http://ipm.osu.edu/fruit/index.html

THE OHIO STATE UNIVERSITY Newsletter Extension

# Fruit ICM News

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**In This Issue:**



## Calendar

**March 24: North Central Fruit Crops Breakfast,** Vanson's Restaurant, Monroeville, OH. Ala Carte Breakfast at 8:00 a.m. followed by Fruit Pest Management presentations in Banquet Room. Contact Ted Gastier for more information at (419) 668-8219 or e-mail at gastier.1@osu.edu

## Strawberry Root Weevil

**(*Otiorhynchus ovatus*; order Coleoptera, family Curculionidae)**

Source: http://ohioline.osu.edu/b861/b861_16.html (Midwest Small Fruit Handbook)

**Damage:** The larvae of root weevils feed on strawberry roots and crowns, which can weaken, stunt, or kill plants. Root systems weakened by weevils are then more susceptible to winter injury and disease infection. Infested plants can have leaves that turn red, and berries that are undersized. Infestations are generally in patches in the field. Damage is worse when plants are under stress such as during droughty periods. Although the adult weevils chew notches from the edges of leaves, their feeding usually causes no economic losses.

**Appearance:** Adult strawberry root weevils are black or dark brown beetles that are about 1/5-inch long. They have a promiment blunt snout and elbowed antennae on the snout. Their backs are marked by many rows of small pits. Larvae are thick-bodied, white, legless grubs with brown heads; they are usually found in a curved position. Larvae reach about 1/4-inch in length.

Two other species of weevils similar to the strawberry root weevil are the black vine weevil

(*Otiorhynchus sulcatus*) and the rough strawberry weevil (*Otiorhynchus rugosostriatus*). These two species are similar in appearance to the strawberry root weevil except that they are larger: 1/4 inch for rough strawberry weevil, and 1/3 inch for black vine weevil. They are also similar to the strawberry root weevil in damage and life cycle.

**Life Cycle and Habits:** The strawberry root weevil overwinters as a full-grown larva, pupa, or adult in soil, or as an adult in plant debris or other protective habitat. Larvae and pupae complete development in the spring, and emerge as adults in May or June; overwintered adults become active in strawberries in May. The adult strawberry root weevil cannot fly. Adults feed on leaves at night. Root weevil adults lay eggs in strawberry fields throughout thesummer, with each female depositing 150 to 200 eggs in the soil. Eggs hatch in about ten days. Larvae burrow through the soil to feed on roots until they mature or until cold temperatures suspend their activity.

**Cultural Control:** New plantings should be isolated from existing fields and wooded overwintering sites, because flightless adults do not travel far. Infested old plantings should be plowed under to destroy grubs before new beds are planted.

**Monitoring:** Plants should be examined in the spring if patches of poor vigor are noticed. Lift up a section of row with a spade and examine the roots within a 6-inch layer of soil. If grubs are found, control measures should be taken after harvest, when the adults emerge. In mid- and late summer, look every one to two weeks for notch-like feeding damage on leaves.

**Control by Insecticides:** Sprays directed to adults are not usually very effective. In some States, carbofuran (Furadan 4F) use is permitted after harvest under a special local needs (SLN) label, also called a 24(c) label, for control of root weevil larvae. Check with your state's Department of Agriculture to find out if your state has such a SLN label.

Additional information and photographs of the larvae and adult are available at:
http://www.gov.on.ca/OMAFRA/english/crops/hort/news/hortmatt/2004/02hrt04a1.htm

# Slash and Burn: Sanitation is the Key to Managing Black Knot

*Source: Neil Carter - Tender Fruit and Grape IPM Specialist/Ontario Ministry of Agriculture & Food (OMAF); Michael Celetti - Plant Pathologist (Horticulture Crops Program Lead)/OMAF*

Management of black knot in plums (and sour cherry) relies first and foremost on pruning infected branches and getting them out of the orchard for good. All of those black knots you can see on the trees are sources of inoculum ("ascospores") that can infect new growing tissue in the spring. Prunings *without* black knots could potentially be left in the orchard but visible black knots should be pruned, removed from the orchard, and promptly burned. Some publications from outside Ontario suggest that flail mowing is sufficient to break down the knots but this is usually not appropriate in Ontario. Those knots need to be pruned well before bloom, preferably in late winter, and you are not likely to be mowing early enough in the year to avoid infections from the pruned knots. Also, mowing will not destroy any prunings inadvertently left in the tree row. If for some reason burning is not an option, bury the black knots at least 30 cm deep in well packed soil.

