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Crop Conditions: The recent warm weather along with some rain has provided excellent growing conditions. Despite some early tribulations in terms of hail and fireblight, we have some good looking crops of apples and peaches around the state. The same is true for blueberries and grapes. Despite frosts, freezes, hail, and the unusual weather this spring, blueberries and grapes are looking very good. Blueberry harvest is getting started in southern areas and will begin soon in central areas. Fruit size is excellent. Bramble harvest has begun in southern areas and will begin soon in central and northern areas. Strawberry harvest is essentially over except for late varieties. 2,4-D damage is showing up on grapes.

Managing Apple Summer Diseases: Apple summer fruit rot and blemish diseases (sooty blotch & flyspeck, black rot, white rot and bitter rot) are now on the increase. The SI fungicides (Nova, Rubigan, Procure and Bayleton) do not provide good control of these diseases. Mancozeb and Polyram are excellent for control of summer diseases, however they can only be applied up to 77 days of harvest. After the 77-day to harvest restriction has passed captan and ziram remain our best options for summer cover sprays; they should be used at the full labeled rate and on a tight schedule if cool, wet summer weather prevails. We also suggest tank mixing with Topsin-M or Benlate if it turns into a 'sooty blotch/fly speck year'; however, Benlate and Topsin-M should be used sparingly (no more than once a month) to avoid harm to predator mites and lessen the possibility of the development of resistance. NOTE: Benlate, and to a lesser extent Topsin-M, are reported to cause 'scarf skin' if used within 40 days of petal fall. Scarf skin is a physiological condition in which the fruit surface develops a milky white or grayish appearance. Scarf skin has

no effect on fruit quality or storage ability, but impairs the appearance and shine on a red apple. Added help in control of sooty blotch and flyspeck is now available with the strobilurin fungicides, Flint and Sovran. See below article on Sovran and SBFS for details.

Infection from summer diseases, especially sooty blotch and flyspeck, can further be reduced through IPM strategies that lower humidity and promote rapid drying. These include keeping grass mowed during summer and keeping trees well pruned. Tree spacing within and between rows should allow air movement between all trees. Removing adjacent woods or cutting breaks in hedgerows will also help improve airflow in the orchard. Of course it goes without saying (so I'll say it) that all the above suggestions are pretty much a waste of time if **good sanitation** measures are not strictly followed. (Pecknold)

Sovran & Flint for Control of Sooty blotch & Flyspeck: As mentioned above, we now have added help in control of sooty blotch and flyspeck with the strobilurin fungicides, Sovran and Flint.

In an earlier edition of this newsletter we suggested a 1st, 3rd, and 7th cover spray program using Sovran (our study included only Sovran, not Flint). This program is based on our research from last year in which Sovran was applied at the maximum rate of 1.6 oz per 100 gallons to Golden Delicious at first cover (May 11th), third cover (June 9th), and seventh cover (August 3rd). The 1-3-7 program provided excellent control of both fruit scab and sooty blotch and flyspeck under extremely high disease pressure for all diseases. The 3rd and 7th cover sprays were especially critical in control of sooty blotch and flyspeck. Just so there is no confusion, this program is IN ADDITION TO your other regular summer fungicide cover sprays, we simply are suggesting you replace Captan with Sovran in the 1st, 3rd and 7th covers. Also, a reminder...we suggest no more than three sprays of the strobilurins per year, and as the label states: “do not apply as the final spray of the season.” (Pecknold)

Winter Injury and Other Maladies in Grapes:

Many grape growers in Indiana were dismayed this spring when they observed winter injury on their vines. Certainly there were some frost problems this spring, both in April and again in mid-May, but the damage we've been seeing is from winter cold, not spring frost. We had a normal winter and damage this severe was not expected. It turns out that the situation is common throughout the east. New York, Ohio, Pennsylvania and Virginia growers have experienced the same problems. Experts are speculating at the causes, but we'll likely never know for sure why so much damage occurred. In some areas early fall frosts or freezes may be to blame. That is likely the case in much of Indiana where warm and wet conditions kept vines growing vigorously through September. When freezing temperatures occurred in October, many vines were not well hardened off. We've also seen an unusual amount of incomplete, or inconsistent bud break on many varieties. In my plots I had vines with 2-3 inch shoots and buds just breaking at the same time. I thought the late buds would catch up, but they haven't and now we have shoots just finishing bloom while others set a crop 2 weeks ago. These conditions are likely due to incomplete bud development last summer. I'd like to think that a situation like this won't happen again, but thinking back about the unusual weather this spring has me wondering what kind of weird symptoms we'll

see next year. (Bordelon)

