Barriers and Opportunities for Greater Organic Vegetable Production in Atlantic Canada

Rupert Jannasch, M.Sc. P.Ag.

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Introduction

Certified organic vegetables have been produced and sold in Atlantic Canada since the late 1980s. What began as a hodgepodge mix of part-time growers supplying neighbours and whole food stores has developed into a distinct market also serving farmers' markets, supermarkets, restaurants and a variety of direct marketing ventures. Organic farming now enjoys unprecedented interest and awareness, especially in the context of the local food movement. Although still a fraction of the overall food supply, organic farming is one of few growth areas in agriculture. Organic vegetables represent one of the best opportunities for new entrants in agriculture to gain a foothold in farming.

Agriculture as a whole, however, stands on a precarious footing. Between 2000 and 2008, about half of the farmers in PEI and NS did not meet their cost of production in most years and the number of farmers continues to shrink. Expense to income ratios, which averaged 87 percent in 1970, recently peaked at 97 percent. Net farm income dropped about 90 percent over the same period (Scott and Colman, 2008a). Advocates for organic farming must be mindful that contraction in the overall farm economy directly affects the organic sector. Organic farmers share the same suppliers, custom operators, processors and transportation links, the same labour pool and to some degree, the same knowledge base of professional agriculturalists. Fertility in the form of manure, and even considerable forages and feed grains (when livestock production is not organic) are transferred from conventional to organic farms. The nagging question is whether contraction in the farm economy has surpassed the critical mass of businesses and stakeholders needed for the industry to be competitive?

Any expansion of organic vegetable production will take place within the scope of the general farm economy, at least in the short-term. This discussion will examine barriers and opportunities for the sector in the context of three essential features: soil fertility, entrepreneurs and labour, and accessible markets. The issue of appropriate farm scale and how this might influence the shape of future organic vegetable farms will also be addressed.

Soil Fertility

Improving soil fertility and crop rotations were recently ranked as a primary research need by organic producers across Canada (http://oacc.info/ResearchDatabase/res_strategies.asp). Soil fertility on organic farms is usually maintained by a variety of methods including beneficial crop rotations using plow-downs, legumes, catch crops and deep-rooted plants, and composted plant and animal matter as well as supplementary fertilizers (CGSB, 2006b). Using livestock manure as the cornerstone of soil building programs was promoted by most of the foremost thinkers behind the organic movement (Balfour, 1943; Rodale, 1946; Koepf *et al*. 1976), but it is generally accepted that stockless rotations

can be a feasible alternative (Lampkin, 1990; OACC, 2006) In Atlantic Canada, where the predominant Podzols are highly leached, supplementary fertilizers may be essential in the absence of livestock.

Most organic vegetable farms in Atlantic Canada do not have livestock. Between 2001 and 2006, the number of organic fruit and vegetable farms increased much more rapidly than farms raising organic livestock (Table 1). Nutrient requirements are frequently met by manure imports from conventional farms, provided they meet increasingly rigourous standards defined by the National Standard of Canada. For example, concerns over animal welfare, industrial farming practices and contamination by products of genetic engineering (CGSB, 2006a; Section 5.5.1) all but eliminated the use of compost made from poultry manure in most provinces after 2006.

Table 1. Certified organic products produced in Atlantic Canada (2001 & 2006).

	N.S		N.B		PEI		NL	
	2001	2006	2001	2006	2001	2006	2001	2006
All Farms	3923	3795	3034	2776	1845	1700	643	558
Organic farms	23	61	25	42	23	31	3	4
By type:								
Hay or field crops	6	16	6	14	11	19	0	0
Fruits, vegetables & greenhouse products	20	50	16	27	17	24	3	4
Animals and animal products	10	12	6	8	3	4	0	0
Maple	0	3	4	8	0	0	0	0
Other (herbs etc)	5	14	3	7	6	2	1	1

Statistics Canada, 2007.

