



INDEX

Drift Warning
 Powdery Mildew of Apple
 Peach Scab
 Fungicide Resistance Reminder
 Crop Load Adjustment in Grapes
 Plum Curculio
 Codling Moths
 Food Quality protection Act
 Grape Pest May be Headed to Cluster's Last Stand
 Count Your Blessings
 Now is Time for Apogee
 Farm Bill Delivers Apple Assistance, Origin Labeling
 Topsin M Granted Section 18 for Blueberries
 Contact Us Toll Free!

FFF02-05
May 8, 2002

Indiana's unusual weather continues. Excessive rainfall has occurred across the state through April and now into May. Rainfall totals in April were nearly 3 times normal in some areas. This is causing more problems for row crop farmers than fruit producers, but it has delayed planting of some new orchards and vineyards. Currently grapes have 8 to 12 inch shoots in the south and 3 to 6 inch shoots north. Blackberries are blooming in southern areas and blueberries are in bloom in the north. Strawberries are finishing bloom in the south. Fruit harvest is 2 to 3 weeks away, about a week behind normal.

Drift Warning: The wet field conditions have delayed planting of corn and soybeans across the state. According to the latest report, Indiana has about 10 percent of its corn in the ground compared to about 50 percent last year. The five-year average of corn planted by late April is 22 percent. Normal rainfall totals for April average 3 to 4 inches across the state. Some areas have received 3 times the normal rainfall. Whenever we have this type of year, we invariably have several cases of herbicide drift injury to fruit crops, especially grapes. As soon as conditions are favorable, spray rigs will be applying herbicides to thousands of acres of cropland. In many cases, applicators are in a hurry to get as much done as possible before the next rain and this can mean spraying regardless of wind or conditions favorable for temperature inversions and drift. Grapes are extremely sensitive to drift of phenoxy herbicides such as 2,4-D early in the season during the phase of rapid shoot growth. Exposure during this phase of growth usually results in severe leaf distortion, shoot stunting, and possibly flower cluster abortion resulting in significant crop loss. It would be a good idea for every grape grower to contact their

neighbors, co-ops, etc. and ask them to be especially careful making applications near vineyard sites. (Bordelon)

Powdery Mildew of Apple: This fungus overwinters primarily in the terminal buds. Although the disease is present every year, it is more prevalent during years when weather is dry and **the previous winter has been mild**. Keep a close watch for the first symptoms of powdery mildew; especially on those inner, shaded, water sprouts. Growers with mildew susceptible varieties, eg. Jonathan, Rome Beauty, Ida Red (my favorite disease apple), Cortland, etc. should be especially diligent in their mildew-watch. Apple fruit can become infected with mildew at pink. Fruit infections become evident later in the season, as netlike russet lines on the fruit surface. The tight cluster, pink, bloom, petal fall and first cover sprays are most critical for controlling mildew, but 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, Vanguard, 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 powdery mildew but you also get the added benefits of excellent control of fruit scab and an early start on prevention of sooty blotch and flyspeck. (Pecknold)

Peach Scab: 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 ID-168, “2002 Indiana Commercial Tree Fruit Spray Guide”, for further information. (Pecknold)

Fungicide Resistance Reminder: For many of you, this will be the ninth or tenth year in which you have used sterol inhibiting (SI) fungicides (Bayleton, Nova, Procure and Rubigan). 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. So remember:

- Use full rates of the SI. Do not “cheat” on the rate, the coverage, or the spray intervals. Alternate row-middle spraying may spell disaster with the SIs. Using full rates is even more important with continued use and as the scab fungus becomes less sensitive.
- Mix the SIs with a non-related, protectant (contact) as suggested in ID-168, “2002 Indiana Commercial Tree Fruit Spray Guide”. Note, the need for a non-related contact fungicide (to control any SI-resistant strains) becomes even more critical the longer SIs have been used in the orchard. (Pecknold)

Important Grape Sprays: Grapes will be starting to bloom in the southern part of the state over the next two weeks so growers should be aware that the next few fungicide applications are very important for controlling the major fruit pathogens. So far, this has been a fairly wet year so disease pressure should be high. Early sprays generally contain an economical broad-spectrum material such as Mancozeb or Captan. The 10-inch shoot spray is probably the first one where black rot control is needed, so addition of one of the sterol inhibitors