Knots should be pruned out at least 8-10 cm below the swelling during late winter or early spring before spores are released and susceptible shoot tissue develops on the hosts. Wild plum and cherry trees in nearby wooded areas should also be removed during late winter or early spring. These wild hosts can be sources of inoculum to nearby susceptible commercial orchards. A more common source of black knot

inoculum is nearby abandoned plum orchards; there are fewer of these in the Niagara peninsula at least, since efforts to eradicate plum pox virus have encouraged removal of abandoned *Prunus* orchards. Sweet cherry, occasionally peach and apricot can also be infected by the black knot fungus *Apiosporina (Dibotryon) morbosa,* but to a much lesser extent than sour cherry or plum.

**Fungicides for black knot will not provide adequate control without proper orchard sanitation (pruning, removal, and burning).** Indar 75 WSP is now registered for black knot in tart cherries and plums but must be used as part of an integrated pest management strategy to reduce the potential of resistant black knot populations developing. Indar can be applied beginning at petal fall in tart cherries and the white popcorn stage in plums but should always be rotated with other fungicides with a different mode of action or from another group such as Bravo 500 in sour cherries and Maestro 80 DF or Supra Captan 80 WDG in plums. (Consult product labels for full details on rates, timing, and resistance management). With spring fungicides always be careful of timing in relation to oil applications and keep a 10 to 14 day interval between oil and Bravo, Captan or Maestro. In 2003, some damage occurred on susceptible varieties even when a 2 week interval was observed because lack of adequate sunshine in the spring meant that leaves were slow to properly develop their protective waxy cuticular layer.

Remember, a protective fungicide program for black knot will only be effective if you prune and burn all black knots before spring.

# Blueberry Pruning and Rejuvenation

*Source: Marvin Pritts, Department of Horticulture, Cornell University, Ithaca, NY, New York Berry News, Volume 03, Number 2, February 13, 2004*

Regular pruning is an essential component of blueberry management, yet its importance is often misunderstood because the costs to the neglectful grower are not immediate. Pruning is required to maintain the vigor and productivity of bushes, to aid in disease and insect management, to maintain large fruit size and quality, and to develop an appropriate growth habit for harvesting. A young blueberry plant will produce many canes for the first several years. Cane production will gradually slow as bushes become tall. Yields will decrease because of the absence of new growth on which flower buds will form. An increasing amount of leaf area will be required to satisfy the respirational demands of both the fruit and wood. Furthermore, light penetration into the canopy will diminish, resulting in a shift of fruit production to the exterior of the bush, causing a decrease in bearing surface. Appropriate pruning practices can maintain a blueberry bush in an efficient and productive state, without the detrimental changes described.

**Selecting canes for removal**

When selecting canes for removal, first look for any winter-injured or broken canes, or canes with disease and insect damage. If injury is severe, remove that particular cane. Cankers and scales are common pests that can be partially controlled through pruning. Second, remove any cane that is rubbing against another to prevent canker infections. Third, remove those that are interfering with movement through the alley. Aim for a plant with an upright growth habit, yet with a sufficiently open canopy to allow for light penetration. Mechanically harvested bushes should be trained to a more upright habit and narrower crown than those that are hand harvested. Finally, remove short, branched canes that never receive much light. If these canes produce fruit, it will ripen late and will rarely be harvested. Care should be taken to remove canes as close to the crown as possible. Do not leave 6 to 8 inch stubs. These will rot and act as a source of disease inoculum.

**Time of pruning**

Early spring is the best time to prune blueberries. Although some growers begin pruning immediately after harvest, it is thought that this makes plants more susceptible to winter injury and reduces the long-term productivity of bushes. By pruning in early spring, one can identify winter injured wood and remove it. Carbohydrates produced in autumn will alsohave had sufficient time to move into the roots and crown for storage.

**Pruning young bushes**

Little pruning is required on young bushes. Remove flower buds for the first two years to promote vegetative growth. This can be achieved by rubbing off the fruit buds, or by pruning the tips of shoots where the flower buds are located. At the beginning of the third year, remove any twisted or low-growing canes to promote new cane production. If more than two new canes were produced the previous year, remove all but the two healthiest at the crown level. In subsequent years, continue light pruning until the plants reach full size, removing all but 2 or 3 of last season's canes. When plants are about 8 years old, they should contain between 10 and 20 canes of many different ages. Some cultivars produce many more canes than others, so the amount of pruning that is required on young bushes will vary with cultivar.

