



Newsletter Extension

Fruit ICM News

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Calendar

June 9: Plasticulture Strawberry, Blueberry, Blackberry, Raspberry Twilight Meeting; OSU South Centers, 1864 Shyville Road, Piketon, Ohio 45661. Field tours are from 5:00-7:00 p.m.; supper will be served from 7:00-8:00. Contact Brad Bergfeld, at 740-289-3727, 1-800-297-2072 (in Ohio only). E-mail: bergfeld.1@osu.edu. Web site: <http://www.southcenters.osu.edu>.

June 25: Ohio Fruit Growers Society Summer Tour, Glen Hill Orchard, 17156 Glen Road, Mt. Vernon, OH. See last week's issue for information.

Orange Rust of Black Raspberry and Blackberry

Source: Mike Ellis, OSU Plant Pathologist

At Wooster the wild black raspberries that are infected with orange rust are starting to produce the "orange" spores. It is important to scout your plantings and remove any infected plants before they release spores and spread the disease. Growers that wish to use chemical control for orange rust should

initiate sprays just before the orange spores are released from infected plants NOW, at least in the Wooster area. The fungicides Nova 40W at 2.5 ounces and Cabrio 20EG at 14 ounces per acre are the fungicides currently registered for control of orange rust. They should be applied on a 10 to 14 day schedule until leaves on infected plants dry up and stop producing the orange spores. This is usually around the first of July.

I have prepared a packet of information on the use of fungicides for control of orange rust. Growers wishing to obtain a copy should contact me and I will mail the information to them. My phone is 330-263-3849 and e-mail is ellis.7@osu.edu.

Peach Scab

Source: Paul Pecknold, Purdue Plant Pathologist

Early shuck-split and shuck-fall sprays are critical for peach scab control. The first spray should be applied about one week after petal fall. Do not wait until the shucks have slipped to begin this program. Continue to spray on a 10-day interval until 40 days before harvest. See the *2003 Commercial Tree Fruit Spray Guide* for further information.

Chemical Thinning of Apples with NAA

Source: 2003 Commercial Tree Fruit Spray Guide

Apply NAA (naphthalene acetic acid) to fall and winter varieties when the king fruit is 11-13 mm in diameter. For fruit larger than 13 mm, Sevin is more effective than NAA. Sevin is useful because of its ability to give uniform results from petal fall to 21 days after petal fall. The combination of NAA plus Sevin should be applied on fall and winter varieties when king fruit are 11 to 13 mm in diameter, and on summer varieties (Wealthy and Earliblaze) at petal fall.

Use of NAA on early summer varieties may result in excessive foliage injury, fruit cracking, and premature ripening. In the warmer parts of the Midwest, concentrations of NAA that successfully thin frequently cause pygmy apples on spur-type Red Delicious. These small seedless apples persist through harvest and are a nuisance. Sevin is preferred for thinning spur-type Red Delicious. In some experiments, Sevin has over-thinned Rome and Gallia Beauty and should not be used on those varieties. NAA is not successful in thinning Fuji, as this often results in pygmy apples. Honeycrisp is easy to overthin and combinations should not be used.

Variability of results and excessive foliage injury often experienced with NAA may be avoided by using this material at 1/3 to 1/2 of the rates recommended on the label in combination with 3/4 pint of "Tween 20" per 100 gallons. The addition of the "Tween 20" increases the rate of foliar absorption and decreases the effects of seasonal factors such as temperature, relative humidity, and wind on the drying rate and amount of material entering the leaf. The elimination of foliage wilting and tree "shock" results in better fruit size at harvest than the same amount of fruit thinning obtained by the full dosage of NAA alone. Wetting agents other than "Tween 20" that have been used successfully in tests in Illinois and Indiana include Regulaid and Amway Wetting Agent, or Ortho X 77.

