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Northern Michigan FRUITNET 2000 *Weekly Update*

James E. Nugent Gary E. Thornton William M. Klein

NW Michigan Horticultural Research Station

Michigan State University

June 6, 2000

WEATHER

Evaporation is up somewhat, totaling 1.09" over the past week at the NWMHRS. Last week's rainfall totaled 0.56". Evaporation exceeds rainfall by 5.35" for this growing season.

GROWING DEGREE DAY ACCUMULATIONS as of June 6th at the NWMHRS

Year	2000	1999	1998	1997
GDD42	810	876	950	483
GDD50	391	465	518	210

GROWTH STAGES:

Apricot: Harcot -- 33mm

Plum: Stanley -- 12mm

Pear: Bartlet -- 16mm

Apple: Red Delicious -- 14mm

Sweet Cherry: Napoleon -- 12mm

Tart Cherry: Montmorency -- 12mm

Grapes: Chardonnay -- 4"-8" shoots

COMMODITY REPORTS

Some apple growers have already biofixed for **codling moth**, mostly in older trees with historically high numbers. Trap catches in the NW region range from zero to over 40 per trap. **Green apple aphids** are building on terminals. **White apple leafhopper** nymphs are present, as well as a few **potato leafhopper** adults. **Plum curculio** stings are common in unsprayed apples. **European red mites** are increasing in untreated blocks; some blocks are already treated. **Predator mites** are common. **Apple scab** has shown up in commercial orchards where spray schedules were light. **Fireblight blossom blight** is beginning to appear from earlier infection periods.

Pear psylla are now in the hard shell stage. **Tarnished plant bug** activity will pick up in peaches with the warmer weather.

Last week spurs and shoots on sweet cherries began collapsing in some lower areas of blocks. Heavy gumosis was common in the affected areas. The cause appears to be **bacterial canker** invasion of cold-injured tissue. This is a very unusual event that was induced by the combination of frost conditions followed by extended periods of cool, wet weather.

Cherry leafspot is common in untreated tart cherry orchards. **Brown rot** pressure remains low. **Plum curculio** stings are common in untreated stone fruits. For the postponed Insecticide Treatment Strategy (PTS) for tart cherry, we are currently at 216 DD base 50 after full bloom. According to the model, a spray is needed at 375 DD. This year growers are encouraged to be conservative and apply sprays early, due to the

cool season. Insecticide sprays should go on by this weekend for the warmer areas of NW Michigan. Growers should also put out their cherry fruit fly traps.

Necrotic ringspot virus (NRSV) is common in tart cherries this season, often appearing on 6-9 year old trees (slightly younger than normal). The symptoms include a stunting of growth with tattered, small leaves. This symptom is referred to as the "shock" symptom of NRSV, typically occurring on young bearing trees when it occurs. This was induced by an extended period of exceptionally warm conditions, which occurred during the period immediately before, during and slightly after bloom. Because of the timing of this heat wave, buds were beyond bud swell, so virtually no bud blast occurred this year. We often refer to the bud blast symptom as "red bud". Because of the lack of bud blast, we do not expect to see extensive die back, but limbs or trees affected are slow to begin growth and will not grow as well as normal.

Miscellaneous

Deer damage appears to be exceptionally heavy this year. One grower reported yesterday that the deer are not only eating his young trees with soap hung in the branches, but are also eating the soap!

[ACTUAL AND PREDICTED DEGREE-DAY
ACCUMULATIONS SINCE FEBRUARY 15, 2000 \(*\)](#)

Please send any comments or suggestions regarding this site to:

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Northern Michigan FRUITNET 2000

Weekly Update

James E. Nugent Gary E. Thornton William M. Klein
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Michigan State University

June 13, 2000

GROWING DEGREE DAY ACCUMULATIONS through June 12th at the NWMHRS

Year	2000	1999	1998	1997
GDD42	978	1102	1066	658
GDD50	505	635	582	329

GROWTH STAGES:

