portland, the farthest away, takes 700 to 1000 pounds each time. “Just that almost makes it worth the trip,” says King.

Composting

Composting is a big “time investment” for King who produces 200 cubic yards of “real good compost” in windrows. Though he still hauls manure for composting, he figures he wouldn’t have to if he plowed down the alfalfa instead of running it through the cows. He has a State compost permit which gives fishermen and fisheries a legal place to dump the waste they used to dump in the ocean. Manure is composted with fish wastes (fish scales, and a lot shrimp and sea cucumber waste) and with hay, sawdust, and straw. He thinks mixing different carbon sources makes better compost because of the varying breakdown rates.

Setting up the windrows is a day’s work with a tractor and bucket loader. Piles are turned daily for a week and once a week or so for 12 times total using a self-propelled compost turner owned jointly with a neighboring farm.

Cropping and Livestock

King stopped growing wheat and selling it because “even at 40 cents a pound” he could only get \$700 on a plot that would bring \$10,000 in carrots. So he grows grains for his own use and for the livestock. He has three small fields in hay rotation where small grains are used as a nurse crop--three or four years in hay, then a grain, then re-seeded to hay. There are ten 3/4-acre plots for vegetables, which he rotates with grain, and he grows a ton of livestock protein supplement (sweet white lupine) on one of those plots every other year. His vegetable/grain rotation is generally two or three years in vegetables, one year in small grain, two or three years in orchard grass/alfalfa mix, then back to vegetables. Rotations “help a lot with diseases,” says King, “and keep pests to a minimum,” including weeds. Pyrethrum and rotenone are used for flea beetles and cucumber beetles, and *Bt* is effective on potato bugs.

The annual lupine King grows is “a better nitrogen-fixer than beans” (100 lbs nitrogen/per acre), and when he plants it with an under story of crimson clover he can follow it with any crop with no other fertility additions. Lupine beans contain no digestion inhibitors, are 35 percent protein, low in alkaloids, and can be combined in mid-September. He feeds them whole to sheep, and runs them through a hammer mill for chickens and cows. Sheep get the regular grain mixture of oats, barley and wheat. Cows and chickens get 4 or 5 parts of grain mixture with one part protein supplement plus mineral supplement.

King and Barrett graze their sheep and cattle together to get more complete forage utilization--what the cattle don't eat, the sheep will, or somewhat. King's wildlife background tells him that "the most productive grazing land in the whole world is the Serengeti Plain in Africa where 20 or 30 species graze together. We've got two," says King, "that's better than one, but you probably should have six or eight."

King mulches some crops with raw organic matter because he gets "beautiful soil structure" the next year for carrots. He seeds rye in the sweet corn after the last cultivation because it gives him weed control and more livestock feed.

Chickens are raised in portable 10 x 12-foot pens this year for the first time. It's a step up from dooryard raising where the soil is bare--no food for the chickens and no plants to absorb manure nutrients. But it's not as far from the dooryard method as New Zealanders go, says King who has traveled there and liked what he saw. "They don't have any barns at all," he says, "and a manure spreader is a foreign tool because their livestock is outdoors and spreading their own manure all year." Nonetheless, King has been raising chickens for 25 years and he's "never butchered a healthier batch" than with the portable pens. "Every single one of them had a beautiful dark red liver," he says. Hens are slaughtered at 9 or 10 weeks, but roosters can go a little longer to ten pounds dressed weight and still have "no fat."

The 120 acres of woodland is also part of the farm's integrated system. Though it is "not a good timber site" it has provided firewood and "almost every stick of wood in every building" on the place, about 40,000 board feet. "I'd rather turn pulpwood into a building than sell it to the Bucksport mill and have it be made into Time magazines," says King, though he has sold "several hundred cords of pulpwood" over the years. His work has improved the timber stand to the point where he thinks he can sell stumpage and hire someone else to cut it, which appeals to him now that he's getting older.

"This is a little dinky farm by most any farm standard," says King, "but the complexity of it adds a lot of work and increases the stress level...You can carry diversity to the point of being ridiculous, and sometimes we do...we can see why people specialize." Winter root crops planted in mid-June and marketed during the winter were a way to reduce the stress load during the main growing and marketing season.

Machinery and Information Sharing

The diversity of crops also increases the need for equipment. "We got by for the first five years," says King, "with just converted junk." Typically he'd spend \$200 at the auction, put \$100 into it and make it worth \$500. "Without that [tinkering] ability," says King, "I couldn't have made it because I didn't have any capital." His first grain drill was an 1880 wooden-wheeled, wooden rig that he used for five or six years. His 1960s John Deere drill distributes seed exactly like the 1880 model. His self-propelled combine with an 8-foot cut is also a 1960s version. He purchased a plastic layer, which he shares with a neighbor, and he owns the compost turner jointly with another farm. "You can have better quality equipment if you share it with somebody," says King, "or it may be something you can't even have at all if you didn't share."

King and Barrett and the other Hancock Organic Farmers' Co-op members also share machinery, and equally important, they share information. Their "number one source of information" is other farmers. King has stopped attending most trade group meetings because he thinks they are "tunnel visioned." "They want policies that are good for them," says King, "and they don't pay any attention to policies that are good for anybody else. They're just more special interests, as far as I'm concerned," King declares.

"That's why we're hooked with MOFGA," he says. "It's more broad-visioned than any of the other groups." He thinks the Maine Sustainable Agriculture Society is also broadly based-- he's on the MESAS board of directors--and that MESAS can "provide a forum for farmers to get together and talk." He thinks USDA policies too often favor specialization, which has helped the commodity farmers to the diversified farmers' detriment, and that small farms like theirs "will exist in spite of the global economy and certainly not because of it."

Risk Management

When people talk about "risk" in farming, they generally mean financial risk, but King doesn't know much about that. "I never risked anything financially," says King, "because I didn't have any money," and he "never made any big capital investments" that he had to borrow for. "One of the reasons I've never borrowed any money," he says with a chuckle, "is because if I went to a banker with my financial statement they'd just laugh me right out of their office."

The risks, he guesses, "were of total failure or going crazy because of the lifestyle you choose. And it is very difficult. You're always feeling like you're swimming upstream...every once in the while you can get a little down and wonder if it's worth it," but his answer was always yes, "it is worth it."

"It's really been a rewarding life," says King, "to take a piece of land like this and convert from a worn out farm into a fairly decent farm. Walking out where it had been sparse grass, hard hack and alder, and seeing lush white clover coming up...It's those kind of rewards. They're simple...It's never been the dollar...My philosophy has been that you do a good job and you run your farm in a good ecological manner and let the dollars fall where they can. You skimp and you save and you don't spend. It's a lot easier thing to come up with methods to not spend money than it is to come up with methods to make money if you're on a farm like this."

Future of the Farm

"I've always said, and people laugh at this," says King, "but I kind of believe it--I ruined a lot of good woodcock habitat to make this farm and it wouldn't bother me one rip to see it go back to be woodcock habitat again. Things change. People change...I've had an impact on this piece of land, and it's only positive because I've defined it that way. To the woodcock it wasn't positive at all."

The Apple Farm
Steve and Marilyn Meyerhans
Fairfield, Maine

Steve Meyerhans started working on The Apple Farm in 1970 picking, pruning and learning about the business. Four years later the owner retired and the Meyerhans purchased the farm with an FHA mortgage. “I think it’s the healthy and wholesome lifestyle that originally attracted us to this,” says Steve.

The production and marketing changes they made have kept them in business for 26 years despite a declining U.S. apple industry. “We’re pretty much thrilled at having done it and have no regrets,” says Steve, “though we don’t have much of a retirement nest egg or anything other than the farm itself.”

“It’s not about money,” says Marilyn. “We make enough money to live on...the kids went to college, and we’ve done OK...It’s really a beautiful place, and when we’re out there in the orchard, we really know we belong.” They have about 100 acres of orchards to belong to.

Production

One of the biggest production changes was from standard size trees to dwarf and semi-dwarf, a process that took 20 years to complete and has significantly increased the efficiency of picking, pruning, spraying and monitoring for insect pests. An electric fence and two dogs protect against deer that can strip a dwarf tree of 90 percent of its buds in one night.

Another big change was pest and disease control. “When we first came here,” says Steve, “we were very much interested in helping to change agriculture toward less pesticide dependency.” They immediately reduced pesticide use and adopted Integrated Pest Management practices. They are able to accept damage a little beyond the IPM economic threshold because retail customers “are often willing to take the utility grade that cannot be sold on the fresh market commercially.” But they had to abandon strict organic management because the organic apple market was poor and they felt the environmental impact of organic practices and materials was “over the Environmental Impact Quotient.”

EIQ measures and compares the environmental impact of each practice and material used. Organic management for disease control required a great deal of time making many applications of significant volumes of materials which had undesired side effects such as leaf burn, changes in soil pH and pale fruit color due to heavy residues that blocked the sun. Synthetic materials require fewer sprays and “are a lot more benign than they were 25 years ago,” says Steve. “They’re safer. They break down quicker. They are not persistent in the environment.”

Marketing Both Retail and Wholesale

The Meyerhans knew at the start they had to concentrate on direct retail sales if they were going to make the farm pay. To that end they added an on-farm retail store and pick-your-own to bring people to the farm to enjoy and learn. They expanded to 35 apple varieties including antique and new “designer” varieties for a spectrum of apples from early August to the end of October. They

added pears and plums, and most recently squash and PYO pumpkins. “It is very important,” says Steve, “to have something new for the customers.”

With such a short season the focus on retail has not been 100 percent. Wholesale accounts have been expanded to provide year-round income. It took ten years to achieve the volume, consistent quality and varieties to satisfy wholesale customers. Here, too, knowing the customer “face to face” is important.

Advertising is “very, very expensive” so most is by word of mouth and through school tours for kids who return with their parents. The store has become an outlet for locally produced processed foods and crafts, and they are adding a small bakery facility. Entertainment and education are integral to the all-day gala annual open house. Visitors enjoy craft demonstrations, cider pressing all day, free food and cider, wagon rides through the orchard and pumpkin patch, and sometimes live music. Every weekend they offer wagon rides and engage in regular farm activities to educate visitors about where apples come from and what’s involved.

Defining Sustainability

“Sustainability on one level is financial,” says Marilyn. “Then the systems have to be sustainable...grow the crop in a way that you can pay the bills and keep the crops and the soil healthy.” Important to the whole farm system is their ability to do all aspects of it themselves from planting to grading to selling.

“[Sustainability] has a lot to do with your marketing strategies,” says Steve. “You need to have a successful marketing arrangement...Direct marketing is really the key to our survivability.”

Financing and Information

The Meyerhans have put “every spare nickel back into the farm,” says Steve, which sometimes seems like a “black hole.” FHA holds the mortgage, but production loans go through the bank and are paid back with proceeds from the crop. Their 26-year history, profitability and business plan make them a good risk for lenders. “It would be nice to avoid [production loans],” says Marilyn, “but there’s no way. Expenses are too high.”

“Extension has probably been our prime source of information,” says Steve, citing Extension’s development of IPM programs, farm visits by apple specialists, and variety trials which are “critical to our industry...and our ability to move to new practices.” The Meyerhans attend the annual New England Apple Growers meeting in Massachusetts and share information with other growers through the statewide organization. “We generally are very open with each other about things, and we help each other out as much as we can,” says Steve.

Labor

The labor situation has changed “radically” since the 70s when “hippies” and new-comers with college degrees “would come and have a great time and do outstanding work,” recalls Steve. “It was a very difficult time” when that labor pool dried up in the late 70s. They now participate in the apple industry’s H2O program, which brings workers in from Jamaica through a contract between the U.S. and Jamaican governments. Growers pay transportation and provide housing

and competitive wages for the six to eight week season. “They’re outstanding workers,” says Steve. “They have a great attitude...We are able to get the same men back year after year...We’re extremely happy with that program.”

Globalization

“In our globalized society”, says Steve, “we’re competing against farms in South America, Africa, India and Asia.” He notes that “a lot of apple farms in New England are going under and selling out to house lots. That’s something that we certainly don’t want to ever have to do.”

“We have been able to create a niche, a marketing niche, which has enabled us to weather a lot of these competitions from away,” he says, but admits they are not totally insulated. During the 1999 apple glut, the Meyerhans were “directly” impacted by China’s apple juice concentrate, a market traditionally filled by U.S. growers’ cull apples. “There was so much apple juice concentrate coming from China,” says Marilyn, “that it depressed the prices of apple juice and apples.”

China is now the third largest apple producer in the world, whereas ten years ago they weren’t on the radar screen. U.S. growers fear the day when the Chinese enter the fresh apple market. “This is a threat for the apple industry in this country,” says Steve. “This kind of marketing disaster for us is something that we have to be constantly aware of.” The Meyerhans are at a scale where they have “adequate cash flow,” but they depend on their neighbors and supermarkets to purchase food locally. “We’re at their mercy,” says Steve. “They could change their policies at any time.”

“We’ve got to be able to compete on a price basis,” says Marilyn who thinks that farmers in general cannot depend on people being willing to pay more for quality or locally grown food because most will shop for lowest prices at the supermarket.

Programs and Advice to Help Farmers

The Meyerhans have limited time for activities outside the farm, but Marilyn participated in the early organization of the Maine Sustainable Agriculture Society recognizing its potential to bridge the gap between organic and non-organic farms. “Agriculture is agriculture,” she says, “and we have got to stop this divisiveness.” At that time she felt MESAS was leaning “too strongly toward organics” and the focus on crop rotation and integrated crop and livestock systems didn’t seem to apply to an apple farm.

A more effective approach, Steve thinks, are public education programs that stress that Maine products—organic or otherwise—are “probably the best or the safest in the world...Agriculture is really the foundation of any society,” he says and without the support of Maine people buying Maine products the state “would have a very hard time sustaining its agricultural economy.” Steve believes that domestic food production is a security issue and that “We should do whatever we can to keep agriculture in this country strong” including finding more effective means of keeping land in agriculture and helping new farmers deal with the difficulties and high capital investment required to enter farming.

For those who might want to grow apples Steve's first advice is to have a market. Being able to grow the product is one thing, he says, "but marketing is actually almost a bigger challenge...Unless they have a market they're just whistling in the wind...And it's hard to crack a market...You also have to have a certain constitution to be able to live with risk...and you can't have great expectations about making great amounts of money. If that's important to you, this isn't the business to be in."

Nutkin Knoll Farm
Len and Nancy Price
Newburgh, Maine

Len and Nancy Price purchased their 120-acre Nutkin Knoll Farm in 1988. They wanted to manage the 80-acre woodlot, produce Christmas trees, and gear their sales to the local retail market to take advantage of their close proximity to the urban Bangor market. They now have 15 acres of Christmas trees and 25 acres of Balsam fir for Christmas wreaths. They manage the small flock of sheep that came with the farm for freezer lamb. They have thinned the woodlot and hedgerows to carve out a sugar bush and provide firewood and lumber for their own use. Their most recent addition is a cut flower operation, and Len anticipates selling logs for lumber or perhaps adding value by selling the lumber itself.

Both Len and Nancy are employed as teachers, Len fulltime and Nancy part-time. Their off-farm income provides security, benefits and health insurance as well as time off during school breaks to work on the farm and grab a little vacation. The farm provides more than half their income and allows saving for retirement and the children's college educations.

