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FFF01-01
March 14, 2001

Crop Conditions: With the 2001 growing season coming up, it is time to review the 2000 season and see what we expect for fruit crops across Indiana this year. Unlike recent years, 2000 was not another La Nina winter. In fact, it was one of the coldest we've had in recent years. Minimum temperatures were not too bad, but we had more than the normal number of days of below freezing temperatures from mid December through February. First freezing temperatures of fall came during the second week of October, causing some die back on crops that were not well hardened off. The coldest time of winter was the last week of December and first week of January. Sub-zero temperatures were reported across much of the state. Several sites in the northern half of the state reported temperatures from -10°F to -15°F at that time. The coldest spot in the state was Crawfordsville with -18°F on December 26. The southern half of the state reported temperatures of -5°F or warmer. These temperatures were not in the range that we normally expect to cause significant damage to fruit crops so we should be in pretty good shape this year. That being said, fruit growers know that significant cold injury can occur from late spring freezes, especially if preceded by unseasonably mild temperatures. Most will remember what happened this past March and April when many crops suffered cold injury. So far we have not had excessively mild conditions this February and March, so it appears that this will be a "normal" spring.

Subscription Notice: If you subscribe to the printed version of Facts for Fancy Fruit, check the mailing label on this issue. If there is a 00 in the corner we have no record of your payment for 2001 and this will be your last issue of the newsletter. If you want to continue your subscription please fill out the subscription form attached to this issue and send with a check for \$15.00 payable to Purdue University, to: 'Facts for Fancy Fruit', 1165 Department of Horticulture, Purdue University, West Lafayette, IN 47907-1165. If you feel there is an error, please contact Penny White at (765) 494-1301.

More Subscribers Choose E-Mail: Over the past few years more and more Facts for Fancy Fruit subscribers have chosen the electronic version of the newsletter. Our hard copy mailing list has fallen steadily and is now less than 100. At the same time our email list has grown to well over 500 subscribers. If you have e-mail and would like a copy sent electronically, send us your

e-mail address and we will include you on the list. Or send a message to fff@lists.hort.purdue.edu with the subject or body "subscribe" (or "unsubscribe") to be automatically included. Another way is to visit our website at <http://www.hort.purdue.edu/fff/fff.html> and subscribe through the Mailing List link. Subscription to the e-mail version is free.

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, air currents carry it. 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 number of fruit pests that can be monitored with pheromone traps. For growers who have not used traps before, I suggest starting out by trapping for codling moth, spotted tentiform leafminer, or peachtree borers. 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.

Monitoring with pheromone traps lets you know when the insect is active. This allows you to better time control practices or, in some cases, to determine if control is even necessary. If you choose to control spotted tentiform leafminers with sprays targeted at the adults, having pheromone traps will help you know when the moths are flying in large numbers. For codling moth control, we can use a combination of pheromone trap catches and degree day accumulations to better time sprays. This will be covered in more detail when we get closer to time of codling moth flight.

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

Consep Membranes, Inc.; 213 S.W. Columbia; Bend OR 97702-1013; 800-367-8727; www.consep.com

Gempler's; P. O. Box 270; 100 Countryside Dr.; Belleville, WI 53508; 800-382-8473; www.gemplers.com

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

Insects Limited Inc.; 16950 Westfield Park Rd.; Westfield IN 46074-9374; 317-846-3399; www.insectslimited.com

Scentry Biologicals Inc.; 610 Central Ave.: Billings MT 59102; 800-735-5323; www.scentry.com

Trece Incorporated; P. O. Box 6278. 1031 Industrial St.; Salinas, CA 93901; 408-758-0205; www.trece.com
-Foster

Consider IPM: Although the effects of implementation of the FQPA has not been as devastating for fruit growers as was once feared, it would be prudent to consider ways that you can reduce your reliance on the standard old insecticides such as the organophosphates (Guthion, Imidan, Lorsban, malathion, etc) and carbamates (Sevin, Vydate, Lannate, etc.) Whether it happens because of regulatory action such as FQPA, the development of resistance in key pests, or lack of acceptance by consumers, the day is likely to come when these older insecticides cannot be used. One way to reduce your reliance on these insecticides is by adopting the use of Integrated Pest Management or IPM. IPM is the use of

all possible methods to manage pests, not just relying on pesticides. For insects, this may include such practices as proper pruning to allow spray penetration, conserving natural enemies, or using pheromone traps to better time sprays. Many of you are using some IPM practices already. Below are several suggestions that you might consider adopting.