**Mature bushes**

Eight year old canes start to lose their productivity as more leaves are required to support a given amount of fruit on those canes. In addition, canes have branched considerably, and the most recent growth on which flowers form isusually thin and weak. Removing one or two of the largest canes in a maturebush will promote new cane growth. If bushes contain a mixture of canes of different ages, then annual removal of canes that have reached 8 years of age will allow for a minimal reduction in productivity, as 7-year-old canes grow to replace those that were removed. Regular renewal will allow for consistent long-term productivity. Canes larger than one inch in diameter are not as productive as younger canes, and eventually should be removed. If one or two of the largest canes in a mature bush are removed annually, and one or two new canes are permitted to grow, then an even age structure among canes can be maintained. In general,up to 20% of the older wood can be removed from a bush without adverse effects on yield. Although berry numbers will be reduced, larger fruit will compensate for this decrease.

**Regularity of pruning**

Annual pruning is essential for stable production and high productivity. When bushes are pruned irregularly, young canes are produced in great numbers the year after heavy pruning. These canes will age together, and become unproductive at the same time. If one then wants to prune out the unproductive canes, nearly the entire bush will have to be removed.

Also, no young growth is present to make up for the loss of fruiting wood. Therefore, irregular pruning results in erratic yields from year to year, and tall bushes will develop as individual canes elongate to compete for light. Research has shown that annual, moderate pruning produces bushes with the fewest canes, but with the greatest yields.

**Detailed pruning**

Removing injured wood should be the primary objective of detailed branch pruning in the tops of the

canes. Branch pruning can result in higher fruit quality because berry numbers are reduced. Also, branch pruning can help relieve drought stress in hot climates where plantings are unirrigated. However, if one has done a good job removing whole canes, then little detailed pruning will be required. Weak bushes require more pruning than vigorous bushes because pruning stimulates vegetative growth. Also, special consideration must be given varieties with spreading habits. Sprawling canes should be removed, but care should be taken to leave sufficient canes for fruiting.

**Rejuvenation**

When rejuventaing an old planting, remove one or two old canes for every five or six younger canes. In following years, remove up to 20% of the wood until new cane growth occurs. Keep only 2 or 3 new canes and continue to remove up to 20% of the oldest canes. Eventually, the bush will become more productive, cane numbers will decrease, and bush stature will decline. In old, poorly maintained plantings, some growers have had success cutting all the canes to ground level; harvesting begins 3 years later. However, for this system to be most effective, canes must be thinned to the most vigorous 6 - 10. Others find that summer hedging immediately after harvest, coupled with selective dormant cane removal, works well.

**Summary**

Pruning is an investment in the future productivity of the blueberry planting. Regular annual pruning will spread costs throughout the life of the planting, ensure stable production from year to year, and serve as a useful tool for managing pests, fruit load, and quality. For more information on blueberry production visit Marvin Pritts' course information site at
http://courseinfo.cit.cornell.edu/courses/HORT442/
Use "guest" / "guest" as your login and password!

# Matted-Row Strawberry Cultivar Trial Notes, 2002-2003

*Source: Kathy Demchak, Department of Horticulture, Pennsylvania State University, State College, PA. via New York Berry News, Volume 03, Number 2, February 13, 2004*

Twenty-eight cultivars or advanced selections of June-bearing strawberries were planted in the spring of 2002 at Penn State's Horticulture Research Farm, and harvested for the first time in 2003. Twenty-four of these were relatively new, while four, 'Earliglow', 'Honeoye', 'Allstar' and 'Jewel', were included as standards for comparison. Plants were grown according to standard recommendations, except that insecticide and fungicide sprays were minimal. The peak harvest season was delayed by 7-10 days from 'normal' and was sometimes different than that expected.

Cultivars and selections included, grouped according to their peak harvest season in 2003 were:

**Season Peak Yield Cultivars**

*Early season:* June 16-23 ByV1, Earliglow, Evangeline, MNUS 138, and Sable

*Early-mid season:* June 20-30 Bish, Chambly, Honeoye, Mira, MNUS 694, and Primetime

*Mid-season:* June 23 to July 2 Allstar, Brunswick, Darselect, L'Authentique Orléans & Mesabi

*Mid-late season:* June 25 to July 5 Cabot, Eros, Jewel, L'Acadie, St. Pierre, and Winona

*Late season:* June 30 to July 9 Idea, Ovation, St. L'Amour and Clancy were included, but due to small original plant size and a late start on establishment, yield data will be compared to other cultivars only in 2004.

A final grouping will be decided after a second harvest season in 2004, and may be different from that presented here. All yields presented below are marketable yields. For reference, marketable yields for the entire experiment ranged from a low of 6,726 lb/A for Yamaska to 20,793 lb/A for Honeoye. Percent marketable fruit ranged from 70.9% for L'Acadie to 84.8% for Yamaska. Mean berry weight over the entire season ranged from 8.5g for Sable to 18.3g for Cabot.

