http://ipm.osu.edu/fruit/index.html

THE OHIO STATE UNIVERSITY Newsletter Extension

Fruit ICM News

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Attention Farm Marketers

Source: John Wargowsky, Ohio Fruit & Vegetable Growers, e-mail for response JWargows@ofbf.org

Your assistance in answering me by Friday (April 13) via e-mail could save you $50 to several hundred dollars in license fees next year, depending upon how many farmers' markets you participate in and what kind of products you sell. I am working on corrective legislation to fix some problems with the new Ohio Uniform Food Safety Code. We are definitely looking for more exemptions in the direct marketing area, but we do need to draw lines somewhere. One area of concern is growers who participate in Farmers' Markets (some use the term "tailgate markets" in some parts of the state).

The following information would greatly help me. Please respond only if you participate in a Farmers' Market. Type your responses ALL IN CAPS. I will maintain confidentiality of information.

1. How many different farmers' markets do you participate in?
2. Do you sell products other than fresh fruits and vegetables?
3. If you answered yes to #2, please list those products.
4. If you sell commercially prepackaged, non- potentially hazardous foods (the kind of things you would buy from Farm Markets of Ohio, Cooper's Mill, Dillman Farms, Walnut Creek Foods, Rothschild's, Webb & Associates, etc.), please estimate the amount of display space of only that kind of food at your stand in the farmers' market by marking one of the following choices.

0 to 10 cubic feet
10 to 25 cubic feet
25 to 50 cubic feet
50 to 75 cubic feet
75 to 100 cubic feet
Over 100 cubic feet

5. Do you sell any food products with expiration dates? Please describe:

Pruning Apples At Planting

Source: Healthy Fruit, Volume 9, Issue 2

Get those newly planted trees off to a good start--HEAD at planting! Following is a guideline for pruning newly planted apple trees as presented by Cornell's Terence Robinson at the International Dwarf Fruit Tree Association's Annual Conference last February.

Please, do heed Dr. Robinson's advice upon planting:

- For large caliper, highly-feathered trees (8-10 feathers): Head the leader at 48" high.
- For whips, raise the heading height to 36"for non-tip bearing varieties and to 42" for tip bearing varieties.

Feathers:

- Remove all feathers below 24".
- Remove feathers that are larger than 2/3 diameter of leader. If there are less than 3 good feathers, then remove them all with a bevel cut.
- If 3 or more good feathers remain, then head feathers that are longer than 12" back to 12".

Scab Note From Mike Ellis

"I draw your attention to the following article provided by Dr. David Rosenberger from the Hudson valley laboratory of Cornell University. Although I have not tested for ascospore maturity here at Wooster, I think the information he is giving may apply here in Ohio as well.

"This is shaping up to potentially be a very severe scab year. Remember the scab epidemic of 1998. Early season infections (green tip to half- inch green) got established in several orchards , and losses were the worst I have ever seen in commercial orchards. An early spray (green tip to half -inch green) of a protectant such as Mancozeb, Captan, Polyram, or Vangard should be emphasized with this wet introduction to spring. This spray should be followed within 7 days (tight cluster) with the second spray. From tight cluster through first or second cover, a sterol inhibiting fungicide such as Nova or Rubigan plus a protectant, or a strobilurin fungicide such as Sovran or Flint (applied alone) should be applied on no more than a 10-day schedule.

"The sprays should also be applied ahead of infection periods whenever possible. A 2-spray blocking program starting with the sterol inhibitor plus protectant (2 sprays) then a strobilurin fungicide (2-sprays) has worked very well here at Wooster under very heavy disease pressure. Consult bulletin 506-A *Ohio Commercial Tree Fruit Spray Guide* for rates and additional information. If you have questions, contact Mike Ellis at (330) 263-3849.

