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CROP CONDITIONS

FFF 99-04
 Apr21, 1999

Plentiful rainfall and cool weather across the state over the past several days has slowed plant development considerably. Though a hard freeze was predicted, temperatures did not get low enough to cause any damage to fruit crops. Apples are at pink in southern areas and tight cluster in the north. Peaches are in full bloom in the south and peach bloom looks excellent. Peach bloom is still 1-2 weeks away in more northern parts of the state. Early grape cultivars are at budbreak in southern areas and at full swell to budbreak north. Raspberries and blackberries have 2-4 inch shoots in the south. Winter injury is fairly prevalent on blackberries in central and northern areas.

Weather Update: 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. The 6 to 10 day forecast calls for below normal temperature and above normal precipitation. The outlook for April calls for below normal temperature and normal precipitation, and the long range forecast for April-June calls for normal temperature and above normal precipitation.

Extension Director Search at Purdue University: As many of you may know, Dr. Hank Wadsworth, Extension director at Purdue, has announced he will retire in June this year. We have been active in searching for a new director and 4 candidates have been identified. We are currently in the process of conducting interviews and hope to have something to announce in a few weeks time.

Fire Blight: Do not become complacent about fire blight! Even though fire blight has been at a low level the past few years you never want to let your guard down, or you could get hurt! The best prevention for fire blight is the application of streptomycin during bloom. Apply streptomycin just as blossoms begin opening and repeat every 3-4 days if weather favorable for blossom blight infection persists. Be especially diligent in your fire blight program if you have M-26, M-9 and/or Mark rootstocks and/or interstems. Due to their high susceptibility, fire blight prevention is mandatory in orchards containing these rootstocks. The "MARYBLYT" computer software program will help you in determining when and if an infection event occurred as well as predict the risk for future infection periods. If you are interested in obtaining MARYBLYT contact Gempler's at 1- 800 - 382 - 8473. - *Pecknold*

Apple Scab: The peak period for scab infection is now! Primary scab spores are ripe and ready to infect, all they need is a good scab rain. Are you prepared? For growers on a curative schedule, or for those who get caught with their pants down (unprotected), we suggest either Rubigan or

Nova. Both fungicides will provide up to 96 hours "curative activity". However, the sooner you apply these fungicides the better! Do not sit around thinking there is no need to rush - apply Rubigan or Nova as soon as possible after an infection period. - *Pecknold*

Rust Diseases: Cedar apple and cedar quince rust are now actively infecting foliage and fruit. The cedar apple galls look especially impressive this year! Except for the northern areas of the state we are now into the peak period for rust infection. We don't want to become a broken record...but, the sterol-inhibiting fungicides are excellent in preventing rust problems; as well as providing excellent control of powdery mildew...which is also infecting new leaf tissue, right now! - *Pecknold*

Nova, Rubigan & Tank Mixes: All Nova or Rubigan applications should be tank-mixed with a standard protectant fungicide to avoid problems with resistance to apple scab. However, it is especially important that your final spray (petal fall or first cover) of Nova or Rubigan be combined with a protectant fungicide such as captan, ziram, mancozeb, or Polyram. The addition of a protectant fungicide at this time will help provide protection from summer diseases such as black rot, sooty blotch and fly speck and also give added protection from fruit scab. Refer to Rubigan and Nova labels for additional information on tank mixes. - *Pecknold*

Strawberries and Botrytis Fruit Rot: The most important sprays for control of Botrytis fruit rot of strawberry are those applied at bloom - starting at 10% bloom! NOTE: while Rovral and Ronilan are excellent fungicides for control of Botrytis, resistance to these fungicides is a very real problem if they are used too often... follow label directions on frequency of spray applications. See ID-169, "1999 Indiana Commercial Small Fruit & Grape Spray Guide", for further information. - *Pecknold*