Growing the Farm

Their primary goals for the farm were "to make some money" with it, to have their children involved with nature and the farm, and to leave the farm better than they found it. "Christmas trees and the woods," recalls Nancy, "those are things we knew we wanted to do. The rest of it all happened." They got into maple syrup when a neighbor asked to tap some of their trees. Cut flowers were a response to a customer's request for specific varieties. "It just kind of grew out of supply and demand and requests and willingness to try something different," explains Nancy.

Nutkin Knoll's farm system is driven primarily by the desire to spend family time together on the farm. The system is further designed to limit the need for off-farm help and keep equipment and purchased inputs to a minimum. Choice of crops and volume of production are determined by the availability of their own labor during the different seasons. They hire high school boys to help during the intense Christmas tree season, which Len says has been unexpectedly "real enjoyable to work with them year after year and see them grow up and they come back from college and stop in and see how we're doing."

Marketing

They chose mail order and on-farm sales rather than farmers' markets because they preferred being at the farm. Local Christmas trees sales are retail and cut-your-own, and one buyer in Boston takes a wholesale shipment of Frazier firs at the same per-tree price as retail customers. Frazier firs are better adapted to growing in Maine than Scotch pine and they don't compete with the Canadian Balsam tree market or the Canadian dollar.

Most advertising has been word of mouth. Nancy brings school kids to the farm in the spring to plant a crop that they return to harvest in the fall. The kids tell their parents, who tell their friends, and "we have grown very fast that way," says Nancy. "That has worked very well for us."

Len says their key for success is having a “quality product” and getting people to come to the farm by making it an attractive and enjoyable place for people to visit. “They like the experience,” says Nancy. “They like to come back.” Three hundred customers come for Maine Maple Sunday and enjoy tours of the sugar bush led by the boys. Customers return to buy or to cut a Christmas tree and walk in the woods.

Nutkin Knoll’s mail order wreath business grew out of their personal Christmas card list, which has since multiplied many times over. They now sell 500 wreaths and 200 centerpieces and garlands. They see greater demand for their products than they are able to supply. “I think we could get as big as we wanted to,” says Len, “if we had the time and the energy, but I’m not sure that’s what we want to do, you know. We’re enjoying the size we are, but the potential is amazing.”

Sustainability

Harvesting wreath brush and tapping maple trees fits Len’s definition of a sustainable practice because it requires minimal purchased inputs and continuous harvesting year after year. Having seasonal enterprises, maximizing use of the farm’s resources and recycling are other aspects of Nutkin Knoll’s sustainability. Integrating livestock by rotating sheep and horses on the same pasture has eliminated the need to worm sheep for internal parasites. No chemicals have been needed to treat for sheep keds since the chickens have been running under the barn where Nancy is sure they eat the eggs. “It’s been a real treat,” she says, “because we don’t like having to use any chemicals on the animals, especially the lambs that we sell for meat.”

Two keys to economic sustainability, says Len, “are producing a quality crop that’s in demand” and matching the crops’ needs to soil types, local growing conditions and spatial location. Len takes advantage of the “natural situation” by using crops and varieties native to the area such as Balsam fir. These are crops, he says, “where we already have a balance in nature between pests and predators” in contrast to imported species which usually bring problems that cost money to solve. Nutkin Knoll’s hedgerows are home to sugar maples and to Arrowood and high bush cranberries, which are harvested for dried flowers.

Finding Information and Financing

Len figures they were lucky to have purchased the farm before local lending became a thing of the past. The land was more valuable for development than farming and the buildings were run-down so the mortgage couldn’t be sold on the secondary market, which is what the more consolidated lenders look for these days. “I think it was the end of the locally financed and locally held mortgage market,” says Len, who realizes that “for somebody else to do something similar in future years is going to be even more difficult.” A good down payment kept mortgage payments low enough that both Nancy and Len wouldn’t have to work off the farm fulltime, which gave them free time to upgrade the place with “sweat equity.”

Neither Len nor Nancy grew up on a farm. Their college educations have been applicable to farming in indirect ways, and they attend the Agricultural Trades Show and association meetings, but their primary source of how-to-farm information has been farmer to farmer

contacts and on-site farm visits. Len is not averse to dropping in unannounced and unknown when he sees a farm that looks interesting. "I've visited people all through New England," he says, people he's heard of or read about and contacted. If they respond he'll drop in when he's over that way. Vacation trips to visit family double as visits to farms in other parts of the country. During his year overseas after college he observed European farmers' intensive use of agricultural land and a different attitude toward farming. "The Europeans really encourage the use of agricultural space," he says, "not just for the farmers' benefit in making a living, but for the whole community's benefit."

The Internet, too, has been "very useful" for finding information, people and appropriate technology for small operations. With an eye to using sheep to mow the Christmas tree fields, Len found a farmer overseas and one in the Midwest who use Tropic Shire sheep which won't harm the trees. He's now breeding these to eliminate tractor mowing, a task he doesn't enjoy. A design at the University of Wisconsin for a solar kiln to dry lumber and a group in Australia doing it on a small scale have he and a friend talking about building a kiln. A portable saw mill and a solar kiln makes a tree that sells for \$200 per thousand board feet as a log worth \$1000 per thousand board feet as kiln-dried lumber. "For a small operation," says Len, "it makes it worthwhile."

Programs That Help Farmers

Because it's important to attract people to the farm, the Prices appreciate such State initiated marketing programs as Maine Maple Sunday and "Get Rural, Get Maine." They also support the Christmas Tree Association's idea of a Maine Christmas Tree Sunday. They think a statewide open farm day would get a lot of people coming out to farms and seeing what's going on. Field trips from the schools are also "excellent," says Len, "get the kids out, get the parents out and they see, they smell, they taste, they touch, and it's real to them...as opposed to whipping into a parking lot and in and out of a grocery store. Once on the farm you have to educate them as to what the farm's about, how to use the product and how good it is." A trade association such as the Maine Sustainable Agriculture Society could help by encouraging networking which is "so important", by conducting field days at other farms and sponsoring relevant workshops.

"Maple sugaring is probably the favorite thing we do," says Nancy. But when Len goes out to collect sap at 10:00 in the evening, after teaching all day and boiling all afternoon, he sometimes feels sorry for himself. But when he drags back at midnight "the tiredness isn't a factor anymore," because he realizes "that was just the nicest two hours I could ever imagine being up in the woods in the moonlight collecting sap."

"Maybe with a full-time professional job we could make a lot more money," says Nancy, "but I don't think we'd have the quality of life we have by any means...A lot of people spend their summer vacation in Maine, one week, enjoying the weather, being outside, being in the woods, or on a lake and swimming...We get to live here 365 days a year where we can ski, we can skate, we can swim, we can chase bugs, pick berries...I mean every day there are so many neat things you can do."

Ricker Hill Orchard
Harry and Nancy Ricker
Turner, Maine

Ricker Hill Orchard is a 200-year old tradition in Maine and one of a dwindling number of large apple growers remaining in the State. The Rickers have 700 acres of orchard and produce half a million gallons of cider. But things have not been going well even for a top notch producer like Ricker Hill growing quality branded apples for the fresh market and using IPM and eco-system management for long term sustainability and reduction of purchased inputs. Diversifying into other fresh markets with cranberries and certified organic, and keeping up with consumers' preferences for varieties both in this country and abroad have not insulated them from the declining apple market.

“There’s nobody in the wholesale apple industry,” says Harry Ricker, “that’s financially well off right now...The price of apples in 1999 was the same as in 1986, and our costs were up by fourteen years of inflation.” Apple growers don’t receive federal commodity payments and Ricker’s gross receipts are twice the \$2.5 million USDA limit for “family farm” so they aren’t eligible for crop disaster payments despite being “very much a family operation.” The farm supports grandfather, father, three sons, their wives and children and all work together and live on the farm. Gross sales “don’t say anything about net profit,” says Harry, who doesn’t believe the government should be bailing anybody out, “but it sure is hard competing with people who get that money.” The Rickers, whose first priority is supporting their family, are taking advantage of the good housing market and selling a few house lots to help make ends meet.

Diversification Driven by Economics

“Everything we do is driven by economics,” says Harry, “and 1991 was the last year that we were really profitable...So back in 1996 we decided to actively look for something to diversify into.” Cranberries, at 85 cents a pound, were “unusually profitable compared to apples,” and careful research convinced them they could do it. They “took on a lot of debt” to establish 14 acres of cranberry bogs over a three year period. But the cranberry market shrank by 33 percent when juice companies further diluted cranberry juice blends with less expensive juices thereby shrinking demand at the same time supply was increasing, which caused a price drop to 10 cents a pound for a crop that “costs 20 cents to harvest.”

The juice market was a fallback hedge for the Rickers who targeted the fresh market where distribution systems, outlets and the Ricker brand name were already established. Now they are prepared to “store and sell fresh cranberries throughout the winter season with consistent quality” if the supermarkets buy into the idea of cranberries beyond the holiday season. “The market doesn’t look great,” says Harry, “but we’re optimists or we wouldn’t be farmers in the first place.”

Organic apples were something they’d looked into 15 years ago when it was thought that organic apples couldn’t be done on a commercial scale. When that thinking changed they decided to

convert 40 acres and go for the 10 percent or better premium in the wholesale organic market for customers who are “willing to pay 30 percent more for something they believe in.”

The switch to organics was not a major change from the “environmentally sound” way they already grew their regular IPM apples, “working with Mother Nature” and not taking the easiest cheapest fixes that throw things out of balance and “come back to haunt you in the end...It [environmental soundness] has nothing to do with how big you are,” says Harry, “it has to do with what you believe” not only as a “way of life” but economically “you have to work with the environment if you want to sustain agriculture.”

Harry won't say much about the specific organic management methods they use because they've done a lot of expensive experimentation, and he thinks the demand side is limited. If too many enter that niche market, the price will go down with oversupply from competitors as far away as New Zealand. They have combined techniques and practices they've learned over the generations with new things they've brought in. They manage the micro-environments to encourage good insects, discourage bad insects and raise the organic matter content of the soils in order to enhance the quality of the fruit and reduce inputs.

They also grow organic vegetables—zucchini, onions garlic, squash and 2 acres of ginseng started in 1997, which takes seven years to come into production.

Because of difficulties in the export apple market and changes in tastes of consumers, Ricker Hill is moving away from export and into new varieties for the domestic market “made popular from other parts of the world” that they think can be grown better in Maine than elsewhere. They have planted Gala, a New Zealand variety and think Maine can produce it “redder, harder and sweeter,” and they anticipate a competitive advantage with Honey Crisp, which was developed in Minnesota and “can't be grown in warmer climates.” Hopefully these varieties “will compliment our Macintosh and Cortland base.”

Information

For information about new crops they rely very much on their own research from whatever sources they can find including travel to where the best producers are. For new varieties they experiment with a few trees of their own and watch the trials at Highmoor Farm research farm which “definitely” aid Maine's apple industry since most breeding programs are in warmer climates. Beyond that, the “very good” education system of university research and Extension education, which “unfortunately has been under-funded in the last ten to fifteen years, and very political” has led to terms like “sustainable agriculture” in order to get funding to teach people “ways they can work with the environment to make their farms last and keep food on the tables.”

Globalization

The Ricker family has been exporting apples “as far back as wooden ships and barrels...so we've always been a player in the world market.” The strong dollar has been hurting export sales for 18 years. It's good for the American consumer but “extremely expensive” for importers to buy their product.

Harry Ricker “very much believes in free markets” if they encourage efficiency and quality production. He sees “globalization as the next step in a free market going past American borders” and he’s willing to compete with the best of them. But problems arise when the playing field is not level, as with China their largest competitor, where the government subsidizes labor and land and apple production has tripled in a decade. In addition, some countries whose currency is not convertible will use, for example, apple juice concentrate in trade for products they need from other nations, which then re-sell the concentrate to the U.S. at “prices that have nothing to do with the cost of production,” a practice that’s been going on for 20 years.

Marketing and Retail

Fifty percent of Ricker’s sales are direct store deliveries to supermarkets and the rest are traditional warehouse. They have their own delivery and trailer trucks which they fill to capacity for efficiency by hauling in-season watermelons during the apple off-season, something “a normal Maine apple farmer wouldn’t even look at.”

A 14-month trial with direct-to-consumer sales through the Portland Public Market turned out to be “one of my bad ideas,” says Harry, despite the research beforehand which included visits to successful public markets in Seattle and Vancouver where “people bought their groceries” and average sales per customer were between \$7 and \$12. Per customer sales in Portland, however, averaged \$2.02 to \$2.30 to people who “were buying a snack on the way through... We lost more money in 14 months than I generate personally in a decade, and it hurt.”

Their other retail activity is three farm stands at orchards they’ve purchased in more populated areas. Nancy Ricker, with six full-time employees, manages these as pick-your-own “family entertainment” operations during the six-week harvest season. The hayrides plus animals to pet and feed attract school tours and are an opportunity to do a “little bit of ag education,” which was helpful during the concern over chemicals fueled by the Alar scare a few years back. Tours explained IPM scouting to reduce pesticide use and the importance of good bugs versus bad bugs, and the refrigerator units showed where apples come from in February and March—not from California. Everybody goes home with a flyer about the farm, and “people like the tradition,” says Nancy, who works with the Ag in the Classroom Program. But retail sales comprise only 0.5 percent of total sales and the farm stands “don’t make us any money at all.”

Future of the Farm and Agriculture

The Rickers believe that retail is the future for apple growers in Maine and New England—small retail operations which Harry has been suggesting to others for ten years, and which “many are already doing” successfully. Operations with ten or 15 acres, very few employees (Ricker has hired as many as 130 Jamaicans through the H2O program), and working 30 or 40 hours a week “do better financially than 100 acres wholesale,” says Harry, which are beginning to look good to him too.

As for the future of agriculture in a global economy, Ricker believes that people will decide, as they did with sugar after WWII, that we need to have “some critical amount of production here and not have to depend on South America or someplace where we have no control.” They will decide to “buy American” or “buy Maine” and be comfortable “paying only a little bit more” to

make it profitable for farmers to stay in business. “I believe it’s going to happen,” says Harry, “and that’s why I’m sitting here.”

Schartner Farms
Herbert Schartner
Thorndike, Maine

Brief History

Herb Schartner is a third generation fruit grower who relocated from Massachusetts to Maine at the age of 43 because he and his wife Phyllis wanted to get away from urban sprawl and high property taxes and “have some peace and quiet.” After three or four years spent looking for the right orchard and finding most “obsolete,” the Schartners decided to plant their own and “have it the way they wanted it.”

The dairy farm they purchased in 1980 had elevated land for frost protection and the right kind of soil. The highway location between several population centers provided easy access to markets. Although apples would be their primary wholesale crop, Schartner Farms would not rely on a single commodity.

Starting a fruit farm from scratch without relying on outside financing meant that Herb worked construction for three years while getting the land ready. Planting began in 1984. With the apple industry doing well, and a promise from his wholesaler to buy his apples, Herb put in 3000 trees.

But by the time Herb’s trees were producing, the apple industry was in serious decline. In 1997 the “net return of 79 cents a case” on 3000 bushels that cost a dollar to have picked put Herb “21 cents in the red just from the picking, never mind spraying or mowing or fertilizing.” Now Herb’s wholesaler “is losing money and ready to go out of business,” and Herb is getting out of wholesaling too. “If you can’t retail an apple,” says Herb, “you can’t get a decent price.”

So Herb is pulling out trees to make room for more pick-your-own strawberries and farmers’ market crops, the only parts of his operation that are “profitable.” Today Schartner Farms consists of 30 acres of mixed fruit, 12 acres of sweet corn and two acres of other vegetables. “The road to success is always under construction,” Herb says with a chuckle. “I’m small, so I have to diversify...It’s part of being in business.”