Apple Scab Update

Source: Dave Rosenberger, Plant Pathology, Cornell University, Highland, Scaffolds, Volume 10, Issue 4

Spore maturity in the Hudson Valley is unusually advanced compared to tree phenology. Trees still had no green tissue present at the time of this spore count (April 5). Significant spore discharges usually begin when we reach 15% mature spores in our counts. Although very few spores were discharged in the tower shoot test, that could change quickly with a few days of warmer weather. (Tower discharges usually exceed 400 spores at the peak of the season.)

The early spore maturation is hardly surprising, given the constant snow cover during winter and the wet weather of the past two weeks. The early spore maturation in the Hudson Valley is similar to that of 1998 when many orchards developed severe scab as a result of a green-tip infection period followed by a wet spring and summer. Thus, Hudson Valley growers should be prepared to spray as soon as there is green tissue and a predicted infection period, even if they can only spray alternate rows. With high carry-over inoculum present in many orchards, this will not be the year to take chances on skipping early infection periods.

Adjusting Apple Fungicide Programs to Compensate for SI-Resistance

Source: Dave Rosenberger, Plant Pathology, Cornell University, Highland, Scaffolds, Volume 10, Issue 4

The last two issues of *Scaffolds Fruit Journal* http://www.nysaes.cornell.edu/ent/scaffolds/ contained articles discussing scab and mildew control

strategies for orchards where SI fungicides (Rubigan, Nova, Procure) are still effective for controlling apple scab and powdery mildew. Strategies suggested in those articles must be modified for orchards where the SI fungicides no longer provide acceptable control of apple scab or mildew.

Status of fungicide resistance in apple orchards: Apple scab has developed resistance to dodine (Syllit), the benzimidazoles (Benlate, Topsin M), and the SI fungicides. Apple scab has never developed resistance to any of the "contact" fungicides, a broad grouping that includes the EBDC fungicides (mancozeb, Polyram), captan, the other carbamates (ferbam, thiram, ziram), or sulfur. The contact fungicides are multi-site inhibitors. That means that they disrupt several different metabolic pathways in fungi, thereby making it difficult for the fungus to circumvent the action of the fungicide. By comparison, the fungicides to which apple scab has developed resistance are single-site inhibitors. They

arrest fungal development by interfering with a single critical metabolic pathway in the fungus. Resistant strains of apple scab survive the fungicide either by using an alternative metabolic pathway or by limiting access of the fungicide to the critical pathways within the cells.

Fungicide resistance comes in two flavors. With benzimidazole fungicides, resistance is an "all or nothing" proposition. That means that strains of the apple scab fungus that are resistant to the benzimidazoles cannot be controlled by using higher rates of Benlate or Topsin M. Resistant strains will grow through any rate of fungicide that could be applied in the field.

Resistance to dodine and the SI fungicides develops in a gradual "step-wise" process. Wild populations of apple scab contain strains with varying levels of sensitivity to dodine and SI fungicides. Repeated use of these fungicides gradually eliminates the most susceptible strains from the population, leaving only the less sensitive strains. These less sensitive strains can still be controlled with higher rates of the fungicides, but they survive in the field when fungicide rates are low, when intervals between sprays are too long, or when spray coverage is incomplete. This gradual selection for resistance ultimately produces stable scab populations that cannot be controlled by applying fungicides at labeled rates and intervals.

Resistance to dodine and benzimidazole fungicides is so widespread in New York State that these fungicides are no longer recommended for control of apple scab. They are still effective in some orchards, but their performance is unpredictable because of the unpredictable distribution of fungicide resistance. Furthermore, Drs. Wolfram Koeller and Wayne Wilcox at the Geneva Experiment Station have shown that a few orchards also contain scab populations with levels of SI resistance sufficient to account for failure of the SI fungicides under field conditions. Growers and fieldmen have also reported that SI fungicides are no longer controlling powdery mildew as effectively as when these fungicides were first introduced. However, levels of SI resistance in powdery mildew have not been documented by researchers.

The extent of SI resistance in apple orchards is difficult to determine because testing for resistance is a tedious and expensive process. As a result, most assessments of SI resistance in commercial orchards must be based on grower experience: If the SI fungicides fail to provide good control of scab or mildew when they are applied in a conservative 10-day program (as always, in combinations with contact fungicides), then quite possibly the scab and/or mildew population in that orchard has shifted toward SI-resistance.