1. If you have not already, purchase the *Midwest Small Fruit Pest Management Handbook* and/or the *Midwest Tree Fruit Pest Management Handbook*. These relatively inexpensive books are full of suggestions for improving your pest management.
2. Are you applying a dormant oil even if you are using Apollo, Savey or AgriMek? Oil will also reduce scale and aphid problems, and will delay the development of resistance to these excellent miticides.
3. Consider using pheromone traps this year for at least one of the insects for which pheromones are available (see previous article).
4. Consider how various cultural practices affect insect pests. For example, tarnished plant bugs and stinkbugs are usually more serious problems when certain weeds are allowed to form a seedhead. Are you controlling weeds to prevent insect problems?
5. When growers call me about an unusual pest problem, it is not uncommon that when I propose a solution, the grower asks, "What will that do to my predator mites?" When growers think that way, it shows that they have really bought in to the IPM philosophy. Before making spray decisions, do you ask yourself "What affect will this spray have on natural enemies, such as predator mites?" Pyrethroid insecticides can provide excellent control of several pests, but is it worth it to kill all your predators?
6. Before you make an insecticide application, do you know for sure what the target insect is? If you apply an organosphosphate to apples early in the season, are you attacking a specific insect with that spray? If scales have not been a problem, then you can probably get by without that spray. If you are in the southern part of the state where apple maggot is not a concern, you may be able to skip a cover spray or two if you know when codling moths are active (by using pheromone traps).
7. Are you scouting for mites on your apples at least every two weeks beginning after petal fall? Blocks that had very few mites last year probably will not need an application of Apollo, Savey or Agri-Mek this year. Blocks that had a fairly high population last season may well require an early season miticide application. But, if you didn't scout, you won't know for sure.
8. Are you scouting for aphids, scales, leafminers, leafhoppers, and other insects that don't necessarily

occur every year? Are you using thresholds to make spray decisions?

9. Is your sprayer properly calibrated? Putting on too much insecticide could result in illegal residues and putting on too little could result in poor control or the development of resistance. Be sure you are applying the right amount of insecticide.

If you can find a way to reduce your insecticide use with IPM, it may save you some money, it may conserve some natural enemies that help keep other pests under control, and it will allow you to tell those curious customers that you are using the latest scientific information to minimize the amount of insecticides necessary to produce a marketable crop. Now is a good time to think about how you could possibly upgrade your IPM practices. If you have specific questions, don't hesitate to call or email me. -Foster

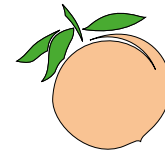
Oil Sprays: One of the first and most important parts of a good insect and mite management program is the application of an early season oil spray to control European red mites, San Jose scale, and several species of aphids. Scales overwinter on the tree as nymphs and European red mites and aphids overwinter as eggs. Because two-spotted spider mites do not overwinter on the tree, oil sprays are not an effective control measure for that species. Although scales, European red mite eggs, and aphid eggs may appear to be inactive, they are living organisms and, therefore, must respire, or breathe. The application of the oil creates an impervious layer over the pests that will not allow the exchange of gases, causing the pest to die of suffocation.

Oil sprays should be applied between 1/2-inch green and tight cluster. Apply a 2% rate at the 1/2 inch green stage or a 1% rate at tight cluster. Oil sprays should not be applied during, immediately before, or immediately after freezing weather. For best results, apply when temperatures are 45°F or above, and not just before rain showers. Remember that the oils are not directly toxic to the pests. They only work by suffocation. Therefore, the better the coverage, the better control you will receive. Our data have shown that mite control is improved if oil is applied at tight cluster rather than at 1/2 inch green.

One question that has arisen as a result of our research that showed that predator mites overwinter on the tree is: What effect will early season oil sprays have on predator populations? In other words, will the oil sprays kill the predators and create more serious European red mite populations? Our research showed that oil sprays, whether applied at green tip or tight cluster, had absolutely no detrimental effect on mite predators. Therefore, we recommend the use of early season oil sprays as a good management practice.

If you plan to use Apollo, Savey, Agrimek, Pyramite or some other material for mite management, a

reasonable question to ask is: Is it still necessary to apply an early season oil spray? I believe that the oil application is still a good idea, for two reasons. First, it will provide control of aphids and scales, as well as European red mites. Secondly, I believe that the use of oil will reduce the likelihood of developing resistance to these miticides. Therefore, I still recommend oil sprays even if other miticides are going to be used. The addition of an insecticide with your oil spray usually will not increase control of any of the three pests by more than a small amount. -Foster



Peach leaf curl: Peach trees need all the help they can get, that includes a spray for control of peach leaf curl. If you have not yet sprayed for leaf curl get on your tractor and spray the first chance you get; however, if peach trees are at, or past bud swell, you're too late. If you always seem to be too late, consider applying your leaf curl spray at leaf fall this autumn, then you won't have to worry about spraying in spring. -Pecknold