(Nova, Elite, Rubigan, etc.) is recommended, especially if black rot was a problem in the block last year. The immediate pre-bloom (or early bloom) and the first post bloom applications are the most important sprays for controlling the major grape diseases. Care should be taken to get thorough coverage of all foliage and developing fruit. Slow the tractor speed, spray every row middle, increase volume, and use full label rates. This would be a good time to use one of the new strobilurin fungicides such as Abound or Sovran. On bunch rot susceptible varieties, addition of a botryocide such as Rovral, Vanguard, or Elevate may be beneficial. For a complete discussion of grape pest management refer to the Commercial Small Fruit and Grape Spray Guide (<http://www.hort.purdue.edu/hort/ext/sfg/>) and the Midwest Small Fruit Pest Management Handbook (<http://www.ag.ohio-state.edu/~sfgnet/>). (Bordelon)

Crop Load Adjustment in Grapes: Annual pruning of grapes is necessary to balance the amount of fruit production with the amount of vegetative growth to insure high yields of high quality fruit. Pruning severity is based on the strategy of ‘balanced pruning,’ which dictates the correct number of buds to retain, or ‘crop load,’ which determines the amount of fruit to retain based on the vine’s pruning weight. Many growers prune vines lightly during the early spring to assure adequate bud number in case of damage by a late frost or freeze. Now that the danger of frost and freeze is over (we hope) and grape shoots are growing rapidly, growers can go back through the vineyard and adjust the crop load by removing shoots and clusters. New shoots are easily broken off by hand without the need for pruners. Growers should pay close attention to the fruitfulness of shoots. Shoots from primary buds have full fruiting potential, whereas secondary buds and latent buds on older wood produce shoots with little or no fruiting potential, depending on cultivar. Ordinarily, all secondary shoots and shoots from older wood should be removed. However, on early budding varieties that may have suffered frost damage this year, the secondary shoots should probably be retained. Shoots should be spaced evenly along the trellis if possible and at a density of about six shoots per foot of row. Cluster thinning (removing one or more of the clusters on each shoot) done before bloom results in the

least yield reduction because the remaining cluster(s) generally set more berries. However, on tight clustered cultivars, cluster thinning after bloom can result in looser, less rot susceptible clusters. (Bordelon)

Plum Curculio: Despite the continued cold weather last week, we began to catch plum curculios in interception traps on the tree trunks in Lafayette last week. If we could get a day without rain, I would be putting on my petal fall insecticide application now. Of course, we all know that Imidan and Guthion will provide excellent control of plum curculio, usually with a petal fall and first cover application. Over the past several years I have looked at a number of alternatives to the organophosphate insecticides. To summarize the results, I have rated each of the pesticides based on the results of my trials. To do so, I looked at the difference between the percentages of plum curculio damaged fruit in the untreated trees and the Imidan treated trees. If a tested insecticide provided less than 50% reduction in that difference, I rated it as poor. If between 51 and 75%, it was fair, between 76 and 90% it was good, between 91 and 95%, very good, and better than 95%, excellent. Remember that these results are only from my trials, and may not be indicative of the results you might get, but it's probably a pretty good measure. Listed below are the pesticides I have tested, how they were generally rated, and in parenthesis, the number of years the pesticide was rated. Obviously, the more years it was tested, the more reliable the results.

Summer oils	Fair (1)
Surround	Good (1)
SpinTor	Poor (3)
Avaunt	Poor (3)
Danitol	Good (1)
Fulfill	Poor (1)
Actara	Poor (1)

As you can see, at this point there are no reasonable alternatives to the OP insecticides (Imidan and Guthion) that will consistently provide the levels of plum curculio control necessary to produce marketable fruit. We will continue to look for alternatives. (Foster)

Codling Moths: One way to improve your control of codling moths is by timing your sprays using

pheromone trap catches and degree-days. This is especially important if you are using some of the insect growth regulators such as Confirm or Intrepid.

The first thing you should determine is your biofix. Biofix is defined as the first sustained catch of moths, which we have established as when 5 moths have been caught in a pheromone trap. Knowing that the moths are flying allows us to predict when the eggs will hatch with more certainty than using calendar date or the stage of growth of the apple trees. The instructions for calculating degree-days follow.

