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Tree Fruit News

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Important Meeting Announcement: Precision Crop Load Management Training for 2014

Tuesday, May 6, 2014 from 2:45 pm - 4:45 pm - Free Training

Training will be given by Dr. Terence Robinson
via Polycom at 2 remote locations - see contact after each location

Precision Crop Load Management allows growers to first determine a target fruit number and then apply sequential thinning sprays. The program utilizes the Cornell Apple Carbohydrate Thinning model and the Fruit Growth Rate model to provide real time information to growers. This program is particularly useful on simple trees such as the Tall Spindle and Vertical Axis and gives growers the confidence to make accurate thinning decisions.

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The program was very successful in guiding chemical thinning decisions in 2013. This year we again encourage you to consider the economic implications of optimum crop load and optimum fruit size for maximum profitability. Learn how to use these methods in this workshop.

UPCOMING PEST EVENTS

Phenology/Pest	Degree Day Base 43	std dev	Degree Day Base 50	std dev
Tarnished Plant Bug	222	105	105	62
Pear Psylla Egg Laying	84	44	33	21
Rosy Apple Aphid nymphs	189	55	189	55
Pink McIntosh	295	22	143	17
Oriental Fruit Moth	277	51	132	34

Region	Station Location	Current Degree Day Accumulation Base 43DD 4/27/14	Current Degree Day Accumulation Base 50DD 4/27/14
Capital District	Albany	154.2	58.2
	Castleton	160.3	55.6
	Clifton Park	122	45.1
Long Island	Northport	190.7	44.5
	Riverhead	174.5	39.3
	Watermill	137.8	17.1
Mid- Hudson Valley	Clintondale	211.5	72.4
	Highland	200.9	66.4
	Hudson	180.2	63.5
	Modena	174.7	52.9
North Country	Chazy	61.6	15.4
	Peru	93.8	34.3

Apple Fertilizer Programs

By Steve Hoying, Cornell Univ. and CCE ENYCHP

Tree growth and fruit quality are directly related to tree nutritional status. Fruit tree nutrition is best monitored and optimized using a combination of soil and leaf analyses.

Pre-plant applications of Ca and P - This is the most effective and therefore least costly manner of adjusting these nutrients.

- Regular soil tests - don't let nutrient levels get too far off optimal; pH between 6-6.5 will allow optimal nutrient levels to be available thus limiting the amount of supplemental fertilizer needed.
- Annual leaf analysis - leaf analysis gives you the best indicator of tree health and knowing this status will reduce under or over fertilization.
- Choose the right material – blended materials that include only the elements needed are more cost effective than complete fertilizers. Generally these would include nitrogen, potassium and boron.
- Make multiple applications of individual nutrients - A single applications may be made when

conditions aren't perfect. Some material is lost to leaching and volatilization. Multiple applications are more efficient thus total fertilizer applied can be reduced by 25%.

- Time the applications properly - N should be applied early (bud break to bloom) or in the fall to assure it is used primarily by the tree for growth or reserves and does not increase fruit N and reduce storability. Given the potential for leaching during the winter, spring applications may be best.
- Buy in bulk - Bulk quantities are usually 11-15% cheaper than bagged materials.
- Manage other cultural practices such as weed control and pruning - Nitrogen fertilizers should be reduced or eliminated after heavy pruning. Good weed control = less fertilizer needed by eliminating fertilizers lost to grasses and broadleaves.

Eliminate snake oils - Be skeptical. If it sounds too good to be true it is! Test on a small block and leave controls. Even if they are effective, they are generally more expensive and not worth the extra cost.

Special Fertilizer Programs are Needed for Gala

By Steve Hoying, Cornell University
Dept. of Horticulture and CCE ENYCHP

Growers and researchers alike know that increasing N will increase fruit size. This is one of the reasons process fruit, where size is so important, is always fertilized more heavily than fresh. In past years, there has been a significant price difference between large and small Gala, so anything we can do to improve size is important. But this must not be at the expense of crop load. Several methods for improving Gala fruit size including thinning, pruning and fertilization has been looked at carefully by Drs. Terence Robinson and Jim Schupp and the role of Nitrogen in fruit size improvement by Dr. Lailiang Cheng and Steve Hoying.