Pear: Bartlett -- 20mm

Apple: Red Delicious -- 18mm

Sweet Cherry: Napoleon -- 16mm

Tart Cherry: Montmorency -- 14mm

Grapes: Chardonnay -- 10"-16" shoots

COMMODITY REPORTS

Tart cherries are currently 354 degree days after full bloom at the NWMHRS, while in Northport they are 270 degree days after full bloom. At this point all tarts should be protected from **plum curculio**, even the cooler areas should protect for them due to the cooler season and the fact that tree phenology is ahead of the insects. No **cherry fruit fly** has emerged yet. **Black cherry aphids** are a problem in some blocks, but are an economic problem only in young trees in most circumstances. **Lesser peach tree borers** averaged 22/trap. Trunk sprays will still be very beneficial if they haven't been applied yet. **Tart cherry yellows** is just beginning to express itself in the last few days, with some leaves beginning to drop off. **Sweet cherries** are starting to take on color, which means that their **brown rot** susceptibility has increased dramatically. Growers should spray them with full covers on a 10 to 14 day schedule depending on the weather. **Bacterial Canker** leaf symptoms are plentiful, often times associated with spray injury. The new growth should not have the same problems with the warmer weather being prevalent.

Apple growers should be scouting their young orchards for **fireblight** strikes. Although it appears we came through the bloom period in good shape, these strikes can spread in the summer storms. **Primary apple scab** is over for the year. Additional fungicide sprays are only necessary if you are going to have **secondary scab** (McIntosh) or have problems with **sooty blotch/ fly speck**. **Codling moth** averaged 6.6/trap at the NWMHRS, while the abandoned orchard averaged 11/trap. Many blocks have biofixed by this point. If you biofixed on June 1st then you have accumulated 170 degree days towards the 250

needed before you should spray. June 17th is the predicted spray date - based on degree totals for the NWMHRS. Growers who are not trapping should apply an insecticide by this weekend to assure clean fruit. **Potato leafhopper** pressure has greatly increased, growers should check their **plums, young apples and grapes**.

Pear psylla summer adults have emerged and some of the hard shell stage still remain behind feeding. Egg laying from the adults has just begun.

Wild **grapes** came into bloom last week. Typically the early blooming varieties like Baco will bloom about 7 to 10 days after the wild grapes, with many of the viniferas following those 3 to 7 days later.

MISCELLANEOUS

LORS-BAN

(From Scaffolds, Vol.9, No. 13, June 12, 2000, by Art Agnello, Entomology, Geneva)

On 8 June, as part of the Clinton Administration's goal of reducing the potential exposure of children to all pesticides, the EPA announced an agreement with Dow AgroSciences to severely restrict the use of all products containing the active ingredient chlorpyrifos, sold in the agricultural market as Lorsban. Although Dow stated that the decision would have a "minimal impact on agriculture", the apple industry will take the biggest hit in the effects on its current pest control practices. The agreement restricts the use of Lorsban 4EC and 50WP/WS in apples to pre-bloom applications only, effective 31 Dec. 2000. The EPA also intends to reduce the tolerance for chlorpyrifos residues in apples, which currently stands at 1.5 ppm. Restricted Entry Intervals (REI's) following treatments of Lorsban on some fruit crops will also be extended, although according to Dow, these are not likely to affect current worker practices in most crops. Additionally, Lorsban 4E (and Lorsban 50W packaged in containers smaller than 25 lbs) will become Restricted Use Pesticides, effective 1 Feb. 2001. For more detailed information on the chlorpyrifos risk issues, documentation can be found at:
<http://www.epa.gov/pesticides/op/chlorpyrifos.htm>.

ACTUAL AND PREDICTED DEGREE-DAY ACCUMULATIONS SINCE FEBRUARY 15, 2000 (*)

Please send any comments or suggestions regarding this site to:

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Northern Michigan FRUITNET 2000

Weekly Update

James E. Nugent Gary E. Thornton William M. Klein
 NW Michigan Horticultural Research Station
 Michigan State University

June 20, 2000

GROWING DEGREE DAY ACCUMULATIONS through June 19th at the NWMHRS

Year	2000	1999	1998	1997
GDD42	1132	1217	1244	792
GDD50	603	699	704	410

GROWTH STAGES:

Pear: Bartlett -- 22mm
 Apple: Red Delicious -- 29mm
 Sweet Cherry: Napoleon -- 16mm
 Tart Cherry: Montmorency -- 14mm
 Grapes: Chardonnay -- trace bloom

WEATHER

Rainfall this past week amounted to 0.54", while evaporation totaled 1.41". Evaporation exceeds rainfall by 0.87" for the week and by 7.15" for the growing season.