The capacity of the conventional livestock sector to make surplus nutrients available in the near future appears slim. In Nova Scotia, dairy cattle numbers have declined 17.5 percent between 2001 and 2006, hog farms have all but disappeared and sheep numbers are flat (Statistics Canada, 2007). Beef cow numbers have dropped steadily by 15, 11 and 3 percent in N.S., N.B. and PEI, respectively, over the same period. Meanwhile, the recent doubling of fertilizer prices makes manure more valuable and farmers are less willing to sell it. Although there is a strong likelihood that organic dairy and beef production will increase in Atlantic Canada over the next decade, it is unlikely such enterprises will produce a surplus of manure.

Many agriculturalists, most recently Scott and Colman (2008a) have argued that forages and ruminant livestock form the backbone of a sustainable agriculture. Without ruminant livestock there is less reason to grow forages, particularly the grasses and deep-rooted legumes recognized as

underpinning soil fertility. Grass/clover leys, once the centrepiece of many organic farms, have all but disappeared from vegetable rotations. Interestingly, respondents to the recent Canadian Organic Farmer Survey of Research Needs by the Organic Agriculture Centre of Canada (OACC, 2008a) did not mention diminishing livestock or forage production as a specific concern. Their stated needs for improving soil fertility and crop rotations may be grounded, however, in the increasingly uncommon connection between forages and ruminants on organic farms.

Potassium (K) and phosphorus (P) depletion is an area of concern on farms of all types in Atlantic Canada. An analysis of 60,000 soil samples (LeBlanc, 2008) reveals a steady decline in soil P_20_5 and K_20 levels between 2001 and 2007 to about 50 percent of optimal levels. Poor economic returns and high fertilizer prices mean farmers are spreading less fertilizer. The possibility of nutrient deficiencies on organic farms is less certain because organic systems are thought to make more efficient use of soil nutrients (Lampkin, 1990). Potassium deficiencies due to crop removals and leaching (Jannasch *et al.* 2000), can be overcome by applying langbeinite (Sul-Po-Mag) or potassium sulphate (with prior approval). Phosphorus is more difficult to replace because affordable, readily available forms of acceptable P fertilizers are scarce. Low solubility limits the use of most rock phosphates (OACC, 2007) and the cost of soft, colloidal phosphate is barely justifiable except for specialized uses like transplant mixtures. Even though Martin *et al*. (2007) noted that apparent P depletion (estimated by annual crop removals) may be compensated for by mobilization of soil reserves through biological soil processes, the possibility of P depletion on organic vegetable farms should continue to be monitored.

The decreasing role of livestock and forage crops in maintaining soil fertility means other sources of acceptable, organic fertilizers must be identified. These may include:

i) materials such as crab meal, lobster shells and compost derived from fish and wood waste;
ii) fly ash from pulp mills;
iii) biowaste composts (OACC, 2008c);
iv) paper mill biosolids (OACC, 2009a).
v) all poultry litter, as implied by recent changes to the Canadian Organic Standard (CGSB, 2006b, Section 5.5.1, Paragraph A) but depending on interpretation by individual certifiers. Although the standard states that manure shall be allowed when "...the non-organic operation is not a fully caged system where livestock are not able to turn 360 degrees", a supplementary note states that priority shall be given to manure obtained from transition or extensive livestock operations....not originating from landless livestock production ... or from livestock operations using genetically modified organisms ... in animal feed."

Provided these novel products are proven to be free of contaminants, regulators could possibly extend the current Permitted Materials List and consider more materials from industrial and urban waste streams. Transportation subsidies already in place for soil amendments such as lime should be expanded to include amendments acceptable to the organic sector such as compost. Should major certifiers agree that all conventional layer and broiler manure is acceptable in organic systems, it will represent a significant new fertilizer source for organic farmers because poultry operations are often landless and manure disposal is a problem.

Entrepreneurs and Labour

> *To farm our land in the best way, to conserve it and keep it permanently productive, we need many more farmers than we have....The best way to get farmers is to raise them on farms, but the seed stock has been drastically depleted ....*
>
> *Wendell Berry*

Expansion in the organic vegetable sector will depend on recruiting a new generation of entrepreneurs and a willing labour force. The first generation of organic farmers is nearing retirement. Despite the overall decline in the farm population, extension workers report considerable interest by new entrants in agriculture to establish organic vegetable farms. Organic farming, coupled with the growing local food movement may rekindle the agricultural awareness, farming skills and community spirit described by Scott and Colman (2008b) as the human and social capital needed to drive agriculture forward. Many new entrepreneurs, however, are starting from different educational and economic backgrounds than their predecessors and are likely to pursue different models of production.