Important Reminders About Chemical Thinning:

NAA generally gives best results under fast drying conditions, and when the temperature is between 70

and 75 degrees F. Amid-Thin gives the best results under slow drying conditions and is often applied in the evening. Thorough spraying and uniform coverage are necessary for satisfactory results. However, if you want to reduce the degree of thinning or are afraid of over-thinning, reduce the concentration, but not the gallonage applied per tree.

Lower limbs are easier to thin than upper ones. Reduce the spray application on the lower limbs by shutting off one or more nozzles; some spray applied to the tree tops will fall on lower limbs.

Concentrate sprays of chemical thinners have been satisfactory. Care should be exercised in calibration so that the right amount of material is applied to all parts of the tree and row. Be careful to avoid double applications to row ends, etc. Mis-calibration of the sprayer manifold is magnified in concentrate application. Concentrating more than 4X has resulted in variable results and should be avoided.

Applying chemical thinning sprays after frost or freezing temperatures is risky. Foliage exposed to such conditions absorbs chemicals much more readily, and over-thinning may result. If you must spray under such conditions, reduce the concentration 25 to 30 percent.

Chemical thinners are generally more effective under the following conditions: (1) low vigor trees, (2) light pruning, (3) heavy bloom, (4) poor pollination, (5) high humidity before spraying, (6) slow drying of spray, (7) poor air drainage, and (8) cloudy, cool weather preceding or following the bloom period.

You should keep records of the conditions prevailing when you make applications and should leave several trees unsprayed to critically evaluate the results of thinning applications. This way you will be able to work out the concentrations best suited for your orchard.

NAA formulations:

Not all NAA formulations have the same amount of active ingredient. Since calculating ppm can be difficult, the table on the following page describes each of several materials and the amount of formulation per 100 gallons of water required to make a 10 ppm solution (Table developed by R. Marini, VPI).

NAA Formulations For Chemical Thinning Of Apples

Trade Name	Chemical	Formulation	Acid equivalent (% of active ingredient)	Amount of formulation per 100 gallons to make 10 ppm.
Amid-Thin W	1 Naphthaleneacetamide	WP	8.4	1.6 oz
Fruitone N 1-Naphthaleneacetic acid, sodium salt (3.5%)	WP	3.1	4.0 oz	
Kling-Tite 256	1-Naphthaleneacetate, potassium salt (8.3%)	liquid	8.6	1.9 fluid oz
K-salt Fruit Fix 800	1-Naphthaleneacetic acid, potassium salt (24.2%)	liquid	20.2	0.63 fluid oz

K-salt Fruit Fix 200	1-Naphthaleneacetic acid, potassium salt (6.25%)	liquid	5.18	2.47 fluid oz
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Apple Thinning

Source: Peter Hirst, Purdue Horticulturalist, Facts for Fancy Fruits, May 14, 2003

The thinning decision you make with apples is one of the most critical management decisions you will make all year, and one that affects not only the crop this year, but next year also. Thinning is all about tradeoffs and compromise. The earlier you thin, the better the response will be, both in terms of fruit size increase and in return bloom for next year's crop. The problem is that early thinning is risky, so what to do? Use the nibble approach where you don't try to get the job done in one shot. Put on a mild thinner application early (say around petal fall) and then follow up with another application about 10-14 days later if you think it is needed.

This way you achieve some of the benefit of early thinning while at the same time spreading some of your risk. A few other pointers for thinning:

- Thinners work best when temperatures are 70-80 F at the time of application and for a few days afterward. Don't apply thinners when temperatures are below 65F as they will have little effect.
- Keep detailed notes of what you applied, what rate, when, what the conditions were at the time of application and for a few days afterward, and what the result was. This will help you build up a picture of what works best on your farm.
- If you suffered some frost damage, think long and hard before you decide not to thin this year. The risk is that there may be more crop left than you think, and by not thinning you may be compromising next year's crop as well as the crop this year.

