



Newsletter Extension

Fruit ICM News

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In This Issue:

[Calender](#)

[Fly Speck & Sooty Blotch Control](#)

[Calcium and Bitter Pit Management in Apples](#)

[Degree Day Accumulations](#)

[Pest Phenology](#)

[Fruit Observations & Trap Reports](#)

[Terminal Market Wholesale Fruit Prices](#)

Calendar

September 18 & 19: Sixth Annual Pawpaw Festival, Lake Snowden, near Albany, Ohio. For information contact pawpaw@frognet.net. The web site for the festival is: <http://www.ohiopawpaw.org/pawpawfest.html>.

September 21 to 23: Farm Science Review, Molly Caren Agricultural Center, London, Ohio. See 2,100 acres showcasing a dynamic Ohio agricultural industry. For information contact Chuck Gamble at 614-292-4278 or e-mail gamble.19@osu.edu. The web site for the Review is <http://fsr.osu.edu>.

A Broken Record - The Other Side Fly Speck & Sooty Blotch Control

Many of you have recognized the need for late season application of insecticides. Mike Ellis, OSU Plant Pathologist, reminds us that late season applications of a fungicide for the control of fly speck and sooty blotch is equally important. The following are his comments from previous seasons and the *2004 Commercial Tree Fruit Spray Guide*.

Cultural practices, such as pruning and fruit thinning, that increase air circulation and reduce drying time of fruits are very important. Good spray coverage is essential.

The benzimidazoles (Benlate and Topsin-M) are highly effective for prevention of sooty blotch and flyspeck. However, excessive use of Benlate and/or Topsin-M may result in a buildup of resistant strains of the apple scab fungus and/or increased mite injury due to the adverse effect of these fungicides on predatory mites. Combination of a benzimidazole plus captan or alternatives of a benzimidazole and captan should provide a good level of control. Thiram and Ziram will work, but you have to keep the

rates up (at least 1.5 lb/100 gal) and spray on a tighter schedule during wet growing seasons.

The strobilurin fungicides Sovran and Flint are very effective for control of sooty blotch and flyspeck, as well as other fruit rots. They also have some distinct advantages over Benlate or Topsin-M plus captan late in the season (preharvest). They are applied at such a low rate (Flint at 2 to 2.5 oz and Sovran at 4 oz per acre) that visible residues on the fruit are not a problem. This is a big plus, especially in pick-your-own operations. In addition, when you compare costs, they are not any more expensive than Benlate plus captan, and may even be less expensive, depending on the deal you get for your fungicides. Flint has a 14 day PHI and Sovran has a 30 day PHI. You cannot make more than 4 applications of a strobilurin fungicide per acre per year. Mike Ellis recommends using two applications early for scab, mildew, and rust and saving two applications for post petal fall control of the summer diseases.

During wet growing seasons, do not exceed a spray interval of 3 weeks from the last spray to harvest.

Calcium and Bitter Pit Management in Apples

Source: Mark Lonstroth, Southwest Michigan District Extension Horticultural & Marketing Agent
<http://www.msue.msu.edu/vanburen/bitpit.htm> Calcium nutrition has become more important in Michigan orchards with the increasing demand for large fruit. These large fruit are increasingly at risk for bitter pit. Bitter pit is a physiological disorder of apple fruit. I am sure that all apple growers have seen the dark, sunken pits and brown, corky tissue that are the symptoms of the disorder. Research indicates that calcium (Ca) metabolism is the key to bitter pit.

It is generally believed that bitter pit is a result of a calcium deficiency in the fruit. This is not always true, since the tissue affected by bitter pit is often higher in calcium than the surrounding tissues. Unfortunately, there is no quick fix for the problem. Calcium sprays are helpful in reducing the amount of bitter pit, but other cultural practices have proven to be more effective in controlling the disorder.

It helps to understand how calcium acts in the plant and its role in plant metabolism. Calcium is not very mobile in the plant and moves mainly in the woody xylem. It is carried in the transpiration stream from the roots to the leaves. The driving force for water movement through the tree is evaporation from the leaves; the movement of water to the leaves carries calcium with it. Calcium is also not very mobile in the phloem, which carries sugars from the leaves to the developing fruit. Therefore, bitter pit can be viewed as a competition between the shoots and the fruit for calcium. Measures which shift the balance to the fruit and away from the shoots will reduce bitter pit.

The key to low bitter pit levels in your harvested fruit is to set large crops of moderately large fruit (2 3/4 to 3"). This requires efforts to reduce alternate bearing by fruit bud stimulation treatments, increasing the potential for cross pollination, having and maintaining moderate vigor, annual light pruning, frost protection to ensure annual crops, and early thinning of excessive crops. Given the small size of last year's apple crop, it is likely that many growers will be faced with heavy crops. Bitter pit will probably not be a problem this coming year, but we could set ourselves up for another small crop with bitter pit if we do not manage our crops correctly this year. Bitter pit is a complex problem that requires an overall management scheme to reduce the problem to acceptable levels.