PESTS AND DISEASES

By Gary Thornton, District Fruit IPM Agent

Apples: Growers are now beyond the thinning window. Some growers report that the second thinner was not needed. **Codling moth** trap catches were 5 per trap at an abandoned orchard and 1.3 per trap at the NWMHRS. A consultant reported a trap catch of 140 per trap in an older orchard! Most orchards have biofixed by now. If you are not trapping, then you should have your fruit protected at this time. Most orchards in NW Michigan have fairly low codling moth pressure. Therefore, growers in this situation should be using 250 degree days after a biofix of 5 moths per trap cumulative average catch. The **spotted tentiform leaf miner** trap catch jumped to 584 per trap at the NWMHRS. **Green apple aphids** are building in untreated orchards. **Potato leafhoppers** are above threshold in some **apples, plums** and **grapes**.

Cherries: **Cherry fruit fly** adults emerged in abandoned cherries last **Friday, June 15th**. A single CFF was also trapped in a commercial orchard on June 15th. Growers who aren't trapping need to have an insecticide on 7-10 days after that first catch to insure clean fruit. **Plum curculio** is no longer laying eggs at the NWMHRS. **Brown rot** pressure is high on warm, wet and humid days

from now until harvest in sweet cherries. Full cover sprays should be used on sweet cherries to insure adequate protection. As we get closer to harvest, be aware of the pre-harvest intervals on cherries: Guthion-15 days, Imidan (tarts only)-7days, Sevin-3days, Pounce-3 days, Ambush-3 days.

Grapes are in the immediate pre-bloom period. First bloom on Chardonnay occurred on 6/15 at the NWMHRS. Fungicide sprays are needed at this time to control **black rot, powdery mildew, downy mildew** and **phomopsis**. **Rose chafer** remains a threat to grapes as well as young apples and stone fruits.

MISCELLANEOUS

Ethephon Use On Cherries

By Jim Nugent

Ethephon used properly will facilitate mechanical harvesting, but it is important to avoid tree injury. Research and grower experience have shown that lower rates can be used than was first thought. This is caused in part because ethephon's activity increases as it is applied in higher concentrations, while the original research was conducted on a dilute basis. Lower rates will reduce the likelihood for tree injury. The activity of the ethephon is greatly influenced by the temperatures that occur during the first 72 hours after application. This creates a challenge to achieve the desired results without experiencing injury. Consider the following:

- 1) Avoid application if temperatures are expected to exceed 85 degrees F during the 72-hour period after application, as activity is excessive.
- 2) Do not apply when temperatures are below 60 degrees F as activity is greatly reduced.
- 3) Do not treat trees low in vigor or under significant stress.
- 4) Applying ethephon with concentrate sprayers (i.e., 20-80 gallons of water/acre) achieves the same level of loosening at lower rates than does dilute applications.
- 5) With light sweet cherries, do not apply until fruit on the interior of tree is developing yellow ground color. Ethephon applied prior to this stage of development may cause fruit to drop prematurely with stems attached.
- 6) Consider the size of the trees when determining the appropriate rate per acre for concentrate spraying. Rates are based on typical full size trees. When treating younger blocks with smaller tree size, adjust the rate per acre downward.
- 7) Ethephon is applied 8-14 days prior to anticipated harvest. The time required to achieve adequate loosening is a function of ethephon rate and temperature.

8) Do not harvest cherries within 7 days of application of ethephon (7 day PHI on label).

9) If temperatures during the next 72 hours are expected to be above average (but not excessively hot), use lower than normal ethephon rates. Conversely, if temperatures are expected to be below normal, rates slightly higher than normal may be used.

