



---

### **Inside**

Crop Conditions  
Weather  
Weather Outlook  
Fire Blight  
Apple Scab  
Nova, Rubigan & Tank Mixes  
Strawberries and Botrytis Fruit Rot  
Holding and Planting Fruit Trees  
Herbicides for Fruit Crops  
Honey Bee Colony Losses  
Grape Flea Beetle  
Mite Management  
Pheromones and Pheromone Traps  
Commercial Spray Guides Available on the Internet  
Pesticide Coordination Policy  
Coming Meetings/Events

---

FFF 96-04

April 10, 1996

## ***Crop Conditions***

Plant development continues to be delayed almost two weeks behind normal across the state due to the below normal temperatures we have experienced this spring. Apples are at silver tip to 1/2 inch green in the south, at silver tip throughout central part of the state, and still dormant in northern areas. Peaches are at pink in the south and early bud swell in other areas. Grapes are at early budswell in the south, and dormant in central and northern areas. Blueberries are at full swell to bud break in the south, early swell in central areas and dormant in the north. Strawberries are developing very slowly in most areas and growers have not yet removed straw.

**Weather:** (From Purdue Crop and Weather meeting minutes, April 5) The dry trend persisted through the month of March with very dry conditions in the northern third of the state (less than 1/2 of normal) while precipitation in the central third was from 2/3 to 3/4 of normal. The southern third of the state fared a little better with near normal precipitation. Temperatures averaged 5 - 7 degrees below normal for the month of March throughout the state. The northern and central sections of the state averaged approximately 5 degrees below normal with the exception of west central which averaged just over 6 degrees below normal. The southern third averaged just over 7 degrees below normal for March. Over the last two weeks these trends persisted with temperature averages 3 - 5 degrees below normal statewide. Precipitation amounts were near normal in the southern two thirds but remained well below normal in the northern portion. - Ken Scheeringa

**Weather Outlook:** (From Purdue Crop and Weather meeting minutes, April 5) Winterlike weather returned to Indiana over the past several days. Portions of Indiana received snow flurries on April 6 - 8. The 6 - 10 day forecast for the period April 9 - 13 indicates much below normal temperatures with temperatures as much as 12 degrees below normal north and below normal precipitation. We should see a slight warming trend the 13th through the 15th. There has been limited recharge of soil moisture levels in the last 2 weeks. Subsoil moisture levels are limited in the north with levels in the central and south better. Some parts of the south are showing some surplus moisture. - Tom Priddy, UK

**Fire Blight:** The late spring has significantly increased the potential for this to be a bad fire blight year. Odds are now even higher that bloom will coincide with warm temperatures, and as you know, warm temperatures (daily

average temperatures above 65°F) accompanied by rain can result in severe blossom blight. 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. 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 - 332 - 6744.

***Apple Scab:*** The peak period for scab infection will occur within the next month. 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.

***Nova, Rubigan & Tank Mixes:*** If Nova or Rubigan have been used alone in your early season spray program for scab we suggest the final spray (petal fall or first cover ) of Nova or Rubigan be combined with a protectant fungicide such as captan, ziram, mancozeb, or Polyram. Using a protectant fungicide at this time will provide protection from summer diseases such as black rot, sooty blotch and fly speck and help give added protection from fruit scab. Refer to Rubigan and Nova labels for additional information on tank mixes.

***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! Rovral and Ronilan are excellent fungicides for control of Botrytis; however, resistance to these fungi-

cides is a very real problem if they are used too often... follow label directions on frequency of spray applications.

***Holding and Planting Fruit Trees:*** Just another reminder to get those trees planted as soon as possible so as to get them off to a good start in the season. However, areas of southern Indiana are currently wet, and if planting must be delayed to get soil conditions right, then the trees should be stored carefully to hold them in the best condition prior to planting. Most of northern Indiana is dryer than usual so planting can be done in a timely manner.

The best storage is, of course, refrigerated storage at 32°F and high humidity. If you are using your apple cooler, be sure that there are no apples in it and that the cooler has been aired out to remove traces of ethylene. An alternative is to heel the trees in on the north side of a building, or in the field, with the tops of the trees pointing 45 degrees to the south to minimize the effect of the sun on warming trees. Be sure in any case to cover the root systems well with soil and to maintain adequate moisture on the tree roots.

