Potential Opportunities and Challenges of Organic Apple Production

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Organic apple production in New England is perceived as being very challenging to accomplish and having few opportunities for success. After seven years of observing the organic industry, I share this perception. Organic growers have experienced some catastrophes, some success, but mostly a high degree of risk, inconsistency in yield, and consistently high costs of production. Despite recent improvements in insect control, new varieties with better scab resistance and greater demand for organic produce, apple growers still face obstacles that limit the growth of organic production in New England.

There has been a surge in demand for organic produce, but not a subsequent surge in production in Maine. Instead, production has only slightly increased over the last several years. There are currently seven orchards and a total of 182 acres in organic apple production. Organic production is 9% of the total apple acreage in the state. In contrast to conventional production, there has not been a decline in the number or size of organic apple farms.

Two important factors have kept organic apple production from substantially increasing in New England. The cost of production is high in relation to conventional production, but yield is generally far less. The methods used to control the numerous insect, disease and weed problems are expensive, but less effective. In addition, most consumers are unwilling or unable to pay the price premium associated with organic produce. As a result, the small market is easily saturated by apples from other production regions in the US, and this further limits the price premium.

Based on my observations, the most problematic aspect of production has been lack of insect control causing the greatest reduction in yield. With the development of Surround(r) and Entrust(r), organic growers have more options to prevent insect damage. Growers use Surround for early season problems alone or in combination with insecticides. However, some perceive that it causes mite flare ups which could limit its use in the future if other methods for plum curculio and sawfly become available. The occurrence of mite outbreaks has been attributed to the effect of Surround on mite predators. Entrust has been used in recent years and appears to have helped in the control of some pests. Bt products, derived from *Bacillus thuringiensis*, are not as widely used as Surround because of a perceived lack of efficacy. Pyganic(r) (pyrethrum), a plant-derived insecticide with broad spectrum activity, has also been used for insect control, but growers perceive it as having a low degree of effectiveness as well. Mating disruption for codling moth is currently not used in Maine, but has been tested in one orchard. Conditions such as hilly terrain, unsprayed orchards nearby and small orchard size reduce its effectiveness and limit its use. Developments in the last decade have

improved insect control making it possible to grow organic apples in New England, but losses to insects are still greater than in conventional systems.

It has been argued in the past that organic orchards become more biologically stable the longer they are in production, as the number of beneficial insects reach a level where they can effectively control insect pests. I have not seen this occur in my observations of organic orchards that receive few inputs nor in orchards that are intensively managed. At this point, I do not see the reliance solely on natural enemies as being an effective method for apple production. For the control of insects, reliance on applications of protective materials in a similar manner as conventional growers is likely to continue.

Apple scab is the most common disease in Maine, but has been well-controlled in most years by frequent applications of sulfur. There is a belief among growers that sulfur is phytotoxic in a subtle, long term manner which eventually reduces yield after several years of frequent use. Research is needed on the long-term effects of sulfur. Since organic growers face the same challenge as conventional growers when attempting to market new varieties with greater disease resistance, resistance is one alternative that has not been used to a great extent.

Most grow popular varieties with consumer appeal, and McIntosh is still the leading variety in Maine. Currently, only one organic orchard in Maine is planted exclusively to scab resistant varieties. Varieties with better scab resistance such as Honeycrisp could make scab control less problematic, but its susceptibility to other diseases could limit is suitability for organic production.

Scab is not the only disease to occur in organic orchards. Other diseases not controlled by sulfur create problems for organic growers. Black rot and Brooks spot could cause disasters for organic growers unless alternative methods of control are found.

Weed control is one area that does not have a cost effective or satisfactory method that has been adopted by organic growers in New England. Methods such as shallow tillage, flaming or mulching have been tested in the past, but are not currently used in Maine orchards. Organic orchards in Maine most often employ close mowing through the season which has not been optimum for the growth of apple trees. Insufficient weed control has deleterious effects on plant growth that do not have the obvious effect on yield that insect or disease problems have. Because of this, more aggressive control typically does not occur, but could improve production particularly in orchards with poor soil.

Fruit thinning is also restricted in the organic system. Research on the combined use of oil and lime sulfur has given growers an option other than hand thinning to improve fruit size and cropping consistency. However, as with most other chemical thinners, there is still a degree of inconsistency with this thinning method.

The organic production system has limitations that keep it from growing beyond its size as a niche market. Currently, there is a disparity between how growers and consumers

define "organic". The organic production system is based on the idea that naturally occurring methods are safer than synthetic ones. However, the increase in demand for organic produce is not based on this same principle, but instead, on a demand for a safe, affordable food supply. While the demand for organic produce remains strong, there is an opportunity for us to consider and develop methods of production that are both safe and cost effective so that organic production can increase to the point where it can be available to the mainstream consumer.