1. Find the high and low temperature (Fahrenheit) for the day.
2. Add the high and low temperatures together and divide by 2 to get the average temperature for the day.
3. Subtract 50 from the average daily temperature to get the day's degree-days. Codling moths don't develop below 50 F, so we are only interested in temperatures above their developmental threshold.
4. Add the day's degree-days to the previous total to get the updated accumulated degree-days. (On the first day you will be adding to zero.)

When you have accumulated 250 degree-days, it is time to spray. The eggs will have developed to the point where they are almost ready to hatch, so if you put on a spray at this time, you will have the maximum amount of residue present to control the young larvae before they enter the fruit.

Using the same evaluation criteria as in the plum curculio article above, I have summarized the results of my trails looking for alternatives to the OPs for codling moth control.

Summer oils	Fair (1)
Surround	Poor (1)
SpinTor	Excellent (4)
Avaunt	Good (3)
Danitol	Very Good (2)
Confirm	Very Good (2)
Intrepid	Very Good (2)
Esteem	Very Good (3)

You can see that we have a lot more possibilities for control of codling moth than we do for plum curculio. If you would like to consider trying one of these alternatives, please give me a call and I will provide you with more details about how to

use the product. (Foster)

Food Quality Protection Act: By now most of you probably react to seeing the FQPA title by saying something to the effect “Which pesticide did we lose now?” Well, the good news is that we haven’t lost any new pesticides. The bad news is that in June the EPA issues its decisions of its cumulative risk assessment for the organophosphate insecticides. So far, they have looked at the risk associated with each insecticide separately. Now, they are looking at the cumulative risk of all the organophosphate insecticides. If you remember the concept of the risk cup, you know that when the risks associated with the use of a product overflow the risk cup, then action is taken to reduce the risk so that it will fit into the cup. Some of the actions taken so far have included fewer applications, greater preharvest intervals, requiring use of enclosed cabs on sprayers, elimination of some uses, etc. Because all the organophosphate insecticides have similar modes of action, the risk associated with all the OPs will be poured into the same cup. If the cup overflows (as it almost surely will), then actions will have to be taken to reduce the risk so that it fits in the cup. Which actions the manufacturers and EPA agree to or the EPA mandates is what is important to fruit growers. Specifically, most fruit growers will be concerned about further restrictions on the use of Imidan and Guthion. We will let you know as soon as we hear something. In addition, decisions regarding the future of dimethoate (Cygon) and endosulfan (Thiodan) will likely be made by August. (Foster)

Grape Pest May be Headed to Cluster’s Last Stand: (By Steve Leer from *AgAnswers* May 3, 2002 <http://www.aganswers.net>) Two nematode species, one native to Ohio, have been found to successfully control grape root borer, an insect pest responsible for major economic losses to the grape industry. In fact, the entomopathogenic nematodes are such effective biological controls that a product may be available for grower use as early as next year. “Farmers really have no control methods for the grape root borer larva, and that is the most destructive phase of the insect,” said Parwinder Grewal, an Ohio State University Extension entomologist with the Ohio Agricultural Research and Development Center. “We are very excited that there is a potential biological control that can be offered to farmers.”

Research conducted by Grewal and associates Roger Williams and Dan Fickle found that the Ohio nematode *Heterohabditis bacteriophora* and the New Zealand strain *Heterohabditis zealandica* produced 92 percent and 86 percent control of grape root borer, respectively, in lab studies. The researchers duplicated field conditions in the greenhouse and found that the Ohio species produced 16 percent control upon applications of 15,000 juveniles per grape plant, while the New Zealand species produced as much as 93 percent control when 60,000 juveniles were applied per grape plant.

Grewal believes the higher the number of nematodes per application, the more effective the control. “We took the New Zealand strain into the field and applied 2 billion nematodes per acre and tests showed over 70 percent control of the insect in a single application,” Grewal said. “Nematodes are easy to come by and recycle very easily. A single host can produce 300,000 to 400,000 new nematodes, which can then move on to the next victim. So control would continue for quite some time after the first application.”

The beauty behind the species’ effectiveness lies in its foraging behavior. The nematodes are known as “cruisers,” so named for their habit of seeking out their hosts by following the chemical trails the insects leave behind. Once the nematodes find their hosts, they enter the blood stream through a variety of natural body openings, releasing bacteria that multiply and kill the host in three to four days. The nematodes then feed on the dead host, reproduce and migrate in search of additional hosts.