***Herbicides for Fruit Crops:*** Nothing beats knowing your problem weeds and aiming your program at the specific problem if possible. If you have problems in identifying any weeds contact your county Extension educator.

If weed-free strips under tree rows are reasonably clean, then pre-emergence control materials can be used without the post-emergence materials. This can result in substantial savings. If weed or grass growth has already begun, or you are just establishing a weed-free strip, then a post-emergence material will be needed. These materials are generally most effective when the grass or weed growth is 4-6 inches tall and growing rapidly. Combine with a pre-emergence material for best weed control. Consult ID 168 and ID 169 for suggestions on both pre- and post-emergence materials.

Growers should not expect any herbicide to be effective year after year. Treatment should be rotated through several herbicides or combinations of materials. Be careful to follow label instructions on combinations. The weed spectrum will change in response to the herbicide used and the grower should respond also with the best choice of herbicide for the new weed problem. The product label is probably the best source of information on weeds that the product should control. If the weed is not on the label the product will probably not control it. Be careful to observe cautions and harvest restrictions just as you would with any pesticide. Some herbicides cannot be used on bearing plants and some others require that plants be 1-3 years old before the material may be used. Read ID 168, ID 169, and the product label carefully.

***Honey Bee Colony Losses:*** Roger Hoopingarner of Michigan State University reports in MSU CAT Alert April 2, 1996 Fruit Edition that the winter of 1995-96 may be the most severe in terms of bee colony loss on any on record. In a fairly extensive survey the average winter loss was 62% in Michigan. Many other northern states have similar losses. These are probably due to the effects of parasitism by the varroa mite. The prolonged periods of cold and the tracheal mites also added to the overwintering problem. This level of loss should be of concern to all fruit growers. In addition, there are two other factors that may impact the pollination situation. The first is that southern package bee shippers are reluctant to increase their production to help replace bees. The price of honey has increased dramatically and they want to use their bees to produce honey as well as bees. Along with this lower package bee availability is the fact that honey bee colonies in the United States have declined more than 37% over the past 10 years. The parasitism by the two mites and the very low price of honey over the past few years has taken its toll.

Beekeepers just could not afford to continuously replace colonies lost to mite infestations.

***Grape Flea Beetle:*** Grapes are in the early swell to dormant stage across the state, depending on location and cultivar. Development should progress rapidly over the next couple of weeks as temperatures climb above 50°F. Early to full swell stages are most likely to be damaged from flea beetles. Scout vineyards for these insects or their damage and control if necessary. Incidence often occurs in outer rows adjacent to fence rows or woods making spot spraying an option. Scout the planting carefully and apply insecticides only where needed. Damage from flea beetles usually decreases as buds break and shoots become 1/2 inch or longer. Sevin or PennCap-M will provide excellent control of this insect. Refer to the label or ID-169 for complete recommendations.

***Mite Management:*** The situation for managing mites in fruit crops, especially apples, seems to be changing almost daily because of the gain and loss of various pesticides. I will attempt to bring you up to date as much as possible in this article.

As you all know, last year Apollo was labeled for use on apples. This miticide can be applied no later than tight cluster. Our research results have shown that an application of Apollo will provide season long control of European red mites, as long as you conserve the predator mites. Using insecticides that kill the predator mites will likely result in a European red mite outbreak, even if you have used Apollo. A major concern with Apollo is the potential for development of resistance. As a result, I have recommended that Apollo be used on problem blocks only. Do not use Apollo on all your apples. We need to keep this valuable tool available for many years.

This winter, Savey was labeled for use on apples. Savey can be applied as late as pink. This product is similar to Apollo in its mode of action, level of control, and compatibility with

conservation of predator mites. However, it appears that if mites develop resistance to Apollo, they will also be resistant to Savey, and vice versa. Therefore, Savey and Apollo cannot be applied in the same year. Again, Savey should be used primarily on problem blocks rather than on the entire orchard. Also, there is no reason to believe that you will not have a mite outbreak if you kill the predator mites, even if you used Savey.

