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CROP CONDITIONS

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Crop Conditions: Warm sunny weather across the state over the past several days has increased plant development considerably. It looks like we're about one week ahead of normal on most crops. Apples are just past petal fall in southern areas of the state, while full bloom is underway in more northern areas. Peaches are at shuck split in the south, but it's hard to assess the stage of growth in central and northern areas (there are no peaches!). Early grape cultivars have 3 to 6 inch shoots in southern areas and 1-2 inch shoots north. Raspberries and blackberries should bloom soon in the south. Blueberries are at bloom in the north central region.

Weather Update: La Nina and Omega Blocks.... there's more to weather than you may want to know. We are still experiencing the effects of a mild La Nina and can expect big temperature shifts to continue according to Tom Priddy, University of Kentucky Climatologist. However, the recent string of warm sunny days was due to an Omega block which occurs when troughs of low pressure in the upper atmosphere develop over the east and west coasts and high pressure ridging settles over the central U.S. Warm, dry air surges northward through the central U.S. An Omega block is very stable and once established can last for several days. The 6 to 10 day forecast calls for normal temperature and above normal precipitation. The outlook for May calls for normal temperature and above normal precipitation, and the long range forecast for May-July calls for normal temperature and above normal precipitation.

Extension Director Search at Purdue University: As many of you may know, Dr. Hank Wadsworth, Director of Cooperative Extension Service at Purdue, has announced he will retire in June this year. The search for a new director is actively underway and four very good candidates have interviewed. Dean Lechtenberg should have something to announce in a few weeks.

State Budget Includes Funding for Purdue Cooperative Extension Service: The State Legislature passed a budget that included \$2.8M support for the Cooperative Extension Service for each year of the biennium. That is great news for CES. It will become part of the base for future biennia and it will allow CES to immediately recruit positions that have been held vacant for the last year.

Director Hank Wadsworth extends his thanks to all of you for your help in supporting this important legislation. We know that many of you talked to your Legislators about it and we want to thank you for your efforts. We also urge you to make sure the members of the Legislature are appropriately thanked. Please express our appreciation to your Representative and Senator.

Apple Scab: As I look out the window and see the rain coming down, with the temperature at 65° F, my reflections go to apple scab. At these temperatures it will take only 9 hours for a light infection or 18 hours for a heavy infection; and to make you feel even better, the new scab infection tables indicate infection can take place in as little as 6 hours at 65° F. In addition, the period when the number of ascospores reach their peak is generally pink through bloom. Hopefully all growers are covered with a good protectant or plan to spray at the first opportunity with Nova, Rubigan or Procure. - Pecknold

Nova, Procure & Rubigan Resistance: Speaking of Nova, Rubigan and Procure. At a recent meeting a number of commercial apple growers indicated they have been using sterol inhibiting (SI) fungicides (Nova, Procure and Rubigan) for 6 years... or more. Don't panic, but... 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. The researchers, Drs. Koller and Wilcox, ask the question: "Where do we stand right now on SI resistance to registered SI fungicides in New

York apple orchards?" Their answer is as follows:

- SI resistance has increased in New York over the past 10 years, but in most orchards, resistance remains at a low and manageable level. In the vast majority of commercial orchards, SIs will remain effective if they are used carefully according to the "rules."
- The first rule. 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.
- The second rule: Mix the SIs with a protectant.
- The third rule: Do not use SIs in a "delayed" program (i.e. the four spray program as described on page 11 of ID-168, "1999 Indiana Commercial Tree Fruit Spray Guide"). This program was developed under "baseline" conditions and used one of the very potent SI fungicides (Nustar). Earlier, yet timely, spraying has once again become more important because many of our New York orchards are not at "baseline" sensitivities. In addition, there will be very few "low inoculum" orchards in 1999 after the difficult scab year of 1998.