Field trials were conducted in 2003 and 2004 across New York to determine the best N fertilization program for improving Gala fruit size. In summary, these trials showed that both fruit number and yield per tree were slightly higher in the trees fertilized with N than in the control, but the difference was not always statistically significant. This was especially true when trees carried

a heavy crop. In fact, programs with split applications of up to 120 pounds N per season were not significantly different than programs with only 40 pounds actual N. Over the two years of the study by Cheng and Hoying, fruit size did not show significant response to N fertilization especially when combined with a heavy crop. At the same time, there was significantly more shoot growth indicating that the additional N was put into the production of more shoots and foliage. It was essential to prune these off to keep the tree open and with good light distribution. Our data suggests that more than 80 pounds per acre N is luxury and did not contribute to increased fruit size or quality. In fact, there are several disadvantages using additional N. Increased shoot growth can result in an increase in fireblight susceptibility. Gala are already sensitive enough without help from extra N. And high N applied early would only increase shoot growth if we happened to lose a crop to frost. Fruit quality reduction through "Stem End Cracking" and "Ring Bowl Cracking" of Gala may also be related to high N and vegetative growth. Although I know of no studies or experience that indicate high N

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Fruit Educator Hired!

We are glad to let you know that Mr. Dan Donahue has accepted the Senior Tree Fruit Extension Specialist position on the Eastern NY Commercial Horticulture Team. He will start May 12th and be based at the Hudson Valley lab. He will spend the first couple of weeks getting oriented. I hope you will join us in welcoming him!

Honeybees and Pollination

Adapted from an article by N. Calderone

Tree fruits require pollinating insects for a successful harvest. Not only is pollination important for a high yield, it is just as important for fruit size, shape and sweetness. A number of insects pollinate crops but for the honey bee is the most versatile pollinator. Honey bees are available in large numbers throughout the growing season, they are easily transported by truck, and they can be easily distributed throughout large plantings. In addition, they restrict their foraging activities to a single species on any given trip to the field. Compared with other pollinators, honey bees are very cost effective. A single strong, two-story colony provides 15–25 thousand foragers.

How Many Hives?

New York growers have traditionally used about one colony of bees per three acres for apple pollination. This number may have been adequate in small orchards however, wild honey bee populations have been greatly reduced by parasitic bee mites and modern agricultural practices have eliminated many natural nesting sites for solitary bees and bumble bees. In addition, the flight range of solitary bees is not generally sufficient to ensure coverage of the interior portions of large plantings. Growers with large blocks of apples and other tree fruits need to increase the number of hives to one per acre. Modern cultivars with high blossom densities, such as trellised apples, also require more pollinators. If your fruit set has been lower than expected in the past, or your fruits are lopsided or misshapen, you probably need to use more bees. Move bees into apples, regardless of variety, right before the king blossoms begin to open.

Most other crops are adequately served by a single strong colony per acre; however, some crops have special requirements. **Red Delicious** apples have a flower structure that is different from that of most other common varieties such as McIntosh and bees have learned to avoid the flower's sexual parts and pollination does not take place as readily. You can counteract this problem by using more colonies per acre. Two colonies per acre may be needed in large stands of Red Delicious apples.

Pollination of **pears** will probably always be a problem because pear nectar contains only about 15% sugar versus 40% for apples, dandelions, and yellow rocket. The answer is to move the bees into the center of the pear block when the pears are at 50% bloom. It will take some time for the bees to discover better sources farther away, and in that time, the pears may be adequately pollinated. An alternative is to use more colonies per acre, which will increase the number of bees foraging within the orchard. **Sweet cherries** should be pollinated immediately after they open. Bees should be moved in the day before bloom. Since sweet cherries require a

high fruit set for a commercially viable crop, and since they bloom early in the season when the weather is often unfavorable for foraging, two colonies per acre may be required.

Hive Placement

Always select good locations for the bees you rent. A good location slopes slightly to the south, is protected from the prevailing winds, is dry, and has as much exposure to sunlight as possible. It is important that colonies of honey bees be kept in full sunlight in order to warm the hives rapidly in the morning and entice the workers out of the hives on chilly spring mornings. Entrances should face south to southeast whenever possible. Keep colonies on pallets or cinder blocks to keep the bottom boards 4–8 inches above the ground. Hives with wet bottom boards will be cooler and have less foraging activity than dry colonies. A hive stand will also keep colonies above tall grass, which may shade or block the entrance. Place colonies in groups of 4–6 to take advantage of good locations. In large orchards and fields, groups of 10–20 hives can be used to take advantage of prime locations. It is best to locate hives near pollinizer rows where that consideration applies, such as with apples and sweet cherries.