The entrepreneurs

Since July, 2008, the Organic Transition Specialist with ACORN (Atlantic Canada Regional Organic Network) has been in contact with approximately 100 individuals who have expressed interest in switching to organic practices or establishing organic farms from scratch. About 35 percent of this group are currently farming using ecological practices, about 20 percent are conventional farmers and another 35 percent are new entrants. The conventional farmers are mainly dairy farmers considering selling organic milk. Only two conventional vegetable growers expressed interest in organic conversion.

In its survey of research needs (n=69), the OACC reports that of the 61 percent of respondents in Atlantic Canada who were vegetable growers, the majority were new entrants between 40-69 years of age (OACC, 2008b). The survey suggests many new entrants are considering farming as a second career. Vegetables are attractive because there is a ready market and minimal outlays of capital are needed to start.

Conversations with some of these farmers make speculation possible on the type of vegetable operations most likely to be established:

- Existing ecological growers considering certification typically farm small acreages with high inputs of personal labour, they grow a large array of vegetables and employ direct marketing methods;

- New entrants typically lack the inherited farm infrastructure such as productive land, sound buildings, operational machinery, as well as family tradition that are often prerequisite for large-scale production;

- Vegetable farming chosen as a second career may not have the economic imperative that often drives farmers to manage large acreages. Instead, operations are more likely to focus on small-scale (less than 2 ha), intensive and sometimes specialized production (asparagus, hops, sweet

potatoes) with life-style considerations given priority;

- Regional growth in organic vegetable production is more likely to be gradual than rapid. The likelihood of a large number of conventional farms transitioning and contributing to the regional organic vegetable supply in the near future appears small. However, the successful transition of only one farm with, for example, 50 acres of mixed vegetables, could increase the supply of certain crops by 50 percent or more.

Labour

Organic agriculture usually has greater labour needs than conventional farming (MacRae and Martin, 2005). Labour requirements in Atlantic Canada are often high (per unit land area) because organic farms usually have less than 1 ha of vegetables under cultivation (not including greenhouses and berries; OACC, 2008b) and sophisticated weeding and harvesting equipment is not cost effective. Labour shortages are perceived as a barrier to the expansion of organic farming (OACC, 2008b). Possible reasons include the farmers' inability to pay competitive wages, an aging population, fewer children and students in the labour pool and a general association between farming and poor career advancement. Conventional horticultural operations, which average 6 ha across Atlantic Canada (Statistics Canada, 2007), often overcome labour shortages by importing off-shore labour, but this opportunity has not, for the most part, been exploited by organic farmers.

Two recent events may attract more people to the farm labour pool:

- The recent economic crisis and associated unemployment has generated more inquiries about job opportunities on fruit and vegetable operations compared to previous years;

- A planned, incremental, increase in Nova Scotia's minimum wage from $7.15/h in 2005 to $9.65/h by 2010 will oblige farmers to pay more competitive wages. Although the wage hike could discourage some farmers from hiring workers, the pool of workers should increase.

The labour supply will continue to be critical to the growth of organic farming. As the population ages and continues to shift towards urban centres, organic farmers may hope to count on initiatives such as the SOIL farm apprenticeship program (www.soilapprenticeships.org) to find temporary workers. This program could also provide the mentorship needed to encourage new entrepreneurs to take up vegetable growing.

Many new organic farmers will need off-farm employment. Vegetable farms will probably be smaller than today's family farms and entrepreneurs will make carefully chosen investments in infrastructure such as greenhouses. Production will be characterized by high levels of management, high degrees of biological efficiency, innovations such as off-season and winter production and direct contact with consumers.