“Over the last 20 years or so, scientists have tried to control the grape root borer with nematodes, but have done so unsuccessfully,” Grewal said. “We then began discovering that different species have different kinds of foraging behavior, so one nematode species may not be as effective in controlling the pest as another.” For example, “cruisers” exhibit different forage behaviors than “ambushers” — species that sit on the soil surface and wait for highly mobile hosts to pass by. “An ambusher released to kill an insect like the grape root borer, which tunnels its way into vine roots and remains hidden, is just a poor match,” Grewal said.

The researchers re-evaluated 17 nematode species with “cruiser” behavior and found that the Ohio and New Zealand strains were the most effective against the grape root borer. The New Zealand

species has been found in Florida, eliminating any restrictions required to commercialize the species. The grape root borer is a major pest of grapes in the eastern United States. Found in states south of Connecticut and east of Kansas, including Ohio, a single larva feeding on a root system can reduce a plant's yield by 50 percent. Two or three larvae within a root system can destroy an entire vine, affecting winter hardiness, fruit quality and yield. Effective control of the grape root borer is difficult. The adults, which fly onto plants beginning in June, can be controlled with insecticide applications. However, once the larvae hatch and reach the root system, external control is ineffective. That is where the entomopathogenic nematodes may provide the best control option, Grewal said. "Nematodes are already used in some food production, such as mushrooms and cranberries," he said. "Florida applies nematodes to 50,000 acres of oranges each year to help control the citrus root weevil. "The same thing can be applied to grapes. Grapes provide the next potentially big opportunity for the use of nematodes. They can replace systemic insecticides and increase food safety." Ohio ranks eighth among U.S. states in grape production, sixth in wine production and fourth in the number of wineries. According to the 2000 Ohio Agricultural Statistics annual report, Ohio harvested 2,000 acres of grapes. Yield per acre approached nearly 4 tons, with a production value of more than \$2.5 million. Wine production is a \$45 million annual industry in the state, with prominent wine areas located in the Lake Erie region, Ohio River Valley and central Ohio.

Count Your Blessings: Recent reports from Fruit News (www.fruitgrowersnews.com) tell of severe crop losses in our neighbor to the North. According to the stories, a combination of high temperatures followed by a killer frost may have all but wiped out juice grapes in Southwest Michigan. Growers expect losses ranging from 75-95%, according to Mark Longstroth, district Extension horticulture and marketing agent.

During the week of April 15-19 temperatures rose to over 90 degrees F with lows in the 60s at night. This was followed by a cold weekend and temperatures dipping to as low as 18 degrees F on April 23. Longstroth predicts that a grape grower with 200 acres may only have 20 acres with grapes this year. Growers told Longstroth that the frost was as bad as in 1976. Grapes on higher elevations fared better

than those at lower elevations.

Longstroth said growers will have to make a decision in the next month on whether to spray or not. "An awful lot of them will just walk away," said Longstroth, about the nearly 400 grape growers in Van Buren and Berrien counties in Southwest Michigan. He said yields of less than one ton per acre may not be worth harvesting. Growers of wine grapes in Southwest Michigan expect losses of up to 50%, according to Longstroth.

Growers and Extension staff will be examining the emerging secondary buds on the grape vines, which have the potential for fruit. This devastating crop loss come on the heels of a loss of 30,000-40,000 tons of grapes last year. Because of last year's low crop growers were expecting a good year this season. Some growers reported they are applying for Michigan's zero interest loan program because of last year's crop loss, but naturally loans are based on the ability to repay.

Sweet cherries were also affected. Annette Bjorge from Fruit Acres in Coloma, Mich. estimated they lost about half of their sweet cherries and had losses of peaches and apples as well.

In addition to the damage in Southwest Michigan, warm weather followed by wind freeze and days of inversion frost have caused severe bud damage on tart cherry trees in Northwest Michigan. The six effected counties in Northwest Michigan produce nearly one-half of the nation's tart cherry crop.

Jim Nugent, coordinator at the Northwest Horticultural Research Station in Traverse City, said that the series of weather events could cause one of the shortest tart cherry crops in recent memory. He said the shortest crop since the mid 1940s occurred in 1981 when there was a wind freeze. Nugent said the wind freeze affects higher elevation while the more typical inversion frosts affects lower elevations. "Wind freezes are very unusual," said Nugent.