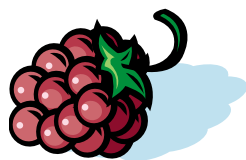


Pruning Grapes: March is the most common month for pruning grapes. The threat of extremely cold weather has passed and we can evaluate any winter injury to vines that may have occurred. By April buds will begin to swell and it is important that pruning is completed prior to bud swell to avoid damage to the tender buds. Winter injury in grapes this year should be minimal. However, there is likely to be some damage on cold-tender varieties. You should assess bud damage prior to pruning so that adjustments in the balanced pruning formula can be made based on the amount of bud loss. Typically, if less than 25% of the buds are damaged you can prune normally. If 25-40% of the buds are damaged then you'll want to adjust the number of buds retained accordingly. For example, if 40% of the buds are damaged then 60% are live. If you need 40 buds per vine for the proper crop load then you'll have to leave 68 buds to end up with 40 primary shoots. To determine how to adjust the bud number multiply the inverse of the % live buds ($1/.60$) times the desired number of buds ($1/.60=1.7$; $1.7 \times 40 = 68$ buds). If more than 40% of the buds are damaged then you'll probably want to do minimal pruning now and wait until after budbreak to determine where live buds occur in order to have an

adequate number for balancing the vines.

Spring freeze damage can also be a significant economic problem for grape growers. A technique called long pruning or double pruning helps avoid spring frost and freeze damage, especially on varieties that tend to bud out early. The procedure utilizes the apical dominance of buds on the cane. The first buds to begin growing are those on the tip of the cane, while buds closer to the base begin growth later. This type of pruning is only applicable to spur or no-tie training systems. To perform long pruning, select canes to be used for fruiting spurs during the normal pruning practice, but leave those canes long, with 10-15 more buds than desired. Spurs are normally pruned to 5 or 6 nodes for fruiting, but if they are not cut back, then the extra buds will help delay the development of the desired basal 5-6 buds, which helps avoid frost injury. After the date of the last probable spring freeze has passed, the canes are shortened to the desired length to properly adjust the bud number for the vine. Growth of the basal buds can be delayed by as much as two weeks if weather conditions are favorable. While this procedure requires an extra trip through the vineyard, it can mean the difference between a full crop and little or no crop. -*Bordelon*

Pruning Brambles: This is a good time to finish pruning summer-bearing brambles. Last years fruited canes should be removed now if they were not removed last summer or fall. Remove weak or spindly floricanes and thin to 2-4 canes per foot of row. Laterals on blackberries and black and purple raspberries should be trimmed back to about 2/3 to 3/4 of their original length to promote flowering on strong wood. Red raspberry canes can be tipped if desired, but should not be tipped more than 1/4 of the cane length. If the planting is trellised, the canes should be tied to the wires now before growth starts. Fall bearing types should be mowed to the ground before growth begins for a fall-only harvest, or remove the fruited tips if a summer and fall harvest is desired. Remove and destroy the prunings to help prevent anthracnose. -*Bordelon*



Raspberry anthracnose: The most important spray you will apply this season for control of anthracnose on brambles is the delayed dormant spray of lime sulfur. DON'T FORGET IT! Liquid lime-sulfur at 20 gallons per acre should be applied when new leaves are exposed 1/4 to 3/4 inches; if you are late in your application and don't spray until a few leaves have unfolded, cut the rate

to 10 gallons per acre. NOTE: There is greater risk of lime-sulfur burn, when applied at this later time.

-*Pecknold*

Pruning Blueberries: Spring is the best time to prune blueberries. Winter injured wood is easily identified and should be removed. Try to establish an even number of canes of various age classes. A well-pruned blueberry bush should have about 15-25 canes (depending on age, cultivar and growth habit) with approximately 1/3 in the 5-7 year-old class, 1/3 in the 2-4 year-old class, and 1/3 new canes for renewal. Pruning should open the center of the bush to encourage new cane growth, and promote an upright growth habit by removing low, drooping branches. Detailed pruning to remove weak growth in the tops of the canes will reduce the number of fruit and improve fruit size. -*Bordelon*