10) Questions always arise about tank mixing ethephon. While there is no research data regarding tank-mixing ethephon, according to experience there appears to be no problem tank mixing ethephon with the fungicides and insecticides commonly used at this time. However, it is possible that materials in the tank may act as a buffer to the ethephon thereby causing some loss in activity. This could be overcome by acidifying the tank mixture prior to the ethephon being added. Do not tank mix with foliar nutrients or compounds such as crack inhibitors, bird repellents, etc. Avoid the use of surfactants unless prior experience has indicated their effect on the ethephon.

11) A question often asked is, "What happened to the ethephon that was applied prior to a rain?" Research by Dr. John Bukovac has shown that 80% of the ethephon is absorbed in the first 4 hours, with 65-70% absorbed in the first 3 hours. This shows that absorption occurs most readily immediately following application, then tapers off until fully absorbed in about 8 hours. Based on this, consider the following as a possible logical course of action:

- Significant rain immediately after application - reapply at 85-95% of original rate.
- Significant rain 1 hour after application, reapply at about 60-65% of original rate.
- Significant rain 2 hours after application, reapply at about 40% of original rate.
- Significant rain 3 hours after application, reapply at about 25% of original rate.
- Significant rain 4 hours after application, do not reapply.

With light to moderate rain, reduce above rates, or plan to wait a little longer to harvest fruit.

12) Ethephon has a 48-hour worker protection re-entry interval (REI).

Sweet Cherries

1. Light Varieties

A. When applied concentrate (80 gal water/acre or less), 1 to 2 pts/acre applied about 14 days before anticipated harvest should provide adequate loosening. Vary the rates depending on temperatures, days before harvest, tree stress and past experience. The full rate of 3 pts/acre will result in tree damage some years.

B. When applied dilute use no more than the full rate of 1 pt/100 gallons

C. When applied dilute, use no more than the full rate of 1 pt/100 gallons.

2. Dark Canners

A. When applied concentrate, suggest using 1 1/2 to 2 1/2 pts/acre applied 12-14 days prior to anticipated harvest. Rates as low as 1 pt/acre have been used successfully by growers, but results have been less consistent. The full rate of 4 pts/acre is generally not necessary and will result in tree damage some years. Do not apply 3 pts/A when applied concentrate.

B. When applied dilute, use no more than the full rate of 1 1/3 pts/100 gallons.

Tart Cherries

A. When applied concentrate, use 1/2 to 1 pt/acre applied 8 to 14 days prior to anticipated harvest.

B. When applied dilute, apply no more than 1/3 pint/100 gal.

Under certain conditions, ethephon may promote softening of tart cherries. This seems to be most apt to occur when a period of extended cool weather follows the application of ethephon. It may be possible to minimize this effect by delaying application during exceptionally cool weather until closer to anticipated harvest, then using a relatively higher ethephon rate, thereby shortening the time cherries are exposed to ethephon, but this technique has not been researched.

[ACTUAL AND PREDICTED DEGREE-DAY
ACCUMULATIONS SINCE February 15, 2000 \(*\)](#)

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Northern Michigan FRUITNET 2000 Weekly Update

James E. Nugent Gary E. Thornton William M. Klein
NW Michigan Horticultural Research Station
Michigan State University

June 27, 2000

GROWING DEGREE DAY ACCUMULATIONS through June 26 at the NWMHRS

Year	2000	1999	1998	1997
GDD42	1314	1434	1465	1007
GDD50	729	860	869	569

GROWTH STAGES:

Pear: Bartlett -- 26mm
Apple: Red Delicious -- 36mm
Sweet Cherry: Napoleon -- 20mm, coloring
Tart Cherry: Montmorency -- 20mm, coloring
Grapes: Chardonnay -- bloom

WEATHER

Rainfall this past week amounted to one inch, while evaporation totaled 1.39". Evaporation exceeds rainfall by 0.39" for the week and by 7.54" for the growing season.

PESTS AND DISEASES

By Gary Thornton, District Fruit IPM Agent

In apples, **codling moth trap** catches are down again as we approach the end of the first generation. If growers are not trapping they should have their first spray on. **Spotted tentiform leafminers** adult trap catch is up for the second week in a row. No second generation mines have been reported yet. **Green apple aphids** are high in some young apple trees. **Rose chafers** are slowing down, but significant defoliation has occurred in some young trees.