Risk Reduction Through Diversification

It was the hail storm in Massachusetts that wiped out his entire apple crop one year that drove the diversification lesson home for the Schartners. “We survived it,” says Herb, “because we had peaches [2000 trees]...99 percent of my peach crop was great... and then we also had sweet corn...That’s why I put in strawberries and raspberries and apples here. Just because of the weather.” But that same plan has also helped Schartner Farms deal with shrinking profit margins, changing market environments and pricing problems.

Herb, with college training in accounting, keeps excellent track of the numbers and he has his theories about the bigger picture. One of the overriding pricing problems he sees is the fact that in the United States “we’re used to cheap food, very cheap food,” and food prices haven’t kept pace with gasoline, chemicals and equipment. “Thirty years ago,” says Herb, “we were getting

\$22 to \$24 for a case of apples...now we're down to about \$15 or \$16...we have more rules and regulations than we had 20 years ago, and we are getting less for apples now than we got 30 years ago!...Back in '51, I paid \$700 for a Ford tractor; now the same tractor is \$35,000...Sixteen years ago my taxes were \$420 and now they're almost \$3000...If I paid \$2000 for a car 20 years ago, it's not down to \$1000 now...it's up 500 percent."

Now that his business is primarily local, Herb feels he's better insulated from external market vagaries such as the damage done to the Macintosh and Cortland markets by the Granny Smith apple. First imported from New Zealand where it originated, Granny Smiths are now grown and shipped East by "big" West Coast growers, and production in New Zealand, according to his friends who live there, is now declining.

Schartner Farms also sells raw apple cider, which is another market in transition. Recent concerns about bacterial contaminants may require pasteurization, an additional cost for the grower. "Now," Herb says, "I need a label on my cider jugs with a warning, like a cigarette pack...if pasteurization comes in, I guess we won't have cider anymore. That's another one that the big farmer is going to take over."

Herb thinks that part of the pricing problems faced by small farmers stem from big business ownership of farms and the fact that "the government" allows them and millionaire hobby farmers to take their agricultural enterprises as "tax write-offs...That's one place where your prices drop," says Herb.

Even at the local farmers' market Herb sees pricing problems arise as when vendors who "don't have to earn a living farming" or want to "unload" an overabundance of a certain crop are willing to underprice others at the market. "That's free trade," says Herb, "it's a free country...do we need regulations?...get together and hold our prices? I don't know. Then you call it price fixing, I guess...In my opinion everybody price fixes, especially the petroleum industry...You can't go to a gas station and say 'I'll buy from you if you give me a dime off,' you either buy it or not...You pay the price and that's it."

Management Practices

Schartner Farms' market-driven transition from wholesale to retail has forced changes in cropping patterns and management practices that take time and require certain compromises within certain limits. "I take great respect for my ground," says Herb, "the land---it's top notch...I have to make a living, but I will not destroy my ground." The transition is disrupting his strawberry rotation regime for green manuring and disease and weed control because one-quarter of his strawberry land has been converted to farmers' market crops. As a result he's had to resort to fumigation, but that is likely to be only a temporary solution, because Herb Schartner is not fond of pesticides.

"In my opinion," says Herb, "they [insecticides] messed up the balance of nature" by "killing off the predatory insects...and they [the chemical companies] are raising their prices. It's big business...they want you to spray, spray, spray because they want you to buy, buy, buy...and I'll be darned if I'm going to buy, buy, buy, if I don't have to spray, spray, spray."

“IPM is great,” says Herb, “but I’m really doing my own thing...I spray probably half of what everybody else does. I don’t use any synthetic pyrethroids.” He sprays for corn earworm twice, applies fungicides twice on strawberries, and doesn’t mow early in the season around strawberry fields because he thinks the tarnished plant bug would rather be among the high blooming grasses than on strawberry blossoms.

“Everything has to be working right to get a perfect plant,” says Herb, who relies on soil and leaf samples for information about calcium levels, micro-nutrients and trace minerals.

Future of the Farm and Farming

The more apple trees Herb pulls out the less able he will be to wholesale should the market reverse. But he’s not looking that far ahead. Because of his age -- he’ll collect social security next year and he has no children to raise anymore -- he’ll keep relying on local business and “juggling things around” planting whatever is most profitable, something he has “done all his life.” His “hobby” is trying out new varieties, especially some that, according to the experts, aren’t supposed to grow here, like the Matsu apple, which has given him a crop “every year” and peaches -- he got his first crop this year, the first in three years. “I like challenges,” says Herb, “I guess I love what I do...and so far it’s paid off pretty well...I don’t have to work construction anymore.”

“I should have a movie of before-and-after,” says Herb of the old house the Schartner’s moved into in 1980. It now has wooden interior doors instead of sheets, and real kitchen cabinets support the sink that used to stand on 2x4s. “It probably would startle a lot of people who wouldn’t live like that....Some people can’t do without,” he says.

Help for New Farmers

Because of the increasing gap between farm prices and farm inputs, Herb thinks that “younger people in the ag industry, if they’re small, are going to have a harder time setting up [than he had].” He admits that now, in his semi-retirement years, he knows little about programs and policies that might help beginners, but he definitely thinks they need help from grants or something, especially for equipment, even if they are willing to “do without,” which he is not sure is the case these days.

One thing that is firm in his thinking is that learning how to farm is a hands-on process that books and publications can only augment. He himself learned from the two generations before him and through 50 years of his own experience. Before he planted a single tree or strawberry plant here in Maine he visited a lot of growers to see their system and how they did it. He believes young people are hungry to learn through hands-on -- like the day the Sustainable Ag students and their professor visited Schartner Farms. “They came at 1:00 and said it would only take an hour,” Herb recalls, “they didn’t leave until 6:00...which was fine with me, I can talk agriculture all day long...the kids were so enthused.”

Another Herb Schartner example of the effectiveness of learning by doing was the day he and another fruit grower took the pesticide applicator’s licensing exam in Massachusetts without

even looking at the book and passed it “with flying colors...Books are great,” says Herb, “but I never forgot that...Hands-on, I think, is a big, big part of it -- a big part...especially in agriculture.”

Nonetheless Herb “reads, reads, reads” and consumes “as much knowledge” as he can from magazines, trade publications, trade shows, seminars, and other growers. Herb thinks County Extension efforts could help farmers more than State programs because they are less centralized and more “in touch with the farmers.” He laments that Extension’s “great, great grafting book,” which he used to hand out at grafting workshops, is only available in single-copy lots.

Looking Ahead

Despite major shifts in markets, the Schartners’ original long term plan has worked out well and Herb is “satisfied, very satisfied.” Although hired help is hard to come by with a seasonal business, their mix of strawberries, raspberries and apples provides income all during the summer, and farmers’ market vegetables “have picked up the decline in the apple industry.” Looking ahead short term finds Herb buying supplies in winter when prices are reduced. But in the very long term Herb sees a disturbing trend. “I think the trouble with America now,” he says, “is greed. It’s money, money, money. Big business. They’re all merging. Before you know it we won’t be able to exist. Big business is going to dictate everything to us.”

Smedberg's Crystal Spring Farm
Roger and Gail Smedberg
Oxford, Maine

The Smedbergs have been farming in their river location in Oxford, Maine for 33 years, at first carrying on with the dairy and sweet corn operation of the previous owners. In response to customer demand and bottom line numbers, vegetable production and farmstand sales increased to eventually outstrip the milk check at the end of the year. The story of this farm, like that of many others, is a story that evolves with time.

Evolution of the Farm

“As we grew,” says Roger, “we found we couldn’t continue to do everything. That’s when we decided to stop milking the cows and expand the greenhouses and the roadside business.” Though Roger had gotten into farming because he wanted to milk cows, at the time he gave it up, help was hard to find and none of his four children were working with him. The roadside business was easier to handle with less help and with less investment in equipment and dairy farm upgrades.

When the milk cows left, the old barn boarded recipient heifers, something Roger could handle alone if he lost his hired help. Boarders bought their hay and silage from Roger, and the bottom line was better than milking cows, but it didn’t last long due to changes in the embryo business. After that Roger put a few beef in the barn, “something to use up feed,” and eight years ago they started selling their own beef and pork. They also have a 600-tap maple syrup operation and they make their own ice cream. They hire pickers in season, have several employees who “come and go,” most part time, most overseen by Gail, whose laissez faire management style, at least with the ice cream crew is to “let them do what they want as long as the end result is what I want.”

The farm still does some hay (200 acres) and 90 acres for corn silage, though the market for both is declining in step with the decline in dairying, which has left plenty of land available for remaining farmers to raise their own feed. Roger is now seeding down corn land and easing out of haying other people’s land.

The roadside stand has grown into a year-round store with a rustic flavor, which Gail was determined to maintain for customer appeal. Their first stand was a 10 by 12 structure across the street where crates and baskets of produce out front crowded access to parking and had to be hauled in at night up and down portable stairs and through narrow doors. The second was across the road from the first with plenty of space until year two when parking during peak season became a highway hazard. The present store/stand, and the greenhouses (seven of them), are all on the same level so everything can be moved around on wheels with minimal lifting and lugging, and parking is adequate. They want to add on for more storage and workspace, incorporate the ice cream, etc. They are, after all, “competing with Wal-Mart on one side and Shop n Save on the other.”

Sustainability

Defining sustainability and integrated farm systems, an objective of the grant that funded these interviews, is often difficult for farmers. They know each farm and each farm couple is different. When asked about sustainability Roger cites direct marketing as “the biggest thing,” evidenced by cash flow and profitability of roadside stand sales versus the milk check.

Diversification fits Roger’s view of an integrated farm, within the constraints of bottom line survival and good stewardship. “Because we’re diversified in doing so many things,” says Roger, “we’ve managed to hang onto the farm and stay in business.” He’s been heavily involved in soil conservation for 25 years and stops just short of apologizing for not being an exemplary textbook soil conservationist. He hasn’t had the land base for rotating his corn, which depends on irrigation from the river, but he follows corn with winter rye for organic matter and now that he doesn’t need corn stalks for silage, he’s chopping and putting them back on the land.

Marketing

The Smedbergs are founding members of the three-year old Norway Farmers’ Market which they attend one day a week for four hours. “It’s right in our own back yard,” says Gail, “but I think we use it more like an advertising tool” than a source of sales, passing out farm brochures and bringing new customers to their farm.

They run local radio ads, advertise in the local newspaper, in the Chamber of Commerce magazine for tourists, and through some major advertisers. They participate in Maine Maple Sunday, advertise with the maple syrup and Christmas tree producers, and they’ve been hosting an open farm day since 1967. They always contribute to local groups’ fundraising efforts in exchange for an ad, and their farm logo and info is on restaurant place mats to attract campers and tourists.

Eighty-five percent of their output is marketed within 100 miles—they do a little mail order—but wholesaling, which they did a lot of in the past, is now done only with other farmers and roadside stand operators and only if they pick it up at the stand. “We used to deliver,” says Roger, “but now my son is getting involved, and he doesn’t want to be on the road delivering. He wants to stay here and work with the crops.”

Globalization

Globalization “affects the whole country,” says Roger. “In order to have it, the country needs free trade. I just wish that the products that are shipped into the U.S. had to live by the same rules that we have to live by here...Not too long ago the Vice President of the U.S. was quoted as saying that within years those other nations are going to supply the U.S. with their groceries. I have a real problem with that. I think we have enough trouble with heating oil and fuels coming from other nations and if they can control the bread basket too, this country is going to be in trouble.”

While one of Smedberg’s slogans is “everything in season,” in order to keep the store open year-round and compete with Wal-Mart and Shop n Save, they have to provide affordable produce, which means they have to buy food shipped in from elsewhere for customers who can’t afford

high-end Maine greenhouse-grown greens and tomatoes, which they also sell. Much of that shipped in food has been sprayed with pesticides that are outlawed in the U.S. “I don’t think that’s right,” declares Roger. “The same people the law was meant to protect are eating it anyway.”

Information and Financing

The Smedbergs have worked with FHA over the years, and FHA had the mortgage. But they’ve recently been working with the local bank, which, along with some hard cutting in the woodlot, helped finance the new store. All the bank needed was the cash flow charts, balance sheets and paperwork prepared for FHA. FHA worked with the bank, giving them the first mortgage on the buildings and a couple of acres.

For information, Roger gets out and around through his involvement as a selectman in town, president of the Maine Association for Conservation Districts, president of the agricultural fairs, an Agway delegate at conventions, involved with Soil and Water Conservation. “All of these kinds of things get you exposed to what’s going on,” says Roger. “Seeing varieties and stuff and what’s new and what’s happening. Then you try some, on your own land, and see if it works. And I’ve always tried to go to informational meetings,” most recently, as retirement looms, “about passing the farm on.”

Future of the Farm

Being a first generation farm isn’t an easy row to hoe. Successful family farms, after several generations, are often able to build up assets, maybe a camp on a lake, or a second home, or land that can be sold for development without sacrificing the farm. But for Roger and Gail, there is only the farm, it’s aging equipment and too little Social Security to live on because they “never earned a lot of money.”

The dilemma of how best to make the farm affordable for their son and still be able to survive themselves, weighs more heavily on Roger than Gail. Gail sees most people looking forward to a retirement they can enjoy, in contrast to their pre-retirement life, but she sees herself and Roger having enjoyed doing what they wanted to do all these years. Now that the stand and greenhouses are all on one level with no stairs to navigate, she laughs about being able to get around with the walker she might one day need and her harvest basket.

Roger, on the other hand, cites one thing he wishes he’d done differently. He wishes he’d put something away for retirement so his son could afford to continue the farm. He’s feeling pressure now to get his ducks in a line before an untimely death, as happened to a neighbor of his, puts it all in hands of others. He’s determined this coming winter to get together with accountants and advisors and with his son to consider all the various options and make a decision. “I mean, my son can’t really afford it,” he says. “If we can’t give it to him or partially give it to him, there’s no way he could afford to stay here.” For this reason Roger thinks the State of Maine ought to continue to pursue the purchase of development rights as a solution despite the controversy. “I don’t think it has to be etched in stone that a farm will still be here two hundred years from now,” says Roger. “I think the people fifty years down the road will

have to take another look at it...Anything Extension or the Department of Agriculture can do to help us is certainly needed.”

Advice to New Farmers

The Smedbergs believe that each farm and farm couple has to find their own way. Not everyone has the traffic and commercial zoning to keep a roadside business afloat. They think people should look for niches and not jump on bandwagons. When new things come along, too often too many jump at the chance flooding the market with too much production and everybody loses. Crystal Spring Farm has changed and grown in sync with customer demand and with Gail keeping careful track of production, sales and pricing.

Smith's Farm, Inc.

Greg Smith

Blaine, Maine

Fifth generation Aroostook County farmers Greg Smith and his cousin Lance Smith are co-owners of this large diversified farm in traditional potato country. They grow 6000 acres of crops with 2500 in broccoli, 1000⁸ in potatoes and the rest in grains for rotation (barley, wheat, soybeans and oats). An additional 50 acres is certified organic in a rotation of wheat, soybeans and broccoli.

“My father farmed because he liked it,” says Greg, “because that’s what he wanted to do... We continue to farm and be successful because we want to please somebody other than ourselves. We needed to continue to please that consumer, the customer, the end customer, with what we were providing... Twenty-five percent of this business is making a profit,” says Greg. “The other seventy-five is farming and doing what we want to do—produce food and crops.”

