



Newsletter Extension

Fruit ICM News

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Update on Plum Curculio Research

Source: Celeste Welty, OSU Extension Entomologist

Preventing damage by plum curculio can be one of the more troublesome tasks for some apple growers, especially in orchards close to woods. Plum curculio adults usually move from their overwintering sites in woods or hedgerows into apple orchards during the pink and bloom stages, and they begin to damage apple fruit at petalfall. What makes their management tricky is that some years they are active for only about 2 weeks, while in other years they are active for 4 to 6 weeks. A single insecticide spray at petalfall provides adequate control during a short activity period, while 2 to 3 sprays are needed to prevent damage during a long activity period.

An effective trapping system for monitoring plum curculio might be available within a few years. A large black trap known as a Tedders pyramid trap, which mimics a tree trunk silhouette, has been used successfully for trapping plum curculio in southern peaches since 1994, but has not worked well in apples. A smaller screen trap that is strapped to the tree trunk, known as a Circle trap, has worked well since 1997 in pecans with the plum curculio's cousin, the pecan weevil, but is unreliable in apples. An alternate design for a visual trap that mimics a branch is under development at the University of Massachusetts, using a cylinder shape. The current prototype of the cylinder trap is black PVC pipe 50 cm tall, 6 cm diameter, topped by a wire funnel, placed in an upright position within the canopy. Traps are being evaluated for use either alone as visual traps or with lures of plum curculio aggregation pheromone or fruit volatiles. Researchers who are developing traps have studied whether the curculio

gets into the tree by walking or flying. It has been found that plum curculio adults usually fly when temperatures are above 68° F, but they usually crawl when temperatures are below 68° F.

A temperature model developed at Cornell University has been useful to New York apple growers deciding whether to use 1, 2, or 3 sprays to control plum curculio. This rule is based on observations that when weather following petalfall is warm, there is a short period when curculio damages fruit, but when weather following petalfall is cool, there is a long period when curculio damages fruit. More specifically, the rule is based on the fact that control is good if fruit is protected until 40% of total curculio damage occurs, which corresponds to an accumulation of 340 degree-days (base 50 degrees F) after petalfall. The rule is simply to spray every 10 days until 340 degree days is reached. The first spray should be applied at petalfall, and this should protect fruit for about 10 days (if an organophosphate product is used). Daily degree-days should be calculated starting at petalfall (degree-days base 50 = average temp - 50 = [(high temp + low temp)/2] - 50). Once it is 10 days after the petalfall spray, calculate how many degree-days have accumulated: if 340 or more degree-days, then an additional spray is not needed; if less than 340 degree-days, then a second spray is needed. Once it is 20 days after petalfall, repeat the same exercise; if 340 or more degree-days have accumulated, then an additional spray is not needed, but if less than 340 degree-days have accumulated, then a third spray is needed.

A potential nonchemical strategy for plum curculio management is frequent mechanical shaking to knock the curculio adults out of the trees. This method should be effective in theory, but a practical way of successfully doing it has not yet been worked out. A study in Quebec used a tractor-mounted bicycle wheel that jarred trees as it made 2 passes through the orchard; using pressure of 49 and 69 psi, about 60-69% of curculio adults fell from trees, but damage was not reduced to an acceptable level.

Area Produce Auction Up and Running

Source: Brad Bergesford, Horticulturist, Enterprise Center for Economic Development, OSU Extension

The Bainbridge Produce Auction will officially kick off the 2001 growing season with an excellent supply of high quality, locally grown bedding plants, perennials, nursery stock, cut flowers, hanging baskets, and early season produce including greenhouse grown tomatoes and much , much more!!

Wholesale Produce Auctions will be held every Friday beginning at 4:00 pm, with hay and straw sales beginning at 3:30 pm at the 4053 State Route 41 south, Bainbridge, Ohio location. Everyone interested in buying or selling some of the areas finest "Home Grown" produce are invited to visit the produce auction.

To expand Agriculture production and marketing opportunities for area farmers, farm families from the Bainbridge area have expanded the Bainbridge Produce Auction to better serve sellers and buyers. Working with Brad Bergesford of the OSU Extension Enterprise Center, in June of 1999 the Bainbridge Produce Auction facility was built by the farmers. The Grand Opening of the Wholesale Produce Auction occurred in July, and produce auctions were held every Monday, Wednesday and Friday throughout the past two growing seasons.