One of our better foliar miticides, propargite (Omite), appears to be in serious trouble with the EPA as a result of residues and the potential for causing cancer. As a result, Uniroyal has decided to voluntarily cancel the registration of Omite on apples and nine other crops. Uniroyal will stop the sale of Omite immediately and will initiate a buy-back program for growers who have stocks of the product.

Last week, Merck announced that Agrimek had received approval for use on apples. Apparently, the EPA hastened the approval of Agrimek because of the loss of Omite. Agrimek is an excellent foliar miticide which can be used as a rescue treatment when populations start to get out of hand. However, growers should be cautioned that mites can quickly develop resistance to most miticides, including Agrimek, if overused. Growers should continue to work hard at conserving their predator mites to reduce the selection pressure that could cause resistance to any of our miticides.

To sum up, I believe that apple growers now have the best tools available to control mites that they have ever had. Apollo and Savey are excellent early season products and Agrimek will clean up any later season problems. However, to keep these tools around for as long as possible, I suggest the following steps.

- 1. Use Apollo and Savey only on those blocks that have had a mite problem in the past and/or you expect will have a problem this year.

- 2. Use Superior oil sprays on blocks that are not treated with Apollo or Savey.

- 3. Conserve predator mites by spraying insecticides only when necessary and by choosing those insecticides that are least toxic to the predator mites. Specifically, growers should avoid using pyrethroid insecticides at any time on apples. Predators eat resistant as well as susceptible mites, so their feeding delays the development of resistance.

- 4. Monitor mites during the growing season and use thresholds to determine the need for foliar miticides. The general recommendations for thresholds are 2.5 mites/leaf until June 30, 5.0 mites/leaf during July, 7.5 mites/leaf from August 1 through August 15, and 10.0 mites/leaf after August 15. If mite populations do not exceed the threshold, then treatment is not justified.

- 5. Consider using miticides other than Agrimek in appropriate situations. The other products may not be as effective as Agrimek, but several of them can provide economic control.

***Pheromones and Pheromone Traps:*** One way insects communicate with individuals of the same species is with pheromones. Pheromones are volatile chemicals released by an insect that usually can be detected only by individuals of the same species. There are a number of different types of pheromones, but the most common type is the sex pheromone. Usually the females will emit a tiny amount of a chemical that attracts the male to her and increases the likelihood of mating. Because the chemical is volatile, it is carried by air currents. The male detects the pheromone in the air with receptors on his antennae. He then flies upwind to find the source of the pheromone, a prospective mate. The chemical compositions of pheromones for a number of pest species have been identified and synthetic copies can be produced in the laboratory. Synthetic

pheromones can be used in conjunction with traps to catch male insects.

There are a large number of fruit pests that can be monitored with pheromone traps. For growers who have not used traps before, I recommend starting out by trapping for codling moth and spotted tentiform leafminer. As you gain experience with the traps and learn how they can improve your pest management practices, you may want to begin trapping for additional pests.

There are two ways you can use pheromones. The first and most common method is to determine when the insect is active. This allows you to better time control practices or, in some cases, to determine if control is even necessary. Specific information for using pheromone trap catches to time insecticide applications for controlling spotted tentiform leafminer, codling moth, San Jose scale, and dogwood borer is available in the Midwest Tree Fruit Handbook (ID 60).

A more novel use for pheromones is known as mating disruption. Here the orchard environment is saturated with so much pheromone that the males are unable to successfully find a mate. Since the females are unmated, they do not lay eggs that hatch into the damaging larvae. The practice has been tested fairly successfully for Oriental fruit moth. The track record for using pheromones to control codling moths is not as strong, but it does show promise. I am not prepared to recommend these techniques at this time, because of the necessity for chemical control of other pest insects.

Listed below are some, but certainly not all, of the suppliers of pheromones and traps.