Strawberry Frost Protection: Strawberries will be in bloom in southern and central areas over the next couple of weeks. Sprinkler irrigation equipment for frost protection should be

set up, tested, and ready to go. Once flowers open they are susceptible to temperatures below 30°F. Application of water through overhead irrigation can prevent temperatures from dropping below 30°F even though the air temperatures may drop to 25°F or colder. The principle behind this method of frost protection is that as water freezes, heat is released. As long as an adequate layer of freezing water covers the bud or berry, the temperature will remain at or near the freezing point. It is important to remember that a layer of freezing water must be present at all times. Ice without the continued application of This means that the rate of application of water must be carefully monitored. The rate at which water freezes is dependent on several environmental factors, including air temperature, humidity, and wind speed. Generally, the lower the air and dew point temperature, and/or higher the wind speed, the greater the rate of freezing. Application rates for frost protection are fairly low compared to normal overhead irrigation rates. Most growers install a smaller set of nozzles in the sprinkler head specifically for frost protection. The correct rate of irrigation can be determined from the following table.

Air temperature at canopy level (°F)	Wind speed		
	0-1 mph	2-4 mph	5-8 mph
At 50% relative humidity			
27	0.10 inches	0.20	0.30
	per hour		
24	0.10	0.30	0.35
20	0.15	0.35	0.45
At 75% relative humidity			
27	0.05	0.10	0.20
24	0.10	0.20	0.30
20	0.10	0.25	0.40

Irrigation should be started before damaging temperatures occur. Start irrigation when the temperature in the lowest part of the planting reaches 34-32°F at canopy level. Continue irrigation until ice begins to melt after sunrise. Irrigation can be very effective for frost protection, but it can also create problems such as excessively wet soils, nutrient leaching, and fruit rots. Misuse of irrigation for frost protection can cause more harm than good. -Bordelon

Excellent Strawberry Publication: The *Strawberry Production Guide for the Northeast, Midwest, and Eastern Canada* is available from the Northeast Regional Agricultural Engineering Service (NRAES). The guide, published in 1998, is a comprehensive, up-to-date resource for both novice and experienced growers in northeastern North America. It contains 178 pages, 115 color photos, 37 illustrations, 47 tables, and adjustable budget spreadsheets on diskette for Macintosh or IBM Compatible computers. The publication is the latest in the highly acclaimed series from NRAES that include the *Bramble Production Guide* (NRAES-35) and *Highbush Blueberry Production Guide* (NRAES-55). The cost is \$45.00 plus postage and handling. Quantity discounts are available. It can be ordered from NRAES, Cooperative Extension, 152 Riley-Robb Hall, Ithaca, NY 14853-5701. Phone: (607)255-7654, Fax (607)254-8770, E-mail NRAES@cornell.edu, Web site <http://rcwpsun.cas.psu.edu/NRAES>. - Bordelon

Herbicide Drift: Ah, it's Spring! The smell of fresh mown grass, freshly tilled soil, flowers, and... herbicides. Each year herbicide drift causes serious problems for growers of fruits, vegetables, nursery, and row crops in Indiana. With the planting season approaching, we are likely to have several cases of herbicide drift over the next few weeks. The number of reported cases has not decreased over the past few years despite efforts by the Indiana State Chemist Office and Purdue Cooperative Extension Service to educate applicators. ISCO plans to increase enforcement and penalties in an effort to reduce the problem. Nevertheless, herbicide drift problems will occur because people get in

a hurry and get careless. Some people might say... Drift Happens! Unfortunately when it happens to you, it's not funny.