Warm weather with temperature in the 80s was followed by cold wind and snow on April 21. The cold wind was followed by four nights of inversion frost with temperatures in the 20s. Nugent was hesitant to predict the extent of the damage abut noted that a short crop could help prices. He said the tart cherry trees went into winter in a very stressed state because of a huge crop last year and a severe drought, making them less tolerant to temperature fluctuations, wind and frost.

While we've had some frost damage on

fruit crops in Indiana, the amount of damage is relatively minor. Peaches in some areas have sustained enough damage that a full crop is unlikely. (Bordelon)

Juice HACCP Workshop: Last month I mentioned an upcoming HACCP workshop for juice and cider producers. Again, the dates for this are July 17-19, 2002 at the Holiday Inn at the Pyramids in Indianapolis. Brochures are available from me or at <http://www.foodsci.purdue.edu/outreach/haccpcider/02brochure.pdf>

This workshop is limited to the first 60 people who register, and this is probably the only time this workshop will be taught in Indiana. The registration fee is \$125, which covers all workshop materials and some meals. The registration deadline is July 1, 2002. (Hirst)

Now is the Time for Apogee: If you have trees that are overly vigorous, Apogee is a material you should consider using. Apogee is a relatively new material from BASF that reduces shoot growth, by blocking the synthesis of growth promoting gibberellins in the tree. The benefits of using Apogee include reduced shoot growth, less time required for pruning, better light penetration in the tree resulting in redder and larger fruit, and improved spray coverage. Trees treated with Apogee are also less susceptible to fireblight since there is less new succulent shoot growth. Apogee has no effect on blossom blight, is not a rescue treatment and has no effect on fireblight once trees have been infected, so it is not a replacement for streptomycin.

OK, so how do you use it? Applications of Apogee must be made early – early as in about now! Apply when new shoots are 1-3 inches long. Later applications have less effect. You should start seeing the effects in about 10 days or so. The higher 12 oz rate has been very effective and generally holds the growth for about 4-6 weeks. Trees will grow out of the effects of lower rates quicker than if higher rates are used. If trees are extremely vigorous, 2-3 applications may be needed. There are 2 approaches to making multiple applications. The first is to apply the first application at about 1” of shoot growth then again 2 weeks later. Another approach is to apply the first spray, then monitor the block closely and when the first shoots show signs of regrowing, then apply the second spray. If just the tops of the trees

are too vigorous, directed applications can be made by shutting off the lower nozzles of your sprayer to direct the spray just to the tops of the trees.

Apogee is compatible with most commonly used pesticides, but any calcium included in the spray tank will result in reduced effectiveness of the Apogee. Therefore don't tank mix it with calcium sprays, and also check the hardness of the water. If you have hard water (calcium in the water) then incorporate spray grade ammonium sulfate in the water (see the Apogee label for rates). A non-ionic or organosilicone surfactant should be included. Again, see the label for rates. The preharvest interval (PHI) is 45 days prior to harvest and the restricted entry interval (REI) is 12 hours. One word of caution regarding the use of Apogee. Apogee reduces shoot growth and usually results in increased fruit set. Therefore you may want to adjust your thinning program to remove more fruit. (Hirst)

Farm Bill Delivers Apple Assistance, Origin

Labeling: (from fruitgrowersnews.com) April 29, 2002 - House and Senate negotiators agreed April 26 on a version of the Farm Bill that would benefit apple growers to the tune of \$94 million in assistance as part of the final farm bill. Specifically, apple growers will receive \$94 million in direct market loss assistance to offset a portion of the devastating losses suffered during the 2000 apple crop.

“We are extremely appreciative of our industry's allies in the House and Senate for their staunch support of our nation's apple growers,” said U.S. Apple Association (USApple) President and CEO Craig R. Naasz, whose group spearheaded efforts to include the apple assistance provision.

Another top goal for the produce industry - country of origin labeling - will also be included in the next Farm Bill. Produce, fresh meat, fish, and peanuts will be labeled by the country of its origin under an agreement reached by congressional negotiators crafting a new, six-year Farm Bill. For the first two years, labeling would be voluntary - then be mandatory.

Another boon for the produce industry is the increase in federal money to pay for marketing programs used to promote sales of U.S. farm products overseas - a big help in a state like Washington that depends so heavily on agricultural exports. Farm Bill conferees agreed to boost funding for marketing assistance from \$90 million

now to up to \$200 million a year.

A final vote should be before the House and Senate the first week of May. The agreement could still change as final budget calculations are run. But, committee members reported that the major provisions of the Farm Bill would remain intact.