Strawberry Insect Pests

Source: Ric Bessin, Kentucky Entomologist, Kentucky Fruit Facts, May 2003

Spittlebugs are annoying pests of strawberries that can stunt plants and reduce berry size. More important to some producers, particularly u-pick growers, is the annoyance that spittle masses cause pickers. Although the spittle is harmless, pickers object to being wetted by the insect excretion. Initially the nymphs feed at the base of the plants, but later move up to the tender foliage. Feeding may cause leaves to become wrinkled and dark green. While fruit may be stunted, significant yield loss seldom occurs.

High spittlebug populations are often associated with weedy fields, so proper weed control along with other practices which encourage healthy plants are important. Fortunately, there is only one generation per year.

Prebloom sprays are rarely necessary for spittlebugs, but u-pick growers should keep populations less than one spittle mass per square foot through prebloom to appease customers. Begin estimating spittlebug density at 10% bloom by inspecting five to ten 1-square foot areas per acre of strawberries at two week intervals. It will be necessary to spread plants and inspect the crowns as well as leaves and stems. Control is considered at one spittlebug per square foot (u-pick) up to four to five per square foot.

Another serious preharvest pest of strawberry is the **tarnished plant bug**. It can cause considerable damage to strawberries by puncturing young fruits before receptacles expand. These damaged areas do not develop along with the rest of the berry, resulting in misshapen "catfaced" fruit. The damage may range from slight deformation to complete loss of market value of the crop.

Most damage takes place just after petal fall. Early June bearing varieties can escape most tarnished plant bug injury because pest populations are small and consist of less damaging early instars. Late maturing cultivars are more susceptible to damage. Plantings near alfalfa fields, woods, or weedy areas are more prone to damage. Alternative hosts, especially weeds and seed-producing plants, should be eliminated around the planting. Regular mowing or weeding may help, but should be avoided during the blossom period. From pre-blossom until harvest, shake blossom or fruit clusters from ten to fifteen plants per acre over a light colored pan. Treatment is suggested when levels reach an average of 0.5 nymphs per cluster.

Powdery Mildew of Apple

Source: Paul Pecknold, Purdue Plant Pathologist, Facts for Fancy Fruits, May 14, 2003

Powdery mildew survives the winter as dormant fungal threads within apple terminal buds. Now is the time to keep a close watch for the first symptoms of powdery mildew; especially on those inner, shaded water sprouts. Shoots infected with mildew have a spindly appearance; leaves are folded inward longitudinally. Fruit infections become evident later in the season as netlike russet lines, similar in appearance to the "normal" russetting we see on Golden and other russet-prone varieties. Indeed, if you have above normal fruit russet in any year, consider powdery mildew as a possible cause.

Growers of mildew-susceptible varieties such as Jonathan, Rome Beauty, and Ida Red (my favorite disease apple) should be especially diligent in their watch for mildew. Tight cluster, pink, bloom, petal fall, and first cover sprays are most critical for controlling mildew; however, fungicide protection is needed until terminal buds are set. Your best mildewcides are the SI fungicides (Bayleton, Nova, Rubigan, and Procure) and the new strobilurins (Sovran and Flint). Good old captan, Vangard, Polyram, and mancozeb products DO NOT provide adequate control of powdery mildew. I especially like the use of Sovran or Flint at first cover. Not only do you get control of mildew, but you also get good control of fruit scab and an early start on sooty blotch and flyspeck.

Bayleton, Nova, Procure, & Rubigan Resistance

Source: Paul Pecknold, Purdue Plant Pathologist, Facts for Fancy Fruits, May 14, 2003

A number of commercial Indiana apple growers have been using sterol inhibiting (SI) fungicides (Bayleton, Nova, Procure, and Rubigan) for over 10 years. As reported previously, research out of Geneva, New York indicates that in orchards where SI fungicides have been used for 7 to 8 years there is a significant increase in the potential for strains of the scab fungus resistant to SI fungicides to be present. To help delay/prevent the occurrence of resistance, it is strongly suggested the following two rules be followed:

- Use full rates of the SI fungicide. Do not "cheat" on the rate, the coverage, or the spray intervals. Using full rates is even more important with continued use and as the scab fungus becomes less sensitive.
- Mix the SIs with a protectant such as captan, mancozeb, or Polyram.