The Bainbridge Produce Auction is located 4 miles south on State Route 41 just off of U.S Route 50, west of Bainbridge. Auctions will be held on every Friday beginning at 4:00 pm until July. For more information , contact Brad Bergesford, Extension Agent Horticulture, OSU Extension Enterprise Center, 1864 Shyville Road, Piketon, Ohio 45661, (800) 860-7232 or email bergesford.1@osu.edu.

United States Blueberry Council Blueberry Promotion, Research and Information Order Assessments in 2001

Source: Richard C. Funt, Extension Small Fruit Specialist, Ohio State University, Columbus

In August 2000, a national referendum by producers and importers was approved to collect assessments from cultivated (highbush) blueberry growers (first handlers). Domestic producer assessments are to be sent to the U.S.A. Blueberry Council, 4995 Golden Foothill Parkway, Suite #2, Eldorado Hills, California 95762 by November 30, 2001. Phone (916) 933-9399; email 104361.2253@compuserve.com or <http://www.blueberry.org>.

Known as the Blueberry Promotion, Research, and Information Order, the U.S. Department of Agriculture (USDA), Marketing and Regulatory Programs, the Agricultural Marketing Service, P.O. Box 96456, Washington, D.C. 20060-6656 has announced the order and is the regulator of the order. Under the order, the U.S.A. Blueberry Council (USABC) will conduct generic promotion, provide information, and conduct related research programs designed to maintain and expand markets for cultivated blueberries. Funds to finance the USABC activities will come from assessments paid by producers and importers of 2,000 or more pounds of cultivated blueberries annually. U.S. Customs Service will collect from importers and remit assessments to USABC.

All Ohio growers who sell 2,000 pounds or more annually are now required to pay a \$12.00 per ton assessment beginning with the 2001 crop. Growers will need to submit a form called a Fruit Handlers Report with payment.

Newly Updated IPM Resources

Source: Scaffolds Fruit Journal #5, April 16, 2001

The New York State Integrated Pest Management Program (Cornell University) has substantially improved its website, which now has a simpler URL: <http://www.nysipm.cornell.edu>. There are many links, free publications, and an abundance of information about agricultural pests and those that affect schools, homes, and municipalities. The new Catalog of IPM Resources and staff directory can be found on the website.

The weekly **Fruit Edition of the New Jersey Plant and Pest Newsletter** is available at the following site:

<http://www.rce.rutgers.edu/pubs/plantandpestadvisory/issues.asp?year=2001&month=All+of&edition=Fruit+Edition&submit=View+Newsletters>

Peach information is frequently included.

Registrant Announces Worldwide Phase-Out of Benomyl

Source: William G. Smith, Senior Extension Associate, Pesticide Management Education Program, Cornell University Department of Entomology

EPA has been informed by Dupont that it will announce today, April 18, a business decision to discontinue the manufacture of the widely used fungicide benomyl throughout the global market by the end of this year. The company has informed us that it expects to phase out distribution and sales of all benomyl products by the end of 2002. EPA stands ready to assist Dupont in carrying out the company's request for voluntary cancellation and phase-out of benomyl, often marketed under the trade name Benlate here in the U.S.

Benomyl is approved for use on about 70 fruit, nut, vegetable, and field crops. No residential uses are approved. EPA has been in the process of reviewing the human health and ecological effects of benomyl in order to complete a reregistration eligibility decision (RED) on the pesticide next year.

On April 18, 2001, Dupont formally requested voluntary cancellation of all of their benomyl technical, end use, and special local need product registrations. The next step under FIFRA will be for EPA to publish a Section 6(f) Federal Register notice announcing our receipt of the request for voluntary cancellation, and inviting public comment for 30 days.

Assessing Ascospore Maturity of *Venturia inaequalis* (apple scab)

Source: Dave Rosenberger, Plant Pathology, Cornell University, Highland, Scaffolds #5, April 16, 2001

Ascospore maturity assessments have been used for many years to predict the beginning of the apple scab season. In most years, mature ascospores of *V. inaequalis* are present and ready to be released soon after apple trees reach the green tip bud stage. However, in some years ascospore maturity is delayed compared to apple bud phenology. When that occurs, apple growers can omit one or more early season fungicide sprays with minimal risk of developing apple scab. Conversely, in years when ascospore maturity is advanced compared to apple bud phenology, early season sprays for apple scab may prove essential for controlling scab. Ascospore maturity assessments provide growers with one predictor for differentiating high versus low risk for early season scab infections. As noted toward the end of this article, there are numerous other factors that contribute to severity of apple scab in any given year.

