



Northern Michigan FruitNet 2002

Weekly Update

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Growing Degree Day Accumulations through 9/9

GDD42	3,266
GDD45	2,881
GDD50	2,237

Weather

Substantial rain fell in NW Michigan on 8/21 and 8/22. The NWMHRS received 2.9" in this rainfall event. Since 8/23, the weather has been sunny, beautiful late summer weather, with no additional precipitation. Evaporation per week the past three weeks has been 0.96, 1.43 and 1.59 inches respectively.

Commodity Reports

Bartlett **pear** harvest is complete; Gingergold **apple** harvest is underway; **peach** harvest continues. Recent weather has been nearly ideal for **grapes**; harvest of early hybrid varieties is beginning.

The insect and disease season is rapidly winding down for the season. **Apple** growers should continue to monitor for codling moth and apple maggot. This past week trap catches of both were very light at the NWMHRS. Codling moth averaged .5 moths/trap and apple maggot averaged .3 adults/yellow sticky board. European red mites have been controlled in most blocks, but a few are showing bronzing. In blocks with heavy infestations, the mites will start to lay eggs in the calyx end of the fruit anytime now.

Cherry: Two spotted spider mite populations have remained relatively low in tart cherries this year, likely due in part to the lack of insecticide sprays being applied. Even the typical Guthion and Imidan sprays may have some influence on total predator populations in orchards. Cherry leaf spot is causing widespread leaf drop in tart and sweet cherries now. The flush of yellow leaves that showed up last week was from the infection periods at the very end of July and the first five days of August. This next wave of yellow leaves will be from the August 12th heavy infection period. This time of year the infections take approximately 30 days to show up visually on the tree. Although many tart cherry orchards are losing their leaves now, they didn't have a crop to reduce the carbohydrate reserves of the trees this year. As a result, if you had the majority of your leaves as of September 1st, your trees likely have enough carbohydrates store going into the winter. Since sweet cherries are more susceptible to winter injury, it is advisable to maintain their leaves into October.

APPLE HARVEST INFORMATION

Edited by Gary Thornton,

from the **FRUIT TIMES NEWSLETTER**, August 20, 2002, Vol. 21, No. 14

PRE-HARVEST INTERVALS (PHI) FOR COMMON INSECTICIDES: Apple harvest is just around the corner. Growers need to watch closely what the pre-harvest intervals are for any of the pesticides that they are applying. The following is a list of the more commonly used insecticides that apple growers may use. Growers should also be aware of any additional processor/packer restrictions that may exist

should also be aware of any additional pre-harvest/packer restrictions that may exist.

Azinphos-methyl (Guthion) – 14 day PHI on apples if applied less than 1 pounds of active ingredient (AI) per acre; 21 days on apples if more than 1 pounds AI per acre. On apples no more than 4.5 pounds/acre of AI can be applied during a season.

Carbaryl (Sevin) – 3 day PHI on apples. On apples no more than 15 pounds of AI is allowed per acre/season.

Esfenvalerate (Asana) – 21 day PHI on apples. On apples no more than 0.525 lb of AI per acre/season is allowed.

Fenpropathrin (Danitol) – 14 day PHI on apples. On apples no more than 0.8 pound of AI is allowed per acre/season.

Indoxacarb (Avaunt) – 28 day PHI on apples. On apples no more than 0.44 pound of AI is allowed per acre/season.

Methomyl (Lannate) – 14 day PHI on apples. On apples no more than 4.5 pounds of AI/acre is allowed.

Methoxyfenozide (Intrepid) – 14 day PHI on apples. No more than 1.0 pound of AI allowed per acre/season.

Phosmet (Imidan) – 7 day PHI on apples. On apples no more than 21 pounds of AI per acre/season is allowed.

Spinosad (SpinTor) – 7 day PHI on apples. No more than 0.45 pound of AI is allowed per acre/season on registered fruit crops.

Tebufoenozide (Confirm) – 14 day PHI on apples. No more than 1.86 pounds of AI per acre per season.

Please make sure to always read label before applying any pesticide.

From the Scaffolds Newsletter, Volume 11, No. 23, August 19, 2002

CLEAN UP BEFORE APPLE HARVEST TO MINIMIZE POSTHARVEST DECAY PROBLEMS

(Dave Rosenberger, Plant Pathology, Highland)

Penicillium expansum, the fungus that causes blue mold decay in stored apples, is generating significant losses both during controlled atmosphere (CA) storage and during shipment of packed apple fruit. Thiabendazole (Mertect 340F) and other benzimidazole fungicides provided excellent control of *P. expansum* for nearly 25 years. However, thiabendazole is no longer effective because the populations of *P. expansum* in most packinghouses have developed resistance to the benzimidazole fungicides. Captan, the only other alternative for postharvest application on apples, has never been very effective for controlling *P. expansum*.