Proper use of SI fungicides is becoming even more important the longer we continue to use them.

Plum Black Knot

Source: Paul Pecknold, Purdue Plant Pathologist, Facts for Fancy Fruits, May 14, 2003

Research has shown Bravo to be an effective fungicide for controlling black knot. However, Bravo must not be applied to plums after petal fall in commercial orchards because applications after petal fall may cause fruit injury and are therefore prohibited on the label. Captan and Topsin M are also effective for black knot control, but are not as effective as Bravo. Thus, the best strategy for controlling black knot would be the following:

- During winter or early spring, prune out and burn all knots found in the orchard and in wild plum and cherry trees in adjacent hedgerows.
- Use Bravo as labeled to control brown rot blossom blight at popcorn, full bloom, and petal fall, or at approximately 7-10 day intervals starting at popcorn.
- Use captan or a captan/Topsin M combination in sprays at shuck split and first cover.

Oriental Fruit Moth in Ohio

Source: Neiswander, R.B., 1936. "Oriental Fruit Moth Investigations in Ohio II," Bulletin 569, Ohio Experiment Station, Wooster, Ohio

High numbers of Oriental fruit moths are being observed in both apple and peach blocks in north-central Ohio. Past pressures have prompted two growers to try mating disruption this season. We will be sharing more about these experimental blocks through this newsletter and a summer twilight meeting.

Meanwhile, a tantalizing question arises: Where did all of these moths (200 to 300 per week) come from? Historic records for Ohio indicate we should expect four generations of OFM in northern Ohio and five in southern Ohio. The occurrence of so many broods each year constitutes one of the factors that makes this insect a severe pest. Even though the overwintering population is small, sufficient numbers can be produced before harvest to do much damage to the fruit. If a calculation is made on the basis that spring brood moths average 20 eggs per female and that moths of the 1st, 2nd, and 3rd broods oviposit at the rates found by early researchers, it is found that a fertilized spring brood female might be responsible for the production of over 140,000 eggs of the 4th brood, provided no mortality occurred in the interim.

Imidan and pH

Source: Rick Foster, Purdue Entomologist, Facts for Fancy Fruits, May 14, 2003

We recently received a report from Gowan that demonstrated the importance of spray water pH relative to longevity of control with Imidan. A common measure of how long a chemical lasts is its half-life, which would be the time until only half the residue remained. The following table shows the effect of pH on the half-life of Imidan.

pH	Half Life

5.0	178 hours
5.5	92 hours
6.0	36 hours
6.5	14 hours
7.0	10 hours
7.5	2 hours
8.2	33 minutes

This table shows the importance of adjusting the pH prior to adding Imidan. Many other pesticides will respond similarly to high pH. If you have not been getting the level of control you would like with your insecticides, an easy place to start is by checking the pH of your spray water. One additional note, if you are applying Imidan and expect rain in the next 7 days, it would be a good idea to add a sticking agent to the spray mix.

Grape Fertilization Update

Source: Alice Wise, Cornell University, Long Island Fruit and Vegetable Update, No 9, May 9, 2003

With the recent changes in fertilizer prices and availability, it pays to review what's now available for ground applied nitrogen.

Ammonium nitrate (34% N) is available but expensive, because one of the world's major processing plants in Europe burned down (and recently resumed production) and high natural gas prices forced U.S. producers to switch to other products. The ammonium part of this compound is converted to the nitrate form by microorganisms in the soil. This occurs within 1 - 2 weeks of application. It does not render NH_4NO_3 a "slow release" N fertilizer. NH_4NO_3 is considered to be an acidifying compound, which reinforces the need for monitoring soil pH. Some volatilization of the ammonia component may occur.