Brambles-Orange Rust: Orange rust is now appearing on blackberries and black raspberries; it does not affect red and purple raspberries. The fungus grows systemically through the plant into the canes, crown, and roots. An infected plant remains infected throughout its life and will produce spores every year after it is infected. There are no controls for orange rust other than immediately removing the entire plant -roots and all- to prevent spread to healthy plants. Where spore pustules are already fully developed (which they are) and the spores are easily dislodged, bag the plants before removing them from the field. Diseased plants may appear to recover later because they produce symptomless leaves, but they are still infected. Nova received a label for control of orange rust on brambles last year. “Control” in this case means preventing infection of the new primocanes of previously uninfected plants. Growers are urged to refer to OSU Bul. 861, the Midwest Small Fruit Pest Management Handbook (www.ag.ohio-state.edu/~sfgnet/) and ID-169, the Commercial Small Fruit & Grape Spray Guide (www.hort.purdue.edu/hort/ext/sfg/default.html) for a complete discussion of orange rust. (Pecknold)

Strawberry Renovation: Matted row strawberry plantings must be renovated after harvest to establish new crowns for next year's crop. For best results, renovation should be started immediately after the harvest is completed to promote early runner formation. The earlier a runner gets set, the higher its yield potential. Renovation should be completed by mid-July in normal years. Now that harvest is over, growers should begin renovation. The following steps describe renovation of commercial strawberry fields.

1. **Weed control:** Annual broadleaf weeds can be controlled with 2,4-D amine formulations. Check the label as only a few products are labeled for use on strawberries. (e.g. Formula 40 [2,4-D alkanolamine salts plus 2,4-D Triisopropanolamine salt (4 lbs./gal.)] or Amine 4 [Dimethylamine salt of 2,4-D (3.74 lb./gal.)] at 2 to 3 pts./acre in 25-50 gallons of water applied immediately after final harvest.) Be extremely careful to avoid drift when applying 2,4-D. Even though the amine formulation is not highly volatile, it can

volatilize under hot, humid conditions and can cause damage to desirable plants a considerable distance from the site of application. Some damage to strawberries is also possible. Read and understand the label completely before applying 2,4-D amine. If grasses are a problem, sethoxydim (Poast) will control annual and some perennial grasses. However, do not tank mix Poast and 2,4-D. See ID 169 and the product label for rates and especially for precautions.

2. Mow the old leaves off just above the crowns 3-5 days after herbicide application. Do not mow so low as to damage the crowns.
3. Fertilize the planting. A soil test will help determine phosphorus and potassium needs, but foliar analysis is a more reliable measure of plant nutrition. For foliar analysis, sample the first fully expanded leaves following renovation. Nitrogen should be applied at 25-60 lbs./acre, depending on vigor. It is more efficient to split nitrogen applications into two or three applications at regular intervals, rather than apply it all at once. A good plan is to apply about half at renovation and half again in late August.
4. Subsoil: Where picker traffic has been heavy on wet soils, compaction may be severe. Subsoiling between rows will help break up compacted layers and provide better infiltration of water. Subsoiling may be done later in the sequence if crop residue is a problem or if soils are too wet at this time.
5. Narrow rows: Reduce the width of rows to a manageable width based on your row spacing, the aisle width desired, and the earliness of renovation. A desirable final row width to attain at the end of the season is 12-18 inches. Wider rows lead to low productivity and increased disease pressure. This means that rows can be narrowed to as little as 6 inches during renovation. Use a roto-tiller or cultivator to achieve the reduction. Since more berries are produced at row edges than in the middle, narrow rows are superior to wide rows. Narrow rows will give better sunlight penetration, better disease control, and better fruit quality.
6. Cultivate: Work in straw between rows and throw a small amount of soil over the row by cultivation. Strawberry crowns continue development at the top, and new roots are initiated above old roots on the crown, so 1/2 -

1 inch of soil on the crowns will facilitate rooting. This also helps cover straw in the row and provides a good rooting medium for the new runner plants.

7. Weed control: Pre-emergence weed control should begin immediately. Dacthal, Sinbar or Devrinol are suggested materials. See ID-169 and check the product labels carefully. Devrinol must be incorporated by irrigation, rainfall, or cultivation to be effective. Rate and timing of Sinbar application is critical. If regrowth has started at all, significant damage may result. Some varieties are more sensitive to Sinbar than others. If unsure, make a test application to a small area before treating the entire planting. Use 2 to 6 oz/acre/application and no more than 8 oz/acre/year total. Sinbar should not be used on soils with low organic matter, or on sensitive varieties like Guardian, Darrow, Tribute, Tristar and possibly Honeoye. If Sinbar gets onto strawberry leaves, irrigate to wash it off.
8. Irrigate: Water is needed for both activation of herbicides and for plant growth. Don't let the plants go into stress. Ideally the planting should receive 1 to 1-1/2 inches of water per week from either rain or irrigation.
9. Cultivate to sweep runners into the row until plant stand is sufficient. Thereafter, or in any case after September, any runner plant not yet rooted is not likely to produce fruit next year and is essentially a weed and should be removed. Coulter wheels and/or cultivators will help remove these excess plants in the aisles.
10. Adequate moisture and fertility during August and September will increase fruit bud formation and improve fruit yield for the coming year. Continue irrigation through this time period and fertilize if necessary. An additional 20-30 pounds of N per acre is suggested, depending on the vigor. (Bordelon)