Pesticides

It is important to read the pesticide label and to avoid using materials that are especially toxic to bees when there is a safer alternative available. Sevin (carbaryl), is especially toxic to bees. There is also concern over the use of the neonicotinoids, but there is no hard evidence of any actual damage to bees at this time. You can eliminate most pesticide damage to bees by following a few simple rules. Never apply pesticides to flowers in bloom, do not apply pesticides when there is a danger of drift. Keep flowering ground-cover plants mowed if you are going to spray in an orchard during the summer. Clover and dandelions are a common problem for bees on orchard floors. If mowing is not possible, use an herbicide for control. Provide a source of clean water near the hives. A wash tub filled with fresh water and straw works well. Spray in the evening or night because bee activity stops when the sun goes down. Always use the largest droplet size possible when spraying, and check out the use of spray stickers to help minimize drift.

General Recommendations

Bees should be moved at night, and once the hives have been placed on location, they should be left there until the job is done. Moving bees in the daytime and moving them short distances at any time (less than 3 miles as the crow flies) will result in a serious loss of foragers and seriously damage the colony. Always contact the beekeepers if the need arises to move the bees.

Considerations for Pruning Peach Trees with No Crop

By Rich Marini, Penn State University

Due to low winter temperatures some peach varieties may have no crop this year. Below are some considerations for managing trees with no crop.

Fertilization: First, consider fertilization. Non-cropping trees need nitrogen, but not as much as cropping trees. A general rule of thumb that has worked well in the past is to apply about half the normal rate of fertilizer. This will allow the trees to grow fairly normally without encouraging too much vigor. Some growers like to split their fertilizer application by applying half about a month before bloom and the second half around shuck split. The second half is applied only when the trees have a crop.

Pruning: Trees with no crop also need to be pruned. Sometimes following a frost most of the fruit is in the tops of the trees and growers are reluctant to remove the crop. Due to frost in the south and low winter temperatures in the Midwest, the eastern peach crop will likely be short this year and peach prices should be good. So there will be an economic incentive to leave the trees a little higher than normal. This is an economic decision that each grower must make, but be aware that if branches are retained in the tops of the trees, it will take two or three years to bring tree height back to the original height.

For trees where no crop is expected, trees will benefit from a normal type of pruning (see following article!)

Usually we try to keep the fruiting wood or “hangers” close to the scaffold limbs, so this would be a good time to remove secondary branches (branches that are 2 or 3 years old) arising from the scaffold branches. New hangers will develop along the scaffold branches this summer and the tree structure will be simplified.

There may be benefits to delaying pruning a few weeks later than normal. Early peach tree growth depends almost entirely on carbohydrate reserves from last season that are stored in the woody parts of the tree. If pruning is delayed until about 2 or 3 weeks after the normal bloom period, some of the growth that developed at the expense of those reserves will be removed and vegetative growth will be slightly suppressed this season.

Also consider summer pruning to retain fruiting wood in the lower part of the canopy. Summer pruning about 2 to 3 weeks before harvest will slightly enhance fruit red color development with some varieties, but pruning in late June to early July is required to enhance flower bud formation and to keep hangers alive in the lower parts of the canopy. To retain fruiting wood in the lower canopy, consider pruning out vigorous upright shoots in late June.

Effects on Next Season's Crop: It's also important to realize that loss of this year's crop will affect next season's crop. Peaches are much less biennial than apples, but fruiting reduces the number of flower buds on the lower sections of the shoots that will be produced this summer. So there will be more flower buds per foot of shoot this winter, and you should plan to prune more aggressively next spring to lower the fruiting potential of the tree.

Also, trees with a light crop and trees that have been thinned during bloom have flower buds that are more tolerant of low winter temperatures. So winter survival of flower buds will be greater this winter for trees that did not crop this summer. The combination of higher flower bud density plus increased cold hardiness will likely lead to excessive crop loads next spring so be prepared to thin aggressively next spring.

HV Info Blogs

To better serve the fruit industry in the Hudson Valley, both Dave Rosenberger and Peter Jentsch have recently established websites where they are posting information on diseases, pests, and pest management that is relevant to fruit growers in the Hudson Valley. Both the plant pathology and entomology websites for the Hudson Valley Lab contain blogs where they post time-sensitive observations and pest alerts.

Fruit growers interested in receiving alerts via e-mail when they make new posts in these blogs can subscribe by entering their e-mail address in the “subscribe” box on the relevant website. The bottom of each e-mail alert from the blogs will contain an “unsubscribe” link so that alerts can be discontinued at any time.