**Consep Membranes, Inc.;** P. O. Box 6059;  
Bend OR 97708; 503-388-3705

**Great Lakes IPM;** 10220 Church Rd., NE;  
Vestaburg, MI 48891; 517-268-5693

**Insects Limited Inc.;** 10505 N. College  
Avenue; Indianapolis IN 46280-1438;  
317-846-3399

**Pest Management Supply Co.;** P. O. Box  
938; Amherst, MA 01004; 800-272-7672  
**Scentry Inc.;** P. O. Box 426, Dept. MPI;  
Buckeye, AZ 85326-0090; 602-233-1772  
**Treco Incorporated;** P. O. Box 6278. 1143  
Madison Lane; Salinas, CA 93912;  
408-758-0205

**Commercial Spray Guides Available on the Internet:** For those of you who don't have a copy of ID-168, Indiana Commercial Tree Fruit Spray Guide, and ID-169, Indiana Commercial Small Fruit & Grape Spray Guide, these publications are now available electronically. You can access them at the following URL (address):

[http://hermes.ecn.purdue.edu:8001/http\\_dir/acad/agr/extn/agr/acspub/ACS.html](http://hermes.ecn.purdue.edu:8001/http_dir/acad/agr/extn/agr/acspub/ACS.html)

**Pesticide Coordination Policy:** The USEPA has issued a notice to explain and reaffirm its long-held policy, the pesticide coordination policy, of coordinating food safety regulations under FFDCA with pesticide registration under FIRRA. This significantly impacts implementation of the Delaney clause. This decision completes the USEPA's response to the 1992 Delaney-related petition by the National Food Processors and others which asked, in part, that the USEPA's policy of linking processed and raw food pesticide tolerances be discontinued. In place since 1963, the coordination policy is designed to ensure that the lawful use of pesticides by farmers will not result in unlawful residues in processed food or feed. As a consequence of this policy and the Delaney clause, some pesticide tolerances are expected to be revoked and the pesticide registrations on which they are based are expected to be canceled. Last year, EPA conducted an economic impact assessment as to potential impacts on agricultural producers as a result of continuation of this policy without change. The assessment concluded that the total economic impact on affected producers could be as high as \$500 million. Only three crops were estimated to incur impacts greater than 5 percent of their

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

annual 1989-91 U.S. production value (Pineapple 29%, Sugarcane 13%, and Grapes 5.1%). Absolute projected impacts were highest for sugarcane, grapes, potatoes, rice, and apples, which together comprised about 70% of total impacts projected. For various reasons, however, the assessment was based on a worst-case scenario and actual impacts are expected by EPA to be far less. EPA will update its economic impact analysis when it evaluates the remaining uses potentially affected by the Delaney clause. For additional information contact: Ms. Jean M. Frane, EPA, Policy and Special Projects, Phone 703-305-5944, Fax 703-305-6244, Email [frane.jean@epamail.epa.gov](mailto:frane.jean@epamail.epa.gov) Source: Federal Register 61(7):2378 1/25/96

Bruce Bordelon  
1165 Dept. of Horticulture  
Purdue University  
West Lafayette, IN 47907-1165  
317/494-1298  
e-mail: [bb@hort.purdue.edu](mailto:bb@hort.purdue.edu)

Dick Hayden  
1165 Dept. of Horticulture  
Purdue University  
West Lafayette, IN 47907-1165  
317/494-1298  
e-mail: [Dick\\_Hayden@hort.purdue.edu](mailto:Dick_Hayden@hort.purdue.edu)

### ***Coming Meetings/Events:***

***April 13*** — Madison Vineyards Opening. Contact Steve and Sandy Palmer at 812-273-6500 or the Indiana Wine Grape Council at 800-832-WINE.

***April 26*** — Northeastern Indiana Fruitgrowers meeting. 6:-00 p.m. Meyer Orchard, 11061 E. 415 N., Kendallville, IN. Contact Rick Kemery at 219-481-6826.

***June 19*** — Southeast Indiana Fruitgrowers Summer Tour. Apple Junction, Batesville, IN. Contact Karen Witt (317-647-3511) or John Ewart (812-926-1189).

Paul Pecknold  
1155 Dept. of Botany & Plant Path.  
Purdue University  
West Lafayette, IN 47907-1155  
317/494-4628  
e-mail: [Pecknold@btny.purdue.edu](mailto:Pecknold@btny.purdue.edu)

Rick Foster  
1158 Dept. of Entomology  
Purdue University  
West Lafayette, IN 47907-1158  
317/494-9572  
e-mail: [Rick\\_Foster@entm.purdue.edu](mailto:Rick_Foster@entm.purdue.edu)

***Disclaimer:*** Reference to products in this publication is not an endorsement to the exclusion of others which 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.