Assessments are done by picking 20 pseudothecia (the small fruiting structures) out of overwintering leaves and squashing them on microscope slides. Pseudothecia usually contain anywhere from 80 to 150 asci. Asci are transparent cylindrical sacs that each contain eight ascospores. The ascospores are clear when immature, but turn an olive-green color as they mature. Maturity assessments are conducted by observing the squash mounts at 400X magnification and counting the number of asci that have clear spores (immature), colored spores (mature), or no spores. Asci in the latter category must be further differentiated between closed asci, which means the asci are so immature that no spores have yet formed, and empty asci from which spores have already been discharged.

In microscopic assessments, squashed pseudothecia appear as a jumble of overlapping asci. The technician conducting the counts must visually scan the field of view in the microscope while clicking off on a counter the maturity category for each ascus that is observed. There is no way to "mark" the asci

already counted, so the observer must mentally track which asci have already been counted. The process is somewhat analogous to trying to count the number of branches in a small brush pile without touching any of the branches. Consistency in scanning and enumerating the asci as seen through the microscope is critical for generating useful squash mount information.

The tower shooting test (or ascospore discharge test) is usually conducted at the same time as squash mount assessments and provides an independent evaluation of spore maturity. In the tower shoot test, leaves are wetted and placed on a screen about 16 inches above a plenum through which air is drawn by a vacuum pump. Spores discharged from the wet leaves are trapped on greased slides just below the holes in the plenum. Counting the number of spores trapped provides an estimate of whether or not leaves are actually discharging spores; however, these counts are of limited utility for several reasons. First, there is no quantitative way to assess how many pseudothecia are present in the leaves used for the tower shoot. A sample of heavily scabbed leaves will always produce more spores than a sample of lightly scabbed leaves, so there is no way to establish an action threshold using tower shoot counts. With moderately scabby leaves, counts in the tower shoot as we conduct them at the Hudson Valley Lab must usually exceed 40 to 50 spores before significant infections can be expected in commercial orchards. However, that threshold is very much a "fuzzy logic" rule of thumb. Another problem with tower shoot counts is that leaf samples collected during or shortly after a rain will discharge relatively few spores in the tower because all mature spores will have been released during the rain. For these reasons, we use the tower shoot only as a supplement to squash mount assessments.

An alternative approach for assessing ascospores involves a degree-day model that was developed by Drs. David Gadoury and Bill MacHardy (1982). Using this model, degree-day accumulations are initiated when 50% of McIntosh fruit buds are at green tip. The model is useful for predicting the period of peak ascospore discharge and the end of the ascospore production season. However, reliability of the model for predicting spore maturity during the first week or two after green tip is questionable. The model uses the green tip bud stage as a biofix, so it cannot compensate for years when ascospore maturity is unusually advanced at the time that trees reach the green tip bud stage. Because years with advanced spore maturity pose the greatest scab risks for apple growers, we decided to initiate statewide squash mount assessments in 2001.

Ascospore maturity is only one of many factors that determine when and where apple scab will cause commercial problems. The amount of overwintering inoculum in an orchard is far more important than relative maturity of ascospores during any given infection period. If ascospore production and release is compared to water flow through a hose, then the amount of overwintering inoculum could be compared to the size of the hose and relative maturity of ascospores could be compared to the time that the valve feeding the hose is turned on. Obviously, the volume coming from a 3-inch fire hose (i.e., a high inoculum orchard) will be much greater than the volume from a half-inch garden hose (i.e., a low-inoculum orchard). Furthermore, spore concentrations will reach economic thresholds earlier in the season in high inoculum than in low inoculum orchards, just as a 3-inch hose can deliver 100 gallons of water more quickly than a half-inch hose when both hoses are activated at the same time. Thus, growers with high-inoculum orchards must always be more conservative with early season sprays (i.e., start earlier and keep tighter prebloom spray intervals) than growers with low-inoculum orchards.