Adjusting programs to compensate for SI resistance: Apple growers with SI-resistant apple scab and/or powdery mildew are at a significant disadvantage compared with growers where SI fungicides are still effective. The new strobilurin fungicides (Sovran, Flint) can control scab and mildew as well as SI fungicides, but the strobilurins represent the last available chemistry with post-infection activity against apple scab and good protectant activity against mildew. Where SI fungicides are no longer effective, growers should take extra precautions (=extra expense!) to protect strobilurins against resistance development. We do not know how quickly scab and mildew may develop resistance to Sovran and Flint, but we know that resistant strains will eventually appear if these products are used inappropriately.

Following are my suggestions for using Sovran and Flint in orchards where growers suspect that apple scab or mildew has become resistant to the SI fungicides:

1. Use a very conservative program of contact fungicides from green tip to tight cluster or pink. Resistance to Sovran and Flint can be expected in orchards where these strobilurin fungicides are routinely used as "clean-up" materials to compensate for missed infection periods earlier in the season.

2. Where SI-resistant scab is present, Sovran and Flint should be used in combinations with a contact fungicide (either mancozeb, Polyram, or Captan). Although Sovran and Flint have been tested as "stand-alone" fungicides, tank mixes are essential for orchards where alternating with SI fungicides is no longer an effective resistance management option. As indicated in last week's article, rates of Sovran and Flint should never be reduced below the standard dilute rates (equivalent to 0.67 oz of Flint or 1.33 oz of Sovran per 100 gallons), and this applies even when the products are used in combinations. Tree-row volume adjustments are acceptable down to the dilute equivalent of 100 gal/A. Thus, even on very small trees, the minimum rate per acre should never be less than 0.67 oz of Flint or 1.33 oz of Sovran.

3. Shift the use Sovran + contact fungicide or Flint + contact fungicide forward in the growing season compared to what might otherwise be considered optimum timing. Thus, where SI resistance is already present, the strobilurin + contact combinations should probably be applied at pink and petal fall (or at pink, petal fall, and first cover) rather than just at petal fall and first cover. In very wet years with high carry-over inoculum, the first strobilurin spray might be justified at tight cluster. The objective here is to eliminate any potential for letting scab or mildew infections become established before the strobilurin fungicides are applied. The peak period of risk for primary scab infections usually occurs near pink, so it makes sense to target the strongest fungicides toward this time period. (As mentioned last week, a mancozeb or captan spray may be needed during bloom to bridge the gap from pink to petal fall.) This forward shifting of the strobilurin sprays is especially critical for orchards where growers believe that SI fungicides are no longer controlling mildew because mildew is usually well established by petal fall and the strobilurins act more slowly than the SI fungicides for arresting a running population of mildew.

4. The strobilurin + contact fungicide combination can be used only three times in direct succession. Where mildew is a significant problem, additional sprays will be needed after petal fall or first cover. The best option here (or where scab is still a threat after first cover) is to follow up with an SI + contact spray. If activity of SI's against mildew has been declining, then higher rates and tighter spray intervals may be needed. In some young orchards, Benlate or Topsin M may provide effective control of mildew in cover sprays, but benzimidazole-resistant isolates are present on many older orchards. The only other alternative for mildew is to include sulfur in the early cover sprays.

These guidelines using Sovran and Flint in orchards with SI resistance are based on our current understanding of fungicide activity and resistance management. The suggested guidelines may change as we gain a better understanding of resistance development in strobilurin fungicides and/or the extent of SI resistance in apple orchards.

Rates of Savey on Strawberries

Source: Celeste Welty, OSU Extension Entomologist

As previously reported, Savey 50WP and Savey 50DF were registered last September for spider mite control on strawberries. The federal label specifies a rate of 6 oz per acre. The manufacturer, Gowan Company, recently issued a section 2ee recommendation for a reduced rate of 3 to 6 oz per acre when used in Ohio and several other midwestern and eastern states. In Ohio, reduced rates of 3-4 ounces per acre will provide excellent mite control in almost all cases. The six-ounce rate should only be required when mite pressure becomes extreme and / or long residual control (45-60+ days) is required, which typically occurs under California and florida conditions.

