

A Case Study of Organic Apple Production: Raven Hill Orchard, East Waterboro, ME

Renae Moran, Sarah L. Kingsley-Richards, and L.P. Berkett

The following information is drawn from an interview with Steven Eveld, owner of Raven Hill Orchard in East Waterboro, Maine, on August 22, 2007. We sincerely thank Steven for sharing his knowledge, insight, and experiences in organic apple production.

Introduction

Raven Hill Orchard in East Waterboro, Maine began operation in 2007. Owner Steven Eveld became involved with the existing, certified organic orchard in June of 2006 and has continued to manage the operation organically. “This is the first year that I have ever operated [an apple orchard]. I decided to go organic because I believe it is better for the environment, better for people who eat it, and better for the guy growing it and since the orchard wraps around my house, I don’t have to sit on my front porch and worry that I am breathing some kind of horrible chemical.”

Establishment and Horticulture

Located among forest and fields, the established orchard is five and a half acres of mostly apples, with a few plum, peach and pear trees. Tree density is 137 per acre on sandy soil with no irrigation. “It is an established orchard, the trees are pretty good size, and we haven’t had any drought situations” to warrant irrigation.

Nearly 30 apple cultivars are present, including ‘McIntosh’, ‘Cortland’, ‘Baldwin’, ‘Yellow Delicious’, ‘Red Delicious’, ‘Paula Red’, ‘Lodi’ and ‘William’s Pride’. Some of the trees had been previously top-grafted to apple scab-resistant varieties by the previous owner. Rootstock is unknown but may be MM.111. Trees have been trained to freestanding central leader or open-center. “The central leader advantage for pick-your-own is that you can maintain lower scaffold branches and they are easier to reach. With open-center, you tend to have longer branches going [up and out].”

The sod in the orchard floor was disked in 2006 with the intention of improving soil health and to incorporate organic matter. “I think you have to cut up the sod. The sod pretty much just seals out everything. I think you have to stir it up every now and then, let some oxygen in.” Compost applications are planned. “Right now I have a giant compost pile that has been there for several years. It is made up of mostly wood chips and shellfish waste. I have a compost spreader but I need to do something so it puts compost on the rows of apples, not in the middle of the drive row.”

Seeded permanent groundcover has been established in the orchard. Mowing to maintain the groundcover occurs at least four times a year in the orchard drive rows and more often around the trees. “It really depends on the time of year. In the spring it grows really fast [under the trees] so we mow probably once every two to three weeks.” A riding mower is used in the orchard drive rows and a push mower is used between the trees. This method is very time-

consuming. “It is the best that I know how to do right now. I like it because it keeps the weeds down and the mowers chop them all up so they decompose quickly. If there was some method that would make it easier and take less time that would be good, but I don’t know what it would be.”

As an interesting side-note, this orchard has been reclaimed from some serious weed issues. “When I first came here, the weeds were probably chest high in most places in the orchard. Plus there were [wild] trees growing next to apple trees and broad-leaf shrubs, like raspberries, growing in the rows with the trees. Hairy vetch was a problem. It was actually growing up into the trees. Grapevines were growing into the trees.”

Trees are fertilized following soil and leaf tests to determine nutrient needs. Tests are performed by the Maine Agricultural and Forest Experiment Station Analytical Laboratory and Maine Soil Testing Service Laboratory at the University of Maine. “They give you recommendations, but then they also give you the results so you can figure out from the results what you need, where you are lacking.” Granular and foliar fertilizers are used. Ground applications of fish meal at three pounds per tree have been used to supply nitrogen. Application by fertilizer spreader was not accurate enough so hand spreading of fertilizer has been performed. “The [fertilizer spreader] throws in all directions, but I wanted nitrogen from the trunk to the drip line and that’s why I did it by hand. It took a long time.” Calcium foliar spray and boron have also been applied. Large amounts of calcium are present in the soil but are not making it into the trees. “We are calcium deficient in the leaves. I think it is a ‘balance’ problem so fertilizer may help. It is all about the cation exchange.” Knowledge of soil chemistry is a key component of this logic. “The challenge is setting up a [nutrient] balance so that the trees can *get* what they need rather than just *putting on* what they need. I think that is the challenge if you are really going to be organic and to me, it means that you set up the soil, microbes, and everything that is going on there to support your trees so you are not just putting on patches as a quick fix.”

A Rears airblast sprayer is used to spray trees and every row is sprayed every time to “get all the trees covered”. The organic materials used on the orchard have been obtained from regional and local suppliers. Record keeping has followed standard practices. “I am keeping a log book so I log in whenever I spray and what I spray and the amounts.”

Disease, Arthropod, and Vertebrate Pest Management

Most insect management is planned according to what pests are coming into the orchard at certain times during the growing season, weather, and temperature to determine optimal effects on target species. Weekly scouting of the orchard for insects is performed. Apple maggot is the only pest that is monitored through traps, placed in the orchard in July. The standard Integrated Pest Management (IPM) threshold is utilized. “If you’ve got an average of five per trap or more it means the pressure for maggots is going to start damaging your fruit so you have to do something. I don’t care who you are, organic or non-organic, it wouldn’t make any difference. There are some organic people that are willing to accept more damage in exchange for less spraying, but I would just as soon have no damage.”