Several factors can affect fruit uptake of calcium in the spring (10 to 45 days after petal fall). High levels of nitrogen, potassium, and magnesium all reduce the fruit uptake of calcium. This is because nitrogen favors shoot growth over fruit growth. Potassium and magnesium compete with calcium because they are all positively charged ions. High levels of available water will increase fruit calcium if shoot growth

is not excessive. In general, lessening shoot growth increases calcium uptake by the fruit. Increasing root growth results in increased uptake of calcium. Finally, maintaining a high photosynthetic rate will increase calcium in the fruit as long as shoot growth is not excessive. Many of the practices which we employ as growers to maintain vigor in the tree canopy can come back to haunt us if we do not also maintain a large crop on the tree to manage vegetative vigor. I would like to discuss the practices we can use to control bitter pit.

Nitrogen: Nitrogen levels need to be low enough to keep leaf nitrogen levels at about 2% in the early spring. Fertilization of processed varieties like Northern Spy should be light in the spring and light in late August or early September (10-30# of actual nitrogen for each application). Fall applications may be needed for fruit set and early photosynthesis next year. Fall applications of nitrogen to Red Delicious may cause ripening and coloring problems. Spring applications should be ammonium fertilizers, e.g. NH_4SO_4 , to lessen the stimulation of early growth and improve fruit bud set. In cold wet springs, urea sprays at 10 lb/acre may be useful at petal fall and at first cover.

Potassium: Potash should be applied only when soil or tissue tests indicate a need for potassium. Potash should only be applied in the fall and only at low rates, 60 lb/acre of actual potassium is the maximum I recommend on bitter pit susceptible varieties. Annual applications of 20 to 30 pounds would be better. Trees growing on sandy soils will be especially sensitive to potash applications, since potassium will reduce the availability of calcium.

Magnesium: Because magnesium and calcium are very similar in chemical activity, magnesium competes with calcium for uptake into the tree. In fact, Doug Burmeister in Dr. Dave Dilley's Lab at Michigan State University was able to induce a bitter pit-like condition by infusing magnesium into ripe apple fruit. Therefore, magnesium should only be applied as dolomitic lime. If a tissue test indicates that magnesium is deficient, then use low rates of K-Mag or Sul-Po-Mag.

Calcium: Growers who have consistent problems with bitter pit in their orchard blocks should determine their soil pH with soil tests. The sandy soils of many of our orchards cannot hold many nutrients and eventually, following years of fertilization, soil pH will fall and calcium will become less and less available. Soil applications of lime are a cheap source of calcium and increase the availability of most nutrients to optimum levels. Many growers use calcium sprays, which I will discuss later.

Boron: Boron sprays have been inconsistent in controlling bitter pit. This is probably because boron is necessary in only small amounts, and we seldom see deficiency symptoms here in Michigan.

Irrigation: Few growers in Michigan routinely irrigate their orchards, but maintaining adequate watering of the soil will increase root growth and calcium absorption. Calcium is most easily taken up near young shoot tips before they fully develop barriers to water loss. These barriers are also effective in reducing calcium uptake. Woody roots do not take up much calcium. Warm springs with little rainfall will reduce calcium uptake and also favor shoot growth, which promotes bitter pit. Irrigation from pink through third cover at about 75 percent of the evaporative demand should help calcium uptake by the fruit under any weather conditions.

Calcium uptake depends on a healthy root system. Any activity that promotes photosynthesis (energy production) and energy storage in the fall, before or after harvest, will promote root growth in the spring. Root growth occurs in two cycles in apples: in the spring and again in the fall. Root deterioration begins in the spring and continues through the summer. This means that calcium uptake from the soil during the summer is severely limited.

Calcium Sprays: The restriction of calcium from the roots and calcium's lack of mobility in the plant are probably why calcium sprays have been so effective in reducing the symptoms of bitter pit. Calcium sprays are necessary to increase fruit calcium in years when fruits are large and the crop is light. No matter how much calcium is available in the soil, calcium related disorders will occur in large fruit. Spray calcium as late in the season as practical, but start early in the first or second cover. The addition of small amounts of calcium to many sprays seems to be more effective than several large dosage sprays. Growers should apply calcium 6 to 8 times, and the total amount of calcium should not exceed 20 pounds to the acre. Raising the calcium content of the fruit is not easy. Essentially, only the calcium which is absorbed through the waxy cuticle is used by the fruit. Other benefits from calcium are increased fruit firmness in storage and increased storage life. There may also be some benefit in disease resistance from increasing cell wall strength and cell membrane integrity.