What can you do to avoid problems caused by herbicide drift? Start by contacting your neighbors and educating them to the potential damage of herbicide misapplication. The most likely herbicide to cause off target damage is 2,4-D, especially ester formulations. Dicamba and clomazone also have potential for serious off-target damage. No reasonable person would knowingly misapply a herbicide in such a way as to cause damage to neighboring crops. A little diplomatic discussion now may help avoid thousands of dollars in damages, lawyer fees, and court expenses, not to mention the frustration and hard feelings that can result from civil litigation. Despite your best efforts, if you grow sensitive crops like grapes, raspberries, or tomatoes, it's likely that at one time or another you will suffer damages from herbicide drift. What should you do if you believe that your crops have been injured by herbicide drift? Start by contacting your neighbor who had the herbicide applied. Find out as much information about the application as possible. Contact the person or company who made the application. Your goals should be confirm that drift occurred, to have the applicator acknowledge responsibility, and to obtain a settlement.

Your local Extension Educator or campus-based specialist can help confirm that herbicide drift occurred. Samples are usually sent to the Purdue Plant and Pest Diagnostic Clinic for experts to evaluate. Though Extension Specialists can make a diagnosis of herbicide injury, investigators with the Indiana State Chemist Office are the ultimate authority on herbicide drift complaints. If you believe that your neighbor or the applicator is responsible for the drift, but they will not accept responsibility, then your only recourse for recovering money from the crop loss is a civil lawsuit. You should file a formal complaint of herbicide misapplication with the ISCO in order to document the incident. They will send out an investigator to survey the damage and collect samples of your injured crops for chemical analysis. Unfortunately, chemical analysis may not always provide proof of drift. Problems can occur with chemical analysis. Some herbicides have no widely available procedure for their analysis. Other times the analysis may not detect the herbicide because concentrations were below detection limits or compounds in the plant interfere with detection. But if the analysis is positive, it will prove that the herbicide is in your crop.

If you are planning a civil lawsuit, collect as much evidence as possible and contact your lawyer. Sometimes a letter or telephone call from a lawyer can make an applicator or their insurance company assume responsibility. Take as many pictures as possible or video tape the damage and have experts look at the plant samples and visit your farm as soon as possible after the incident. It is far easier to diagnose recent injury than symptoms that are months old. Make sure the experts you rely on for advice are knowledgeable about herbicide injury to your particular crops and unbiased. Experts from the applicator or the herbicide manufacturer usually will not be helpful to building your case. Lastly, expect this process to potentially drag on for several years. - Bordelon

Codling Moth: Codling moths, the proverbial 'worm in the apple', will soon be emerging from overwintering sites and moths will mate and begin laying eggs. Codling moths are one of the primary insects that apple growers must control to produce marketable fruit. The strategy for preventing the newly hatched larvae from entering the fruit is to have a lethal dose of insecticide present when the eggs hatch. Codling moths usually are well controlled by routine cover sprays of broad spectrum organophosphate insecticides such as Imidan or Guthion. However, control can often be improved by using pheromone traps and the accumulation of heat units to better time the application of the insecticide. You may hear the terms heat units and degree days used interchangeably, but I will stick to heat units to avoid confusion.

Pheromone traps baited with codling moth lures should be placed in the orchard at bloom. Place the traps in the southeast quadrant of the tree about six feet off the ground. Do not place traps in the outside rows. Two traps should be used, separated by several hundred feet. Change the pheromone lures every two to three weeks. Traps should be checked daily and catches recorded. When the fifth moth is caught in a trap, start to monitor the accumulation of heat units. If you have more than one trap out, start accumulating heat units when the first trap catches five moths. Insect development is driven mostly by temperature, so we use heat unit accumulations to predict when the eggs will begin to hatch. There are several ways to measure heat units

To monitor the accumulation of heat units, follow these steps daily.

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 heat units. Codling moths don't develop below 50 F, so we are only interested in temperatures above their developmental threshold.
4. Add the day's heat units to the previous total to get the updated accumulated heat units. (On the first day you will be adding to zero.)

When you have accumulated 250 heat units, 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. A second application should be made 10 to 14 days later.

