Maine Apple Newsletter
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Contents

Preseason Tree Fruit Meeting
Research summaries presented by Dr. Renae Moran at Ag Trade Show

Upcoming Event

Apple Pre-Season IPM Meeting
Wednesday, March 16, 2011, 9:00 AM to 3:00 PM
Highmoor Farm, 52 U.S. Route 202, Monmouth, ME

This meeting will provide pest and horticultural management updates for large and small-scale orchardists. At least one pesticide applicator recertification credit will be offered for attending the program.

The cost is $15.00 per person to cover lunch. Everyone is welcome to attend. No preregistration required.

Tentative Agenda
8:30 – 9am. Coffee, meet and greet

9:00 – 9:30am. Weather, Weather Everywhere. Glen Koehler, UMaine Cooperative Extension, Pest Management Office


11am – 12pm. Growing Plums in Maine, Renae Moran, UMaine Cooperative Extension Tree Fruit Specialist.

12 – 1pm Lunch

1 – 2pm. Techniques for High Density Tree Fruits, Jon Clements.

2 – 2:30pm. Orchard groundcover management 101. Glen Koehler

2:30 – 3pm Board of Pesticides Control Update?
This meeting sponsored by University of Maine Cooperative Extension & USDA Risk Management Agency / Maine Crop Insurance Education Program

Any person with a disability who needs accommodations for this program should contact Pam St. Peter at (207) 933-2100 ext. 100 to discuss their needs at least seven days in advance, or at 1-800-287-8957 (voice and TDD).

Horticultural Research Summaries

By Dr. Renae Moran, Extension Tree Fruit Specialist

At the Maine Agricultural Trades Show in Augusta, I presented a summary of tree fruit research at Highmoor Farm on projects involving variety trials, cold hardiness, nutrition, and storage disorders. Many of these projects were financially supported by grants from the New England Tree Fruit Growers Research Committee which receives funding from the Maine State Pomological Society. We greatly appreciate the financial support of tree fruit growers in Maine.

Cold Hardiness in Apple Rootstocks

This project was done in collaboration with Cornell University and the USDA ARS in Geneva, New York. Additional funding was provided by the International Dwarf Fruit Tree Association and the Maine Agricultural Center.

We compared the hardiness of several new rootstocks to M.26 in a way that simulates injury during winters with little or no snow cover and very cold soil temperatures. Very little difference occurred in hardiness of the roots, but G.30 has less injury than M.26 at temperatures that could occur in a cold winter, 14 °F. All trees died after exposure to 0 °F, but soil temperatures at Highmoor Farm do not reach this low even in the coldest winters in Maine. Other rootstocks, G.11, G.41, Bud.9 and a Polish rootstock had similar survival as M.26 indicating a good level of hardiness since M.26 is one of the hardiest of the Malling rootstocks. G.5935, a new rootstock from Cornell University that will be available for planting in 2015, had greater root hardiness than M.26 and may be a good choice for sandy or rocky soils.

In the fall, the trunk is very susceptible to sudden and severe drops in temperature. Last year, we measured the hardiness of tree trunks in December. Bud.9, a popular dwarfing rootstock, had a high level of trunk hardiness. G.11 was slightly hardier and G.30 was as hardy as M.26. G.11 had some injury in its bark that other rootstocks did not, indicating possible problems with sudden drops in temperature. A highly dwarfing rootstock from Poland, P.2, had greater hardiness than M.26.

Screening for lack of cold hardiness gives us additional criteria in selecting rootstocks that will increase tree survival and longevity.
Storage of Honeycrisp Apples

Preventing the two types of chilling injury in Honeycrisp apples, soft scald and soggy breakdown, during cold storage has been a focus of postharvest research over the last several years. Preconditioning or delays in cold storage have been repeatedly tested since 2002. Under some circumstances, preconditioning fails to prevent chilling injury. It seems to be less effective on fruit harvested at early stages of maturity, but soft scald is less severe with early harvest dates. Soft scald can be very severe in fruit harvested at a more mature stage, but preconditioning reduced and sometimes completely prevented soft scald (external), but not soggy breakdown (internal). Very few fruit developed chilling injury when stored at temperatures of 37 °F or above, but bitter pit was severe. Controlled atmosphere storage at a temperature of 37 °F or warmer was useful for reducing soft scald while maintaining quality, but how it affects soggy breakdown and bitter pit are not clear since they do not occur every year.

Results on preconditioning have been inconsistent, but research conditions may differ from commercial storages in a way that makes chilling injury worse. At this time, I am recommending that storage operators test their own harvest and storage conditions on Honeycrisp before a large volume of fruit needs to be stored. There is variability from farm to farm, and it is probably related to how different growers harvest and store this variety.