Insect pest management is focused on plum curculio, codling moth, and apple maggot. European apple sawfly is presumed to be managed by the same materials that are applied against plum curculio: Surround[®] and PyGanic[®]. It was found that early-bearing apples, such as ‘Lodi’, need special attention with early management as the fruitlets are larger and more attractive to insects at an earlier date. Surround[®], Dipel[®], and Entrust[®] have been applied against codling moth and are presumed to manage other pests. “I am figuring that any *Lepidoptera* in the worm stage would be affected by the Dipel[®] and Entrust[®] would take care of them if they are flying around.” The use of Entrust[®] for apple maggot stems from a desire to discontinue use of Surround[®] early in the season. “Mostly because they [apple maggots] come in later, I didn’t want the Surround still on the apples too much.” Approximately fifteen sprays were applied for insects over the growing season.

Borer damage had been a problem due to permanent installation of vole guards. The guards have been removed and borers are now less of a concern. “The trees look a lot better now.”

Ladybugs, lacewings, spiders and dragonflies are among the biological control agents present in the orchard. Organic practices are “absolutely” believed to enhance the presence of such organisms. Cultural insect management is planned for the future such as not mowing parts of the orchard and cultivating plants that attract predatory insects. “There are a lot of other things that you can do organically, but that requires more management than I had time for this year.”

Apple scab is the only disease managed in the orchard. The susceptible trees, although mixed in with apple scab-resistant cultivars, necessitate treatment of the entire orchard. Some trees are also larger and have denser foliage that make them difficult to spray. Black rot, frog-eye leaf spot, and sooty blotch/fly speck are presumed to be managed by the same treatments used against apple scab. Cedar apple rust and powdery mildew have not been present. Fire blight strikes have been minimal and are pruned out when they occur.

Scouting for presence of scab is performed. “The odd part about the scab in this orchard is that it showed up on the apples first and not the leaves. I thought I didn’t have any scab. I couldn’t find it anywhere, but I never looked way high up on the trees. I was looking [lower on the tree] for lesions on the leaves and there weren’t any. And even until right now [August] you will not find very many infected leaves.” Sulfur was applied against scab infection prior to rain events based on the University of Maine Extension recommendations of infection potential.

Approximately ten sprays were applied. Copper is being considered as an additional management material. For cultural management, “last year in the fall, I cut the grass enough that I chopped up all the leaves so that they were pretty much decomposed by this spring when the apple trees started to grow. You really couldn’t find too many leaves. I am going to it again this year too. That riding mower does a really good job. It is better than the flail mower.”

Voles were abundant in the previous year due to weed cover but have not been as problematic since mowing and weed management began. The presence of two juvenile red-tail hawks has also helped to manage the vole population. The orchard is not fenced so “the deer take a certain amount of toll on lower branches, especially in the spring, on the tender foliage.” Another problem is damage from sapsucker (*Sphyrapicus*) birds. These woodpecker relatives poke holes around the trunk, girdling the tree. “I don’t know whether there is something wrong with the trees and that’s what attracts them, but there are several trees that have so many holes from the sapsuckers all the way around that they have pretty much cut off the top of a couple of trees.”

Harvest and Processing

The mature orchard is almost entirely a pick-your-own harvest operation. Cider and baked products and some supermarket sales are planned. Cold storage options for the harvest are being considered. Because the entire orchard is organic, no special measures are needed to maintain separate organic and non-organic areas.

Orchard Operation

Information on organic production is found through regular contacts with Extension agents, consultants, and fellow growers, and through books, workshops, and classes. Information for applied materials has been found without “too much difficulty. You just have to do the research. Get an OMRI (Organic Materials Review Institute) listing and figure out what all the abbreviations are.” However, there are many alternative methods of interest to organic growers. “A lot of this information that you would want to come by [through regular channels], you have to go looking for [on your own].”

A skilled consultant was employed during pruning, pickers were hired during harvest, and two part-time employees provided labor in the orchard throughout the first year. The two workers are departing and a full-time employee is being sought through newspaper advertisement. Employees have largely been found through word-of-mouth from the local labor pool. “I have a couple of the neighbors hired to pick.” The organic operation is perceived to be more desirable than conventional operations for attracting employees.

Insights

Steven has quickly learned a great deal about producing apples and about doing it organically. As an established organic orchard, Raven Hill had the advantage of an existing operation, albeit in need of management attention. As a new grower, “it was my first year so the timing of management will be better next year. I know more about it and that’s the critical thing.” Steven wants to explore more methods as he becomes familiar with managing his orchard. “It is a pretty much a wide open thing. The people who are out in front or on the fringe are doing things that I am not doing here yet.”

Research is needed to substantiate the new and alternative information available to growers. “People are out there just doing their own methods and they are not verified.” It is difficult for growers to interpret these practices to determine if they are worth adopting. “More information would be the key. I think it is valuable to look at [new and alternative methods] even though some of them sound kind of bizarre. We need to get somebody reputable to test them.” This should be among the top priorities for research and outreach to help enhance organic apple production in New England.

The market for organic apples in New England is “absolutely” going to expand. “I think it’s going to be more and more in demand. I don’t care where you are. I think there is going to be more demand for organic produce and fruit from everywhere because people just want what they consider to be more healthy.” The ability to demand a premium price for organic apples, however, is not expected to last due to an increase in both domestic and overseas producers. There is still an advantage to being a local producer as long as consumers “*really*” support local.

“Well, I have to say that I do believe in organic production. I do believe in using less poisonous stuff and more nonpoisonous stuff. It think it is good for the environment and it’s good for everybody concerned.”