The Organic Market

Growth in the broader organic market over the past decade has consistently averaged about 20 percent. Fruits and vegetables make up approximately 40 percent of organic food sales in Canada (Vitins, 2008). There is widespread optimism that sales will continue to grow as consumers become better educated about the benefits of organic farming choose to source more local food and participate in alternative marketing structures (OACC, 2008a, OACC 2008b). The organic market can be divided into three main categories: (i) wholesale markets, (ii) chain stores, and (iii) direct marketing.

The wholesale market

A recognizable wholesale market for organic vegetables through brokerage firms has existed in Canada and the United States for about 15 years. Pulsifer and Associates (1999), Morton (2003) and others have identified New England as a potentially lucrative market for organic produce from Atlantic Canada. Potatoes, cole crops, carrots and string beans from the region have been shipped across North America. Today, the majority of exports are commodity crops such as potatoes where large volumes make transport by the tractor trailer load possible. Increasing sales of other vegetables will depend on producing or pooling substantially larger shipments than at present, so producers or cooperatives such as SeaSpray Atlantic can achieve the economy of scale necessary to absorb currency fluctuations, declining price premiums and increased competition in the organic market.

Chainstores

The three major grocery chains in Atlantic Canada have sold local, organic produce since at least 1987. What began as modest, backdoor sales overseen by individual produce managers has evolved to pallet-sized deliveries to regional distribution depots coordinated by regional managers. Interest by retailers in promoting organic produce from the region has fluctuated. Some organic farmers claim the large grocery retailers are monopolizing the produce trade and blame lack of market access for the industry's failure to expand more rapidly (OACC, 2008b). Others believe that the presence of organic food in chain stores has actually helped spur demand. A number of factors have hindered the development of local supply chains:

- The switch to centralized distribution warehouses virtually eliminated direct store sales. This can be advantageous for growers with large quantities of product having good shelf life (potatoes, cabbage, grape tomatoes). For smaller growers, transportation costs can be prohibitive because freight is typically charged by the complete skid (pallet) and shipments may be considerably smaller;

- Grocers demand consistency in both quality and quantity of product and this has not always been delivered by growers. On the other hand, grocers have been inconsistent making purchasing decisions, occasionally making abrupt changes to purchasing agreements within the growing season. Support for buying local product appears to vary between managers at national, regional and individual store levels;

- High costs for packaging and labelling suited to modern merchandising systems are often prohibitive for small growers, as are hefty fees for registering barcodes and mandatory online listing and purchase order schemes such as ITRADE.

- The cost and administrative burden associated with on-farm food safety protocols may discourage some growers from selling to chain stores.

A one desk, cooperative marketing system implemented by SeaSpray Atlantic Organic Cooperative has generated the economies of scale necessary to address some of these issues. This enables smaller growers to more easily participate in trade with grocery chains. Although there are some indications that major grocery retailers are relaxing restrictions on direct store deliveries, it is not clear how this may affect other purchasing decisions. Pooling resources and product will probably continue to be important tools for growers to move produce through local chain stores. Nonetheless, the relationship between the region's organic growers and chain stores may remain a poor fit.

Direct marketing

Although the demand for organic produce is growing, many potential customers do not have good access to locally grown organic produce. More householders and business owners would buy local, organic produce if it were more consistently available and delivered direct in the freshest condition (Morton, 2007). Direct marketing can fill this void.

The number of farmers' markets is growing rapidly across the region and some markets are expanding. Organic produce enjoys a high profile at these venues. Noteworthy is the investment of hundreds of thousands of dollars by individual taxpayers into the new Halifax Farmers Market through Community Economic Development Investment Funds (CEDIF). This personal commitment to the local food movement bodes well for the continued growth of local produce sales. A stand at a farmer's market provides a sales volume that matches the production capacity of most organic growers.

An increasing numbers of eaters expect to find organic produce at whole food stores, inns, resorts and restaurants. Typically, these kitchens require small but regular deliveries of unique, high quality produce. Market gardeners are extremely well positioned to provide these products.