Other factors that affect scab severity in any given year include the timing of the first rains that produce an infection period, the weather during bloom and petalfall, and weather during the early part of summer. The timing of rains during the prebloom period may be the most critical determinant in scab development, because every day of dry weather after bud break delays scab development in trees by one more day. In years when no infection periods occur prior to tight cluster or pink, scab is often easy to control, even in high-inoculum orchards, because the earliest primary infections occur too late in the season to allow multiple cycles of secondary inoculum before fruit begin to lose susceptibility to scab.

Dry weather during bloom and petalfall can similarly delay secondary infections and decrease the number of scab cycles that occur in a year. Hot, dry weather during early summer reduces viability of conidia and speeds terminal bud set on trees. Older leaves are relatively resistant to scab until autumn, so scab epidemics usually end when terminal buds are set.

None of the factors in the preceding paragraph are predictable when growers must make decisions about spraying fungicides at green tip. The squash mount assessments of spore maturity, coupled with a grower's or fieldman's assessment of inoculum levels in the orchard, provide the only two parameters for assessing potential risks of early season scab infections. The wet summer last year contributed to high levels of carry-over inoculum, and scab counts completed to date show scab maturity is ahead of tree phenology compared with an average year. Thus, this may not be a good year to gamble on omitting early season scab sprays.

Literature Cited: Gadoury, D. M., and MacHardy, W. E. 1982. A model to estimate the maturity of ascospores of *Venturia inaequalis*. *Phytopathology* 72:901-904.

Sign-Up Extension for Market Loss Assistance Program

Source: John Wargowsky, Ohio Apple Growers

The U.S. Department of Agriculture (USDA) announced that sign-up for the \$100 million apple market loss assistance program has been extended through Friday, May 4. Growers were originally required to sign-up for their portion of the assistance by April 13. USDA has given growers three additional weeks to submit an application, thus providing an additional opportunity to all growers to recoup a portion of their recent economic losses. Growers must submit their completed application to a county Farm Service Agency (FSA) office by no later than close of business on Friday, May 4.

Applications can be downloaded from USApple's website at <http://www.usapple.org>. Look under industry information.

Ohio Low Temperatures for Selected Locations

| | |
|--------------|--------------|
| Akron-Canton | 26 degrees F |
| Cincinnati | 26 |
| Cleveland | 28 |
| Columbus | 30 |
| Dayton | 29 |
| Mansfield | 26 |
| Norwalk | 28 |
| Piketon | 28 |
| Toledo | 28 |
| Wooster | 27 |
| Youngstown | 24 |

Fruit Observations & Trap Reports

Insect Key

AM: apple maggot
CM: codling moth
ESBM: eye-spotted budmoth
LAW: lesser apple worm
LPTB: lesser peachtree borer
OBLR: obliquebanded leafroller
OFM: oriental fruit moth
PTB: peachtree borer
RBLR: redbanded leafroller
SJS: San Jose scale
STLM: spotted tentiform leafminer
TABM: tufted apple budmoth
VLR: variegated leafroller

Waterman Lab, Columbus, Dr. Celeste Welty, OSU Extension Entomologist

Traps used: STLM = Wing trap, Others = MultiPher

Apple: 4/11 (tight cluster) to 4/18 (pink)

RBLR: 24 (down from 43)

STLM: 11 (down from 59)

Peach: 4/11(pink) to 4/18 (bloom)

OFM: 0 (same as last week)

Wayne County Report, April 19 - Ron Becker, Program Assistant, Agriculture & IPM

Apples were still at tight cluster. Various cultivars of peaches, cherries, and plums were in full bloom. Except for one block of apples in Holmes County, there was very little damage found from cold temperatures. According to the monitors at both Moreland and Rittman, no scab infection period has occurred since 4/11. In looking at blackberries that had orange rust last year, several new sprouts were coming up that showed yellowing on the tip of the leaves and pustules were present.

Traps used: STLM = Wing trap, Others = MultiPher

Apple: 4/13-4/19

CM: 0 (same as last week)

RBLR: 32.8 (up from 49)

STLM: 844 (down from 1078)

PTB: 0

LPTB: 0

OFM: 0

Columbiana County, April 20 - Dano Simmons, orchardist via Dave O'Brien of UAP

Apples have not yet been adversely affected by cold temperatures. Crop prospects look good.