Getting the Most Out of Glyphosate and Other Sprays

Source: Bruce Bordelon, Purdue University, Facts for Fancy Fruit, April 11, 2000

Fruit growers often apply a post-emergent herbicide beneath the tree or vine row in spring to control winter annuals and other weeds. Often a pre-emergent herbicide is included in this application. Glyphosate (Roundup) is a post emergent systemic herbicide that is widely used for this first weed spray. In order for glyphosate to be effective, it needs to be absorbed into the plant.

In soft water glyphosate has no problems in being absorbed. However, in hard water glyphosate will be "tied up" and not absorbed as readily. Hard water, common in many parts of Indiana, contains high concentrations of soluble salts, calcium, and magnesium. When these cations are present they react with the negatively charged glyphosate to form compounds that are not readily absorbed by plants. This results in poor uptake and poor weed control. The solution to the hard water problem is to add ammonium sulfate to the spray water before mixing with glyphosate. Ammonium sulfate ions tie up the calcium and magnesium ions form conjugate salts. Additionally, some of the glyphosate reacts with ammonium to form a compound that some weeds preferentially absorb.

Follow the roundup label recommendations on the amount of ammonium sulfate to add. Another problem associated with spray water quality is that many fungicides and insecticides break down quickly in high pH water. Captan, Cygon, Imidan, Kelthane, malathion, and Omite are examples of compounds that are especially vulnerable to alkaline hydrolysis. Both the Commercial Tree Fruit and Small Fruit and Grape Spray Guides have a discussion of spray tank pH. Briefly, addition of about 2 ounces of food grade citric acid per 100 gallons of water will lower the pH from about 8.0 to about 5.5.

Web Site Corrections

Some of the web links listed in last week's newsletter (both e-mail and hard copies) were incorrect. Bruce Eisley has made the corrections on the web version and I am repeating those with corrections.

Ohio Sites

Brambles, Production, Management, and Marketing http://ohioline.ag.ohio-state.edu/b782/index.html

Controlling Diseases and Insects in Home Fruit Plantings, OSU Extension Bulletin #760
http://ohioline.ag.ohio-state.edu/b780/index.html

Ohio Extension Internet Resources for Tree Fruit http://www.ag.ohio-state.edu/~nedoanr/sfnf/crops/fruit.html

Ohio Extension Internet Resources for Berries http://www.ag.ohio-state.edu/~nedoanr/sfnf/crops/berries.html

Ohio Fruit ICM News http://www.ag.ohio-state.edu/~ipm/fruit/index.html

Regional Site

Midwest Small Fruit Pest Management Handbook http://ohioline.ag.ohio-state.edu/b861/index.html

Other State Fruit Sites

Cornell University Scaffolds Fruit Newsletter http://www.nysaes.cornell.edu/ent/scaffolds/

No Carolina State Univ. Apple Production Newsletter http://henderson.ces.state.nc.us/newsletters/apple/

Michigan State Fruit Information http://www.msue.msu.edu/fruit/

Fruit Observations & Trap Reports

Insect Key
AM: apple maggot
CM: codling moth
ESBM: eye-spotted budmoth
LAW: lesser apple worm
LPTB: lesser peachtree borer
OBLR: obliquebanded leafroller
OFM: oriental fruit moth
PTB: peachtree borer
RBLR: redbanded leafroller
SJS: San Jose scale
STLM: spotted tentiform leafminer
TABM: tufted apple budmoth
VLR: variegated leafroller

Waterman Lab, Columbus, Dr. Celeste Welty, OSU Extension Entomologist

Traps used: STLM = Wing trap, Others = MultiPher
Apple: 4/4 (green tip) to 4/11(tight cluster)

RBLR: 43 (up from 1)
STLM: 59 (up from 0)

Peach: 4/4 (green tip) to 4/11(pink)

OFM: 0 (same as last week)

Wayne County Report, April 12 - Ron Becker, Program Assistant, Agriculture & IPM

Most trees today are at tight cluster with a few lagging behind at 1/2 inch green. According to the logger at Moreland, we had a moderate scab infection period on 4/10 and a heavy infection period on 4/11. Ladybugs and both brown and green lacewings are present. Cherries are at swollen bud and peaches are at half inch green (at least as of several hours ago, could be further along by now!) Grapes are starting to

bud.