Smith’s Farm has been through some “hard times.” Encouraged by processors in the 1970s many Aroostook County farmers invested heavily in sugar beet production, a deal, which went sour all the way around. “That nailed us pretty good,” says Greg. Then it was French fries, again pushed by processors who moved in and moved out again. “They don’t pay enough,” says Greg...they don’t allow the guys to get a return on their investment.”

Smith’s has survived, says Greg, “maybe because we were more market oriented...a little more diversified...being fairly progressive and continuing to look at other avenues and areas, not being afraid to take a risk...I think I remained in the business because I enjoy it and have a passion for it. If you don’t have a passion for it, during those tough times it’s easy to turn and walk away.”

Now potato processor McCain’s is looking for another 20,000 to 30,000 acres of potato production, but producers aren’t likely to jump so fast this time. “The difference between now and then,” explains Greg, “is that back then you probably had 2500 farmers and today you have about 700 growers that are business people. They’re there because they’ve gone through the tough times and they understand the numbers...Growers today are producing on the basis of being efficient...They’ve had to be lean and mean...They don’t have excess equipment, they don’t have extra land, and they don’t have that excess storage.”

In the early ‘90s Smith’s hired a management consultant who looked at the whole operation and insisted they formalize the planning process around a table in the winter when things were slow. “It brought a whole new aspect to the business, a lot of advantages that we hadn’t considered... We took their recommendations...sold off the truck stop and the

⁸ Since the time of the interview, Smith’s Farm, Inc. has discontinued potato production.

restaurant...merged the two separate operations [his and Lance's] into one ...We've done some organizational changes...We've sold off some of our forest and reduced debt."

Sustainability and Risk Management

"When we talk about sustainability we refer to it as land and land base and fertility," says Greg. "Being a farmer, that's my first sustainability. Then on the next level you have sustainability on the financial side...It takes adjustments on both levels...So if you can stay agile enough on the financial side and make the adjustments as you go [rather than in giant leaps] then it's sustainable...The position we were in the 80s, we couldn't afford to get out of it and couldn't afford to make the adjustments."

Sustainability on the production side is about variety selection and soil tilth, organic matter, and erosion. Smith's customizes rotations according to the needs of the particular field in terms of organic matter, productivity, fertility and susceptibility to erosion. Their typical 4-year rotation is potatoes, barley underseeded with lentil rye, potatoes, broccoli. Where the short season precludes cover crops, sloping fields are slashed and ridged with a soil saver to protect against erosion.

Compost has become an integral part of Smith's soil viability. Made from cull potatoes, fly ash from energy plants and by-products from paper mills, compost is turned regularly to maintain 145 to 150 degree temperature, which "cooks out the pathogens" and weed seeds. High in nitrogen, potassium and phosphorus, compost is typically spread at 10 tons per acre where yield monitors indicate low productivity, a condition that would worsen without the compost intervention.

Price risks are tempered by "doing things for customers and really doing it as a partner with the customer," says Greg, who notes, "there's a definite layer of difference in the market," which means that service pays. If a customer has a problem or wants a certain product, Smith's "will dive in and try to help them and solve it," which gives them some say in the solution. As a result, in bad-price years "buyers don't take us to the low lows," says Greg, "and on high-price years we don't take them to the high highs."

Integrated Pest Management for timing spray applications reduces disease and insect risks. They follow IPM recommendations based on temperature and humidity conditions that predict for potato blight, but they treat broccoli earlier than recommended—prior to head formation and before insect pressure reaches the economic threshold—because early control may last until harvest and "we may not have to come back through with a second shot," says Greg. "We try not to add any products to the head of that broccoli...in the long run this probably will benefit us as consumers become more and more aware of where their food comes from and how it's produced."

Broccoli and Organics

In the early '80s when broccoli consumption was increasing and the possibilities looked good, Greg visited operations in California where most of the broccoli was coming from. He would need a crop that equaled or surpassed California's in quality and packaging. They put extra

money into a “sharp looking box” and noting that marginal broccoli packed with plenty of ice sold better than perfect broccoli without ice, they leased icing equipment. “Then when we went in the market,” recalls Greg, “we turned some heads. The first appearance was critical.” They shipped 60,000 to 75,000 cartons that first year and one million in 2000.

Another head-turning venture emerged from their packing facility where broccoli with broken stems was going into the cull chute because it couldn’t be bunched. In search of a market for these “crowns” they offered them to the distributor at a dollar less than market. Crowns rapidly became a premium product in the market introduced by Smith’s Farm 15 years ago.

Smiths got into organic crops not only because the demand was there, says Greg, “but we also figured that what we’d learn from the organic we could apply to the standard practices....The application and timing of pesticides is more critical so in that respect we have learned some tricks from the organics...But it hasn’t been easy to run that type of an operation with our operation...a lot more hand labor...and we have a little problem [with neighbors] when we go in with chicken manure or cow manure or fish waste...So we stopped with broccoli, soybean and wheat. It’s a good rotation for us, and it seems to be working.” There’s a “real demand” for wheat and broccoli and Smiths is building demand for the soy.

Greg thinks today’s lenders view diversification as a plus and weigh pay-back ability more heavily than assets.

Management

Smiths’ management team consists of supervisors and foremen who run the various operations in different locations. There’s a comptroller and a lawyer. Others are in charge of the grain operation, planting schedules, the cooler operation, packing and shipping, and sales. “Each is responsible for their own piece,” says Greg. “We allow them to run their operations and make decisions.” They work as a team with their own people and they work together across teams to make the whole operation work.

“From late April to the first of November these farms go from daylight to dark and six days a week,” says Greg. “We try hard not to do anything on Sundays.” Most employees are from the area and many started working on farms as high school students. As the farm has grown, work loads have increased, and Smiths is putting more assistants in “so they can all take a little more time off and reduce their hours.”

Growth

Part of the drive behind growth at Smith’s Farm “comes out of necessity,” says Greg, “or the market demands it, but some of it isn’t forced upon you.” Some farms have remained viable with little growth which Greg attributes to the “makeup of the people...Lance and I talking and always pushing and looking at the next venture.” Push also comes from employees. “They all want to improve their place in life...so they’re always looking at ways of improving and growing, too.”

A neighboring seed potato producer who has not grown significantly “is probably making a decent living,” says Greg, “and putting money away every year so he can have a decent retirement when he’s done. He does it very modestly. And I think, boy, that would be good...just stay where you are...and just work on becoming more and more efficient at that...I look at that and respect that and envy it at times...But I think an operation of this size, if you’re not growing at a certain rate, then you’re dying at a certain rate.”

Globalization

Smiths has sold products in South America, the Caribbean, England and Scotland, and of course Canada, and he’s been to England several times to keep on top of what Sandsbury, an owner of Shaw’s, is doing and might do. “In the production side of it, we only go into a country when they have a need for it [as when England and Spain needed broccoli]...otherwise they produce their own food, and I think every country in the world—I’m not sure about the U.S.—wants to feed their own people. Sometimes I question whether the U.S. wants to feed their own people or they just want to buy the cheaper food from other countries.”

For 50 years Maine farmers have struggled to protect Eastern markets from subsidized Canadian imports to no avail. Smith’s Farm was among those kicking and screaming, says Greg, “but we finally decided there wasn’t a lot we could do about it, other than figure out how we could do better, more efficiently, and meet them head on in the markets. And since we’ve taken that attitude and done it, it’s worked, and today it appears that we can compete.” The traditional way of marketing Maine’s crops has been in price, but Smith’s has found “it isn’t all price. It’s service, it’s quality, and it’s attitude,” says Greg. “It’s how you deal with your buyers...If we protect them, if we help our customer grow, then we’re going to grow with them.”

Help for Agriculture

“The Maine Department of Agriculture,” says Greg, “needs to be the advocate for the grower of Maine; the advocate in the marketing side, the production side, and all the way through...You’ve got to sell Maine agriculture to Maine people first, and I don’t think we’ve done that. All I’ve heard over the last 15 years is the bad news about agriculture in Maine led by potatoes. There are other pieces out there...a lot of little growers doing vegetables for the consumer...Something that’s as important as agriculture that actually brings money into the state, that’s a key part of the health of the state.”

“I always remember Dad talking about the cheap food policy in the U.S.,” says Greg, “but if the American consumer wants to buy their food as cheap as they can, that’s a short-term outlook.” In the long term, says Greg, “we need to preserve the farmland of Maine and the country. And the best most economically feasible way of doing that is to make farming viable...Once the farmland is built to houses, you’ve lost it. You’ve lost it forever.”

When Greg inquired about Maine’s program for buying development rights on farmland, he was told the program wasn’t funded and if it were southern Maine, where development pressure is greater, would get priority. He was concerned about the “good producing farm” across the road

being sold as house lots to people whose vision of country living did not include the smell of manure or the noise of tractors going late into the night. “If a retiring farmer could sell the development rights to the state and sell the land to another farmer, that would work,” says Greg. “I would still have the land to farm with.”

Another issue debated for years is over the Presque Isle Stream watershed where 95 percent of the land is controlled by farmers. The stream quality is much improved since the ‘60s when it “ran purple” from pollution. Now EPA wants to upgrade it even more, and five government agencies, each with their own interests, are butting heads and going in the direction of dictating what farmers can and cannot do. A better solution that farmers are working on with DEP and the local soil and water conservation district involves sedimentation ponds to intercept runoff before it reaches the stream. Farmers could use the ponds for much needed irrigation and remove sediment and return it to the fields. “Any time soil goes down the stream,” says Greg, “that’s soil I’ll never see. It’s on its way to Calais and not coming back,” says Greg... They seem to want to put up roadblocks more than they want to help you solve the problems.”

Optimism

Greg believes that to be successful at farming, “you’ve got to have a passion for it. You have to understand it and enjoy it.” And you have to be an optimist. Speaking to legislators on the state of agriculture, Greg presented an optimistic outlook because, as he says, “I’m an optimistic person and I’ll tell you why I think I am. I’ll tell you what I do.

“I go out every spring in May. I take a million dollars and I bury it in the dirt. And if Mother Nature does everything that she’s supposed to do, and I’ve done everything right up to that point, and all comes up in good shape, I’ll put another million dollars into nurturing that crop and taking care of it and getting it into storage. And if I’ve done everything right up to that point and I’ve got it in storage, now I’ll take a third million dollars and I’ll put it into taking care of it, packaging it and marketing it. I’ll do all of that in hopes that somebody is going to pay me \$3 million and one dollars so I can go back and do it again next year.”

Snell Family Farm
Ramona and John Snell, Jr.
Bar Mills, Maine

This farm had 100 apple trees when John Snell's grandfather, who needed fresh air and sunshine for his tuberculosis, bought it in 1926. He and John's father planted 650 more trees, raised hens for eggs, and in the 1960s they added an apple storage building. As factory egg production pushed the poultry business downhill, they switched from eggs to wholesale vegetables.

When Ramona and John finished college with degrees in English and journalism, they went back to the farm to raise crops, but not for the wholesale market. "We were more interested in direct marketing," recalls John, "selling them retail, trying to get more money for them."

The farm's successful evolution from wholesale commodities to diversified retail has brought about many changes. Drained hay fields now help support 12 acres of mixed vegetables. John's father still does apples--mostly pick-your-own, but some of the old trees are coming out to provide higher, lighter drier soil for vegetables and to facilitate longer crop rotations and greater utilization of green manures. The maple syrup operation, which they started with borrowed pans and boiling under the open sky, now attracts 2500 visitors on Maine Maple Sunday. Customers take home most of the syrup (produced from trees rented from neighbors) and some stay to enjoy the pancake breakfast. The half-acre of greenhouses added in 1986, and the one-acre nursery bring solid sales in May. They have a mailing list of 5000, publish a quarterly newsletter, and have a 100-member CSA, which helps with start-up season costs.

Family Support

Despite the changes, the farm is still very much a family operation. "You almost need a support system to start up," says John, "you just can't wake up one morning and say you're going to raise twelve acres of vegetables and instantly know how to do it and have all of the equipment laying around to do it with." In the beginning they used John's father's equipment, and his apples help attract customers in the fall. Last year they purchased part of the farm from John's parents who hold the mortgage--which gives them some retirement income--while John and Ramona get "a good mortgage rate...It's been a big group effort," says Ramona, "we couldn't have done it by ourselves."

That kind of support enabled John and Ramona to grow their "over-sized home garden" as their market grew and as their skills and abilities grew. Ramona kept her teaching job until the babies were born and much of that money went toward purchasing equipment. They claim they never had a 5- or 10-year plan, which "is probably a good thing," says Ramona, "because a lot of things we sort of picture for ourselves don't happen, and other opportunities come up and we can respond to those."

Sustainability Through Diversity and Flexibility

John and Ramona frequently contrast the diversified way they are farming with the more specialized approach taken by the previous generation and with which they grew up. "The industrial model for a farm, I think, is a poor one," says John. And many of his reasons relate to

the need to remain flexible enough to respond rapidly to marketing and production problems and opportunities.

With regard to size, John thinks bigger is not better if it means planting more acres of the same mono-crop or raising 400 cows instead of 60. “[It] makes all of your problems bigger,” says John, “manure problems.... management problems” that once were spread among many farmers then become bigger problems for just one farmer.

With regard to crops produced, says John, “with mono-culture you’re more apt to cling to what you did last year, because you have so much invested...and you’re one headline away from disaster.” He’s referring to the *E.coli* scare that recently hit cider producers. “A change in the headlines and suddenly the product your raising isn’t worth anything.” John even finds vegetables an advantage over apples because you don’t need a “crystal ball” to know what people will want 10, 20 or more years down the line. “With vegetables,” says John, “you’re on an annual cycle. It’s easier to adjust your amounts.”

John and Ramona’s “store-wide group of items” is their “crop” and it varies with the seasons from maple syrup through bedding plants to post-frost cider, pumpkins and squash. “That [diversity] works well,” says John, “because it spreads the risk out...It’s sort of like an insurance policy.” While their crop varies, their customer base remains steady and their numbers each week “are fairly similar over the whole season.” John calls it the “average load concept...You’re looking at selling many different crops to one customer, rather than trying to find more customers for one crop”.

John and Ramona point to other disadvantages of wholesale marketing. The wholesale farmer grows for the receiver “who checks it off at the loading dock” and knows only what has sold in the past and what his boss wants but little about what the end user wants, and too often the farmer waits for payment which sometimes never comes. “There have been times in the apple business where you deliver beautiful apples, and little did you know that your broker was about to go bankrupt.”

“By dealing directly with the customer,” says John, “you hear what they want and what they don’t want...and you can raise the crop for them.” Certain customers seem to be “ahead of the trends,” says John, “and if you listen very well to those customers, you get a feeling for what is coming in the future.”

“Sustainability,” says John, “is also dependent upon using our buildings and machinery many times and in innovative ways.” Ramona cites the greenhouse which doubles as the cafe for the pancake breakfast, seedlings are moved in the next day, followed by a couple more greenhouse crops, and then garlic for drying and pumpkins for display.

John and Ramona like the flexibility that sustainable agriculture methods afford, and they contrast that to their experience with being certified organic. “Where you have a wide choice of [methods] you can use,” says John, “I think the ‘sustainable one’ is...the one that’s best for you at the time. There are many ways to cultivate out the weeds...many ways to deal with insect

problems, marketing problems...at each step of the way, you pick the best tool for the job...and that's really the reason we discontinued being certified organic...we found that system to be limiting the options."