Example: Let's say that you catch the fifth moth in your pheromone trap on May 8. The next day, you check the newspaper, your thermometer, the internet, or whatever you use and find that the high temperature on May 8 was 82 degrees and the low was 64. When you add 82 and 64 together, you get 146 and when you divide that by 2 you get 73. Subtract 50 and you accumulated 23 heat units on May 8. If the high and low on May 9 were 74 and 56, you would accumulate 15 heat units. Adding the heat units from the two days gives you $23 + 15 = 38$. If on May 10, the high was 56 and the low was 42, the average temperature would be 49, so no heat units would be accumulated for that day and your total accumulation would still be 38.

Second generation moths will begin to fly about 30 days after petal fall. Because there are relatively few pests attacking apples at this time, monitoring the second generation may provide the best opportunity for reducing the number of sprays necessary. Be sure to replace your pheromone lures for the second generation. -*Foster*

Insecticide Sprays: From pink until shortly after petal fall, apple growers often have to control some of the insects that are not controlled well by Imidan or Guthion, such as rosy apple aphids and spotted tentiform leafminers. When making those spray decisions, be sure to consider the effect that spray will have on your mite predators. If at all possible, try to avoid using insecticides that are highly toxic to the predators, such as Ambush, Asana, Carzol, Lannate, Pounce, and Vydate. Rosy apple aphids can be controlled with Dimethoate, Lorsban, PennCap-M, Provado, or Thiodan without doing serious harm to the predators. Spotted tentiform leafminer adults can be controlled well with Thiodan and the larvae with Provado. -*Foster*

Label Change for Apollo: AgrEvo USA has announced that the EPA has changed the pre-harvest interval for Apollo on apples to 45 days. Previously, Apollo could not be applied any later than tight cluster, before you knew for sure if you were going to have a mite problem or not. Now, you can wait until later in the season before making the decision to use Apollo. Remember that Apollo kills European red mite and two-spotted spider mite eggs, not the nymphs or adults. If you use it later in the season, don't expect it to kill the mites you see crawling around. An application of Apollo will stop the population from getting any higher, because the eggs won't hatch. The existing population will gradually decrease from the action of predators and natural mortality. This is an important improvement in our ability to use integrated pest management for mites on apples.

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.

Pollination Resource: Apple and blueberry bloom will occur fairly soon. Have you made arrangements for pollination service? One resource I found recently on the internet is the Pollination Home

Page. It has a listing of US and Canadian beekeepers who have bees available for pollination service, and they have a separate listing of growers who are seeking beekeepers. If you are looking for bees, or have bees available, check out <http://www.pollinator.com>. They try to get all listings on within 24 hours. This is a free service; no endorsements or recommendations are expressed or implied. -*Bordelon*

Meeting Correction: The May 5 East Central Indiana Fruit Growers Meeting will be a Twilight Orchard Tour and Program at Grabow Orchard & Farm Market in Madison County starting at 6:00 p.m. The location is about 2 miles north of I-69 on S. R. 13. In the last edition of Facts for Fancy Fruit this meeting was incorrectly listed as being at the Minnestrista Cultural center in Muncie.

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Coming Meetings

April 27 - Illinois Grape Grower's and Vintners Association Annual Conference, Rend Lake Resort, Wittington, IL. Contact Gen-Kota Winery at 618-246-9463 or Spring Pond Vineyard at 618-439-9176.

April 27 - Afternoon fruit meeting at Seilers Orchard, Rockport (Spencer County). 1:00 pm. Contact Peter Hirst at 765-494-1323

April 27 - Twilight meeting, Spring Valley Farm, Lanesville (Floyd County). 6:30 pm (fast time). Contact Roy Ballard at 812-948-5470.

May 4 - Fruit Grower Twilight Tour, Garwood Orchard (LaPorte County). 6:30 pm. Contact Walt Sell at 219-326-6808

May 5 - East Central Indiana Fruit Growers Twilight Orchard Tour, Grabow Orchard and Farm Market, Madison County. 6:00 pm. Contact Harold Brown at 765-747-7732.

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

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