



Healthy Fruit

Volume 11, 2003

Prepared by the University of Massachusetts Fruit Team

Issue 17 – August 5, 2003

Apple summer disease update

Unusually wet and humid weather this week has increased the risk for summer disease infection. The following article by David Rosenberger, reprinted from Scaffolds Fruit Journal (Vol. 12 No. 21, August 4, 2003) is certainly timely:

SUMMER DISEASE UPDATE

(Dave Rosenberger, Plant Pathology, Highland)

□□ Wet postbloom weather, along with hot wet weather during July will probably make this a memorable season for development of summer diseases on apples in New York and New England. □ Summer diseases include flyspeck, sooty blotch, black rot, white rot, and bitter rot. □

Flyspeck

□□ Flyspeck ascospores are released shortly after apples reach petal fall. □ On apples, the fungus requires roughly 270 hours of surface wetting time between early season infection and the time that symptoms become apparent on fruit. □ In northeastern United States, we are still uncertain of the exact details concerning disease development on apples. □ However, I believe that infection of fruit by ascospores is relatively unimportant in commercial orchards because our scab fungicides effectively protect fruit during the interval after petal fall.

□□ Ascospores are probably very important for generating new infections in woods and hedgerows that border orchards. □ If we assume that infections on these other hosts (of which there are many) develop at approximately the same rate as infections on apples, then those infections should also become visible and begin producing conidia for secondary infections after approximately 270 hr of surface wetting. □ The conidia are far more abundant than ascospores, and conidia can blow into orchards from the border areas.

□□ During a dry summer, the secondary infection cycle may not begin until early September and most infections that occur on apple fruit in September will not have enough time to develop visible symptoms before fruit are harvested. □ During wet

These recommendations are not a substitute for pesticide labeling. Read the label before applying any pesticide. It is the legal document.

summers such as the one we are currently experiencing, secondary infections on fruit can be initiated much earlier and symptoms on unprotected fruit will become visible during late summer. A wet summer may also allow multiple secondary cycles, thereby dramatically increasing inoculum that is available to blow into orchards during late summer.

Petal fall on McIntosh in the Hudson Valley occurred around 12 May this year. Peak ascospore discharge for flyspeck presumably occurred about 10 days later. Counting from 22 May, we reached 270 hr of accumulated wetting in the middle of the 91-hr wetting that occurred 19-23 June. Thus, conidia of flyspeck might have been available for infecting apples as early as late June. A flush of symptoms from those late June infections should appear on unsprayed apples within the next few days because we are nearing the completion of another 270-hr wetting accumulation (counting from 23 June).

The standard recommendation for controlling flyspeck in the northeast has been a combination of a benzimidazole fungicide (currently, Topsin M is the only choice) plus captan. However, research conducted over the past several years has shown that Sovran and Flint are at least as effective as Topsin+Captan, and that in some cases they are more effective. Sovran and Flint are more expensive than the Topsin+Captan combination, but this may be a year where one or two applications of Flint in August might pay dividends, especially if one adds the potential benefits that Flint sprays may have for bitter rot control.

Bitter Rot

Bitter rot is a sporadic disease in northeastern United States. We have not really had weather favoring bitter rot since the early 1990's. Bitter rot can be caused by several species of *Colletotrichum*. Infections occur during hot wet weather and often appear as decays on the sun-facing cheek of ripening fruit. Decays are tan and slightly sunken. Slimy pale orange spores may be evident in the center of fruit lesions during wet or humid weather. In North Carolina and other southern states, bitter rot spreads rapidly and can cause major losses within several weeks if fruit are not protected with fungicide during late summer.

The life cycle for bitter rot in the Northeast has not been adequately studied. I have noted the following scenarios for development of bitter rot under NY conditions:

1. Unsprayed fruit have no symptoms at harvest but develop bitter rot lesions if fruit are incubated at 100% relative humidity until they become senescent. This suggests that the fungus is often present on unsprayed fruit, but that it usually cannot cause decay until fruit become senescent.
2. The disease appears only on a few fruits near the orchard borders just prior to harvest. This occurs some years in my fungicide check plots where no fungicides are applied throughout the summer, but I rarely find more than 1-2% of fruit affected.
3. The disease may invade fruit after harvest and appear as a postharvest decay. In apple storage surveys conducted during the mid-1990's, we found that bitter rot accounted for 13% of the postharvest decays in one apple packinghouse in 1995.
4. Very rarely, bitter rot can become epidemic. This occurred in Michigan in 1995

These recommendations are not a substitute for pesticide labeling. Read the label before applying any pesticide. It is the legal document.

(See Jones & Shane, Plant Disease 80:1294-1297) Annual epidemics occurred in one Long Island orchard during the early 1990's.