Research that we conducted over the past six years has led to the following conclusions:

1. Inoculum levels for *P. expansum* gradually increased from year to year after postharvest fungicide treatments were no longer effective.

2. Inoculum of *P. expansum* survives from one year to the next on field bins and on storage floors and walls. A single badly contaminated wooden bin can carry more than 2 billion spores. Plastic bins may carry fewer spores, but even plastic bins have been shown to carry 480 million spores. These spores are released into postharvest treatment solutions where they can contaminate the new crop each year. Spores can also be spread from bins to fruit by air movement in CA rooms.

3. When inoculum levels are high, *P. expansum* can invade apples through their stems during long-term (>6 months) CA storage.

4. Fruits with the early stages of stem-end decay are difficult to detect on packing lines, so some of them end up in retail packages. Airborne spores released during packing contaminate other fruit on the packing lines and cause additional decays in packed fruit.

5. As a result, decayed fruits are appearing with unacceptable frequency in retail store displays. We found blue mold decay in 87% of 424 Fuji apples, and in 94% of 444 McIntosh apples during systematic

blue mold decay in 37% of 131 Empire displays and in 21% of 141 McIntosh displays during systematic grocery store surveys of bagged apple displays that were conducted during February, March, and April of 2000 and 2001. The presence of decayed apples in bagged fruit almost certainly contributes to lost sales.

6. Improved sanitation measures provide the only option for reducing losses to *P. expansum*.

Following are sanitation measures that should be implemented by apple growers, storage operators, and packinghouses prior to harvest:

- At a minimum, all decayed fruit mummies should be removed from field bins before bins are refilled. Decayed apples do not float, so they remain in bins as bins come out of the water flotation tanks on packing lines. Conscientious packinghouse operators will ensure that workers remove all of the decayed fruit before the empty bins are bundled. These decayed fruits carry vast amounts of inoculum that will contaminate next year's crop if they are left in the bottoms of bins. Apple growers should inspect bins as the bins are unbundled in the field prior to harvest, and any of these unwanted "gifts" that remain in the bins should be removed.
- Sanitize packinghouse and storage walls and floors during summer by treating them with a quaternary ammonium sanitizer. Quaternary ammonium compounds are registered for disinfecting storage rooms and can be purchased from your chemical supply dealer. Follow directions on the product labels. In addition to eliminating inoculum, quaternary ammonium sanitizers will also eliminate foul odors caused by non-pathogenic bacteria and fungi (molds) that sometimes persist on storage walls and floors. Storage odors can be transferred to and persist in fruit, so cleaning storage walls and floors may improve fruit quality at the same time that it reduces the inoculum for post harvest decays.
- If possible, sanitize badly contaminated bins (i.e., bins that came out of storage containing many decayed fruits) with a quaternary ammonium wash. Quaternary ammonium sanitizers can reduce inoculum loads on bins by more than 99% if all of the decayed fruit and fruit residues are removed before the sanitizer is applied. Steam cleaning bins is also effective, but it may be less practical than a drenching system for applying quaternary ammonium sanitizers.
- Whenever possible, avoid wetting fruit after harvest. Postharvest drenching spreads spores of *P. expansum* from bins to wounds and to fruit stems where they can initiate decays. Fruits that are not drenched can still become contaminated by airborne spores in the CA rooms, but the proportion of fruit exposed to inoculum will be significantly reduced if fruits are not drenched.
- When fruit must be drenched to prevent storage scald, drench solutions should be mixed in relatively small quantities and solutions should be changed regularly to avoid accumulating a large number of spores in the drench solutions. Even though most storages contain benzimidazole-resistant populations of *P. expansum*, the fungicide thiabendazole should still be included in drench solutions to control *Botrytis cinerea* and to suppress fungicide-sensitive strains of *P. expansum*.

Postharvest handling procedures for apples will probably become more tightly regulated in the future because of increasing concerns about food safety. The same pathogens that have caused sporadic problems with apple cider can also contaminate fresh apples. To date, I am not aware that anyone has gotten sick from eating fresh apples, but laboratory studies conducted elsewhere have shown that some human pathogens can survive on or in whole apple fruit. As a result, both chain store buyers and government regulators are likely to impose new food safety requirements that will affect apple handling and storage. How those regulations and requirements will evolve is still unclear, but it might be wise to avoid any new investment in postharvest drenching equipment for apples until the industry can determine how food safety issues will be addressed.

ACTUAL AND PREDICTED DEGREE-DAY ACCUMULATIONS SINCE MARCH 1, 2002 (*)

Please send any comments or suggestions regarding this site to:

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