Again, don't panic, the results of the above research are even "kind of good". The researchers did not find wide spread occurrence of high levels of SI resistance. However, they do make the point that judicious use of SI fungicides is becoming even more important the longer we continue to use them. -*Pecknold*

Peach Scab: Just in case there are growers out there with peaches.....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, "1999 Indiana Commercial Tree Fruit Spray Guide", for further information. -*Pecknold*

Early Season Grape Disease Control: The most important time of the season for disease control in grapes during the early growth stages, from early shoot growth through two weeks post bloom. The major diseases of concern are black rot, Phomopsis cane and leaf spot, downy mildew, and powdery mildew. These pathogens overwinter on grapevines and vineyard debris and become active during this time. Spores produced from these overwintering structures are the 'primary inoculum' for the new season. If these primary spores cause infections on the new growth, secondary spores can be produced throughout the growing season, causing a high level of disease pressure whenever environmental conditions are conducive. When vines are protected from primary infections by a good spray program during the early season, or if

weather conditions are unfavorable for infection, the overwintering inoculum will be expended, no secondary spores will be produced, and there will be much less disease pressure during the remainder of the season. The basic rule is: It is much easier to prevent a disease outbreak than to stop one in progress.

There are many factors to consider when deciding on a spray strategy, including weather conditions, disease history of the vineyard, varietal susceptibility, canopy vigor, and so on. There are two main strategies growers can consider. The first uses the plant growth stage and calendar to determine when and what to spray. The second strategy, called post infection spraying, has come about with the advent of newer fungicides, called Sterol Inhibitors (SIs), that have the ability to 'cure' an infection after an infection period has occurred, but before symptoms develop. Applications are timed based on weather related events. Weather must be monitored closely and sprays applied in response to specific conditions that signal an infection period. Post infection programs generally lead to a reduction in the number of sprays applied, but increase the level of management necessary.

In the calendar strategy growers should start disease control measures once new growth reaches the 1 to 3 inch stage and continue those measures at 7 to 10 day intervals through two weeks past bloom. The interval should be relatively short during periods of rapid shoot growth and wet weather to keep the new growth protected. The period from budbreak through bloom usually lasts about 4 to 6 weeks, depending on the weather, so 3 to 6 sprays may be required during this time. The early season disease control program should include a broad spectrum protectant EBDC fungicide such as mancozeb (Dithane, Penncozeb, etc.) combined one of the sterol inhibitor (SI) fungicides (Nova, Bayleton, Rubigan, Procure). Mancozeb provides good protection against black rot, Phomopsis and downy mildew, but no protection against powdery mildew. SIs provide excellent control of powdery mildew and, in most cases black rot. (Rubigan and Procure are not as effective as the others on black rot.) Mancozeb is a broad spectrum fungicide that will provide protection for at least 7 days. It must be on all susceptible plant parts before infections occur. The SIs are systemic, protectant, and curative fungicides that give good protection against infection for up to 14 days. Since the SIs provide 14 days of protection, they can be used in every other spray if applying on a 7-day schedule.

In a post infection program, sprays are timed according to the occurrence of an infection period. An infection period for powdery mildew occurs when 0.1 inch or more of rainfall occurs and the temperatures are equal to or above 50°F. Infection periods for black rot are determined by the number of hours of leaf wetness at various temperatures. See the 'Spott's Chart' on page 9 of the 1999 Indiana Small Fruit & Grape Spray Guide. In short, approximately nine hours of leaf wetness are required for infection to occur at temperatures between 60°F and 85°F. Once an infection period for either black rot or powdery mildew has occurred, an

application of SI fungicide must be made within 72 hours after the start of the infection period. The higher labeled rates of Nova (4-5 oz/A) or Bayleton (at least 4 oz/A) should be used to insure control. The first application provides 14 days of protection. There is no need to respond to another infection period during that time. However, once the 14 days is up, weather monitoring begins again and an application is made when the next infection period occurs. In order to follow a post infection program, growers must have the ability and dedication to accurately measure rainfall, leaf wetness, and maximum and minimum temperatures daily. Computerized field stations are available. One problem with the post-infection program is that it is aimed at powdery mildew and black rot so other diseases, such as Phomopsis cane and leaf spot and downy mildew may become a problem. Phomopsis and downy mildew are NOT controlled by the SIs, and the 14 day interval used is too long for protectant fungicides.