□□ Why does bitter rot act so differently in different orchards and different years?□ No one knows, but all of the following are probably factors:

- a. Inoculum levels probably vary greatly from year to year.□ In the Long Island case, we eventually discovered that horse chestnut trees (*Aesculus hippocastanum*) and sycamore maples (*Acer pseudoplatanus*) adjacent to the affected orchard were severely affected with *Colletotrichum acutatum* and were probably supplying inoculum for the orchard.□ The role of non-orchard hosts in the bitter rot cycle has not been investigated elsewhere in the northeast.
- b. The time when inoculum becomes available is probably critical for infections in the northeast.□ Bitter rot infections occur best under hot, wet conditions.□ If inoculum does not reach orchards until September, it may be too cool for rapid development of infections.
- c. Bitter rot is favored by long, warm wetting periods.□ Severity increases with duration of wetting up to 60 hr.□ In the northeast, we rarely have long wetting periods during August when temperatures are high enough to favor bitter rot infection.

□□ So why be concerned about bitter rot this year?□ Extended wetting during May and June promoted bitter rot infections in non-orchard hosts.□ I have noted that horse chestnut trees in the Hudson Valley are already turning brown due to disease, something that has not happened in recent years.□ (Diseases other than those caused by *Colletotrichum* are also involved in blighting of horse chestnuts.) The hot, wet weather of the past week is likely to have allowed extensive dissemination of bitter rot spores in the Hudson Valley, and early ripening cultivars are already showing some evidence of infection at the Hudson Valley Lab.

□□ Only two fungicides provide good activity against bitter rot at this time of year: Captan and Flint.□ However, captan must be applied at the maximum label rate; half-rates will not prove satisfactory.□ Heavy rains can presumably remove captan residues more easily than Flint residues because Flint tends to bind to the waxy cuticle of the fruit.□ Thus, Flint might perform better if our frequent rains continue.□ Either captan alone or Flint alone should provide adequate protection against bitter rot in most orchards.□ However, where extremely high disease pressure is expected (e.g., adjacent to wood lots or to known source trees such as horse chestnut), growers may wish to apply a combination of Flint at the full rate plus captan at one-half of the full label rate.

□□ Neither fungicide is known to have post-infection activity against bitter rot, so timely protectant sprays are essential.

□□ Sooty Blotch, Black Rot, and White Rot will all be controlled by sprays applied for flyspeck and bitter rot.□ However, given the wet conditions this summer, the interval between the last spray and harvest may need to be shortened to prevent late season infections by black rot and white rot.

Honeycrisp is especially susceptible to black rot and white rot, so this cultivar will need careful protection during August.

These recommendations are not a substitute for pesticide labeling. Read the label before applying any pesticide. it is the legal document

Peach brown rot risk high

It goes without saying that with the current weather pattern, the risk of brown rot infection in peaches is very high. Peaches become very susceptible to brown rot infection as the fruit matures. (2–3 weeks before harvest, and as background color changes from green to yellow.) You are advised to maintain excellent fungicide protection on peaches as harvest approaches. Two or three pre-harvest fungicide sprays may be essential to control brown rot if this wet weather continues. Use the best fungicides for brown rot control, such as Indar, Orbit, or Elite. Tank-mixed with Captan or Sulfur, these fungicides should give excellent control of brown rot. (All have 0 days PHI.)

Pre-harvest Intervals

As we get closer to harvest, it is important to keep an eye on PHI's so as to not have unacceptable residues present on fruit. The following table of selected insecticides, miticides, growth regulators and fungicides with PHI's 14 days or longer is drawn from the 2003-2004 New England Apple Pest Management Guide (see pages 73-75).

Vanguard	72 days
Rubigan	30 days
Aliette (bearing trees)	14 days
Sovran	30 days
Dithane, Manzate, Penncozeb, Manex, Maneb	77 days (extended program)
Polyram	77 days (extended program)
Nova	14 days
AgriMycin	50 days
Bayleton	45 days
Procure	14 days
Flint	14 days
Ziram	14 days
Retain	28 days
Agri-mek	28 days
Guthion	14 days or 21 days depending on rate of final application
Apollo	45 days
Diazinon 50 W	21 days
Thiodan	21 days
Vendex	14 days
Danitol	14 days
Carzol	Not after petal Fall
Savey	28 days
Avaunt	28 days *
Lannate	14 days *
Intrepid	14 days
Vydate	14 days *
Pyramite	25 days
Esteem	45 days

These recommendations are not a substitute for pesticide labeling. Read the label before applying any pesticide. It is the legal document.

Confirm	14 days
---------	---------

* Cannot be used after a "Pick-Your-Own" site is opened for public entry

Spider mites

Mite build up is spotty at many sites. Research has indicated that 80 to 85% of leaves can be infested with mites at this time of year with little or no effect on trees. If rescue treatments are needed, Acramite and Pyramite are both effective against European red mite, although Pyramite is less effective on Two-spotted mites. Other options include Vendex and Kelthane. Acramite has moderate negative impacts on *T. pyri* and *A. fallacis* predators. Pyramite has a high impact on *A. fallacis*, but low impact if *T. pyri* are the prevalent beneficial. Kelthane has moderate impact on *A. fallacis*, but high impact on *T. pyri*.