Now, when customers ask if they are "organic" Ramona says a better word for it is "sustainable." But explaining what sustainable means can get complicated. "If the general public could know a little bit more about sustainable ag it would make my life a lot easier." She tries to explain that sustainability has to do with IPM, with maximizing fertility, with rotations, with "making sure that farming can continue and that people like us can keep doing things like this profitably," but her philosophy goes even deeper. "I think [sustainable ag] has to do with national defense," says Ramona. "If all of our food is raised somewhere else and shipped in, that seems to me to be a very dangerous kind of thing...having strong farms nearby...it seems to me that's as important as B-1 bombers and expensive hardware."

Learn as You Go and Grow as You Learn

In coming up with their model of farming, which is "a diverse mix of crops that you can reasonably grow, that fit, and that are profitable," John admits they "have quite a long list of failures" or mistakes, but mistakes are part of learning. It's just that in farming, "you can't afford to make them on a 10-acre scale."

While traditional farmers talk in terms of gross receipts and acreage, John and Ramona talk about row-feet and net return. Though they value the lifestyle that farming affords, it's the net bottom line that ultimately drives their decisions. When they try something new, they begin with a market point of view, do the research by reading and talking with people, start with row-feet not acres, and then make adjustments. Garlic and Fall mums were new products that worked out very well. They are now learning about water gardens and water plants.

For their research and learning, says Ramona, "I think we get every conceivable magazine that's at all related to agriculture, and many that are not." Meetings take them to vegetable and greenhouse grower's conventions, trade shows, Johnny's Selected Seeds' trials, MOFGA's Farmer-to-Farmer conference and MESAS farm tours. Because of their location, they get information from Extension services in two Maine counties and the University of New Hampshire. On their "busman's holiday" vacations they frequently tour a farm somewhere and have visited Montreal's McGill University campus and Nova Scotia's experiment station. They look not for how-to recipes but rather for ideas and approaches to problems.

Financing

Early financing for their operation began with borrowing from the credit union and "paying it off quick." As they needed more sizable loans for production money and capital improvements, they approached the Farm Credit people. Their diversified operation fits under the category of "other" which comprises only five percent of Farm Credit's portfolio. But, says John, "they know that...a large part...of the future of farming is 'other' and they are looking to always vary their portfolios." Farm Credit has been "very good" to them, and their loan officer is one of their customers.

Production

As sustainable ag farmers and ex-organic growers, John and Ramona look forward to putting the extra orchard acreage into production as a way of dealing more effectively with disease and pest problems and eliminating the need to plant almost everything on hills. Already, of course, they are scouting for insects and spraying only when needed. They have more fungus problems in potatoes than they would like, but the blight problems they had on their basket-weave tomatoes grown outside have disappeared now that tomatoes are under tunnels. The greenhouses have allowed them to transplant rather than direct seed a lot of crops which helps with weed control, flea beetle and early cucumber beetle damage, and discourages the crows who prefer to pull up smaller seedlings.

Talking about weed control leads John to observe that “it’s sort of a matter of re-learning old techniques that people used before herbicides...It’s a matter of picking the right tool for the job.” For John that’s his Lely cultivator, a couple of rototillers, and single- and double-row cultivators on an offset tractor. Eliminating herbicides and their no-plant restrictions allows more efficient use of the ground as with double-cropping.

Peer Pressure

Coming from a traditional farm background, John and Ramona are aware of peer pressure against doing things the way they do as with manual work and walking the rows instead of riding a tractor--these were not considered “manly farming things.” But these are things that help them to know their own system “inside and out,” and Ramona thinks hand work is an important part of the learning process-- “almost tilling the soil by hand...knowing things on a very personal level...before you start introducing machinery.”

They also rejected the old-time stigma attached to working off the farm as a sign of failure. John’s been driving an oil delivery truck in the winter for 13 years. Like the farmers’ markets in the summer, working out helps him feel less isolated in the winter, he gets a lot more done on his days off, and he learns from observing how the company deals with problems inherent to any business. It also helps with the gas and oil they buy for the greenhouses. And it fits with their own farm schedule; when the sap starts running, the phone stops ringing for oil deliveries. John looks at his winter job “like another crop.”

Future of the Farm

John and Ramona are not making any predictions about the future of their farm or the proliferation of farms like theirs. Their work crew jokes that they will probably be loading trucks and picking beans when they are 80, and they suspect they will be doing something similar, but they know a lot depends on their own health and what their children will choose to do with their own lives. They have had 25 years of being happy with what they are doing and being able to pay their bills. “I think if we were working for other people and they were asking us to do all the things that we do for this job, we wouldn’t be so happy,” says John. “But doing it for yourself, you look at it differently, and you’re willing to put in longer hours.”

Spear Farms, Inc
Richard Spear
Nobleboro, Maine

Spear Farms was started in 1933 by Richard Spear's father and grandfather. They grew the dairy farm in size until 1975 when Richard's father died and he and his brother took over and continued to expand. In the mid 1980s they added a vegetable business. Now Richard works with his brother's two boys, nephews Terry and Jeff. Together they milk 140 cows and grow 140 acres of silage corn and 300 acres of hay. They also grow 100 acres of vegetables with 65 acres in sweet corn, 6 in cucumbers, 20 in pumpkins and winter squash, 3 in miscellaneous. Six 14 by 100 foot hoop houses are full of tomatoes and another houses cucumbers. Spear Farms owns 500 acres, 400 of which is woodland, and they rent or use another 300 acres. Other family members in the corporation help with other aspects of the operation.

Sustainability

Spear thinks the diversification into vegetables is what makes his farm sustainable. Lacking the land base to milk 200 or 400 cows "what we found economically," says Spear, "was we had to have the vegetable business to stay in the dairy business and furnish three families with an income...We have to do more than just milk cows in order to survive here on this farm...I think finding some second income for your farm is very important" as is off-farm income. "You also have to have a wife who works off the farm," says Spear whose wife Andrea is a registered nurse.

The move into vegetables required little investment. They had the necessary equipment and the manure and they started small with a sweet corn market that kept growing and growing. Eventually the stores wanted other crops as well so they continued to grow to meet the market demand. "Milk prices haven't changed a lot," says Spear, "but all the bills seem to have gotten bigger, so we keep growing bigger with the vegetables." The monthly milk check pays monthly bills, the four months of vegetable income, beginning with peas on the 4th of July and ending with pumpkins, pays the other bills.

Marketing

Spear Farms has three retail farm stands of their own on the farm and in nearby towns, but most sales are wholesale. They supply about a dozen different roadside vendors, three Shaw's stores and four Shop n Save stores in Rockland and the Bath/Brunswick area all in a 30-mile radius. Developing markets is a "slow process" that has happened over time by building a "good relationship" with existing markets and gradually adding more especially as super markets have begun pushing local produce in recent years. Spear makes pickup deliveries daily during the season.

Two or three other growers in the area comprise Spear's competition but all have agreed not to infringe on each other's territory. "Most of us are all in it for a living," says Spear, "and if we work together, it works better." When one farm has extra produce they contact the others who may be able to "get rid of it" for them.

Crop and Dairy Management

“We haven’t rotated crops as much as we should,” says Spear, because of a limited land base close enough to facilitate picking without traveling. Some fields are ten miles distance. “But we’re rotating a lot more and finding it valuable” in controlling weeds and disease. Winter rye follows the early sweet corn for a green manure crop. Their three acres of early sweet corn is grown under 50 feet by 500 feet sheets of Reemay which brings it to market a week or two earlier.

Spear Farms’ new liquid manure pit built with help from a federal “319” grant for protecting the Duck Puddle watershed will allow better use of farm nutrients. The old pit was semi-solid, held only a months’ worth of manure, and it had to be spread with a tractor and spreader. “It’s not economical to run a tractor with a manure spreader that far,” says Spear, but with a truck and a liquid tank they will be able to utilize manure on all their fields which will reduce the use of commercial fertilizers.

Advice

“I’ve always said the only way that you can get into farming is either be born on one or marry into one. Trying to start up from scratch is very hard financially...almost impossible. Farmers are Jacks-of-all-trades, master of none. We grow up learning to do our own farming, our own electrical, mechanical—we can do everything almost right.”

But Spear thinks it’s important for those who have grown up on a farm to get away for a while—he went to college and studied something other than agriculture—in order to know whether they want to dedicate their life to farming. “You have to love it,” says Spear. “It’s your whole life. Everything revolves around the farm.”

“You also have to be an optimist,” he believes, “because if you aren’t you couldn’t get out of bed in the morning. Because nothing goes right on a farm. That’s just what a farm is. You’re out there doing stuff and you take risks like buying a \$1500 cow and hoping she’ll make some milk for you and you know darn well she could die the next day or something would happen. You have to keep doing things and keep going. Yes, you have to feel optimistic about farming. If you don’t, you shouldn’t be in it.”

Having three families working the farm allows each to take some time off, rotating vacations and weekends off. “If you don’t get some time off,” says Spear, “you’re going to get burned out, and it’s no fun then.”

Information and Financing

Operating loans when needed are obtained through the local bank, which also carries the mortgage.

Spear says he doesn’t make changes fast but he tries something new each year in terms of varieties and puts it into his system if he likes it. He gets ideas from other farmers, including his competitors, from magazines and from the New England Vegetable Growers annual conference.

The farm hires foreign students through the Future Farmers of America program. The students pay \$2000 to get into the program and the farm pays fair wages for their labor. This adds an educational component, which Spear says goes both ways. “Most of the foreign people have a great work ethic,” says Spear, “and they think it’s a vacation here working.”

Programs that Help Farmers

The public needs to be “aware of where their food is coming from and what goes into making a product,” says Spear, citing the small proportion of the American household income spent on food compared with other countries. “The American people just haven’t really gotten to paying the farmer what it costs them to produce something...what it really takes to grow stuff.” Spear thinks programs that encourage people to buy local produce are helpful. “It hurts when you have corn coming in from Florida and Georgia for a dollar a dozen when we’re trying to get three and four dollars a dozen.”

Spear thinks farmers would benefit from assistance and encouragement in diversifying into other crops and products to protect against risk “so you’re not putting all your eggs in one basket.” Because of the aging farm population and the financial difficulty young people have getting into farming, he’d like to see programs that help young people get involved with older farms—maybe go to work on a farm, get some experience, and then try to work something out with a farmer who is retiring.

Stevenson's Strawberries
Ford and Susan Stevenson
Wayne, Maine

Ford and Susan Stevenson's main crop is 20 acres of pick-your-own strawberries. They also produce 15 acres of sweet corn, four acres of peas, 50 acres of field crops and hay, an acre of mixed vegetables and 19 acres of grain. Of their total 400 acres, part was in the family, part was purchased and some is leased. They have a sizeable woods operation on 350 acres of family-owned land. Susan works as a teacher and Ford also taught but only for four years until 1976 when farming was taking more time and "something had to go. I couldn't do them both," recalls Ford, "and I really like being outside."

Their farm system has evolved over 25 years. Ford says he didn't have a strategic plan for the farm, though that "might have been a good idea. At the time I just had to feel my way along. I had to see what was going to work and what wasn't going to work. I didn't have capital. I didn't want to go deep in debt. I just eased my way along. It took a lot of years to get up and going."

Ford wanted a high-value crop that could be done on small acreage with limited labor and limited equipment. Extension helped him settle on strawberries, which no one else in the area was doing. He started with a small plot, trying other things as well—growing seeds for Johnny's Selected Seeds, doing the hay and forage crops, growing raspberries for a while—but always focusing on strawberries. Grains, peas and corn "are really rotational crops with the strawberries," says Ford. He has recently cleared some land and bought another piece to facilitate rotation. Berries are planted one year, picked for three years, then rotated out for a year, or maybe two. He's aiming for a longer rotation out. He uses oats to seed everything down, never leaving any ground bare.

Marketing

Stevenson's strawberries are primarily pick-your-own, and they have 20 local people working for them during the harvesting season. They don't have their own farm stand but they wholesale berries, vegetables and sweet corn to other farm stands and stores, and some berries go into the big freezer they recently built in the barn to be sold to a company on the coast that makes jam. Field crops are used on the farm or swapped with neighbors. Peas, which come the same time as strawberries, are also PYO.

Financing

Like many farmers Ford has an aversion to financing. "If I couldn't afford to do it, I didn't do it..." within limits, of course. He used his line of credit with Farm Credit to set up his irrigation system, which took "a lot of money right up front. "Farm Credit was "very good," says Ford. "Probably the most nervous time for me was the initial getting set up back in the 70s. I tried a commercial bank first, then rolled it into Farm Credit. They had much more flexibility and more understanding of what we were trying to do."

Information Sources

A lot of Ford's information comes from other growers and grower association meetings where he can talk with growers from other states and regions. "You can learn a lot from them," says Ford, who also attends Extension conferences and one year went to Nova Scotia for a one-week strawberry growers' course.

Sustainability and Agricultural Movements

Ford thinks sustainability as related to farming is "probably one of those words that's been worked to death by now...I would think if your farm was sustainable it would be productive over your career of using it and beyond. And, it would be able to make a living decent enough to support a family to a standard comparable to non-farm people...If a farm has been in business for three generations are you going to call it non-sustainable...just because you don't like some practice?"

"The sustainable agriculture movement, when it first came out, it was something between organic farming and conventional farming, and then I think the thrust of it went more toward the organic side. I felt they lost sight of the part that you've got to be able to make a living. I felt that the movement went too far to the organic side...It didn't really address the needs of the traditional farmer.

"I'm also disturbed with the organic side...I belonged to MOFGA in the early years and got disillusioned because of the politics, the philosophy, the religion they got into...It became a kind of purist thing. Instead of promoting organic farming it seemed "they were pointing their finger at me...telling me what not to do...wanting me to change my practices...I get upset when I end up having to go to hearings in Augusta and learn to defend myself...I hate to see the factions, you know. Let's all be together. If you're organic, great! If you're not, great!"

Integrated pest management is a different story. "I'm really happy to see research going on for better ways to control pests besides the canned stuff," says Ford, who lives just 10 miles from Highmoor Farm's research facility. His farm is one of their scouting sites for corn and strawberry pests and he learns a lot from the scouts and the meetings at Highmoor. "They are getting better techniques of scouting, better ideas, better handle on how much insect population you can tolerate...That's an advance for agriculture in the whole State of Maine."

To support sustainable agriculture Ford thinks the "number one thing" is practices that work and research and information that gives farmers confidence that they work. "Good solid research, applied research, and on-farm trials...positive information, but also information from the projects that didn't work out too well...I just don't think we have a commitment money-wise from the government to really do all that, to do it well."

Rather than any one group or agency promoting any one method or philosophy, Ford thinks agriculture in general needs "a lot of promotion in-house, within the agriculture community, within the state, to promote agriculture to the people of Maine...You've got all these different groups, but they all have their own little twist on things...I just wish we could be more inclusive."

Globalization and Industrial Agriculture

“I really worry about us relying more and more on food imported from other countries,” says Ford. “When food is imported, it’s not being grown here, and farms are being converted to some other use. There’s going to be other problems in the world on down the road. If we let our farms go too far, when we need to get back, they’re not going to be there.”

As for bigger and bigger farms—the industrialization of the dairy industry, of the chicken industry—Ford says, “I don’t like it. I don’t know if it’s bad, but I think it’s sad...Small scale producers can’t compete against them either...In my case where I’m producing a fresh product, a fairly perishable product, in a short season, I don’t see why it won’t hold it’s own. One advantage, you know, we can grow a much better product than they can possibly grow and ship, just by the nature of the beast.”