Calcium nitrate (16% N) prices and availability have remained stable. As all the N is in nitrate form, it is available immediately to the vine. Calcium nitrate is impractical as a source of calcium. If calcium is needed, go with a high cal lime rather than dolomitic, or try gypsum. Gypsum will not affect soil pH.

Urea (46% N), while more expensive per pound, is higher in N and therefore a better buy per unit of N. Losses into the air can occur; incorporation or irrigation soon after application can reduce this.

Ammonium sulfate (21% N) is not a traditional grape fertilizer but is finding some use for economic reasons. The sulfur component is minor in terms of soil acidity. It may, in fact, offer some nutritional benefit. Some sources recommend rapid soil incorporation due to the risk of volatilization.

Nitrogen solutions: There are different liquid N's on the market; many contain ammonium nitrate and urea nitrogen. The advantage is easy application through irrigation lines or herbicide sprayer. The disadvantage is that some may be corrosive to certain materials. Corrosion inhibitors may be added to the product. Since urea and ammonium nitrate may be components, some references discuss the need to shank the product below soil surface to avoid losses to air.

Footnote on volatilization: according to *Grapevine Fertilization and Nutrition in the San Joaquin*

Valley, volatilization of ammonia varies with soil pH, texture, and temperature. Sandy, acidic (pH 5-6.9) loams actually lose much less ammonia than sandy, alkaline soils. Most volatilization occurs in 7-10 days, with half occurring within 3 days after application.

Organic products: Many growers are interested in organic fertilizers. There are a number of N sources including peanut meal (8% N), blood meal (12% N), proprietary blends, and more. Mined Chilean nitrate (16%) or sodium nitrate is allowed on a limited basis in organic agriculture. Expense can be an issue with organic products as can lack of practical information on application and use of these materials in a perennial crop like grapes. On the other hand, they may benefit organic matter and have other nutritional components which benefit vines.

Compost and composted manure: N can be released from decomposition of these materials though it can span several years and is almost impossible to predict. Analysis of the material helps but does not provide all the answers. Still, periodic compost application on sandy soils will improve organic matter, hence nutrient and water retention as well.

Cover crops: Growing and especially incorporation of cover crops, particularly N-fixing legumes, can supplement N in a vineyard. There are formulas which can be used to roughly estimate the amount of N being incorporated, but they still yield best guesses rather than a hard and fast amount.

Thanks to Lailiang Cheng, Cornell, and Carl Key, LICA, for their input. References: Christensen, Kasimatis and Jensen. 1978. Grapevine Fertilization and Nutrition in San Joaquin Valley, Univ. of CA publ. No. 4087; California Fertilizer Association. Western Fertilizer Handbook, 7th ed. Interstate Printers & Publishers, Danville, IL, 61832-0594.

Pest Phenology

Coming Event	Degree Day Accum. Base 50° F
Peachtree borer 1 st catch	299 - 988
Codling moth 1 st flight peak	307 - 824
Obliquebanded leafroller 1 st catch	392 - 681
Lesser peachtree borer flight peak	392 - 1526
San Jose scale 1 st flight subsides	434 - 656
Oriental fruit moth 1 st flight subsides	442 - 1026
European red mite summer egg hatch	442 - 582
Pear psylla 1 st summer adults present	443 - 512

Spotted tentiform leafminer 2 nd flight begins	449 - 880
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Degree Day Accumulations for Ohio Sites May 14, 2003

Ohio Location	Degree Day Accumulations			
	Base 45° F		Base 50° F	
	Actual	Normal	Actual	Normal
Akron/Canton	514	424	301	253
Cincinnati	745	685	492	433
Cleveland	464	399	272	239
Columbus	698	523	453	322
Dayton	653	534	418	331
Kingsville	334	335	174	197
Mansfield	482	413	276	247
Norwalk	453	384	261	229
Piketon	793	706	508	451
Toledo	420	372	230	222
Wooster	576	386	351	224
Youngstown	444	375	249	221

Start of Strawberry Harvest in Southern Ohio

Source: Shawn Wright, Ph.D., Horticulturist, OSU South Centers

We picked our first strawberries from the plasticulture strawberry demonstration at Piketon this AM (May 12). We did have a lot of culls from poor pollination, but the dandelion was in full bloom at the same time. Good reminder to try to control that as much as possible. The Hillsboro location is typically behind the Piketon location.