Leafminers

Like mites, Leafminers populations are highly spotty both between and even within orchards. Research at Cornell has indicated that many cultivars can tolerate high levels of mines (up to 4 per leaf) with little impact. Determining the need to treat for the upcoming third generation of leafminer is tricky due to the spread out emergence of adults, and the possibility of counting earlier mines from which emergence has already occurred. Treatment for third generation miner is usually ineffective due to the extended emergence, and the thickness of the tree canopy. In addition, some materials that are effective against the pest also can seriously disrupt building LM parasite populations at this time.

Apple maggot fly

AMF levels remain relatively low in monitored blocks, although virtually all orchards have required treatment by now. Guthion, Imidan and Avaunt are all effective against AMF, although Imidan has the shortest PHI should populations build closer to harvest.

ReTain™ timing for pre-harvest drop control approaching

Typical timing for ReTain application to control pre-harvest drop is early-mid August. ReTain can be a highly effective tool for improving harvested quantity and quality, particularly in drop-prone varieties such as McIntosh. But there are some definite guidelines for its use. Again, the following article by Win Cowgill reprinted from Rutgers Cooperative Extension Plant & Pest Advisory (July 29, 2003) is appropriate.

MANAGING APPLE HARVEST with RETAIN™ in 2003

(Win Cowgill, Agricultural Agent, Rutgers Cooperative Extension)

□□ The cool cloudy weather during bloom and the weeks following has delayed tree fruit maturity significantly in Northern New Jersey. Summer apples (Jerseymac, Paulared) are running a week or more behind schedule. I anticipate that this will continue to hold true for the Gala cultivars and McIntosh, with harvest running three to five days later than normal.

□□ New Jersey growers focus management strategies on harvesting a crop of optimum fruit quality. Consumer demand, market, storage requirements and labor availability all influence harvest decisions. One tool that allows for increased flexibility in management decisions is the ReTain Plant Growth Regulator from

These recommendations are not a substitute for pesticide labeling. Read the label before applying any pesticide. It is the legal document.

Valent BioSciences. ReTain is a harvest management tool that slows the maturation process. It is an excellent stop drop material that can delay fruit maturity from 7-10 days and give growers a longer picking window on many cultivars. ReTain works by retarding the development of ethylene, the chemical that causes ripening. ReTain will increase fruit firmness, decrease watercore and allow for longer cold storage. ReTain may also indirectly enhance fruit size and color by allowing the fruit to remain on the tree longer.

□□ The active ingredient is a naturally occurring product aminoethoxyvinylglycine (AVG), which is produced by fermentation. The fermentation process required to produce AVG is very difficult and very expensive. As a result, ReTain retails for \$200 - \$240 per acre. Because of this, ReTain should only be used in high value blocks with large crops of unblemished fruit.

□□ Fruit treated with ReTain can be picked during the normal harvest period for enhanced retention of firmness in regular cold storage, or harvest may be delayed, allowing the fruit to continue to grow and develop red color for an extended time. Our experience in New Jersey is that ReTain reduces preharvest drop on McIntosh from 10-30%.

□□ Research also indicates that stem-end split (SES) and internal ring crack (IRC) may be reduced on susceptible varieties, such as Gala and Fuji, with the use of ReTain. Although these disorders will not be eliminated with its use, ReTain reduces the stress fluctuations that are thought to cause these disorders.

□□ ReTain must be applied four weeks prior to anticipated harvest, therefore it is essential growers carefully project ripening dates of each individual block which they plan to use ReTain on this season.

□□ Important considerations to follow with ReTain applications in New Jersey:

- Use the full rate of ReTain (1 pouch or 333 grams/Acre of formulated product) with an organosilcone surfactant at 0.05% to 0.10 % (v/v).
- ONLY use one of the approved organosilcone surfactants such as: Silwet L77 at 6.5-13 fluid ounces per 100 gallons, or Sylguard 309 at 6.5-13 fluid ounces per 100 gallons. When high temperatures prevail, the lower rate of surfactant is recommended.
- Apply 4 weeks before anticipated harvest (28 day PHI), it is better to apply slightly earlier rather than later, i.e. up to five weeks pre harvest.
- ReTain should be applied with a sufficient amount of water to ensure thorough wetting of the fruit and foliage while avoiding spray run-off. Adjust water volume based on tree size and spacing. No alternate row spraying.
- For optimum results apply during periods of slow drying weather conditions. No rainfall or irrigation should occur within six hours of ReTain application.
- Do not apply ReTain to trees under stress. They may not respond to the benefits of ReTain.
- Do not tank mix ReTain with other agricultural products.

These recommendations are not a substitute for pesticide labeling. Read the label before applying any pesticide. It is the legal document.

- NAA may be used according to label directions after the use of Retain if very long drop control is desired, or fruit begins to loosen. Be aware that NAA may accelerate fruit maturation.
- The interaction of ethephon products with ReTain is not well understood but research continues.

These recommendations are not a substitute for pesticide labeling. Read the label before applying any pesticide. it is the legal document