**Results**

Since 2003 was only the first harvest year, results are somewhat preliminary. However, growers may be interested in these results as they make decisions concerning cultivars to try this spring. Out of the 5 early season cultivars tested, Earliglow had the next-to-lowest marketable yields (11,493 lb/A), and berry size was small (9.6 g/berry average over the season), but considering flavor, color, and firmness, it's still difficult to recommend any others over it. ByV1 was bred for plasticulture, and came out of dormancy too early, resulting in low yields. Evangeline yields and berry size were similar to that of Earliglow. Evangeline's berries were small, but attractive, with a rich color, consistent size and shape, and flawless caps.

MNUS 138 produced the highest yields (19,634 lb/A), yielded for a longer time than most, and had large berries for an early cultivar (12.1 g), but they were soft and the flavor was a bit flat. Sable was second highest in yields (16,383 lb/A), but the berries were the smallest for all of the early-season cultivars (8.5 g), and were sweet but missing complexity. Sable plants hug the ground closely.

Among the early-mid season cultivars, Bish had excellent flavor, but like ByV1, was bred for plasticulture and came out of dormancy too early resulting in low yields. However, in this environment, it runnered and filled in the rows as well as matted-row cultivars. Chambly was average and Mira did not perform well. Honeoye produced the highest marketable yields for this category and the entire experiment (20,793 lb/A), and had good flavor and size, but berries became too dark later in the season. MNUS 694 produced the second highest yields (17,535 lb/A), and like MNUS 138, produced over a long season and had large berries that were a bit flat. Primetime was a surprise. Growers had been disappointed with its yields, but here it produced well (16,367 lb/A marketable fruit), and had the largest berries for the group (12.8 g/berry) with good flavor. Maybe it just needs a lot of water, or a lot of snow cover.

In the mid-season category, Mesabi was the highest producer of marketable yields (20,766 lb/A). Negatives are that it tends to develop a very dark color, is a bit soft, and is quite susceptible to sunscald. Allstar and Brunswick produced similarly (14,115 and 15,722lb/A respectively), but berry quality and flavor >was not notable for either one. Darselect yields were on the low side (12,021 lb/A), but size and flavor were the best for the category. It was also susceptible to leaf diseases and leafhoppers, though these were easily controlled. L'Authentique Orléans yields were low.

There was a narrow range of yields among the 6 mid-late season cultivars tested, ranging from a low of 12,096 for St. Pierre to a high of 16,092 lb/A for Cabot. Cabot was the most interesting. Its first fruit averaged 40 g (the size of a small peach), and were oddly-shaped. However, fruit quickly became normal in appearance, though large. Cabot produced very few runners, so might be worth trying in plasticulture. Flavor and firmness was good. Marketable yields of Eros were good (14,712 lb/A), berries were large (14.0 g) but soft, and had a light color, making it difficult to judge when they were ripe.

Berries started ripening at the tip, and often remained white near the cap. Jewel, the standard, was average with sourtasting berries. L'Acadie was the highest producer of total yields for the category, but many fruit were unmarketable due to the bottoms of the fruit splitting open. St. Pierre has Chandler and Jewel for parents, and was a favorite for flavor. However, its fruit is light when ripe, being somewhat peach-colored. The fruit has a nice shape, and gorgeous light green caps that complement the fruit color perfectly, making it amazingly attractive for a light berry. Winona produced its berries on short pedicels, so fruit tended to hug the ground. The pedicels (stems) on the berries broke off at the plant end rather than the cap end, so many stems remained attached.

Late-season cultivars extended the season beyond that normally considered late. All were low-yielding, so apparently high yields are sacrificed for season-extension. Idea, while producing the highest yields in this category (12, 346 lb/A), had berries that were light, soft, and oddly shaped, though flavor was good. Ovation had the best flavor and appearance for the group, though yields were on the low side (9,185 lb/A), especially considering the amount of foliage it produced. St. Laurent d'Orltans produced decent yields, but bottoms of fruit tended to split open. Yamaska produced low yields and was not well-adapted to this climate.

Sincere thanks to the Pennsylvania Vegetable Growers Association for funding this research. MNUS 138 and MNUS 694 were provided by Dr. Jim Luby from the University of Minnesota. Dr. Courtney Weber from Cornell University at the NY State Agricultural Experiment Station at Geneva provided L'Amour and Clancy, Dr. Harry Swartz of the University of Maryland as part of Cooperative MD/NJ/VA/WI breeding program provided ByV1, and Dr. Jim Ballington of North Carolina State University provided Bish. Dr. Shahrokh Khanizadah of Agriculture and Agri-Food Canada and McGill Univ., Quebec provided Chambly, L'Authentique Orléans, L'Acadie, St. Pierre, St. Laurent d'Orltans, and Yamaska. All other cultivars were obtained from Nourse Farms of Whately, Massachusetts.