Codling Moths: I have received one report from a grower that last week he had a major catch of codling moths in his pheromone trap. This is unusual because theoretically we should be between generations of codling moths at this time. In my traps I am catching a codling moth every couple of nights. Even though I have not have a major catch, this means that at least a few codling moths are still active. If you are on a regular spray schedule with Imidan or Guthion, these between

generation flights should not have a major impact on your level of codling moth damage. However, if you are using some of the newer insecticides such as the insect growth regulators (Confirm, Esteem, etc.) and are trying to properly time your applications, or if you are trying to save a spray or two between generations, you could end up with more damage than you would like. I would encourage you to continue to monitor codling moths with pheromone traps throughout the season. I think you can assume that if you are continuing to catch moths in your traps that female moths will be continuing to lay eggs and the resulting larvae will need to be controlled. (Foster)

European Red Mites: With the warmer weather we have been having lately, populations of European red mites have begun to increase. The populations I have observed are still below the economic threshold, but increased dramatically over the previous week. This would be a good time for growers to be out checking their blocks where they have historically had problems with mites. Based on the results we have seen in our trials, I would recommend using Pyramite at this point in the season if you seen damaging populations of mites. (Foster)

Potato Leafhoppers: High populations of leafhoppers have been observed on several different crops. Like many insects, hot weather is conducive to increases in leafhopper numbers. Growers should be checking their crops (especially apple and grapes) for the presence of leafhopper adults and nymphs. Provado and Sevin both will provide excellent control of potato leafhoppers. Remember that Sevin is toxic to predators and may flair mite or aphid populations. (Foster)

Herbicide Drift Each year herbicide drift causes serious problems for growers of fruits, vegetables, nursery, and row crops in Indiana, not to mention in home landscapes. 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 has increased 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.

What can you do to avoid problems caused by herbicide drift? Start by contacting your neigh-

bors 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, nursery crops 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 weeks 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)

Training Course on HACCP for Cider: Interested in finding out more about HACCP for cider? A training course will be held on July 23-25 at the Kellogg Biological Station in Michigan specifically on HACCP for the juice and cider industries. The course is being run by Rich Linton from Purdue and Les Bourquin from Michigan State. The workshop will cover many aspects related to HACCP in cider including understanding the final HACCP regulation, how to develop a HACCP plan, record keeping and verification, and emerging technologies to achieve a 5-log reduction. I'll have brochures and registration forms available at the IHS summer meeting in Trafalgar next week. Alternatively email or phone me and I'll be happy to send you one. (Hirst)

Indiana Winegrower's Guild Summer Meeting: The IWG will hold its summer meeting at Butler Winery and Vineyards in Bloomington on Saturday July 14. The board of directors will meet at 12:30 pm and the general membership will meet at 3:00 pm. Dinner will be held afterward at a cost of \$10 per person. There is an important issue to discuss during the business meeting (Bond to Bond bulk wine sales) so the board is urging all members to attend. The meeting is open to IWG members and anyone interested in Indiana grapes and wine. The meeting will be at Butler Vineyard, 6200 East Robinson Rd. Directions from SR 37: Exit SR 37 onto Sample Road (Wylie Floor Covering Warehouse is at the corner) follow Sample Rd. until it ends at Old 37. Go right for two miles. After the bridge, take the first left onto Robinson Rd. (up-hill). Travel 3.5 miles to the vineyard on the right. For a detailed map visit www.butlerwinery.com.

Please RSVP to make dinner arrangements to 812-339-7233.

IHS Summer Meeting: Just a reminder on the Indiana Hort. Society summer meeting. This is next week at The Apple Works in Trafalgar IN, on the evening of June 26 and all day on June 27. See the last issue of FFF for an itinerary, directions and information on accommodation. We hope to see you there.

Risk Management Agency Seeks Grower Input: The RMA is seeking input from groups and individuals representing producers of crops grown on trees, vines, and bushes so that their needs, concerns, and other input may be considered before it enters into a contract for the research and possible development of a tree, vine, and bush replacement program for growers of these perennial crops. Please provide your input to Charles Naglich by July 13, 2001 to assure consideration. Contact Mr. Naglich by phone at (816) 926-1832, by fax at (816) 926-7343, by e-mail at Charles_Naglich@rm.fcic.usda.gov or at the following postal address:

Attention: Charles Naglich
Research and Evaluation Division
Risk Management Agency
PO Box 419293, Stop 0813
Kansas City, MO 64141-6293

Upcoming Meetings:

June 26-27 - Indiana Horticultural Society Summer Meeting. The Apple Works, Trafalgar, IN. Details are in this issue of Facts for Fancy Fruit.

July 10-13 - American Society for Enology and Viticulture – Eastern Section Annual conference and symposium “Space Age Winegrowing” Niagara-on-the-Lake, Ontario. Contact Ellen Harkness. 765-494-6704. email: harkness@foodsci.purdue.edu

July 14 - Indiana Winegrower's Guild Summer Meeting. Butler Winery and Vineyard. Bloomington, IN. Contact Jim Butler 812-339-7233 email: vineyard@bluemarble.net

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