The URL for the Hudson Valley Entomology website and blog is <http://blogs.cornell.edu/jentsch/>, and the URL for the Hudson Valley Plant Pathology website/blog is <http://blogs.cornell.edu/plantpathhv/>. Both websites are still in the early stages of development, but then websites documenting the current state of knowledge are never really complete.

Pruning Peaches

By Steve Hoying, Cornell University Dept. of Horticulture and CCE ENYCHP

Looks like peach pruning can start next week for those of you with a crop! For those of you with a full crop:

- ◇ Prune to thin! Peach trees often set 10 times as many fruits as needed for a full crop! Hand thinning is expensive, time consuming, and the quality of your work can affect ultimate fruit size (the bottom line). By removing ½ the potential flowers during pruning you can significantly reduce the amount of hand thinning required later. Recent work has shown that the number of peaches on the tree is as important as the ultimate peach spacing on the tree. As with apples, the earlier the thinning is done the better result in fruit size. This shows us how important pruning to reduce crop load is for achieving maximum fruit size.
- ◇ Peaches should be pruned at bloom for several important reasons. Pruning at bloom allows you to assess the crop and make intelligent decisions about how much wood can be taken off and still preserve a full crop and encourage good shoot growth. Cytospora canker (also known as Valsa canker) is a cool weather fungi that can actively colonize in the spring. Fresh cuts made during cool weather (dormant or early spring) are an excellent site for colonization. There is no effective chemical control. Only dry weather and rapidly growing tissue can minimize the amount of canker colonization. Later pruning results in smaller

fruit size. This is especially important in blocks near existing peaches, cherries, or hedgerows where the fungi may be present in huge amounts.

- ◇ Prune with warm dry weather in the forecast. This allows rapid growth to heal wounds and prevents fungal spores from being washed into fresh cuts.
- ◇ Do not leave stubs on peaches unless you want to regrow fruiting wood in that portion of the tree. Stubs commonly can become infected with canker since they do not easily form healing callus, flush cuts callus over and heal quickly.
- ◇ Remove all very fine wood throughout the tree particularly on the trunk and main scaffolds. This wood especially when shaded dies and becomes a site for canker infection on the structural parts of the tree. Ideally all wood throughout the tree is “pencil sized”.
- ◇ Remove all visible canker throughout the tree. If it occurs on the trunk or main scaffolds consider “surgery” to remove infected tissue back to the wood.

Prune according to the planting system chosen and the age of that system. Each system requires a different pruning scheme. Even the same system with different spacings can require different approaches. **I have pruning schemes available for Open Center (closely spaced and widely spaced), Central leader, Fusetto, and Perpendicular Vee.**

Cornell Pest Management Guidelines

Please note that the 2014 Cornell Pest Management Guidelines for Commercial Tree Fruit Production is available only as a hard copy this year. A visit to the PMEP website (<http://ipmguidelines.org/treefruits/>) gives the following explanation:

“Due to budgetary constraints, the 2014 Cornell Pest Management Guidelines for Commercial Tree Fruit Production will not be available online. We are currently exploring options that will allow us to recover the costs of posting this publication online. We hope to have the Guidelines back online in 2015.”

Distribution has been taken over by the Cornell Store. Guidelines can be purchased with enrollment in the ENYCHP—one free copy of a pest management guidelines comes with enrollment (contact Marcie at 518-272-4210)—or through the Cornell Store, online at <http://store.cornell.edu/c-875-guidelines.aspx>.



Foliar Nutrient Recommendations-Tree Fruit

NOTE: Foliar sprays do not substitute for ground applied fertilizers and use should be based on leaf analysis results.