# Education Program Highlights from the Empire State Fruit and Vegetable Expo, Feb. 2004

*Source: Jon Clements, Extension Tree Fruit Specialist University of Massachusetts Amherst*

**Stone Fruit Session**: Bill Turecheck gave a rundown on stone fruit (peaches and cherries) diseases (with an emphasis on brown rot) and 2004 fungicide options. Among the protectant fungicides he recommends Captan and Bravo, the latter being the best choice when brown rot pressure is high and for cherries and plums because it also controls black knot. The SI fungicides Elite, Indar, and Orbit are all effectively control brown rot at bloom, however, they should be rotated with other fungicides for effective resistance management. He reminded the audience that although Abound is labeled and effective on stone fruit, it's use anywhere near apple orchards is strongly discouraged because it is extremely phytotoxic to some apple varieties, including McIntosh. Pristine is a new fungicide that appears to perform better than Orbit, but it is not registered (yet) in New York. (Editor's note: Pristine is registered for use in the Midwest.) Finally, he says "with the wide variety of fungicide options, brown rot can many times be controlled with one spray at bloom, but be sure to read the label carefully for rates and timing restrictions."

**Peach thinning:** Jim Schupp of Cornell's Hudson Valley Lab said that bloom thinning of peaches shows real promise to reduce but not entirely eliminate the practice of hand thinning. Ammonium thiosulfate (ATS) has worked well in Massachusetts (research of Duane Greene) and is recommended there he reports. Schupp's latest research with Wilthin and several other bloom thinners has worked to varying degrees, however, phytotoxicity has been an issue. More research is needed to nail down some protocols for consistent (if that's possible!) chemical thinning of peach in New York and New England.

**Mating disruption**: Art Agnello elaborated on current research to control oriental fruit moth and peach borers using mating disruption. For oriental fruit moth, mating disruption was effective deep within the orchard, however, where pressure was high from adjacent non-disrupted plantings (including apples) border sprays may be necessary to fully control this pest. For borers, the news is even better, as they (both peach-tree borer and lesser peach-tree borer) are easily disrupted by pheromones. In fact he says, "mating disruption is now the preferred tactic in our Cornell IPM guidelines."

**Sweet cherry shelf life:** O. Padilla-Zakour portrayed research using modified atmosphere packaging (MAP) to extend the shelf-life of sweet cherries. The technology reduces oxygen while increasing CO2 (similar to CA storage of apples) in semi-permeable membrane bags during refrigerated storage of sweet cherries. Because they have notoriously short storage and shelf life, MAP may be the key to significantly extending the marketing season (up to one month per harvest) as more sweet cherries are being planted in New York. But, variety seems to make a big difference in how cherries perform in MAP, and she says more research is necessary before MAP technology will be truly useful to NY growers.

**Sweet cherry systems and crack reduction:** Steve Hoying addressed these topics as related: the readily available and dwarfing Gisela rootstocks present an opportunity to use rain covers to prevent cracking. (Rain covers are already widely used in European sweet cherry production.) But first, the production goals for a modern cherry orchard; precocious production, larger fruit size, high per-acre yields, and tree survivability must be addressed. A sweet cherry planting systems trial at Geneva was planted in 1999 to address these needs, and the Zahn 'vertical-axis' system with G.5 and G.6 rootstocks has performed the best (in terms of per-acre yield) after five years of data collection. To prevent cracking, Hoying discussed rain covers and calcium applications. Quite simply, covers are effective yet expensive. Calcium sprays, either by airblast or automated over-the-row sprinklers can work, but, like covers, are far from perfect.

**Tree Fruit: Technology Road Map** - watching and predicting weather. A grower panel discussed their experience with weather prediction and stations. The Internet has become a primary source of forecasts, however, on-site weather stations are useful when paired with a personal computer and software that makes it easy to calculate degree-days and run predictive models for scab and fireblight. Weather stations from Davis (www.davisnet.com) and Spectrum Technologies (www.specmeters.com) were discussed.

**Making 'scents' of insect trapping:** Wendell Roelof gave a brief history of how species-specific pheromones including redbanded leafroller, codling moth, and apple maggot were first identified at the Geneva experiment station. Such pheromones now form the basis of trap-monitoring in a modern IPM program, and Roelof and his crew were leaders in this field. In fact, they are still on the cutting edge. He also gave an example of how a new technique that isolates biologically active attractants/antagonists in host plants, such as apple vs. hawthorn, may be used to reduce apple maggots in commercial apple orchards.