Control fruiting: Large annual crops of moderately- sized fruit are necessary to control shoot vigor in varieties susceptible to bitter pit. This means carrying a large crop to harvest, but also good thinning early so that as many spurs as possible set fruit buds for next year. Setting fruit buds not only provides for next year's crop, but also stops the growing point controlling shoot vigor and the number of active growing points. Sprays of NAA and Ethephon may be useful for fruit bud development and thinning. Use NAA at 1/2 of the normal rate plus 200 ppm Ethephon, and use 3 sprays at weekly intervals starting at petal fall if a heavy set is anticipated. Growers should not use NAA and Accel on the same trees, as the two thinners seem to be antagonistic and do not work well when used in combination or when different sprays of each material are applied. The NAA and Ethephon may help calcium uptake in the young fruit by suppressing shoot growth for short periods. As far as I know, no one has worked with the combination of Accel and Ethephon to determine the effect on the trees. If growers do not have a heavy bloom this year, the aggressive 3 Ethephon spray program is probably not necessary. Many growers will be using Sevin aggressively this year because it is compatible with Accel.

Pruning: Annual pruning will result in good light penetration into the tree canopy and will increase the production of fruit buds. Drastic pruning every second or third year is counter-productive, since the heavy flush of shoot growth which follows in the spring will result in bitter pit. Heavy pruning in alternate years also reduces the yield, since much of the wood removed is 2-year-old wood would have borne fruit. Trees that were heavily pruned this last winter will certainly benefit most from calcium sprays.

Summary: Bitter pit can be managed by maintaining moderate vigor in your trees. Avoid heavy applications of nitrogen or heavy pruning. Manage your crop by thinning the fruit aggressively so that you have a moderate-sized crop, which will result in large numbers of good-sized fruit and many flowers next year. Avoid large applications of magnesium or potassium, which may reduce calcium availability to the fruit. Calcium sprays will help to control bitter pit in light crop situations and reduce losses in varieties which are prone to bitter pit. Calcium sprays will not correct mistakes made in orchard management. Reduction and control of bitter pit requires that the orchard be managed to increase calcium to the fruit.

Degree Day Accumulations for Ohio Sites September 8, 2004

Location	Degree Day Accumulations Base 50° F	
	Normal	Actual
Akron-Canton	2335	2480
Cincinnati	2977	3168

Cleveland	2449	2459
Columbus	2918	2839
Dayton	2751	3115
Kingsville	2248	2244
Mansfield	2330	2436
Norwalk	2504	2409
Piketon	2973	2857
Toledo	2491	2483
Wooster	2502	2348
Youngstown	2203	2271

Pest Phenology

Coming Events	Degree Day Accum. Base 50° F
Spotted tentiform leafminer 3 rd flight peak	1776 - 2134
Obliquebanded leafroller 2 nd flight peak	1779 - 2117
San Jose scale 2 rd flight subsides	1785 - 2371
Oriental fruit moth 3 rd flight peak	1821 - 2257
Rebanded leafroller 3 rd flight peak	1876 - 2342
Apple maggot flight subsides	1908 - 2368
Codling moth 2 nd flight subsides	1944 - 2536
Lesser appleworm 2 nd flight subsides	1973 - 2387
Oriental fruit moth 3 rd flight subsides	2000 - 2288
Lesser peachtree borer flight subsides	2011 - 2425
Obliquebanded leafroller 2 nd flight subsides	2022 - 2438
Redbanded leafroller 3 rd flight subsides	2142 - 2422

Thanks to Art Agnello, Cornell University

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

Site: West District; Huron, Ottawa, Richland, and Sandusky Counties

Lowell Kreager, IPM Scout/Technician

Apple 9/1 to 9/7/04	
Apple maggot (3 trap sum)	0.0 same as last week
Codling moth	0.6 down from 3.2
Lesser appleworm	9.6 up from 8.6
Oriental fruit moth	1.3 down from 2.7
Redbanded leafroller	22.8 down from 33.0
San Jose scale	0.0 down from 0.1
Spotted tentiform leafminer	40 down from 210
Peach 9/1 to 9/7/04	
Lesser peachtree borer	6.5 up from 5.7
Oriental fruit moth	0.6 down from 2.3
Peachtree borer	0.2 down from 0.8
Redbanded leafroller	31.2 down from 34.4

Beneficials include lady beetles and lacewings.