Satisfaction and Future Plans

Ford says he’s generally satisfied with the system he has going, though he’d like to change his mulching system from square bales to round bales. He currently purchases his straw from Canada using 3000 to 4000 bales each year. His next change would be to grow more of his own straw, and the kind of straw he can produce would be better handled by the machines that spread round bales.

Ford thinks in five years he’ll be looking for somebody who’ll be interested in taking the farm over because he doubts any of his three sons will want to carry on. He himself “wants to go do something else...I tried to develop it so I could sell the business and get enough money to get something else going.”

Straw's Farm
Lee and Pebble Straw
Newcastle, Maine

Lee and Pebble Straw founded Straw's Farm in 1981 with 50 acres of land they purchased under conservation easement. That 50 acres is now certified organic. They farm an additional 200 acres and use two off-shore islands for pasturing sheep. The farm keeps 300 brood ewes, 1000 laying hens (added two years ago), and a 30-head certified organic dairy herd from which they sell a dozen beef steers a year. Hay is also a cash crop, and, except for the milk, which goes to Vermont Organic Cow, all products are sold locally. Eggs, both free-run and organic, are wholesaled to health food stores, which are beginning to take some of the meat, but much meat is still sold through the farm store.

Sheep and lambs have been the "backbone" of the farm since the beginning, but the Straws never intended a single commodity operation because they like "the economic security" of not depending on a single crop, and Lee likes the variety. "If all I had to look forward to was getting up and milking 200 cows, I probably couldn't get out of bed in the morning," he says. "But milking 25 or 30, most mornings, is enjoyable. Going out to the islands, tending my sheep is enjoyable...most of the time I feel like I don't have a job, I don't work, I'm doing what I like to do."

Sustainability through Diversification and Reduced Inputs

"Sustainable agriculture to me," says Lee, "is first and foremost to sustain the people that are performing it, to keep the family farm sound, the bills paid, the family happy...we've spent the last 20 years getting to this point...all the enterprises seem to fit together so that we keep the ball rolling."

Diversification is one key to Straw's Farm's sustainability. Improving the quality of feed and reducing purchased inputs is another. To this end, all livestock are grass-fed to the greatest extent possible, which not only reduces feed costs but lowers culling rates and veterinarian bills. All feed is either silage or high quality hay harvested early enough in the season to be followed by a second crop and pasture, maybe twice. To make most efficient use of pasture, sheep follow cows in grazing paddocks.

Dairy cows are managed as a "seasonal" herd meaning they calve during a 2-week window in April and are dried off in the coldest months. This leaves a two-month period when Lee doesn't have to "get up and milk every morning," although that may change for economic reasons while their two children are in college. Vermont Organic Cow, which would prefer milk 365 days a year, has cooperated with the seasonality of Straw's milk supply.

To further reduce purchased inputs for the dairy operation, Lee is cross-breeding his pure-bred Jerseys and Holsteins to end up by 2003 with a cross-bred herd of smaller cows. Lee expects that the lower maintenance and feed costs, and the increased butterfat, will offset the loss in production. The smaller cattle model follows New Zealand tradition where farmers, says Lee,

“think we’re absolutely nuts for having an 1800 pound Holstein cow that we feed grain to. They’d much rather have a 900-pound cow that they get 10,000 pounds of milk out of and doesn’t know what a grain scoop is.”

Sheep are also managed with minimal inputs. “When you’re talking about sustainability,” says Lee of the island sheep, “they are about as self-sufficient as they can get.” The flocks, which restock themselves, live mostly on seaweed, and one flock has been on the island for 150 years. Rams are kept isolated on another island and put with the ewes in December for lambing in May and June. In June, the flock is sheared, docked, and castrated and the rams are returned to their island, although new blood is added every few years. In October, Lee returns to worm the ewes and cull out the unproductive. The best lambs are left with the flock for replacements and the rest are brought ashore. Out of 120 or so lambs, 20 or 30 go straight to slaughter. Careful management of the onshore lambs is required since island sheep have no immunity to shore diseases.

Financing Locally

Financing a mortgage was difficult in the beginning because the bank wasn’t fond of conservation easements and didn’t understand the Straw’s nontraditional farming plan. An FmHA loan came through a local bank after the seller reduced the price to compensate for the easement requirement that the farm remain a farm. When the local bank sold out to a conglomerate, lender rapport broke down and the Straws shifted to “a real local bank in Damariscotta” which has become “quite interested in how the operation works and in seeing the land kept open.”

Although most capital needs have been generated internally, debt seems to be a “necessary evil” which Lee has learned to limit. He tries to follow the edict not using hired money to buy “things that rust, rot, or depreciate.” Until a couple of years ago, when Pebble got the chicken operation up and running, either she or Lee had worked off the farm to bring in an income that did not fluctuate with the seasons.

Thoughts on Globalization and Industrial Agriculture

Lee thinks agriculture has become its own victim in the sense that technological improvements have meant that the farmer produces more but gets less for it. “We’re getting just a little more for eggs now,” says Lee, “than my dad did in 1957...and wool from our sheep, unless we have a specialty market, we’re getting drastically less than we did 20 years ago.”

Capitalizing on niche markets and staying small enough to market locally gives them some insulation against the kind of global competition that negatively impacts commodity producers such as Maine’s poultry and apple farmers.

“Our ace-in-the-hole,” says Lee, “is to be associated with whatever it is we produce...the assurance of quality comes from the producers and the pride they take in their products.” And he believes that consumers are willing to pay a little more for quality and freshness and for knowing where their food comes from.

Policy Suggestions

Preserving farmland is something the Straw's "feel very strongly about," and the best way to do that is to keep farmers farming profitably. For most farmers the farm is their only retirement account so when they retire "they've got to sell it for the biggest buck." To prevent farmland from being developed, says Lee, "one of two things has to happen—either government policy has to encourage land to be used for agriculture by buying the development rights, or people just plain and simple have to start paying what food is really worth, what it really costs to produce it." He thinks farmers need to be more involved in policy making at the State and local levels and he'd like to see the universities and Extension focus less on producing commodities and more on promoting sustainable agriculture "as an important part of our life in Maine." He suggests that MESAS have its own field day of sustainable practices, similar to Maine Farm Days, which is "wonderful, but it's all high-tech, high-input agriculture."

Future Plans

At middle age, and after 20 years of hard work, the farmer-propensity to "work a little harder" is beginning to "wear thin," and the Straw's short term goal is to "work smarter." They know that means improving profitability so they can hire the help they need and get a little time off. In the long run they hope their children, when they finish college, will want to take over the farm and run it and that their grandchildren will someday do the same.

Advice for New Farmers

The Straw's advice to new farmers is not to get in over their heads. "Start with something you can handle," says Lee, and recognize that farmers must not only produce, they must also promote and sell. "Any idiot can produce food," he says, "but producing good food takes talent, and selling good food takes a lot of talent—and patience." Farmers, he thinks, have to be businessmen, veterinarians, agronomists and laborers, and they are as much professionals by experience as doctors or dentists are by formal education and training.

Maple Hill Farm
Donna and Albion Tracy
Farmington, Maine

The Farm

The original Maple Hill Farm on Titcomb Hill in Farmington was a 175-acre traditional Maine farm dating back to the early 1800s. It was owned by the Titcomb family until Nellie Titcomb died in 1970 and gifted the farm over to Albion Tracy who had worked for her when the farm was under horse power, producing maple syrup and milking about 20 Jersey cows. When Albion and Donna Tracy took over the farm, the fields had been neglected for 15 years, the syrup operation was outdated and the buildings were run-down.

Today, Maple Hill Farm includes an additional 50 purchased acres and 200 leased acres. An 85-head Angus beef herd provides 20 percent of gross farm income, 900 gallons of maple syrup is 20 percent of gross sales, baled hay brings in 30 percent, wood products (firewood, logs and pulpwood) around 20 percent, and another 10 percent comes from “miscellaneous,” which includes hogs and feeder pigs from six brood sows. Four of the Tracy’s work the farm full-time and two others work part time.

What improvements have been made since they started? “You ought to have seen this place when we moved here,” says Donna. The list is long. They had to work on the house before they could even move in. Although still a modest dwelling, it now has a foundation under it and the woods isn’t knocking on their windows anymore. They have improved the beef herd genetically, they are doing selective cutting in the woods, and they have a management plan based on soil tests on all of the fields. They’ve gone to round bale silage and raise 15 acres of corn for silage. They’ve put up two pole barns and a 10 by 50-foot hay feeder. They have replaced sap buckets with pipelines, added on to the sugar house, and purchased a larger 5 by 14-foot Leader™ evaporator that boils down 260 gallons of sap an hour. On forty acres of rotational pasture divided into nine sections with high tensile and barbed wire fencing, 85 animals are moved every day or two until the first of November.

Sustainability

What makes Maple Hill Farm sustainable? Donna and Albion rescued an old farm, improved it, made it profitable, raised a family on it, and will pass it on better than they found it. To them, that’s sustainable agriculture, keeping farming going and profitable. Bruce cites sustainable conservation practices like putting in high use areas, manure pits, drainage tile, repairing erosion problems, and fencing the cows out of wet areas, all of which helped them win the Franklin County Conservationist of the Year award in 1981 and 1999.

The Tracy’s also recognize the risk-reduction value of their diverse mixture of products, which keeps them busy year round, provides a steady cash flow, and protects against weather and market fluctuations. “You’ve got to have something going for all seasons,” says Donna, “maple in the spring, then the haying, work your woods in between, and the beef is a year round thing. So you’ve always got an income coming in. That’s what you have to look for. You can’t depend on one thing.”

“The price of beef can fluctuate up and down,” says Albion. “If beef’s going good, you may keep a few extra. If it isn’t going so good, you get rid of them and sell more hay, or whatever.”

Contributing to profitability is the fact that the Tracys know what their costs are. “We set down and we figure,” says Bruce, “like a bale of hay. It costs us about \$1.35-\$1.40 for the bale we sell off our wagon for \$2.00...A lot of people don’t push a pencil and realize how much it costs.” And those who sell hay for \$1.50 or less, says Donna, “you know they’re not making a profit.”

Another key to sustainability is their commitment to quality. “We guarantee our products,” says Albion. “If someone gets something they aren’t satisfied with, we’ll either replace their money or the product.” The Tracys know if their product isn’t good they’ll lose their market fast to competitors.

Marketing

“We like to retail as much as we can,” says Bruce, “you know, get it all on both ends, but sometimes you have to wholesale.” Bulk sales of maple syrup go out in 30-gallon barrels or 5-gallon jugs for re-bottling. Two retail farm outlets, take 100 to 150 gallons a year. Supermarket chain sales carry the Maple Farm label, which generates phone orders, especially around Christmas when shipments go out in-state, around the country and a few overseas. Some syrup bottled at the farm is sold through small local outlets and large supermarkets statewide. Syrup stored at the farm is bottled or sold bulk as needed during the year.

Beef is sold on the hoof or freezer-ready. Feeder calves and slaughter beef are sold at the Expo, through other Angus outlets, or in local fall sales, but they have hauled animals all the way to Pennsylvania. It all depends on the market. Genetic improvements in the herd enable them to sell bull and cow breeders privately to farmers and 4-H. Freezer beef is slaughtered at the nearest federally inspected slaughter house, which is in Albion, a 50-mile trip, and it’s custom cut for the customer. Donna keeps meat in the freezer to be sold out the door. A couple of local stores are able to take the hamburger, since it’s inspected, which eliminates the dealer’s cut. “We sell more beef by word of mouth than we ever have by trying to advertise,” says Albion, “and we usually sell all that we want to sell.” Albion thinks the farm’s recently purchased computer, with e-mail and maybe a website for the farm, might help with retail sales. Maple Farm is on the Maine Maple Producers’ web-site and the Maine Products list on the Maine Department of Agriculture’s web-page.

The farm’s 280 acres of fields yield around 25,000 square bales of hay, 350 round bales and 500 wrapped bales. About 20,000 square bales are sold, year-round, mostly to horse people, and mostly in the local area. Customers either pick it up or Maple Farm hauls it.

The Tracy’s participation in Maine Maple Sunday, Maine/New England Beef Expo, 4-H, agricultural fairs, school tours, and just talking with neighbors and customers, is their way of promoting their products and educating people about farming and farm living. Maine Maple Sunday, a statewide program sponsored by the Maine Department of Agriculture, brings nearly 2000 visitors to their wood-fired sugar house at an otherwise dreary time of year.

Free Trade and the Future of Farming

The Tracys are concerned about the hundreds of thousands of acres of farmland lost each year to development and would like the State to act to preserve at least its prime land. They think that tourism and farming go together and ought to be promoted that way. They see unregulated imports as a danger, citing the negative impact on the U.S. apple industry of imports from China.

Quebec is the number one producer of maple syrup in the world, Vermont is first in the States, and Canada, Bruce says, wants to double its production of maple syrup. Though he feels his own maple syrup markets are fairly secure--barring a serious market glut-- there is pressure from Canada in the hay market, and they are concerned about the effect of imports on their beef.

Advice to New Farmers

What advice would the Tracy's give to someone new to farming? "I would get some advice from other people who had been successful," says Bruce. "Find out what you can get from what you want to go into, price-wise. When you start out it's going to be pretty expensive. I don't give a darn what it is. And there's gonna be some setbacks. But you gotta go ahead. And you gotta keep on top of things. I think that is one of the biggest problems with a lot of farmers. They don't keep up on what's going on. They don't get out and see what's going on." Exchanging ideas, listening, talking with other farmers, attending informational meetings and conferences is how the Tracy's learned and it still works well for them.

Donna and Albion are in their 60s now, three of their four children have earned college degrees, and the farm will be turned over to two of the boys, Bruce and David (Woody). "Maybe they won't have to work quite so hard," says Donna. "They haven't got to start from scratch like we did in '71." Not that she minded the work. "I think farming is the way, if you've got a family to bring up. It's hard work, but it's fun work, and everybody kind of works together." Donna's not sure they could have made it if they hadn't inherited the farm, but Bruce is convinced he'd be farming no matter what.

Beddington Ridge Farm
Ron and Carol Varin
Beddington, Maine

Ron and Carol Varin came to Maine from Rhode Island during the back-to-the-land movement in the '70s. In 1979 they purchased one-half of a 45-acre piece of undeveloped blueberry land for cash. Five years later they purchased the other half with a Farmers Home mortgage. Like many back-to-the-landers they originally envisioned selling vegetables and growing them organically. "Pretty quickly" they knew they "weren't going to make a living selling vegetables" in their remote location with their uneven rocky land.

Wild blueberries and balsam fir for Christmas wreaths were the traditional crops in the area for which their land was suited, the infrastructure was already in place, and neighbors had knowledge and skills they were willing to share. Beddington Ridge Farm still does wild blueberries and balsam fir, but they now have other crops to round out the seasons and value-added products to "squeeze more income out of a small piece of cultivated land."

Ron and Carol describe Beddington Ridge Farm as "small and diversified...kind of low input...with an emphasis on niche markets and value-added products." They have 15 acres of blueberries, three acres of balsam fir brush, 1/3 acre of cranberries and 1.5 acres of perennials, cut flowers and herbs. Processing includes jams and jellies, dried flowers and herbs and Christmas and "twig" wreaths.

Both Ron and Carol hold small, part time, low or no-paying elected town positions, but the farm is their primary source of income. With gross sales of less than \$50,000, they live low on the economic totem pole.