**Sprayer testing:** Always colorful 'Brit' Andrew Landers described how mandatory sprayer testing is now underway in 14 European countries, and how the EUREPGAP checklist for 2004 now recommends sprayer testing by an independent agency. Clearly, he feels growers should be testing their sprayers annually to: increase application efficiency by improving technical condition of sprayers; reduce pesticide application costs; decrease environmental pollution; and improve knowledge of application technology and sprayer management. Landers has all the gadgets to perform the testing, so New York growers were invited to volunteer to have their sprayers tested.

**1-MCP and future planting decisions:** Interestingly, Chris Watkins did not really answer the question

posed by the title of his talk! Why? Watkins insisted that there are still significant unanswered questions about use of 1-MCP (SmartFresh) on popular NY/New England varieties such as McIntosh and Cortland. The exception may be Empire, on which 1-MCP has performed consistently well. He says stay tuned -- no doubt SmartFresh will have an impact on future planting decisions, but the writing is not on the wall was the take-home-message of his talk.

**Orchard support systems:** Steve Hoying was back to share some experiences in New York with orchard support systems. His first point was that any support system should be designed to last 20 years. Second, that economics ought to play a role in choice of construction materials. For example, bamboo may be substituted for conduit at considerable savings in a single-wire system, which he prefers. And finally, little things count like a simple increase in staple gauge results in a significant increase in holding power. Hoying and Terence Robinson have developed specific recommendations for a single- or double-wire, vertical-axis support system that is worthwhile looking into if you need a system for a new orchard.

**TracApple recordkeeping system:** Julie Carroll updated the audience on TracApple 2004, an Excel-based computer application that allows input of pesticide and fertilizer applications and makes it easy to produce use reports, including central posting for WPS, processors (Motts, Birds Eye, Beechnut, Knouse, generic) and EUREPGAP. The Excel spreadsheet has a built-in chemical table that reduces the amount of manual input using drop-down menus. Although TracApple is tailored for NY growers, it's applicable to out-of-state growers too. It costs $20 for the 2004 version. I'd recommend it for someone looking for a computer pesticide recordkeeping application. For more information, see http://www.nysipm.cornell.edu/trac/trac_apple.html.

**Tree Fruit General** - internal *Lepidoptera* control in 2003. Entomologist Harvey Reissig reviewed their 2003 research on insecticide resistance and mating disruption of codling moth and oriental fruit moth. Both have been prevalent in recent growing seasons in New York orchards and have contributed to unacceptable amounts of 'wormy' fruit at harvest. In particular, oriental fruit moth appears to be on the upswing, and insecticides have been ineffective at times, either a result of resistance or poor timing. In 2003, these pests were adequately controlled, but usually at the cost of numerous applications of broad-spectrum, harsh insecticides.

Mating disruption shows promise, however, not without some insecticide applications, and the details of spray timing in combination with mating disruption are yet to be resolved.

**How much nitrogen does Gala need?** Lailiang Cheng gave a research update on a nitrogen fertilization experiment with Gala. As you know, small fruit size of Gala is an issue, and the thought is that insufficient nitrogen may contribute (among other factors) to size dysfunction. In fact, Cheng's research confirms this hypothesis, that Gala does indeed need more nitrogen than soft varieties such as McIntosh, Cortland, and Jonagold to achieve good fruit size and yield. He addressed the issues of how much, 30 to 100 lbs. N per acre, depending on soil O.M., 2.2 to 2.4% in leaf tissue, and optimum timing, which he claims is budbreak to bloom.

**Causes of phytotoxicity in fruit trees:** Dave Rosenberger of Cornell's Hudson Valley Lab addressed the subject of common causes of phytotoxicity in tree fruit. His experience suggests that pesticides are a common culprit, usually "when applied at the wrong rate, timing, crop, or part of the crop." Plant conditioning plays a role too when the cuticle is thin during periods of damp, cloudy weather. Rosenberger also says to beware of tank mixes, particularly when including products with fungicides or insecticides that are formulated to enhance uptake, such as oil, some foliar nutrients, adjuvants, and some plant growth regulators. Herbicides and nutrient sprays (zinc, calcium) were also identified as precursors of phytotoxicity.

**EUREPGAP certification process:** Invited speaker David Speller, a consultant from England, discussed the EUREPGAP certification process - a standard now used all over the world, and which many European retailers now require. EUREPGAP is really synonymous with Good Agricultural Practices, which key areas include food safety, environmental protection, occupation health and safety, and (where applicable) animal welfare. New York fruit growers are very interested in EUREPGAP because some ship fruit to European markets, and because a proposed set of Integrated Fruit Production guidelines for New York growers are based on the the EUREPGAP protocol. For more information about Eurepgap see http://www.eurep.org .