Also, we had some scattered wind damage in the black raspberry cultivar trial that caused canes to break at the ground. The damage was limited to the SE corner of the plot, which was more exposed than the rest that gets protection from the blueberry planting.

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

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

Apple: 5/7/03 to 5/14/03

CM: 55.7 (up from 46.3)
ESBM: 0 (first report)
LAW: 46 (up from 38)
OBLR: 0 (first report)
RBLR: 0 (down from 1)
SJS: 4 (up from 1)
STLM: 1 (up from 0)
TABM: 0 (down from 4)
VLR: 0 (same as last week)

Peach: 5/7 to 5/14/03

OFM: 0 (same as last week)
LPTB: 1 (down from 3)

Site: Medina, Wayne, & Holmes Counties

Ron Becker, IPM Program Assistant

Apple: 5/7 to 5/14/03

STLM: Holmes: 58 (down from 83)
Medina: 56 (down from 88)
Wayne: 50 (up from 25)
RBLR: Holmes: 9.3 (down from 43)
Medina: 9.3 (down from 18)

Wayne: 4.3 (down from 16)
CM: Holmes: 5.3 (down from 43)
Medina: 0 (same as last week)
Wayne: 27.1 (up from 1.6)

Biofix for CM - May 2 in Wayne

Peach: 5/7 to 5/14/03

LPTB: Holmes: 3 (up from 1)
Medina: 0 (same as last week)
Wayne: 4 (up from 0)
OFM: Holmes: 1 (down from 11)
Medina: 2 (up from 0)
Wayne: 4 (same as last week)
PTB: Holmes: 0 (same as last week)
Medina: 0 (same as last week)
Wayne: 0 (same as last week)

Insects found in apples include European red mite, two-spotted spider mite, green peach aphid, and potato leafhopper. Pear psylla was found in pears. Strawberries had spittle bugs, aphids, slugs, and two-spotted spider mites. Beneficial *A. fallacis* mites were also found. Apples are showing fire blight. Strawberries are starting to show effects of poor pollination. Rust pustules on brambles are starting to erupt.

Site: East District: Erie & Lorain Counties

Jim Mutchler, IPM Scout

Apple: 5/6 to 5/13/03 (petal fall)
CM: 0 (first report)
OFM: 6.1 (down from 34.7)
RBLR: 21.8 (down from 69.8)
STLM: 431 (down from 725)

Beneficials found include native lady beetles.

Peach: 5/6 to 5/13/03 (shuck split)
OFM: 2.3 (down from 4.3)

RBLR: 16.3 (down from 44.7)

Site: West District: Huron, Ottawa, Richland, & Sandusky Counties - Gene Horner, IPM Scout

Apple: 5/6 to 5/13/03 (petal fall)

CM: 0.4 (up from 0)

OFM: 59.9 (up from 16.6)

RBLR: 37.0 (down from 80.6)

STLM: 541 (down from 895)

Peach: 5/6 to 5/13/03 (shuck split)

LPTB: 4 (first report)

OFM: 6.7 (up from 5.2)

RBLR: 18.8 (down from 62.2)

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Information presented above and where trade names are used, they are supplied with the understanding that no discrimination is intended and no endorsement by Ohio State University Extension is implied. Although every attempt is made to produce information that is complete, timely, and accurate, the pesticide user bears responsibility of consulting the pesticide label and adhering to those directions.

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