European red mites are building in plums. All plum blocks should be checked and treated if above 5 mites per leaf. Ideally this should be done prior to cherry harvest.

Brown rot and **alternaria** are a concern in **sweet and tart cherries**. If you have experienced hail and/or frost injury, keep a tight sprays schedule in the pre harvest period. Captan is the only material that will suppress or control alternaria fruit rot. Rovral is no longer labeled after petal fall. **Cherry fruit fly** emergence has increased this past week. Growers who are not trapping should have a spray on at this time. Alternate middle row sprays work well on this pest.

Grapes are nearing full bloom. Growers should have a spray on to control all major diseases at this time. An important follow-up spray 10-14 days after the pre-bloom spray will be equally important.

MISCELLANEOUS

Plum Pox Virus

As you can see from the article below, Plum Pox was recently discovered in Canada. It is of utmost importance that all growers who have purchased peach, nectarine, apricot or plum trees from Pennsylvania in the last 5 years check for symptoms of the plum pox virus. Your local MSU Extension office has free plum pox virus pocket guides to aid in this process. The virus in Canada showed up on Fantasia Nectarines. Any growers with Pennsylvania sourced Fantasia Nectarines should let us know at the NWMHRS ASAP.

Plum Pox Virus Confirmed in Canada

Ottawa, June 23, 2000. The Canadian Food Inspection Agency (CFIA) today announced the discovery of plum pox virus (PPV) in an orchard outside Niagara-on-the-Lake, Ontario. Sample testing by the CFIA Centre for Plant Health in Sidney, B.C. confirmed the infection. This is the first discovery of plum pox virus in Canada.

Plum pox virus, also known as sharka, is a serious disease infecting stone fruit species of the genus *Prunus* including peaches, nectarines, plums, apricots and ornamental varieties. PPV does not kill trees but it renders the fruit tasteless and low in sugar, making it unsuitable for eating and processing. There is no treatment for infected trees. They must be destroyed to prevent the spread of the disease. PPV is spread over short distances by aphids and over larger distances through grafting of infected budwood or nursery stock. PPV does not affect humans.

The strain of the virus found in Canada has been identified as Strain D. The same strain of PPV was found in *Prunus* trees in Pennsylvania in October 1999. This was the first time PPV was found in North America. The CFIA suspended the importation of *Prunus* plant material from the U.S. in November 1999. The nectarine trees outside of Niagara-on-the-Lake confirmed to have PPV were imported from Pennsylvania.

All *Prunus* plant material (including nursery trees, scionwood and rootstocks) imported from Pennsylvania in the last three years have been placed under a prohibition of movement, and surveying of this material for the presence of PPV began this spring. The CFIA has initiated a PPV

Emergency Program to intensify surveys to assess and determine the extent of the disease and take actions to control its spread.

The CFIA is consulting with the National Plum Pox Virus Task Force, a group of scientists, provincial advisors and industry representatives on activities to prevent and control the spread of this disease. The CFIA will continue to provide updates on the progress of the survey and eradication activities.

Bacterial Canker

By Jim Nugent

Bacterial canker (BC) can invade cherries through wood, leaves and/or fruit. It is favored by extended periods cool, wet weather. These conditions were common during several extended periods since bloom. There is some fruit injury showing up this year, as well as some leaf injury.

The extent of leaf injury can be greatly affected by the spray program. In particular, sprays that have some tendency toward phytotoxicity can lead to significant invasion of the causal organisms into the leaves. Often it appears the spray-related problems are due to a combination of materials.

What's unusually prevalent in 2000, however, is invasion of BC into spurs on sweet cherries. The spur invasion was predisposed by a late frost event (or at least very cold temperatures) following bloom that was then followed by a lot of cool, wet weather. This combination of events is very unusual. The result has been very significant spur loss in some blocks, particularly in low areas.

There is no cure for the spur loss problem. Try to keep trees as healthy otherwise as possible. Make sure pH is above 6.2. Consider copper during the dormant season (late fall and/or early spring). Do not apply copper now! This could lead to much more serious problems.