Community Supported Agriculture initiatives, often called CSAs or "box programs", have increased in popularity over the past few years (www.umassvegetable.org/food_farming_systems/csa/). CSAs usually involve direct contact between the farmer and customers who pay up front for weekly deliveries of vegetables throughout the growing season. Many variations of this system exist, but the basic elements are a guaranteed market for the farmer, with consumers assuming some risk for production shortfalls due to weather, insects etc. CSAs are well established near large population centres like Montreal where urban-based, non-profit groups like Equiterre have taken the lead to coordinate CSA projects (www.equiterre.qc.ca). Smaller CSAs are being established throughout Atlantic Canada and the room for growth appears to be substantial.

Given that only an estimated 18% of produce handled by large chain stores is supplied by local producers (Scott, 2008), there is a considerable opportunity for organic growers to displace imported food. Direct marketing involves considerable salesmanship and time commitment, but the end result is usually appropriate to the scale of the farm. Characteristic of farmer-filled direct markets is a shortage of supply, especially in the shoulder and winter seasons. This supply gap urgently needs to be solved and offers considerable opportunities for new organic growers. Alternative crops like oilseed pumpkins (OACC, 2009b), Lindsay, 2009) and value-added products such as prepared foods may also be commercially viable.

The Importance of Scale

The average gross income of organic vegetable farms in Atlantic Canada is well below $100,000, with just 10 percent of producers earning more than $100,000 and over 30 percent earning less than $10,000 (OACC, 2008b). The opportunities for some producers to scale-up production appear to be considerable. The trick is finding the right balance of management skills, production capacity and capital investment to match the scope and size of the end market.

Many small farms are profitable because they generate efficiencies by unconventional means. For example, a farmer may use second-hand refrigerators and chest freezers to avoid the expense of larger, walk-in units. A general purpose farm truck may serve as a delivery vehicle, and recycled bulk containers are used instead of costly, new cardboard boxes and plastic clamshells. Direct marketing avoids the cost of elaborate labelling systems. Organic farming is management intensive and successful farmers spend long hours working directly in the field.

Direct marketing keeps growers in contact with customers and provides more control over pricing. Expanding production can be advantageous, but the level of investment must be tailored to the potential rewards. The risk is that the efficiencies which generated profits on a 1 ha scale rarely count when the scale is 5 ha. Kitchen-sized refrigerators and freezers must be replaced with walk-in models, a dedicated delivery vehicle must replace the farm truck, and the operator spends more time completing invoices and payroll tasks than he does on the tractor. Small farms are cost-effective because the outlay of capital is minimal and debt loads can be kept small. Higher capital expenditures mean slimmer margins and it takes more volume to pay the bills. If marketing evolves to include wholesale markets, then the grower will effectively compete on the international market. It is not impossible for small farmers to sell wholesale, but they need solid financing to withstand market volatility. Direct marketing gives farmers more control over operations and they can avoid becoming trapped on the disastrous economic treadmill so characteristic of the conventional food system.

Conclusion

Expansion of the organic vegetable sector in Atlantic Canada depends on a variety of agronomic, social and market factors. Existing and transitional growers need to recognize the challenges of maintaining soil fertility in the face of reduced livestock and forage production and the decline in the general farm economy. Alternative fertilizers from urban and industrial waste streams may provide new options for growers.

Sustained interest in organic vegetable production by a new generation of entrepreneurs will be critical to replacing the production of retiring organic farmers, as well as increasing the supply. New entrants to organic farming are mostly interested in small, intensively managed farms with production matching the size of local markets. Sourcing labour will be an ongoing concern.

Demand for local, organic vegetables is expected to continue to grow. A variety of direct marketing methods offer the best options for organic vegetable growers to meet this demand. Cooperative ventures and pooling of produce offer some opportunity for sales to wholesale markets and chain stores. The transition of a few larger, conventional farmers to organic production could easily

double the organic vegetable acreage in Atlantic Canada. Overall, expansion of organic vegetable production is more likely to be gradual than rapid and may not result in a large increase in organic acreage.

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Rupert Jannasch, M.Sc., P.Ag. is the organic transition specialist with ACORN (Atlantic Canada Regional Organic Network) and is owner of Ironwood Farm, a mixed berry and vegetable operation in Summerville, N.S. He is a former agricultural researcher and organic farm inspector and serves as a consultant with the Organic Agriculture Centre of Canada.