Lots of information is available to growers on disease control in grapes. ID-169, the 1999 Indiana Small Fruit & Grape Spray Guide has recommendations for the standard calendar approach to grape disease and insect control, as well as comments on post infection programs and specific diseases. (<http://www.hort.purdue.edu/hort/ext/sfg/>) The Midwest Small Fruit Pest Management Handbook has a thorough discussion of IPM strategies for grape diseases and insects. (<http://www.ag.ohio-state.edu/~sfgnet/>). Another good source of information is the manual Grape IPM in the Northeast (NYSIPM No. 211) which contains complete descriptions of post infection and traditional approaches to disease and insect control and information on weather monitoring equipment. (<http://www.nysaes.cornell.edu/ipmnet/ny/fruits/index.html>). All of these are available on the web. -Bordelon

Codling Moths: In Lafayette, the first catch of codling moths was made on April 30 and biofix was reached on May 3. Remember that 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. I will now start to accumulate heat units to estimate when the first eggs should begin to hatch and, therefore, when I should apply my first insecticide spray for codling moth control. See the April 21 issue of Facts for Fancy Fruit for instructions on calculation of heat units for codling moths. -Foster

European Red Mites: Shortly after petal fall, growers should begin looking for European red mites in those block of trees that were not treated with Apollo or Savey. Initially, sampling does not need to be very intensive. Just look at the underside of leaves in areas where you would normally expect to see your worst mite problems, such as in Red Delicious blocks. Using a 10X hand lens will make the mites a lot easier to see. Until you start to see a fair number of mites, there is no point in counting mites on a large number of leaves. However, there is a lot of tree to tree variation, so look at leaves from several trees. After mite populations start

to build up, I recommend counting mites on 4 leaves from each of 5 trees per block. This will take you about 10-15 minutes. When you consider the cost of miticides (around \$60 per acre), and that by sampling you may find that you don't need to spray, think about where else you can earn \$240 per hour.

We usually use thresholds of 2.5 mites per leaf in early season, 5 mites per leaf in mid season, and 7.5 mites per leaf in late season. These thresholds are suitable for miticides such as Pyramite that kill adult and immature mites. Because Apollo only kills the eggs, these thresholds may need to be adjusted when Apollo is used later in the season than in the past. I will be investigating this idea this summer and will report the results as soon as possible. However, for now I would recommend using these same thresholds for Apollo. -Foster

Plum Curculio: The warm, sunny weather we've had for the last five days has been perfect to get the plum curculios moving. It is likely that they are moving into your orchards right now. An application of one of our organophosphate insecticides (Guthion, Imidan, Lorsban) at petal fall and first cover should take care of the problem. When temperatures are cool during bloom, it is sometimes necessary to control them at second cover, but that should not be a problem this year. -Foster

Pollination, Fruit Set and Thinning: Although we had a lot of rain and cloudy weather over the last few weeks, the weather over the last week or so has been excellent. For many in the state, the nice weather has coincided well with full bloom of apples, so it's likely that we'll have good fruit set in most places. We all know that sunny weather is good for promoting bee flight and pollination, but that's only half the battle. The other half is turning good pollination into good fertilization and fruit set. Apples require cross pollination. Suitable pollen may come from virtually any apple that blooms at the same time within a mile or so radius. Most varieties will pollinate most others, except triploids do not provide pollen that will get the job done. Also, parent varieties usually are not very compatible with their siblings (for example, Golden Delicious on Gala). Many crabs make excellent pollinizers. Once the pollinator (bees in most cases) transfers the pollen to the stigma of our variety, the pollen tube must reach the ovary while it is still viable in order for fertilization and seed set to occur. Pollen tube growth is much faster in warmer conditions, so this warm weather helps not only with bee flight, but also with pollen tube growth.