Straw removal on strawberries: Studies done in Illinois indicate that proper time to remove straw from matted row strawberries is when the bare soil temperature at 4 inches averages about 40-43°F. According to data from the Purdue Applied Meteorology Group bare soil temperatures are averaging in the high 30s for most areas of the state. Soil temperatures should rise steadily through the month of March and should reach the low 40s over the next two weeks. Once temperatures reach this range the straw should be raked off the tops of the beds and into the row middles. Leaving some straw on top of the beds for plants to grow up through provides a clean surface for fruit. Straw should be removed from strawberry beds before the plants grow enough to cause yellowing of foliage. Allowing the leaves to become etiolated (yellowed with long petioles) due to late straw removal can reduce yields by as much as 25%. However, uncovering the plants early may promote early growth and increase chances of frost or freeze injury. This is a judgment call that growers have to make for themselves. After the straw is removed the frost protection irrigation equipment should be set up. -*Bordelon*

2001 Spray Guides: The revised 2001 Commercial Tree Fruit (ID-168) and Commercial Small Fruit and Grape (ID-169) Spray Guides are now available. The new issues contain the latest pesticide label information available at printing time but, as always, you should read and follow the label directions. Several changes have occurred this year and all commercial growers should

have a copy of the revised versions. The spray guides will be available at the regional meetings, through your local Cooperative Extension office, or directly from Agricultural Communication Service, Media Distribution Center at 1-888-EXT-INFO. (1-888-398-4636). The current version of the Small Fruit and Grape Spray Guide is also available on the web at: <http://www.hort.purdue.edu/hort/ext/sfg/>. Any changes in pesticide registrations that have occurred since printing will be listed under a special button on that web page. Speaking of which, there are some important corrections to the printed version that all growers should be aware of. We try to avoid making mistakes in the printed version, but sometimes things are beyond our control. The spray guides are a group effort of fruit workers from Universities in several states across the Midwest. Coordinators work to incorporate the changes in registrations and recommendations for all states across the region. There are two mistakes we want to point out.

Danitol: Danitol (fenprothrin) is labeled for use on strawberries, grapes, apple and pear. In the 2001 Commercial Small Fruit and Grape Spray Guide we failed to note that this product is a Restricted Use Pesticide.

Captan Registration:

Last year we received a copy of a proposed label for 2001 and were under the impression that it was approved and the Federal registration was granted. This was not the case, and the label is still in review and should be approved during spring or summer of 2001. The 2001 spray guides have the recommendations for the proposed Captan label incorporated in them. As of yet, the label has not been approved and all Captan products being marketed still contain the old (2000) label information. The following changes (mistakes) were made in the 2001 spray guide and they need to be pointed out to growers:

Small Fruit:

1. Captan is not registered for use on brambles until the new label is approved. Several states have 24-C registrations for Captan and brambles so it can be legally used. The old reentry period is 4 days, so under the 24-C registration the reentry period is still (2001) 4 days. The new label proposes reducing the reentry interval on brambles to 24 hours.
2. No change on strawberry. Captan is registered for us on strawberry and the reentry interval is 24 hours.
3. On grapes, the reentry interval is still 4 days. The new label reduces the reentry interval to 3 days.
4. On blueberries, the reentry interval is still 4

days. The new label reduces the reentry interval to 3 days.

Tree Fruit:

1. On apple and stone fruit (peach, nectarine, plum and cherry) the reentry interval is still (2001) 4 days. The proposed new label reduces the reentry interval from 4 days to 1 day (24 hours) on apples and stone fruits.
2. No other changes have occurred in relation to Captan use on tree fruit.

We apologize for the confusion related to this mistake. It is important that growers remember that they must always read and follow the current label information on the product they are using. -*Bordelon*



Apple Cider Contest Winners: Once again we congratulate Steve Doud of Doud Orchard in Denver IN for producing the best apple cider in the state. This is the third year we have held the cider contest and the third time Doud Orchard has been the overall winner. We would also like to recognize the 2 runners-up, John Beasley of Beasley's Orchard in Danville and Gene Wild of Zionsville. While these three cider producers warrant special mention, I think all cider makers in the state ought to be congratulated for improving cider quality and paying particular attention to sanitation. - *Hirst*

Federal Assistance for Apple Growers Available Now: Federal assistance is available for growers who have suffered 3-4 years of low prices due to unfair foreign competition (apple juice concentrate from China) and severe, adverse weather conditions. Details of the assistance program, valued at \$100 million, were published in the Federal Register last week, on March 8. **Growers have until April 8 to file for assistance.** Payments will be made on grower's first 40,000 bushels of production in either 1998 or 1999, depending on which was the grower's highest production year. "At the close of the sign-up period, a national per pound payment rate will be determined based on the factoring of the available \$99.78 million divided by the total pounds of eligible apple production from each applying apple operation, with no operation exceeding 1,600,000 pounds of apple production" according to the Federal Register.