NUTRIENT	GREEN TIP – ½ INCH GREEN	TIGHT CLUSTER TO PINK	PETAL FALL (PF)	SUMMER COVER SPRAYS	COMMENTS
BORON (1) (1 lb Solubor or 1 qt Borosol/100gals dilute)		Application may improve fruit set and bring up deficient levels. Use when leaf level is below 50 ppm.		1 st and 3 rd covers maintenance program.	Not compatible with oil. Do not use with PVA water soluble bags.
ZINC (2) (1lb or 1 qt/100gals Chelate EDTA, NZN @ 1 qt/100 or Nutra –Spray Zn @ 1 lb/100 gals)		Application required when leaf level is below 50 ppm. Cover spray recommended.		2 nd and 3 rd cover in a maintenance program.	If leaf levels less than 15 ppm, apply high rate and third spray 4-5 weeks after PF
MAGNESIUM (Epsom salts 15 lbs/100 gals dilute)			Begin applications if leaf level is below 0.35%. Do not apply when temperatures exceed 80° F or during poor drying conditions.	1 st and 2 nd cover applications recommended to reinforce PF spray. Monitor soil test for optimum levels.	Avoid high concentrate sprays when applied during poor drying conditions. DO NOT apply later than 30 days after P.F. For best results apply at 3x or lower concentrations.
NITROGEN (3) (Urea 3-5 lbs/100 gals)		3 lbs/100 gals when trees indicate an N level less than 2.4% leaf N.	5 lbs./100 gals when trees indicate an N deficiency.		For maximum uptake do no concentrate. Max concentration 2-3x. May contribute to delayed fruit coloring and wood maturation. Therefore do not use after first cover (or later than about June 1 - 15)
CALCIUM (Calcium chloride 1-2 lbs/100 gals or 2-4 lbs/100 gals of Calcium nitrate) (Other sources may give comparable results when used at equivalent rates.				1-2 lbs in 1 st , 3 rd or 4 th covers; 3 lbs/100 gals in final 2 covers. DO NOT apply when temperatures exceed 80° F or during poor drying.	Greatest benefit will be achieved when calcium-related problem is serious. Complete control of problem is unlikely. Calcium chloride will corrode but has 1.6x more calcium than the nitrate form: however, the potential to burn foliage is greater. B or Zn deficiency may be associated with Ca-related problems.

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Foliar Nutrient Recommendations-Tree Fruit, *continued*

<p>COPPER (8-8-100 Bordeaux or 2-4 lbs COCS or Kocide)</p>	<p>Apply before ¼-inch green. Use 1 qt/100 gals of oil in the finished spray to enhance efficiency of copper. Will control early scab, stone fruit diseases and supply nutritional copper when leaf levels are below 12 ppm.</p>			<p>Copper sprays will reduce fire-blight inoculum in orchards and provide 5-7 days of scab protection. Expect some phytotoxicity when applied late or during freezing temperatures.</p>
<p>MANGANESE (Manganese sulfate @ 4 lbs/100 gals)</p>			<p>One spray @ 1st cover when leaf level is less than 50ppm.</p>	
<p>“TONIC SPRAYS” (1 lb or 1 qt B plus 1 lb or 1 qt Zn plus 3 lbs Urea)</p>	<p>Apply at ½-inch green for trees where enhanced cropping is desirable (weak trees, chronically shy bearing).</p>	<p>Apply when orchard appears weak.</p>	<p>Apply 1-2 sprays in young orchards that need a boost.</p>	<p>May enhance cropping of weak trees when applied at ½-inch green-PK and stimulate growth of weak trees when applied at PF – 2nd cover.</p>

- 1) Not for use on peaches without specific recommendations from leaf analysis
- 2) EDTA only, 3x concentration or less.
- 3) Apples and pears only.

Compatibility. Zn, B, Urea, Epsom salts are compatible. Oil not suggested with Zn or Urea. Oil not compatible with B. Concentrations higher than 3x are not suggested.

Special Fertilizer Programs are Needed for Gala continued from p. 2

affects storage quality it only makes sense that Gala will follow other varieties with decreased fruit quality. Finally excess shoot growth will result in increased sensitivity to winter injury.

The results of ongoing studies by Robinson are quite clear. Nitrogen plays almost no role in increasing fruit size. Pruning by reducing crop especially with appropriate stubbing back pruning can increase fruit size (spur removal will do the same thing but costs more to do it!). Thinning especially using BA at relatively late timings also increases fruit size, and irrigation will help in dry years.

The economics of Gala vary from year to year depending primarily on the state of the market in Washington State. However, in today’s market, we believe that the greatest returns to growers come from high yields of moderately sized fruit. In order to achieve the largest size, fruit crop load is reduced below economic levels and in general the difference in price among the largest size no longer compensates for crop reduction through excess thinning or pruning.

Our recommendations; 1) Prune removing a significant proportion of the fruit buds, 2) Use BA in your thinning program, 3) Irrigate especially if it is dry, 4) Use no more than 80 lbs actual N per acre.

Every effort has been made to provide correct, complete and up-to-date pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly, and human errors are possible. These recommendations are not a substitute for pesticide labelling. Please read the label before applying any pesticide. This material is based upon work supported by Smith Lever funds from the Cooperative State Research, Education, and Extension.

Diversity and Inclusion are a part of Cornell University’s heritage. We are a recognized employer and educator valuing AA/EEO, Protected Veterans, and Individuals with Disabilities.