Sustainability

When the Varins first came to Maine they were "babes out of the city." As word got around about their intent to grow blueberries organically, neighbors, in "good neighborly faith" advised it was "fool hardy" not to use sprays. Many years later Ron came to understand "just how difficult it is to grow wild blueberries without the chemicals." He was getting 500 to 3000 pounds per acre versus the 5000 to 10,000 pounds others were getting and weeds were taking over his fields. Reluctantly he applied the blueberry herbicide Velpar. "It's something we kind of bit the bullet and did," says Ron.

Now, to "make the work easier" he hires the blueberry processor to burn his fields, apply Velpar every six or eight years and spray to control the fruit fly. In exchange he "owes" the processor some of his crop, a trade-off that saves a great deal of labor for an operation too small to justify purchasing labor-saving equipment. Years ago "people used to get together and help each other do the burning," says Ron. "I'm kind of the last one left."

"We've tried to follow the general principles of organic farming as far as we can take them," says Ron. "But sometimes we have to make some compromises...to be financially

sustainable...to find the balance between environmental and financial sustainability. We try to do the best we can by the land.”

“We don’t fertilize,” says Carol, “because once you fertilize you’ve got more weeds and you have to put more herbicide on. The more you use, the more you have to use.”

Diversity in terms of “having a lot of different enterprises” contributes to sustainability by reducing risk. For example, when the blueberry crop has been poor “we kept going,” says Ron, “because the perennials and Christmas wreaths, and all these other things were able to keep us going...and that was a conscious choice from early on...to not put all our eggs in one basket.”

Marketing

“While we have a beautiful location, and it’s a great place to live,” says Ron, “this is not the first place you would choose for a marketing operation that depends on direct marketing.” Their location precludes attracting customers to the farm, so they take their products to farmers’ markets and craft shows, and 15 percent of sales are mail order. Perennials are sold in May, June and July at the Machias Valley and Brewer farmers’ markets. In August when the blueberry crop comes in, they are at the Brewer market 5 days a week. Carol observes that when they began doing farmers’ markets 20 years ago, “it was still more profitable to do a commodity farm, and as that has become less profitable, I think more and more people have gone into direct marketing, and farmers’ markets have proliferated” to the point where many are not open to new growers.

The October and November craft shows in Orono, Bangor and Brewer are “pretty major marketing outlets.” About 10 percent of blueberry sales are wholesale to farm stands and vendors. They have just recently gotten on-line and think the Internet may “have some promise” for them with value-added products that ship well, although other Christmas wreath producers who do mail order report little advantage other than not having to “decipher the handwriting.” Carol notes that websites that aren’t linked to other sites are difficult for people to find.

Financing and Information

The Varins “have very good relations” with Farmers Home (which is now Farm Service Agency) out of the Machias office. “I think at first they didn’t know what to make of us,” says Ron. “At first they were fairly skeptical. But over time we’ve proven that we...generally had a pretty good idea of what we were doing before we went to them...We started pretty small and paid it off in a reasonable time frame.” Most financing has been for specific equipment.

For information they have “used the Cooperative Extension as much as possible,” says Carol. “They don’t always have all the information we need, but sometimes they have some of it, and they’ve been fairly helpful.” Other farmers have “definitely” been helpful and farmers’ markets “are often a good learning place.” When the Maine Organic Blueberry Growers Coop existed, “we learned a lot from others there,” says Carol, “and we get some good information from MOFGA and their conferences.”

Industrialized and Globalized Agriculture

The impact of industrialized, globalized agriculture causes concern. “It’s really easy for us to be cynical in our isolated market here,” says Ron. “You wonder if everything’s going to be a commodity. And we talk about niche marketing...How many niches are going to be left when you can go to the supermarket and find dried flower wreaths made in Mexico...and the price of these things is less than the cost of production?” The Varins suspect they are too small to participate in global markets but Ron wonders if there might be some way small farmers could benefit in the future.

“We wonder sometimes what the future holds,” says Carol. “Whether there will be any family farms left,” adds Ron. “We notice at the farmers’ markets and other venues that in general our customers are getting older and older...these older people had a connection to agriculture, to a farm someplace,” and the farmers’ market maintains that connection. “I don’t see as many younger people coming and buying heads of cabbage from the growers,” says Carol. Instead they’re at the supermarkets. The growers, too, are getting older, Ron notes, and he doesn’t see as many younger growers coming along.

Future

Although “satisfied in general” with their current farming system, the Varins are “pushing fifty” and “what was easy when we were 25,” says Ron, “isn’t as easy as it used to be,” adds Carol. “So we’re thinking of ways to make some of the work easier” perhaps growing perennials in containers to “cut back on how much fork work we have to do,” says Carol. They contemplate “tapering off a little bit” but with two children approaching college age “that’s not in the cards for the next five to ten years,” says Ron. “Hopefully each year we’ll get a little smarter, get a little more experience” and find ways to fine-tune the operation. One thing they have been looking at as a result of decreasing precipitation is irrigation and possible funding assistance through the watershed water management program.

Programs That Help Farmers

The Varins think that a group like MESAS might help farmers find appropriate technology and equipment for small scale production. On the marketing side “educating the public about buying from local growers” is number one on their list, and Carol thinks it could begin in elementary schools much as the recycling movement began many years ago.

Nezinscot Farm
Gregg and Gloria Varney
Turner, Maine

Gregg and Gloria Varney had farming “in their blood” long before they purchased Gregg’s 200-acre family dairy farm in 1987. That was the year milk prices plummeted from \$18 to \$12/hundred weight. Gregg’s father missed the price tumble by selling his own herd in the early 1980s, but he also missed the herd buy-out opportunity. One thing Gregg learned from that experience was that “as difficult as it is to maintain a dairy farm with a herd of cows, it’s a lot harder to maintain that farm...when the cows are gone.” And the Varneys wanted very much to keep the land in farming. “We have some beautiful land on the Nezinscot River,” says Gregg, “and we’ve got a beautiful community in the Town of Turner.”

With a rich land base, a supportive community, and a determination to “make a living at something you love doing,” says Gloria, “it made no sense that [the farm] couldn’t support itself.” Dairying would be an important part of their operation but not the only part, because Gregg didn’t think that a conventional dairy farm getting \$12 to \$14/hundred weight for milk could pay all its bills.

Today Nezinscot Farm resembles a traditional Maine dairy farm in that 200 head of cattle including 100 milkers are seen grazing the fields. But there are also 25 sheep, 20 goats, 20 pigs, 100 laying hens, 200 turkeys, 600-800 broilers, and an acre or two of mixed vegetables. All of the land and all of the livestock they sell, except the turkeys and broilers, are certified organic. Organic certification brings a premium price for Nezinscot’s milk which is processed into organic yogurt at Stoneyfield Farm in New Hampshire. Another 25 to 30 gallons is made into cheese at the farm each week, and 100 gallons is bottled for consumer sales at Nezinscot’s farm store, which is an even more profitable milk market than wholesale organic and “it really draws people to the farm,” says Gregg

The year-round store is the other major change at Nezinscot and a “key point” in the success of the farm. “We’re in the retail business,” says Gregg. “We sell a big part of the products we produce here on the farm. And so we get the producer’s margin, the middleman’s margin, and the retailer’s margin. And that gives us a little bit more income and that’s what keeps us in business.”

In the store one will find a yarn shop and a full line of natural food products. Products from the farm include eggs, a dozen different breads, cookies, pies, soups, quiches, lasagnas, goat cheeses, butter, pickles, jams and more, and sometimes venison or turkey from nearby local farms. Foods can be purchased frozen, or as take-out, or they can be eaten hot in the pleasant little cafe in the back.

How They Got There

“I think farming has changed around the world,” says Gregg, “and farming has changed in the United States, and in order for us to survive we have to learn how to change. And once in a while, we have to do things a little different, something that’s not conventional. But I think

that's why we may be in business today and some other folks aren't...The risk [in farming] is in not being brave enough to change. We changed."

Another thing Gregg says makes the farm work is that they "started off simply with a herd of cows. And everything that we've added to the farm complemented what we were doing. It didn't compete at all for the scarce resource of the time...I think that's our big plus right there."

"I like to tell folks," says Gregg, "when I got married and Gloria came here to start the farm with me, the only thing I had on the farm was cows." Although Gloria had thought she might work off the farm using her degree in Community Health and Fitness, her interest in crafts--those that add value to a farm product--brought sheep and angora goats to Nezinscot. Her hand spun yarns and clothing in turn attracted buyers. "That," she says, "is really what prompted the whole growth of this farm--a small flock of sheep and the value-added product from them." Gloria started baking breads, and advising customers about diet and health. Customers started buying lamb, and then other meats, and that's how the store began in 1990--right in the house in the kitchen.

Financing

Five years later they moved the store into the old barn. Financing that move is an example of the Varney's style of growing slowly, growing out of the farm profits, and using the farm's asset base for that growth. External financing was not an option, since the Varney's farm lender, Farm Credit Corporation, made it clear that they finance farms, not stores. "We sold some springing heifers," says Gregg, "and I worked in the woods for other people, and I cut some pine off my own land....basically we traded some of our assets around to help develop the store."

Creative internal financing was also needed for the cheese operation, which required a licensed cheese room with a \$10,000 price tag. That's when Gloria started with CSA products, interesting her customers in "buying a share in the farm" with a five percent discount if they paid in advance. "That generated almost two-thirds of the amount of money I needed for the cheese room," says Gloria. "And I've just utilized that practice for every new growth for the store." A full CSA share is \$350 plus 5 percent discount which gives customers \$365 of credit at the farm. Customers just say "put it on my card," and Gloria believes "people actually tend to spend more" than if they were paying cash or writing a check for each separate purchase.

Of course, Farm Credit reviews the farm's annual report each year, and Gregg notes with pleasure that "recently they've been commenting on how well the store is doing....they've seen that probably our store is the most profitable aspect of this diverse farm." Gregg hopes his example will encourage lenders to be more receptive to other farmers wanting to make changes or diversify.

Future of the Farm

The Varneys are satisfied with where they are now, though they never stop trying to do what they do better. Their goal has been to have 150 milk cows, so Gregg will expand the dairy facility this fall, but they don't anticipate getting much bigger because of the constraints on their own time and the lack of experienced labor for hire. The flexibility, diversity, and opportunity

for growth exists in any one of the farm's multiple enterprises should one of their children want to get involved and expand. Some changes and perhaps expansion will likely occur when Gregg's twin brother, who retires from the Vermont National Guard in two years, returns home with his family to work on the farm.

Another change will be the boiler system Gregg will build this fall, like the one his farming cousin Ras Caldwell designed and built. It will replace the wood stoves, oil burners and gas heaters that heat the farm now. A single boiler that burns wood debris, firewood, waste products from the farm, and it will heat all of their buildings and greenhouses. "That is part of our [five-year] plans," says Gregg, "always to be a little more efficient."

Globalization and Government Support

Gregg thinks his own operation is pretty well insulated from the effects of globalization because the farm is growing in response to a consumer demand, which is also growing, from "people who want to know where their food is coming from." But globalization in general, Gregg feels, "is going to affect us all an awful lot" as it impacts on the country and rural communities. He cites the problem of cheap imported apple cider from China which last year undermined even the largest apple growers' ability to compete. Consumers who buy local, he says, are willing to pay a little more "because they [know they] are buying more than the product...They are maintaining the rural character of a community."

The Varneys believe that conventional single-commodity agriculture will continue to lead to larger but fewer farms and Gregg doesn't think "there's a thing we can or should do about it. That supports agriculture," he says, "and agriculture is a good thing to support." They doubt that sustainable farming will replace conventional farming, or vice versa, but rather that both will co-exist and learn from each other. They've seen that happening in their own community where some conventional farmers are beginning to look at possible changes.

The Varneys recognize the value of farmland and open space and the critical role it plays in maintaining rural communities. They have no complaints about Maine's Department of Agriculture and Extension services, which have been valuable and supportive. But the one thing they'd like to see change is the tax structure. "When the taxes on an acre of woodland are greater than that woodland can grow in stumpage," says Gregg, "the guy who owns it is losing money every year unless he converts it to a house lot." The way Gregg sees it now, farmland and woodland are subsidizing housing, and it should be the other way around. If a state wants to control urban sprawl and help farmers and communities survive, says Gregg, "there is no better place to start than current-use taxation."

Equipment and Cropping

Gregg circumvents the high cost of equipment by building much of it himself, as his father did, and as "five out of six of the remaining farms in town" are doing. "Sometimes," says Gregg, "it's not the money that you make, it's the money that you don't spend." The self-propelled liquid manure spreader he built for \$2500 consists of a 3000-gallon tank on the back of an army truck that articulates like a skidder, and it does the same job as a \$25,000 piece of equipment.

Repairing and building one's own equipment, Gregg thinks, "is a big part of the sustainable part of agriculture. You can't run and buy everything you need."

Organic farmers in general are remarkably ingenious at controlling weeds through cultivation. Gregg attributes the 26-ton per acre cut off on corn this year and last (with a high of 30-ton per acre) to the Lely vibrating cultivator. He cultivates four times, once each week, beginning one week after planting. The inexpensive and light-weight Lely replaces the Livingston rolling cultivators he used before, even though the Lely is not designed for corn because the hook at the end of the tine pulls a little corn as well as weeds. Gregg compensates by seeding more heavily. He plants in 15-inch rows at a rate of 40,000 plants per acre and ends up with 36,000. At the end of four weeks his corn is knee-high, the canopies have closed inhibiting further weed growth, and that's the end of his cultivation on 150 or so acres of corn.

With regard to insect pests, even Gregg himself is amazed how few he has in spite of serious infestations on other land nearby. "We've been organic for over 15 years," says Gregg, "and I've never seen a root worm. I've never seen an army worm. I've never seen a cut worm...I don't need any pesticides to control a problem I don't have."

Labor

Since it's not a seasonal business, Nezinscot Farm can provide year-round jobs, which helps ease the ubiquitous farm labor problem. Gloria has one full-time and two or three part time people who help with the store, the vegetable gardens, and the value-added food processing. Gregg has a full-time field person who also feeds the cows and cleans the barn, and a second person who does the milking and cleans the milk parlor. Sometimes the kitchen crew helps in the field and vice versa--a flexibility, which makes their labor system "really work"--and often they have an intern or two learning cheese-making, store management, or animal husbandry.

It is obvious that the Varney's desire to earn a living farming is in a sense personal but it reaches beyond their own dooryard. They are successfully bridging both the technical and cultural gap between conventional and organic farming. Their farm is not small by Maine standards and their income is not minimal by farm standards. Their organic status has not isolated or stigmatized them, perhaps because they don't think "their way" is the only way or the only right way. If there is a right way to farm, they might say the right way is the way that keeps farmers in business farming.

"When the farm goes away," says Gregg, "and the Town of Turner has been one of the fastest growing communities in the State of Maine for ten straight years--well, I can tell you firsthand, when people stop farming, if there's no one there to rent that land, it gets planted out to houses and the whole community feels that effect. Every time a house gets planted somewhere, the farmer's taxes go up--the farmers that are left. So, it's in all of our best interests--not only farmers, but residential home owners--to keep the open space in farming."

Even the expansion of the Nezinscot milk herd fits that community objective and is dependent on a community of land owners who feel the same way about open land. "If you milk 150 cows," says Gregg, "you've got to have land enough to feed those cows and dispose of the manure...we

can actually rent land for farming practices at rates less than the taxes” because there are enough people in the town of Turner who “love that open space...they want to maintain their fields and the rural character. So, the more cows I milk and the better I take care of the manure, the more rural Turner is going to be, and there are several other farms in the community that are following that same line of thought.”