**Cropload affects on Honeycrisp fruit quality:** Terence Robinson presented results of some recent research on this topic. As you may know, Honeycrisp is prone to biennial bearing and widely varying crop loads from year-to-year. Excessive crop loads have been linked to poor fruit size, reduced flowering the following year, poor tree growth, and lackluster fruit quality. Too light a crop load and the fruit are just too large and per acre yields are reduced. Robinson's research suggests an annual crop load of 4 to 5 fruits/cm2 of trunk area to be a target that will give optimum fruit size and quality. This will require "precise chemical thinning followed by accurate hand thinning." He also states per-acre yields of 600 to 700 bushels/acre will be "about it" with this variety at the suggested crop load.

**Apogee for fireblight management on young trees:** Jay Norelli, USDA Research Scientist from Kearneysville presented some interesting research on fireblight prevention on young trees using Apogee. Because young tree shoot growth is important to fill in-row spacing rapidly, it at first seems contradictory to use Apogee on young trees he started off. But, when susceptible cultivars such as Gala and GingerGold enter their 3rd-6th leaf explained Norelli, they are most susceptible to fireblight.

Therefore, he proposes a fireblight management strategy on young trees is to apply one or two shots of Apogee to susceptible varieties in the 4th to 6th leaf when shoot growth is most rapid (usually early in the season) and there is a concurrent high risk of shoot infection. But, he cautions "in young orchards the use of Apogee should only be considered when the risk of shoot infection clearly outweighs the negative effects of growth suppression."

**Managing resistance of apple scab:** Wolfram Koeller, word-famous expert on resistance of apple to fungicides presented evidence that unless used very carefully, we can expect resistance to continue to develop to both old, where it has not already developed, and new fungicides. He is interested in the role of dose in resistance development and management, and for now, he suggests growers adopt the following tactics to minimize the resistance risk: be conservative with rates (i.e., use full rate); avoid post-infection use of SI fungicides; do not use fungicides where resistance has already developed (he estimates 25% of New York orchards already have some resistance to commonly used protectant and post-infection fungicides); and diversify chemistries, i.e. rotate fungicides.

**Thinning apples with the new 6-BA:** Jim Schupp was back to update the audience with his research using the newly labeled thinner MaxCel. In 2003 MaxCel had an EUP in New York, and the rest of the country. Unlike Accel, which it essentially replaces, MaxCel has initially proven to be a potent thinner both in research trials and EUP orchards. "The GA was removed from Accel, and the per/acre rate was increased to make MaxCel," Schupp says "so now we finally have a truly effective BA thinning product." He notes it may be wishful thinking that the EUP status of MaxCel in New York will be elevated to a full label in time for the 2004 growing season, however, for apple growers outside of New York it's on-track for 2004 and we should have it here for sure in 2005.

# Pear Psylla

*Source: Midwest Tree Fruit Pest Management Handbook*
http://www.ca.uky.edu/agc/pubs/id/id93/ch_1.htm

**Damage:** The most troublesome insect pest of pears is usually the pear psylla. It sucks plant sap and injects a toxin into leaves as it feeds, causing wilting and leaf drop. It may take the tree several years to recover from the reduction in vigor. Psylla excretes honeydew on leaves, which can kill leaf tissue and lead to a condition known as psylla scorch. Black sooty mold can grow on honeydew, which can further affect the appearance and vigor of pears.

**Appearance:** The pear psylla is a small insect, only 1/10-inch when fully grown. The adult has a stout body with a wide head and thorax, red eyes, and wings longer than the body. The clear wings are held roof-like over the sides of the body. It looks like a miniature cicada. Eggs are yellowish orange and may be seen with the aid of a magnifier. Newly hatched nymphs are yellowish, 1/80-inch. Late-stage nymphs are hard shelled, and wing pads are apparent.

**Life Cycle and Habits:** Adults overwinter on the trees in bark crevices. Adults emerge, mate, and begin laying eggs when temperatures reach 50° to 60°F. Eggs are deposited in crevices in the bark and near the terminal buds. Most eggs hatch by petal fall. Nymphs move to the axils of leaf petioles and young fruit to feed. Five nymphal stages are passed before the adults appear. Females of the later generations deposit most of the eggs along the leaf midribs. There are three to four generations per year.

**Monitoring and Thresholds:** Look for adults on spurs and branches on warm days just before bud burst, and on the tender new shoots the remainder of the season. Eggs in late dormant to bud burst are found singly or in rows on spurs and twigs or around bud scales. Through the remainder of the season, look on the undersides of tender new growth for rows of eggs along the leaf midribs. Small nymphs are found from green cluster throughout the season on tender new growth; larger nymphs are found on leaves that are hardening off. Nymphs and adults can be monitored with beat cloths and adults with yellow sticky cards.