Fire Blight Rundown

(Dave Rosenberger, Plant Pathology, Highland)

In *Scaffolds Fruit Journal*, June 26, 2000

In the last three weeks, severe fire blight has been reported in a number of apple orchards throughout the Hudson Valley. The blight outbreak this year has several unusual characteristics. Pear blocks are mostly unaffected because pears were at petal fall when the blight infections occurred. In apples, most of the fire blight in the Hudson Valley has developed in Gala blocks where trees are three to five years old. In several cases, Gala blocks are so severely affected that several hundred trees have already been removed and many more will be lost to rootstock blight.

At this point, the incidence of blight appears manageable in adjoining blocks of other cultivars including Cortland, Rome, Spartan, Macoun, and Delicious. The distribution of blight strikes in cultivars adjacent to affected Gala blocks suggests that Gala acted as a source of inoculum for other cultivars. The number of blight strikes in those blocks is greatest immediately adjacent to or downwind from the Gala trees. In several of the Gala blocks, we discovered evidence of over-wintering cankers from last year or point-sources for this year's infections, even though the growers involved were not aware that fire blight had been present in the orchard last year.

The good news is that the fire blight epidemic in the Hudson Valley is still limited to relatively few orchards. The devastating hailstorms that occurred beginning May 19 did not generate the disaster that would have developed if blight inoculum had been present in all orchards. The hailstorms did contribute to spread of blight to adjacent cultivars in some of the affected orchards, but there are still many orchards, including Gala blocks, that do not have any fire blight at this time.

What is the best way to deal with fire blight in young orchards where blight was not completely controlled during bloom? No single answer can be applied to all situations, and there is considerable room for debate on many details relating to blight management during summer. Dr. Paul Steiner at the University of Maryland has posted some excellent articles about fire blight on the World Wide Web at www.caf.wvu.edu/keameysville/wvufarm10.html. However, none of the articles answers all of the questions that arise after blight appears in an orchard. Answers for many questions are lacking because the appropriate research has not been done or because research results have been inconsistent.

Growers dealing with fire blight must make daily management decisions even when scientists do not have enough data to provide research-based recommendations. Therefore, I have provided below my "best guesses" for some of the questions raised by growers. Much of this information may come too late to be useful for this season, but it may help to stimulate discussion and awareness concerning the best approaches for managing shoot blight in the future.

1. Q: Should I try to prune out fire blight when it appears in young trees?

A: Absolutely, unless blight is so severe that the orchard is beyond hope. Strikes should be pruned out as soon as possible after they appear. Failure to do so increases the likelihood that blight will continue to spread both to adjacent trees and into the rootstocks of affected trees. Pruning out infections in mature trees may not be practical, but mature trees with a full crop will set terminal shoot buds earlier than young trees. When trees set terminal buds, blight stops spreading both between trees and within the affected trees.

In order to remove strikes before cankers extend too far into the tree, trees must be examined at least two or three times weekly until the epidemic begins to slow. In sections where trees are severely affected, it may be more cost-effective to immediately remove entire trees, especially if trees are a susceptible cultivar like Gala. Pulling out badly affected trees will allow blight removal crews to focus their efforts on trees that can be salvaged.

Blight removal crews should be trained to recognize the early symptoms of blight on terminal shoots. On terminals just beginning to show symptoms, the first or second fully expanded leaf will droop and closer examination will show blackening along the midvein at the base of the leaf blade. The entire shoot tip may appear to be slightly yellowed. Remove such shoots by cutting back into two-year-old wood at least 8-12 inches

below the last visible symptoms. If a spur or shoot on the central leader shows signs of blight, immediately remove the central leader down to 8-12 inches below the last visible symptom. Immediate and aggressive removals reduce the need for repeated pruning in the same tree and may result in fewer trees lost to root stock blight.

2. Q: Is it necessary to disinfect pruning tools between cuts?

A: Dr. Paul Steiner has shown that disinfecting pruning tools is a waste of time because minute cankers often form on the ends of cuts even when pruners are disinfected. Instead of wasting time disinfecting pruning tools, Paul recommends making all cuts into at least 2-year-old wood where bacteria will be less able to multiply. Also, leave "ugly stubs" by cutting branches between nodes and at least several inches away from the central leader. Small cankers that form on these stubs can then be removed during winter pruning whereas a canker that forms at a flush cut on the central leader will be missed during winter pruning.