In 2010, we began a fertilizer study to test the effects of fertility on these storage disorders. In this first year, we did not see an effect of three different fertilizers, but the study got off to a late start and was very small in scale. We will probably expand this project in 2011 to include additional fertilizers and a larger number of trees. My goal with this study is to find an easy to implement cultural practice that allows us to prevent disorders in this variety. Manipulating storage conditions has, so far, not been very practical or effective.

Plum variety trial

Plums are more adapted to a wide range of climates than other stone fruit. Some are as tender as peaches, but some species are as hardy as apples which means there should be varieties that is adapted to both southern and northern Maine. Plum culture is not as well-known as apples, so we are undertaking the task of both learning how to grow plums and finding out which varieties are both hardy and good enough for commercial production.

In 2007, five varieties of Japanese plums were planted for comparison to Methley and Shiro, the two varieties with good winter hardiness. One variety, Black Amber, has not been able to survive at Highmoor Farm. The Canadian variety, Vanier, produced fruit this year and last, but eating quality was not as good as other varieties. It has good fruit size and ripens after Shiro.
Queen Rosa and Au Rosa (the AU indicates it is from Auburn University) produced their first crop this year and were indistinguishable from each other. Fruit size and flavor were good. They have a purple skin, yellow flesh and ripen later than either Methley or Shiro.

In this trial, Methley has been the best plum for eating quality, but fruit size is small. Shiro fruit were prone to cracking in both this year and last, but the trees have been more productive than any other variety. The fruit quality for fresh eating is poor because of a tough and sometimes bitter skin.

Each year, all varieties except Vanier have shown signs of shot-hole. I thought at first that this was a disease, but now think it is caused by Captan. Captan is phytotoxic to plums (see the Pest Management Guide). We will switch fungicides next year to see if conditions improve.

Hybrid plums, which have more winter hardiness than Japanese plums, were planted several years ago, but have not done well for unknown reasons. The variety Superior produced a few fruit this year with good fruit size and eating quality. This spring, we will plant several varieties of European plums and another hybrid variety, Alderman.

**Increasing the Zinc Status of Apple Trees with Preplant Fertilizer and Mycorrhizae**

Maine orchards have chronically low zinc levels because of low levels in the soil and cold soil temperatures that slow down uptake by roots. Despite repeated foliar applications of zinc fertilizer, some orchards continue to have low leaf levels. Symptoms of zinc deficiency are poor bud development and small fruit size. Poor bud development maybe occurring in our orchards without being obvious.

We are comparing preplant soil incorporated zinc sulfate, mycorrhizal inoculation of roots and unamended soil. Trees were planted this spring in three locations, Acton, Sweden and Caribou, a site with high phosphorus. Leaf analysis, done only on trees at the Sweden site, indicated very effective uptake of zinc with preplant zinc sulfate. The rates we applied were too high as indicated by above optimum levels of leaf zinc. Our goal was to increase zinc status of apple trees with ground applied fertilizer and we succeeded at this, but need to do more studies to find the best rate. Tree growth was the same in the different preplant soil treatments. This study will continue into the next few years.

Mycorrhizae are root-inhabiting fungi that benefit plants in a number of ways, particularly in infertile soils. They are most well-known for increasing phosphorus, zinc and copper in plants. Other potential benefits may be greater drought tolerance and protection from soil-borne pathogens. Most apple trees already have them, but I have been testing artificial infection with a commercial product from BioOrganics (http://www.bio-organics.com/index.html). In a previous study, artificial infection at planting increased yield and tree growth, so I thought it was worth testing again under different conditions.
Organic Weed Control Methods

This project is funded by a USDA Organic Research and Extension Initiative grant. It is also a joint project with the University of Vermont and the University of Arkansas (http://www.uvm.edu/~organica/OrganicAProject/welcome.html).

We continued to manage an organic orchard for a second year with the purpose of comparing weed control strategies. Mulch that was thickly applied last year continued to control weeds this year. GreenMatch™ herbicide killed weeds, and they began to grow back after two weeks, so repeated applications were needed for long term weed control. Tree growth was greatest with Mulch. Herbicide was slightly better than mowing the weeds, but the herbicide was applied later than recommended. An earlier application may have improved tree growth.

We also measured disease incidence in the organically managed orchard. Four sulfur sprays were applied during primary scab season with no other fungicides applied this year. Trees were left unprotected during some scab infections. Northern Spy trees had a small number of leaf and fruit infections. Honeycrisp and SnowSweet were mostly scab free. Sooty blotch and flyspeck were worse on SnowSweet than Honeycrisp. Other disease symptoms on fruit were minor in occurrence.

Closing Words

“Action expresses priorities.”
Mohandas Gandhi

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