**Chemical Control:** Pear psylla is difficult to control and has become resistant to many insecticides. A delayed dormant oil should be applied as adults are emerging, but before egg laying has occurred. This is green tip in most years, but monitoring will determine more exact timing. The most important times to treat for pear psylla are at the pre-bloom (white bud) and petal fall stages.

Materials listed in the 2004 Ohio Commercial Tree Fruit Spray guide for pear psylla adults, along with comments, are as follows:

| Material | Rate/100 gal | Rate/acre |
|---|---|---|
| Ambush 25 WP | - | 12.8 to 25.6 oz |
| OR Ambush 2 EC | - | 18.8 to 25.6 oz |
| OR Pounce 25 WP | - | 12.8 to 25.6 oz |
| OR Pounce 3.2 EC | - | 8 to 16 fl oz |
| Ambush and Pounce may be combined with 2 to 8 gallons of oil per acre for dormant through delayed dormant periods only. See label for amounts of finished spray per acre for either air or ground applications. | | |
| OR Danitol 2.4 EC | - | 16 to 21.3 fl oz |
| OR Asana XL 0.66 EC | 7.3 to 12.8 fl oz/100gal | |
| OR Asana XL 0.66 EC | - | 9.6 to 19.2 fl oz/a |
| Apply this rate of Asana only during dormant to pre-bloom (white bud) stage | | |

only

| | | |
|---|---|---|
| OR Actara 25 WG | - | 5.5 oz |
| OR Esteem 35 WP | - | 4 to 5 oz |
| OR Assail 70 WP | - | 2.3 to 3.4 oz |
| OR Calypso 4 F | 2 fl oz | 8 fl oz |
| OR Warrior 1 E | - | 2.5 to 5.1 fl oz |
| OR Surround | 25/50 lb/100gal | |

Apply Surround every 7 to 14 days, beginning no later than green tip.

## Preliminary Monthly Climatological Data for Selected Ohio Locations, February, 2004

| Weather Station Location | Monthly Precip | Normal Monthly Precip | Year-to-Date Precip | Normal Year-to-Date Precip | Avg High | Normal High | Avg Low | Normal Low | Mean Temp. | Normal Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| Akron-Canton | 1.22 | 2.28 | 4.29 | 4.77 | 36.7 | 36.9 | 20.1 | 19.9 | 28.4 | 28.4 |
| Cincinnati | 1.25 | 2.75 | 5.80 | 5.67 | 42.3 | 43.1 | 25.4 | 25.0 | 33.9 | 34.0 |
| Cleveland | 0.76 | 2.29 | 3.45 | 4.77 | 37.2 | 35.8 | 22.2 | 21.0 | 29.7 | 28.4 |
| Columbus | 2.02 | 2.20 | 7.10 | 4.73 | 40.3 | 40.5 | 23.6 | 23.5 | 32.0 | 32.0 |
| Dayton | 1.31 | 2.29 | 5.93 | 4.89 | 38.9 | 38.2 | 22.4 | 22.4 | 30.7 | 30.3 |
| Fremont | 0.36 | 1.66 | 2.03 | 3.45 | 36.2 | 35.1 | 17.7 | 18.4 | 26.9 | 26.7 |
| Kingsville | 0.40 | 1.80 | 3.03 | 3.80 | 35.5 | 33.6 | 16.6 | 17.4 | 26.1 | 25.5 |
| Mansfield | 0.83 | 2.17 | 4.61 | 4.80 | 35.7 | 36.1 | 19.3 | 18.8 | 27.5 | 27.4 |
| Norwalk | 0.81 | 1.73 | 3.39 | 3.63 | 36.9 | 35.8 | 21.3 | 19.0 | 29.1 | 27.4 |
| Piketon | 1.57 | 3.00 | 4.99 | 6.40 | 44.9 | 41.7 | 24.2 | 23.6 | 34.6 | 32.7 |
| Toledo | 0.44 | 1.88 | 1.73 | 3.81 | 35.6 | 35.2 | 20.3 | 18.9 | 27.9 | 27.1 |
| Wooster | 1.15 | 1.97 | 4.58 | 3.92 | 38.1 | 36.9 | 19.2 | 19.1 | 28.7 | 28.0 |
| Youngstown | 1.01 | 2.11 | 4.61 | 4.45 | 36.2 | 36.1 | 19.8 | 19.3 | 28.0 | 27.7 |

Temperatures in degrees F, Precipitation in inches

*Table created by Ted W. Gastier, OSU Extension from National Weather Service, OARDC, and local data.*

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