An extension specialist in California reported that he failed to transmit fire blight with pruning tools when he purposely made cuts through active

cankers in dry weather. However, he succeeded in transmitting blight on pruning tools when pruning was done in wet weather. Blight removal operations should usually be suspended in wet weather, but that is not always possible. (See question #4 below). As a precaution, perhaps pruning tools should still be disinfected if blight removal must be done in wet weather.

3. Q: Should prunings be removed from the orchard?

A: I haven't found any recent recommendations addressing this question (although I admit my search was not exhaustive). My personal recommendation is to place prunings in the row middles and allow them to thoroughly dry before running a mower over them. "Thoroughly dry" means that the bark no longer slips on the branches that have been removed, and the out bark and cambium have turned brown. With today's tightly spaced orchards, I am concerned that carrying prunings out of the orchard may spread more blight than occurs when prunings are left to dry in the row middles.

4. Q: What about pruning out blight in damp or rainy weather?

A: In the ideal world, blight removal would only be done in dry weather. However, when a week of rain is predicted just as the first symptoms of blight appear, one must weigh the risks of spreading blight by pruning in wet weather versus the risks of giving the epidemic a full week, or even a two- or three-day head start. With highly susceptible cultivars like Gala, I would opt to remove blight as quickly as possible, even if that meant that some removal would be done in less than ideal weather.

5. Q: Can I do hand thinning or bud pinching while blight is active in the orchard?

A: Avoid these activities until after terminal bud set. Delaying hand thinning may result in some loss of fruit size, but risks of spreading blight outweigh the benefits of early hand thinning. One local grower demonstrated that pinching buds as part of tree training for the vertical axe system is a great way to spread blight. Even though we no longer recommend disinfecting pruning tools between cuts, one can still spread blight on one's fingers while pinching buds (and presumably while hand-thinning). Pinching is done to succulent shoot tips that are highly susceptible to blight, whereas cuts made to remove blight are made in wood that is at least two years old.

6. Q: What can be done to stop the spread of blight to new terminal shoots?

A: No good answers here. Anything that helps to shut down tree growth will help to limit the spread of blight since the epidemic stops when terminal buds are set. Lucky growers never get blight, but if they do, they only get it in drought years when trees stop growing in mid-June. (This is not a lucky year!) Obviously, blocks with blight should not be trickle-irrigated until well after terminal bud set. Allowing weed regrowth beneath trees may increase competition for water and nutrients, thereby helping to slow tree growth.

The new plant growth regulator called "Apogee" may prove useful for arresting blight epidemics. This product has a Federal label, but it is not yet registered in New York State. Apogee causes trees to set terminal buds beginning about two weeks after it is applied. To control vegetative growth in overly vigorous blocks, Apogee application will be recommended at late bloom or at petal fall. In young orchards, however, early cessation of terminal growth is undesirable except when blight is present. If Apogee is applied after the first symptoms of blight appear in an orchard, two applications will probably be needed to rein in the growth process and blight will continue to spread for at least two weeks after the first Apogee application. In highly susceptible cultivars, blight may reach the rootstocks in many trees before Apogee can shut down terminal growth and make the tree more resistant to blight. In dry years, untreated trees may stop growing on their own about the same time that Apogee takes effect. The earlier cessation of shoot growth triggered by Apogee will help control blight in wet years, but the combined cost for the two Apogee treatments may exceed \$150 per acre. Cost-effectiveness of Apogee for fire blight remains to be determined.

Until the mid 1980's, fire blight experts recommended reducing action thresholds for aphids and leafhoppers in orchards with blight because of concerns that these insects might spread blight during summer. Research in the Mid-Atlantic States has shown that aphids and white apple leafhoppers cannot vector blight. The role of potato leafhoppers (PLH) is less clear. A spray of Provado or carbaryl to control PLH may be helpful. However, complete control of PLH is impossible in a season when thunderstorms regularly drop new immigrant PLH adults into orchards.

Streptomycin sprays should NOT be applied during summer because summer applications will result in rapid development of streptomycin-resistant strains of the blight pathogen. The only exception is that streptomycin should be applied immediately after any hailstorm if there is active blight in the orchard (i.e., orchards where blight was present this year and terminal shoots are still growing).