Site: East District; Erie and Lorain Counties

Jim Mutchler, IPM Scout/Technician

Apple 9/1 to 9/7/04	
Apple maggot (3 trap sum)	1.2 down from 3.4
Codling moth	3.6 down from 4.9
Lesser appleworm	14.3 down from 23.0
Oriental fruit moth	14.5 up from 13.0
Redbanded leafroller	12.9 up from 11.4

San Jose scale	0.0 same as last wk.
Spotted tentiform leafminer	no report
Peach 9/1 to 9/7/04	
Lesser peachtree borer	1.4 down from 8.4
Oriental fruit moth	4.2 down from 5.8
Peachtree borer	0.2 down from 3.6
Redbanded leafroller	15.3 up from 10.0

Beneficials include lacewing adults, lady beetles, and brown lacewings.

Terminal Market Wholesale Fruit Prices September 8, 2004

Source: Chicago http://www.ams.usda.gov/mnreports/HX_FV010.txt

Detroit http://www.ams.usda.gov/mnreports/DU_FV010.txt

Pittsburgh http://www.ams.usda.gov/mnreports/PS_FV010.txt

	Chicago	Detroit	Pittsburgh
Apples , cartons 12 3-lb film bags	IL U.S. Fancy Jonathan 2¼" up 14.00	MI U.S. ExFcy Earligold 2½" min 15-15.50 Gala 2½" min 12-14.00 2¼" min 11.50-12.00 Ginger Gold 2½" min 12-14 Gold Supreme 2½" min 14.00 Paula Red 2½" min 13.50-14 NY McIntosh 2½" min 15-15.50 MI U.S. Fancy Jersey Mac 2½" min 16-16.50 Paula Red 2¼" min 11.50-12	NY U.S. ExFcy Tydeman Red 2¼" up 15.00 U.S. Fancy Paula Red 2½" min 14.00-15.00 U.S. Fcy Tydeman Red 2¼" up 11.00-14.00
Apples , cartons tray pack, U.S. ExFcy (unless noted)		NY Ginger Gold 64s 23.50-24 72s 23.50-24.00	No grade marks WV Ginger Gold 88s 18.50
Apples , cartons cell pack		NY U.S. ExFcy McIntosh 100s 21.00-22.00	Carton cell pack ExFcy NY McIntosh 21.00 Comb U.S. ExFcy-
Apples , bushel cartons loose U.S. Fancy	IL Red Delicious 14.00	MI Gala 2 ¾" up 15.00 Ginger Gold 2 ¾"up 14.00 3" min 20.00	Fancy Paula Red 80s 18-19.50 100s 18.00-19.00 U.S. Fancy McIntosh 100s 14.00-17.00

		Gold Supreme 3" min 20.00 Paula Red 2 3/4" up 12.00	
Blueberries , 12 4.4-oz cups/lids	MI 20.00	MI med 23.00	
Blueberries , 12 1/2-pt cups/lids	MI 14.00-15.00		
Blueberries , 12 6-oz cups/lids		MI med 20.50-21.00	
Blueberries , 12 1-pt cups/lids		MI med 35.00	MI med-lge 33.25
Grapes , 3 8-qt baskets			NY Concord 24.75
Nectarines , 1/2 bu cartons loose, U.S. One various yellow flesh varieties (unless noted)		MI 2 1/2" up 14.00-17.00 NJ 2 3/4" up 19.50- 20.00 U.S. ExOne 2 1/2" up 17.00	
Peaches , 25 lb cartons loose, various yellow flesh varieties	MI 2 1/4" up 9.50-11	Pittsburgh - WV U.S. ExOne Redglobe 2 1/2" up 12.75 2 1/4" up 9.50 NJ ExOne 2 1/2" up 14.00, 2 1/4" up 10.50, 2 1/8" up 8.50	
Peaches , 1/2 bu cartons/crates U.S. ExOne various yellow flesh varieties (unless noted)		NJ 2 3/4" up 17.00- 18.00 White 2 1/2" up 14.00- 15.00	
Peaches , 1/2 bu cartons/crates U.S. One various yellow flesh vr			
Pears 1/2 bu cartons, U.S. One			NY Seckel 17.00-18.00 WV 2 3/4" up 11.50
Prune Plums , 30 lb cartons	MI Bluefire 1 1/4" up 12.00-12.50	MI U.S. One Stanley 1 1/4" min 14.00 - 16.00	MI U.S. One Stanley 1 1/4" min 14.00-14.50

The intent of listing terminal market prices is to provide information available in the public domain. It is not intended for price setting, only to assist growers in evaluating the value of their crops. Producers need to remember that the prices listed are gross; consideration must be given to other marketing costs, i.e. commission, handling charge, gate fees, and possible lumper fees.

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Information presented above and where trade names are used, they are supplied with the understanding that no discrimination is intended and no endorsement by Ohio State University Extension is implied. Although every attempt is made to produce information that is complete, timely, and accurate, the pesticide user bears responsibility of consulting the pesticide label and adhering to those directions.

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| [Back](#) |