Pleasant Valley Acres
Betty Weir
Cumberland, Maine

Betty Weir has lived and farmed organically at Pleasant Valley Acres for 32 years. The gardening she learned from her great-grandmother was organic by default. “They just didn’t have the herbicides and pesticides back then,” says Betty, “so it wasn’t a question.” Betty and her carpenter husband were raising three children and Betty was working fulltime in Portland when they started market gardening in their three-quarter-acre backyard on Main Street in Cumberland. They raised vegetables for the family and “put in quite a lot of strawberries” to sell street-side to pay property taxes.

When they bought the farm, all of the roofs were leaking, part of the 150-year old barn roof had fallen in and one wall had fallen out. Little by little, over the years, they roofed and painted and shored up all of the buildings and gave the 40 by 60-foot barn a concrete floor and foundation. And all without any external financing.

Betty started raising goats and selling goat’s milk back when “it wasn’t nearly as regulated” as now. To “take care of the extra milk” and to have better meat to eat than the supermarket had, she got a calf and a “couple of pigs” and raised chickens. For 15 years all of this was “just for the family.” Then she took her goats to the first Common Ground Country Fair in the late ‘70s and met Sue Sargent who was selling vegetables at the Brunswick farmers’ market. Before long Betty was going to market and working to set up the farmers’ market in Cumberland. There wasn’t any “strategic plan” for development of the farm, says Betty, “it just grew out of producing for the family at first and then later for the farmers’ market.”

For the last year and a half, Betty, now 76, has been farming with her son. They keep 25 dairy goats, raise 10 veal calves, 20 acres of organic hay, 1.5 acres of mixed vegetables, organic blackberries, an acre of blueberries, and a few organic apple and pear trees. The farm also produces maple syrup from 400 taps, and the 40-acre woodlot is intensively managed by the Southern Maine Forestry Service, a complete and “remarkable service” that marks the trees, hires contractors and truckers, and finds the best market.

Marketing

Betty’s Toggenburg goats give her 15 or 20 young bucks, which go to the Muslim community through a “broker” who came to work for her five years ago and has since bought his own farm in Litchfield. She feeds excess milk to the 10 calves she buys from a neighboring dairy farm. The calves also get grain, hay and pasture and are marketed at five months for her customers who want the “larger chop.” The animal rights people are among the non-profit groups who also have space at the farmers’ market. “They come and say things like ‘You’re going to eat that dead meat?’ and I say, ‘yes, and I’m going to accompany it with this equally dead carrot.’”

Eight hundred people visit Pleasant Valley on Maine Maple Sunday, and the farm is open every weekend in March, but the farmers’ market is Betty’s “store.” She’s in Brunswick twice a week

and at the Cumberland market on Saturday. “I’m putting a lot of effort into marketing,” she says. “Clearly one third of farming is marketing. Stew Smith was the first one that came out in his little *Mainely Agriculture* column and said, ‘don’t plant the crop if you haven’t already got some idea where you’re gonna sell it...That was very sage advice to me. I have certainly followed that.”

Betty gauges her market by what her customers want right down to the size of packages of hamburger. “It’s been difficult to get my butcher to do the single pounds. He’d like to do them much larger.” Betty sees Shop ‘n Save as her “stiff competition” and sets her prices just a little higher than their top quality items “because she’s organic.” Her location near the Brunswick Naval Air Station and Bowdoin College provides many customers, especially young women with children, who are “quite sensitive” about their food and are “very heavy organic buyers. Without that good market,” she says, “I couldn’t make a profit on my animals.” Organic, she says, “is a very important feature. Particularly now, with genetic engineering. People don’t want to touch it.”

The market is open until Thanksgiving, so in late August Betty is setting out broccoli transplants and wishing her customers, with their youth, energy and vigor, felt enough connection with the farm to help out a bit, along the lines of the original notion of CSAs with members who participated hands-on. Over the years Betty has hired people to help who also want to learn.

Betty is on the Cumberland County Extension board of directors and she leans “very heavily” on Extension for information. She herself will be hosting and teaching an Extension-sponsored workshop on feeding veal calves with goat’s milk and marketing them. She was also on the Get Real, Get Maine advisory board and the lead organizer of the Cumberland farmers’ market. The market is on the same Main Street where she sold so many strawberries. “Right down on Route 9,” she says, “oh, a wonderful place to sell, there in front of Greeley High School in their parking lot.”

Betty still pushes farmers’ markets, “begging and encouraging” people to participate as vendors, to at least try it a couple of times, hoping they’ll get hooked like she did and find it “fun.” “There are only 52 farmers’ markets in the state,” she says. “We have 400 towns. What’s the matter with the rest of them?”

Programs to Help Agriculture

“I think the University and the agriculture Department better start thinking of sustainable farmers and training young farmers. “Extension does a very good job,” says Betty, “but you can’t get a degree. And I think a degree is more and more important to farmers...University courses in soils and agriculture could serve commuters with farming interests better if the standard three per week 45-minute sessions were pushed into one day a week. The courses need to be available not just to 18 and 20 year olds. Life doesn’t stop there. I don’t think the University has really caught on to that. They think Extension will take it from there.”

Betty thinks there could be farm camps for kids to learn, like any other kind of camp. She thinks of the job opportunities, “like the old corn canneries...We could certainly process sunflower oil,

probably canola oil,” and for all the liquor consumed in the state, “we don’t have a liquor factory, we don’t have a brewery. We have some of the small beer outfits, but so much comes from somewhere else. We could raise beef and ship it around the country, our own country, even just the Northeast, whatever, so many opportunities. We’re not using our resources well. We’re wasting them, just wasting them by not using them. By allowing unused fields to come up into bushes, for instance, instead of planting them into a crop of trees or something.”

Even with her organic premium Betty thinks that “a lot of times” she doesn’t get fair market value for her products. If agriculture is to be viable, she thinks the U.S. should follow Japan’s example with rice—not allowing U.S. rice into their country to destroy their own rice market. And though she doesn’t mind Mexican products coming into our markets, she thinks it’s wrong to “allow U.S. firms to go down there and treat those people like dirt,” driving them into ghettos.

Satisfaction and Future Changes

“My vision for the farm in the first place,” Betty recalls, “was to buy every piece of land in the valley—the whole 1200 acres—and to raise cattle. I could have raised more than the Windham butcher could have handled, so I knew that wouldn’t work.” But she is quite satisfied with her operation. “It pays the taxes,” she says, “and some more. The buildings are whole, the taxes are paid, we have enough to eat. What is anybody’s goal? If we set the goals too high, then we can certainly be very disappointed and that can lead to depression.” She’s not sure her son is quite as satisfied. “He thinks it should pay more,” she says.

“I’m only planning to live the next 20 years,” says Betty. “I just hope to maintain this, at this point, and keep it going and keep the fields and so forth in good condition” though she has no doubt it will change—“change is a permanent thing in our lives,” says Betty, who still tries something new every year. She thinks her farm system is about as integrated as it could be. “Everything fits right in,” she says. “It’s really a complete system. It’s a way of life. You follow the cycles around the calendar. You’re gentle with the earth and all the growing things.

She expects agriculture, in general will change as well. “I am concerned that we may very well be poisoning ourselves with a lot of things. We may be using agricultural practices that are using up the land, not paying quite enough attention to restoring, renewing and that sort of thing...I think either the world will learn to do sustainable and quite possibly organic agriculture, or they will have famine and starvation.”

Sandy River Farms
L. Herbert (“Bussie”) and Brenda York
Farmington, Maine

Bussie York has been dairy farming in Maine for nearly a half century. But because he’s committed to diversification, only half of his gross farm receipts derive from milk production. He works with 560 acres of rolling bottom land in crops and forage and 800 acres of working woodland. He produces, mixes and grinds feed for his own 150-head herd. He sells grains, forage, hay, timber and commodity food crops, and he custom mixes feed for other farmers. The changes in York’s operation over the years have been driven by a “market philosophy” but always within the constraints of maintaining both a diverse production base for risk reduction and a healthy balanced soil for long-term productivity.

Land and Soil

Long term soil health is the foundation of York’s enterprise. He has a manure management plan, subscribes to a long term soil testing program, and rotates crops and inputs for the benefit of the soil. “The health of the soil is not only what you put in for N, P and K,” says York, “it’s also the tith of it, the organic matter.” York has worked with worn-out land and land that has been well cared for and, he says, “There’s no comparison.” Rebuilding worn-out soils “takes a long, long time,” says York. To his mind, organic matter is “probably the key.”

York’s corn/soybean rotation benefits his soil organic matter. Shell corn leaves a lot of residue, soybeans very little. No-tilling or mulch-tilling corn for two or three years puts raw residue into the soil. Returning corn land to soybeans for two or three years allows breakdown of the organic matter, which then “becomes much more effective.” In general, York’s four major crops, alfalfa hay, corn, soybeans and oats, are all on a less than five-year rotation schedule. It all depends on markets, weather, and “a lot of other things.”

Marketing

“Marketing,” says York, “has changed tremendously in the last 40 years.” His commodity food crops over the years have included sweet corn and shell beans for canning, dry beans, turnips, sugar beets, dandelions, beet greens, oats, corn, sweet corn for retail sales, everything except potatoes. “The real challenge,” says York, “is how these things fit together and if they don’t overlap in the harvesting season where you lose on one what you gain on another...The really big challenge is to try to get to a level where your labor force, machinery, land base, everything, kind of fits together so you don’t get a big conflict...We still do a lot of wholesaling but we’re trying to work toward more direct marketing....That’s really the future, I think, to create that [direct marketing] type of system.” New for Fall 2000 is pick-your-own pumpkins, a response to the changes in retail customer behavior. “If they can pick it themselves,” York observes, “[they think] it’s great, but if somebody picks it for them and it’s got a worm in it, it’s no good.”

Sustainability

York attributes the sustainability of his operation to his long term commitment to utilizing “all of the assets on the farm in a diversified way.” It’s an integrated system that has developed over the years. “It’s always evolving,” says York. “You never get to a certain plateau where you’re

completely satisfied and everything works fine such that you know you're going to be there for the next 20 years, because it doesn't happen that way...Part of the challenge is to evolve without putting yourself through bankruptcy."

"I think you have short term and long term sustainability," says York. "I think short term is making a profit. Long term is making a profit on a long term, which is different than making a profit on the short term because of the things that you can neglect in the short term that will catch up with you in the long term...We try to look at it long term and I think if you keep looking at it long term, the short term will take care of itself."

Sources of Information and Financing

"I pull no stops on trying to find information," says York. "I ask questions, I travel. I attend the National Corn Growers meetings, the National Soybean Growers meetings, all the way from Long Beach, California to Tampa, Florida. I'm interested in the technology...pick and choose what fits Maine...adapt it. I talk to a lot of farmers, industry people, Extension people...Books, reading, magazines. Any way that I can get the information, I'll get it."

Diversification is York's insurance against "disaster," and farming in the same community for years has been his assurance for obtaining necessary financing. "The established farmer," he says, "will always have the preference from a lending institution." York keeps the high cost of equipment down by purchasing used equipment whenever possible. And he thinks the pooling of big specialized equipment would be a big help for farmers.

A Cooperative Venture

York's goal of becoming self-sufficient in feed production, including protein concentrates, led him and other Maine farmers to try the new short season soybean varieties. For three years York got good soybean yields and managed the harvest demands, but he was feeding raw beans, which meant the cows were utilizing only half the protein and wasting the other half.

As an outgrowth of Extension's dairy seminars, a group of farmers began thinking about increasing protein bio-availability. Roasting seemed the easiest; roasting equipment was portable and thus could be shared, and it was the cheapest--around \$30,000. But it was still quite costly considering the few times a year it would be used. Extension suggested they submit a grant proposal to USDA's Sustainable Agriculture Research and Education program. When that proposal was turned down, they submitted another to the Maine Department of Agriculture's grant and loan program requesting \$20,000 in grant funds. They were awarded \$10,000, they put in \$6000 of their own cash, borrowed \$11,000 in program loan funds, and purchased the machine. The research and development component of the project involves testing the grain for protein bio-availability and assessing the effect on herd growth and production. The farmers own the machinery, but the project participants include ag experts, industry and university people. The technology is now in the state, and the machinery and information are available to everyone. Because York finds that too little effort is made to bring technology for small farmers into this state, he thinks the grain-roasting project is "the kind of cooperative venture that can be quite beneficial."

Policies and Programs for Sustaining Agriculture

The lack of appropriate technology is one of four areas that York feels are critical to the sustainability of agriculture in Maine. He thinks strategic planning efforts statewide should also focus on paying more attention to long-term soil fertility and “total” soil health, stimulating the development of agricultural infrastructure, and attracting more young people to agriculture.

He cites the lack of a knowledgeable and interested farm labor pool as a problem, especially for dairy. “The labor base for dairy in Arizona and New Mexico...comes in out of Mexico,” says York, “and they are totally committed, totally willing and do an excellent job, just an excellent job...In the Northeast we don’t have that labor pool to draw from...We need some innovative means of getting some people in that would help the dairyman continue...Some type of an exchange program, something like that.” Perhaps York will come up with something through his trip to Holland which is “great dairy country” but where the land base is restricted. There may be people or families in Holland with herdsmanhip leanings and no land who would come to Maine in a “long term labor program,” maybe two to five years.

York also thinks there are opportunities for rural development programs that “utilize our agricultural natural resources in long-term strategic development.” He mentions infrastructure initiatives such as regional processing facilities. Sweet corn, for example. “We can shell it off, freeze it, put it in a bag and sell it,” says York. “And it’s far superior to anything that you can buy.” And roasted soybeans. “Two pound bags, one pound bags, big bucks....I think that’s an area somebody should be concentrating on.”

When the human resource base of farming decreases “it leads to the loss of the infrastructure of agriculture,” says York, “and that’s getting to a very critical point here in this state.” To bring younger people back in, says York, “I think we need a strategic plan....I think we need financial and peer assistance....a program where older or more experienced people can assist the incoming younger people....a mentoring program...I think that could become a very important part of the sustainable effort.” In general, York says, “anything you can do to make agricultural production more profitable will make agriculture more sustainable.”

Globalization

York is “not a big fan” of industrialized agriculture or globalization. He thinks the Free Trade Act between Canada and the U.S. has had a “negative impact” on Maine agriculture because “it’s mostly one way, it’s mostly the U.S. giving more concessions than they actually receive.” Globalization “is a big danger--nationwide and world-wide,” he says, “because it allows a few entities to accumulate substantial control over a product to the detriment of both farmers and consumers...I just don’t think in the long term it’s going to benefit anybody, except a very few that are going to get very rich.”

Advice to New Farmers

“Agriculture is changing, and it has been,” says York, “and you have to be willing to change. You have to understand what it is that is changing before you can incorporate it into your farming business...change for a certain reason...have a goal--short term and long term. Have a

market driven, entrepreneurial philosophy. Do your homework. Seek out the best advice and resources available. Be willing to take calculated risks...Make a long term commitment to that change. To sum it up: Exhibit innovative thinking and then go out and have innovative execution of your thoughts.”

Future of the Farm

“There really isn’t much that I would have done differently,” says York, looking back. “We’ve been fairly successful in most everything we’ve done.” One of the key factors in that success he attributes to his land base, which has allowed flexibility and change. Maintaining that flexibility--not maxing out or wearing out the land on one commodity--has been intentional, not only for the objective of sustaining his own operation, but even if he sells out, he thinks his diverse land base will attract people who might want to use it in a variety of ways, big or small.