Copper sprays applied in summer theoretically should inactivate blight bacteria on plant surfaces and thereby help to reduce inoculum and slow the epidemic. However, attempts to document the benefits of summer copper sprays have provided inconsistent results. Proponents of using copper during summer admit that benefits of copper will be limited because copper is not systemic and therefore will not affect bacteria inside plant tissue. Furthermore, actively growing terminal shoots "outgrow" the copper residue, thereby leaving the blight-susceptible shoot tips unprotected within several days after an application. Copper applied in summer is also phytotoxic to fruit, with injury appearing as necrotic black spots at fruit lenticels. Thus, copper sprays are not acceptable where the crop is destined for fresh market. In young orchards, salvaging the crop may be less important than salvaging the trees. This is especially true this year when many orchards in the Hudson Valley already have severe hail damage.

The bottom line: If I was managing a young Gala block with fire blight, I would be applying a low rate (about 4 oz/100 gallons dilute spray) of a fixed copper on a 7-10 day schedule until terminal buds are set. Copper sprays should be applied under good drying conditions. The alkaline nature of copper sprays means that they probably cannot be combined with other pesticides that are subject to alkaline hydrolysis.

7. Q: What determines how many trees will develop rootstock blight?

A: No one knows. Rootstock blight develops when bacteria move from strikes in the top of the trees down through the trunk and cause cankers in the rootstock. Because M.9 and M.26 rootstocks are highly susceptible to blight, rootstocks that become infected usually die. In the Hudson Valley, Gala orchards that showed the first symptoms of fire blight in early June now have many trees with bacterial ooze coming out of the rootstocks. Some of the trees with rootstock blight still have a reasonably intact canopy, but they will not survive. Some will die within several weeks, some will die later this fall, and some will survive until next spring when they will wilt and die soon after bud break. Incidence of root stock blight can range from less than 5% of trees to more than 80% in a severely blight block. Rootstock blight is most common in orchards less than 6 years old, but other factors that make trees susceptible to rootstock blight have not been determined.

2000 Tree Fruit Crop Estimates						
		Actual			Estimate	
Tart Cherries	1997	1998	1999	3 yr. avg.	Processor	USDA

(million lbs.)					est.2000 *	est.2000
NW MI	140.0	186.0	108.5	144.8	88.0	90.0
West Central MI	70.0	59.0	47.5	58.8	51.3	57.0
SW MI	15.0	18.0	29.0	20.7	16.2	18.0
Total MI	225.0	263.0	185.0	224.3	155.5	165.2
Total U.S.	292.9	348.1	256.1	298.8	228.5	245.4
<u>Sweet Cherries (million lbs.)</u>						
Michigan		70.0	56.0		37.8	44.0
U.S.		423.0	449.3		NA	448.8
<u>Apples (million bu.)</u>						
Michigan	25.0	23.1	29.8	26.0	22.5	NA
Washington	119.0	152.4**	121.4	131.0	153.0	NA
U.S.	247.3	271.1	255.7	258.1	272.0	NA
* Michigan Food Packers Assoc., June 22, 2000						
** Current record for WA						

**Marketing Order Scenario Based on USDA Crop
Forecast for 2000 Supplies**

U.S. Crop (USDA Est.) 245 Mlb
 Carry in +88
 Total Available 333

Optimum Supply Formula
 3 yr. avg. sales 275
 Target carry-out +0
 Optimum supply 275

Surplus 58
 Adjustment for diversion
 Qualifying export +35
 Adjusted surplus 93

Crop restricted

districts (USDA Est.) 195
 Initial restriction 47.7%
 Market growth 28 M = 14.4%
 factor release
 (Required release from
 restriction in January)

Effective restriction 65 M

of this 65 M restriction, it is thought that the industry might export about 35M and put 5 M into qualifying new products/new markets, leaving about 25 M, or 13%, for non-harvest and and/or reserve pool.

ACTUAL AND PREDICTED DEGREE-DAY
 ACCUMULATIONS SINCE February 15, 2000 (*)

Please send any comments or suggestions regarding this site to:

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