Since we're expecting heavy fruit set, this may be the year to get a little more aggressive with your chemical thinning. Take a look at what you did over the last few years and how well it worked for you. This is the best basis to determine what to do on your farm this year – each farm is different and selecting a chemical thinning strategy is not a “one size fits all” proposition. Remember, early thinning gives the best results, both in terms of fruit size and return bloom. Early thinning is also the most risky, because we could have a frost after

thinning is done. Each one of you must balance the risk versus the return, and this balance is going to be different for everyone. –*Hirst*

The Small Hive Beetle: A new pest of the honey bee called the small hive beetle, *Aethina tumida*, was found in Florida last year and caused extensive damage to bee hives. Thousands of hives were destroyed. This pest has also been found in Georgia, South Carolina and North Carolina. Recently, the beetle also showed up in some packages of bees that were shipped to Ohio. There is a good chance that some of these beetles could be introduced to Indiana this year.

We don't know how these beetles will survive in Indiana. They are used to warm weather because they come from South Africa. It seems they were present in South Carolina for two years before they were found in Florida without causing any serious problems. The adult beetle is small - about half a centimeter long. The adults and larvae eat bee brood and honey. They spoil the honey for the bees and they can quickly ruin the hive for the bees, at least in Florida. Beekeepers receiving packages of bees this spring should be on the lookout for beetles in their hives. But be aware that many non-harmful beetles are often present in hives. Indiana has just received permission under EPA section 18 to use Coumaphos to control this beetle and also varroa mites.

The Coumaphos can be bought from Mann Lake company in the form of Checkmite Strips. They look like the Apistan strips that are used for controlling varroa mites, but contain a different pesticide. But at this point, we cannot recommend that beekeepers buy these strips unless they have a problem with small hive beetles or varroa mites that are resistant to the compound in Apistan strips. Neither small hive beetles or Apistan-resistant varroa have been found in Indiana. Beekeepers should use special care when handling and using the Checkmite strips because they contain an organophosphate pesticide which is a nerve toxin. The EPA says they will have a zero tolerance for Coumaphos in honey. Never leave honey supers on hives when using either Checkmite or Apistan strips. –*Greg Hunt, Bee Specialist*

Young Tree Care: If you planted trees this spring, don't forget about them. It's no good just keeping these trees alive – what we're trying to achieve is maximum growth. Aspects to especially watch on young trees are making sure they have enough water, and ensuring good weed control around the trees. If you planted trees on a dwarfing rootstock, they need support and the earlier you provide it the better. Also, keep in mind that the more you prune a young tree, the more you will delay fruiting. Minimal pruning in the early years is the key to early fruiting. –*Hirst*

IHS Summer Meeting: The summer meeting of the Indiana Horticultural Society will be held on June 29-30 this year. Dave and Bonnie McAfee, County Line Orchard in Hobart IN, have graciously agreed to host the meeting this year. It will begin with a dinner and

round table discussion at 6:00 pm on Tuesday, June 29 to be followed by a farm tour and presentations on Wednesday, June 30. This will be a great opportunity for us to see first hand the energetic and creative marketing that the McAfee's are famous for. More details will follow later, but write the dates on your calendar now.



Subscribing electronically: To subscribe (or unsubscribe) to Facts for Fancy Fruit, send a message to fff@lists.hort.purdue.edu with the subject or body "subscribe" (or "unsubscribe"). You can also use the form at the web site <http://www.hort.purdue.edu/fff/maillinglist.html> to submit your subscription. Electronic access is free of charge.

Coming Meetings:

May 12 – Twilight Orchard Meeting, Ohline Orchard, Allen County, 6:00 pm. Contact Rocky Kemery at 219-481-6826

June 8 - East Central Indiana Fruit Growers Twilight Orchard Tour. Located yet to be determined. Contact Harold Brown at 765-747-7732.

June 10 – Blueberry Growers of Indiana Summer meeting. Luedtke's Blueberries, 725 East 1400 North, Wheatfield. Contact Melvin Vankley at 219-956-3687.

June 27 – Indiana Winegrower's Guild Summer meeting, Huber Orchard & Winery, Starlight, IN. Contact Bruce Bordelon at 765-494-8212.

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