Muskingum County, April 20 - Mark Mechling, County Ag Agent

"We dodged the bullet." Growers are reporting minimal damage from cold temperatures on some early apple varieties. Otherwise crop prospects are good.

Southern Ohio Report, April 18 - Brad Bergefurd, Horticulturist, Enterprise Center for Economic Development

Weather has been keeping fruit growers on edge this week. Last week (Tuesday and Wednesday April 10 and 11) northern growing regions of southern Ohio received in excess of 5 inches of rain within a 24 hour period, causing many fields to flood and soils to become saturated, halting all field operations. Earlyglow and other early strawberry varieties are in bloom. With the cloudy and cool days lately there is concern about honeybee activity and pollination or lack of. There is a fair fruit set on the peach crop so far in southern growing regions, but the forecast for record freezing temperatures has growers concerned. There is also concern with the freeze forecast, since most all apple varieties are at full bloom. Growers are also concerned with the lack of honeybee activity in the apple orchards during this period of bloom due to cloudy and cold weather conditions. Blueberry crops are in full bloom in the region and there is concern about the forecast for record freezing temperatures. **NOTE:** We escaped injury Tuesday night, April 17. Growers are still digging and transplanting black raspberries, blueberries, and red raspberries.

North Central Ohio Report, April 20 - Ted Gastier

Fruit progress still lags behind last year's development. We are facing a long, wet weekend with increased scab pressures. See the following report.

Northern Ohio Apple Scab Activity SkyBit Product & Spectrum Technologies Orchard Monitors

| | Dates | Level of Scab Activity |
|----------|---|-----------------------------------|
| Observed | Green tip April 9. April 9, 10, 12-15, 17-19 | Active, but no infection |
| | April 11, 16 | Possible infection & damage |
| Forecast | April 20-25 | Possible infection & damage |
| | April 26-29 | Active, but no infection expected |

Degree Day Accumulations for Selected Ohio Sites January 1,

2001 to date indicated

Degree Day Accumulations for Selected Ohio Sites January 1, 2001 to date indicated

| Location | Actual DD Accumulations 4/18/01 | | | | Normal Degree Day Accumulations for 4/25/01 | |
|----------------|---------------------------------|---------------------------------|------------|---------------------------------|---|------------|
| | Base 43° F | Base 43° F normal accumulations | Base 50° F | Base 50° F normal accumulations | Base 43° F | Base 50° F |
| Akron - Canton | 190 | 225 | 103 | 91 | 310 | 117 |
| Cincinnati | 377 | 407 | 188 | 179 | 542 | 226 |
| Cleveland | 172 | 213 | 88 | 86 | 291 | 111 |
| Columbus | 308 | 293 | 160 | 124 | 396 | 157 |
| Dayton | 273 | 294 | 152 | 126 | 401 | 161 |
| Mansfield | 188 | 218 | 107 | 89 | 301 | 115 |
| Norwalk | 176 | 193 | 96 | 77 | 270 | 100 |
| Piketon | 386 | 428 | 201 | 196 | 565 | 245 |
| Toledo | 141 | 180 | 68 | 72 | 256 | 94 |
| Wooster | 209 | 205 | 116 | 79 | 282 | 101 |
| Youngstown | 178 | 196 | 94 | 78 | 272 | 101 |

Phenology - Thanks to *Scaffolds Fruit Journal* (Art Agnello)

| Coming Events | Range of Degree Day Accumulations | |
|---|-----------------------------------|------------|
| | Base 43° F | Base 50° F |
| Tarnished plant bug active | 71-536 | 34-299 |
| Spotted tentiform leafminer 1 st adult catch | 73-433 | 17-251 |
| Rosy apple aphid nymphs present - 1 st egg hatch | 91-291 | 45-148 |
| Green apple aphids present | 127-297 | 54-156 |
| Oriental fruit moth - 1 st adult catch | 129-587 | 44-338 |
| Spotted tentiform leafminer - 1 st oviposition | 141-319 | 48-154 |
| European red mite egg hatch | 157-358 | 74-208 |

We appreciate the support given by the following OSU Departments toward the creation of this newsletter:

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Department of Horticulture and Crop Science, Dr. Dave Ferree, Dr. Dick Funt, and Dr. Diane Miller

Department of Plant Pathology, Dr. Mike Ellis

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