Contact your local FSA (Farm Services Agency) office for more details and for an application form. If you need the contact information of your local FSA office, look at <http://www.fsa.usda.gov/in/> or call the state office in Indianapolis, phone 317-290-3030. A further \$38 million of assistance primarily related to weather and disease problems is currently under review by the Office of Management and Budget (OMB).

- *Hirst*

HACCP for Cider - It's Here: After a few years of deliberation, the Food and Drug Administration (FDA) has mandated HACCP procedures for the production of fruit and vegetable juices, including apple cider. The final rule was published in the Federal Register on January 19, 2001. If you're interested in reading all the wonderful 66 pages of this, it can be accessed on the internet at <http://www.access.gpo.gov/nara/> For those with better things to do, here's a brief summary:

HACCP procedures will be mandatory for all apple cider producers. The date at which the ruling comes into effect differs depending on the size of operation. The dates are:

1. January 20, 2004 for very small businesses. These are businesses with annual total sales less than \$500,000, OR sales of greater than \$500,000 but food sales less than \$50,000, OR those with fewer than an average of 100 full-time equivalent employees and fewer than 100,000 units of juice sold in the United States. This category will include almost all cider producers in Indiana.
2. January 21, 2003 for small businesses. Small businesses are those with fewer than 500 employees. This will include the few operations in the state that don't qualify as very small businesses
3. January 22, 2002 for all other businesses - this is not applicable to any operations in the state

The bottom line is that HACCP is definitely coming, but we have a couple of years up our sleeve to get ready for it. Individuals at your farm are required to undergo HACCP training. Watch the next FFF for details on training courses which will be held around the state. Until the HACCP rule takes affect, you may either produce your cider with a HACCP operation in place or else a warning label is necessary. The warning label requirements have not changed since last year. If you are having labels printed remember that the warning label should be included as part of your main label on the jug - *Hirst*

Hort Congress Continues to Grow: The Indiana Horticultural Congress continues to be one of the strongest meetings in the Midwest. This year was no exception, with excellent educational programs, trade show and attendance.

The Indiana Horticultural Society presented 2 Golden Apple Awards this year for distinguished service to the industry.

- Brian Garwood for serving the industry as past president of the HIS
- Dr Rick Foster for excellence in extension (Rick was also the recipient of the Sharvelle Award during the past year).

In addition, certificates of appreciation were also presented to Dr Mario Morales for taking over leadership of the IHC, Dr Liz Maynard for taking charge of the finances of the IHC (this is not a small or insignificant task) and Jane Slipher for administrative assistance with IHC. - *Hirst*

Upcoming Meetings:

March 20-23 – Wineries Unlimited Seminars and Trade Show. Lancaster Host Resort Hotel, Lancaster, PA. Contact Vineyard & Winery Management at www.vwm-online.com

March 24-26 – Illinois Grape Growers & Vintners Association Vine to Wine Conference. Holiday Inn, Carbondale, IL. Contact IGGVA at 773-281-1866

**FACTS FOR FANCY FRUIT
SUBSCRIPTION NOTICE FOR 2001**

Facts for Fancy Fruit is a newsletter for commercial and/or advanced amateur fruit growers. It provides timely information on pest control and production practices that should be of interest to all growers. The information is not intended for home fruit growers unless those growers wish to follow commercial practices. All growers or interested persons are welcome to subscribe, however.

At least 14 issues will be published during 2001, bi-weekly during the growing season and monthly otherwise. The subscription price of \$15.00 includes only the basic costs of printing and mailing at first class rates. The newsletter is also available free of charge electronically through the world wide web at <http://www.hort.purdue.edu/fff/fff.html> or by email. If you have e-mail and would like a copy sent electronically, send your e-mail address to bordelon@hort.purdue.edu and we will include you on the list, or subscribe through the web at <http://www.hort.purdue.edu/fff/fff.html>.

If you wish to receive the printed version of the newsletter in 2001, please fill out the form below and send it to the Department of Horticulture, along with a check for \$15.00 (tax included) **made out to Purdue University**.

We hope that you will benefit from the information contained in the newsletter. We welcome your comments and suggestions.

Bruce Bordelon

Please send me "Facts for Fancy Fruit" for the 2001 season. Enclosed is my check for \$15.00 (tax included). Make checks payable to PURDUE UNIVERSITY.

Name _____
Address _____
City _____
State _____ Zip _____
Phone# _____ County _____

Please Check:
Grower _____
Sales _____
Other _____

I would like to see information on the following fruit crops:

Apple _____
Peaches _____
Pears _____
Blueberries _____
Strawberries _____
Grapes _____
Raspberries _____
Cider _____
Other _____

Please Return to: Facts for Fancy Fruit
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