Traps used: STLM = Wing trap, Others = MultiPher
Apple: 4/5-4/12
CM: 0
RBLR: 49
STLM: 1078

North Central Ohio Report, April 12 - Ted Gastier

Once again, Lake Erie has held back our fruit development. With the present weather forecast for cooler temperatures next week, that may be a blessing. Our apple trees are at green tip and the peaches show half-inch green. Our scouts, Jim and Gene, will be starting the eleventh year of our IPM Program as they visit orchards and hang traps next week.

Southern Ohio Report, April 9 - Brad Bergefurd, Horticulturist, Enterprise Center for Economic Development

With the warm, summer-like weather, things are really beginning to pop!! Raspberry planting continues into its third week, with one grower planting 5,000 plants on Saturday. With the dry field conditions being experienced, especially in the northern growing area, irrigation is being supplied to new plantings. Liquid lime sulfur applications are also being applied quickly since raspberry plantings are beginning to leaf out with the warm temperatures. Raspberries on darker soils were beginning to leaf out the last weekend of March. Blueberries at Piketon are leafed out.

Herbicide applications were being made last week to raspberries and blueberries. There seems to be a shortage of Surflan herbicide. Fertilizer applications have been made to bramble plantings for about three weeks now. After a long winter of pruning brambles, the job is now completed.

With the high temperatures, growers have been removing straw mulch from strawberry plantings. Plants are greening up quickly. Growers are setting up overhead irrigation. Strawberries planted in non-heated high tunnels are in full bloom and beginning to set fruit.

About 1 inch of rain fell around the Piketon area this weekend past, whereas northern growing areas received just a light drizzle Friday night. Growers in this region are irrigating newly planted raspberry crops in some situations, and using lots of water at transplanting due to the dry soil conditions.

Growers continue to work ground, chisel plow, form beds, lay plastic mulch and utilize trickle irrigation for bramble plantings, install irrigation main line, install drain tile, and spread fertilizer.

Degree Day Accumulations for Selected Ohio Sites January 1, 2001 to date indicated

	Actual DD Accumulations April 11, 2001				Normal Degree Day Accumulations for April 18, 2001	
Location	**Base 43° F**	**Base 43° F normal accumulations**	**Base 50° F**	**Base 50° F normal accumulations**	**Base 43° F**	**Base 50° F**
Akron - Canton	145	159	82	59	225	91
Cincinnati	303	301	149	122	407	179
Cleveland	128	151	67	57	213	86
Columbus	239	211	124	84	293	124
Dayton	213	210	123	83	294	126
Mansfield	148	153	89	59	218	89
Norwalk	134	133	77	49	193	77
Piketon	308	320	156	137	428	196
Toledo	102	120	51	45	180	72
Wooster	163	144	94	52	205	79
Youngstown	137	136	77	50	196	78

Phenology

	Range of Degree Day Accumulations	
Coming Events	**Base 43 F**	**Base 50 F**
Pear psylla 1st oviposition	25-147	1-72
Redbanded leafroller 1st catch	32-480	5-251
Tarnished plant bug active	71-536	34-299
Spotted tentiform leafminer 1st adult catch	73-433	17-251
Rosy apple aphid nymphs present - 1st egg hatch	91-291	45-148
Green apple aphids present	127-297	54-156
Oriental fruit moth - 1st adult catch	129-587	44-338

Thanks to Scaffolds Fruit Journal (Art Agnello)

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