Topsin M Granted Section 18 for Blueberries:

EPA has granted a section 18 Specific Exemption for Topsin-M (thiophanate-methyl) fungicide on blueberries in Indiana (and 6 other states) for the 2002 growing season. Topsin-M is used for the control of mummyberry disease, Botrytis blossom blight, anthracnose fruit rot, Phomopsis twig blight and canker, and Fusicoccum canker. It replaces Benlate (see FFF 2002-1). The supplemental label for the Section 18 exemption has been issued by Ceraxagri, Inc. This supplemental label must be in the possession of the applicator at the time of application. Check with your agricultural chemical dealer, contact Ceraxagri, 630 Freedom Business Center, suite 402, King of Prussia, PA. 19406, the Indiana State Chemist at 765-494-1587, or download a copy from the Midwest Small Fruit and Grape Spray Guide website at www.hort.purdue.edu/hort/ext/sfg under "Recent Updates" link. (Bordelon)

Contact Us Toll Free!!! Beginning immediately, growers with questions for state Extension Specialist can contact us using the new Purdue Extension toll free number: 1-888-EXT-INFO (398-4636). The operator (a real live person!) will direct your call to the appropriate specialist. We ask that you start by contacting your county Extension Educator for help, then if you need our assistance, feel free to call us and save yourself a little money. You can use this same line to order Extension Publications from the Media Distribution Center.

Upcoming Meetings:

May 8 - Eastern Indiana Horticultural Society. Twilight meeting. Grabow Orchard. For directions, see "<http://www.graboworchard.com>" <http://www.graboworchard.com> For other information, call Dave Clamme, 765-747-7732

May 14 - LaPorte fruitgrowers twilight meeting. 6.30 pm Garwood Orchard. For directions, see <http://www.garwoodorchard.com> For other information, call Walt Sell, 219-326-6808 ext 271

June 4 - Eastern Indiana Horticultural Society. Grabow Orchard and Farm market. The location of the orchard and market is in Madison County on State Road 13, one mile north of I-69 and State Road 13 junction. See <http://www.graboworchard.com> For more information, call Dave Clamme, 765-747-7732

June 11 - Blueberry Growers of Indiana Spring Meeting and Farm Tour. Blueberry Dune Farm, LaPorte. 4:00 PM Farm tour, 5:00 PM Potluck dinner (bring a dish to share), 6:00 PM BGIN business meeting, 6:30 PM MBG business meeting. Blueberry Dune Farm in on State Road 39 1 mile south of I-94 on the west side. For more information call Don Kepler 219-362-3393 or Melvin VanKley, BGIN Pres. 219-956-3687.

July 17-19 - July 17-19. Workshop on developing and implementing HACCP for Juice and Cider Industries. Holiday Inn at the Pyramids, Indianapolis. For a brochure and program see <http://www.foodsci.purdue.edu/outreach/haccpcider/02brochure.pdf> or call Peter Hirst for a copy of the program.

Department of Horticulture &
Landscape Architecture
Purdue University
1165 Horticulture Bldg.
West Lafayette, IN 47907-1165

Bruce Bordelon
1165 Dept. of Horticulture &
Landscape Architecture
Purdue University
West Lafayette, IN 47907-1165
765/494-1301
e-mail: bordelon@hort.purdue.edu

Paul Pecknold
1155 Dept. of Botany & Plant Path.
Purdue University
West Lafayette, IN 47907-1155
765/494-4628
e-mail: Pecknold@btny.purdue.edu

Peter Hirst
1165 Dept. of Horticulture &
Landscape Architecture
Purdue University
West Lafayette, IN 47907-1165
765/494-1323
e-mail: hirst@hort.purdue.edu

Rick Foster
1158 Dept. of Entomology
Purdue University
West Lafayette, IN 47907-1158
765/494-9572
e-mail: Rick_Foster@entm.purdue.edu

Disclaimer: Reference to products in this publication is not an endorsement to the exclusion of others that may be similar. Any person using products listed in this newsletter assumes full responsibility for their use in accordance with current label directions of the manufacturer.

It is the policy of Purdue University that all persons shall have equal opportunity and access to its programs and facilities without regard to race, color, sex, religion, national origin, age, marital status, parental status, sexual orientation, or disability. Purdue University is an Affirmative Action employer. This material may be available in alternative forms.