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Northern Michigan FruitNet 2004
Weekly Update

NW Michigan Horticultural Research Station

Jim Nugent, District Horticulturist
Position Vacant, District Fruit IPM Agent
Bill Klein, Farm Mgr, NWMHRS
Duke Elsner, Agricultural Agent
Jim Bardenhagen, Leelanau Extension Director

June 1, 2004

GROWING DEGREE DAY ACCUMULATIONS as of May 31, 2004 at the NWMHRS

Year	2004	2003	2002	2001	2000	14 yr. Avg.
GDD42	543	579	452	700	731	608.1
GDD50	242	264	228	362	350	306.2

WEATHER

More rains in recent days brought our May totals at the NWMHRS to 4.34 inches. Last night's rain started June off with 0.47 inches. The rainfall amounts were significantly higher in the Benzonia and Bear Lake areas. Degree-day accumulations are lagging further behind the 14-year average; the rest of the state has slowed down a bit in the last week as well.

GROWTH STAGES at NWMHRS (5/24/04)

Apple: Red delicious-- petal fall
Pear: Bartlett – fruit set
Sweet Cherry: Napoleon – 9 mm
Tart Cherry: Montmorency – 6 mm
Apricot: 14 mm
Plum: European type – early fruit set
Grapes: Chardonnay – 4-6" shoots

COMMODITY REPORT

Apple: Development has continued to be slow, with significant bloom remaining on late varieties or in late areas. **Apple scab** symptoms began appearing last week. More symptoms will appear where fungicide coverage was not adequate during the lengthy wetting periods in mid and late May. **Fireblight** infection potential remains low with the continuation of cool weather. No significant activity of apple insect or mite pests has been reported.

Cherry: Some **brown rot** infections on sweet cherry have been seen, especially where shuck tissues are in contact with the small fruits and on fruit stems. Overall, the pollination of sweets looks to have been good. Tart cherries are far less uniform, with a broad range of fruit sizes in the shuck and variability in fruit stem length within clusters. The first lesions from **cherry leafspot** have been found, mostly on the first leaves beyond the small bract leaves. Overall the activity of cherry insects has been minimal, but we should expect **plum curculio** to begin egg laying as soon as cherries are out of the shuck and evening temperatures warm into the 60º's. The majority of egg laying occurs in the first two weeks after the cherries are exposed. If it remains relatively cool the egg laying may be delayed somewhat.

Grapes: Shoot growth is in the 3 to 4 inch stage, with clusters clearly showing now. The first sprays for **powdery mildew** should be considered now for varieties or vineyards that are prone to this disease. **Potato leafhoppers** are already in the area, so vineyards should be scouted for this important pest.

APPLE THINNING
By Jim Nugent
District Horticulturist, MSUE

What a tough year to decide thinning strategies!

Apple set is influenced by several factors, but two factors seem particularly important this season. First, conditions during apple bloom in NW Michigan was mostly cool to cold and cloudy, with lots of rain. These are obviously not good conditions for pollination.

The second particularly pertinent factor for 2004 is the weather that occurs from petal fall until fruit size reaches about 12 mm on king blooms. This is a period of great competition within

the tree for carbohydrates. Early growth of leaves and fruit utilize only storage carbohydrates from last year. As more leaves develop, they contribute more and more carbohydrates from current season photosynthesis. This is occurring as storage carbohydrates are being used up. The tree reaches its maximum deficit for carbohydrates at about 8-12 mm fruit size. It is for this reason that apples are most easily thinned when chemical thinners are applied at this time, i.e., the tree is doing most of its natural thinning at this stage of development. Therefore, both the amount of stored carbohydrates and the rate of production of new carbohydrates play a significant role in the thinning process. Hence, more thinning occurs naturally when factors occur that reduce storage of carbohydrates or reduce the production of new carbohydrates during the critical period from petal fall through the 12 mm fruit size. So when conditions are cloudy during this point, the production of carbohydrates from photosynthesis is reduced. Phil Schwallier indicates that two consecutive days of cloudy weather is equivalent to the application of a mild thinner.

So how do we handle thinning in 2004? My suggestion is that this season trees will not need aggressive thinning. My best estimate is to consider mild to moderate thinning strategies. Also keep in mind that all thinners work best when conditions will be warm for 2 to 3 days after application. So try to apply thinners when a warm weather pattern is expected.

There are a couple of new thinners available in 2004 that utilize a cytokinin, 6-BA. This compound has been available as an ingredient in Accel (in a mixture with a gibberellin). However, both of the new compounds, MaxCel and Exilis, can be used at higher rates than Accel. These are gentle thinners that thin without stress to leaves and fruit, plus help with fruit size. The 6-BA products are best applied between 8 & 12 mm under warm conditions. They are less effective at or shortly after petal fall than other thinning alternatives.

Phil Schwallier put together a nice handout for last week's meetings in NW Michigan, entitled "Thinning Points 2004", which can be found on the Clarkesville Experiment Station's Extension web site at:
http://web4.msue.msu.edu/msuewc/clarksville/pub/Thinning%20Points%202004.pdf

ACTUAL AND PREDICTED DEGREE-DAY
ACCUMULATIONS SINCE MARCH 1, 2004

Please send any comments or suggestions regarding this site to:

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Last Revised: 6-2-04

Northern Michigan FruitNet 2004
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June 8, 2004

GROWING DEGREE DAY ACCUMULATIONS as of June 7, 2004 at the NWMHRS

Year	2004	2003	2002	2001	2000	14 yr. Avg.
GDD42	674	700	559	780	844	732.5
GDD50	321	334	282	397	411	379.3

WEATHER

Temperatures this week have warmed significantly after the long period of cool weather.

GROWTH STAGES at NWMHRS (6/7/04)

Apple: Red Delicious - 9mm
Pear: Bartlett – 9mm
Sweet Cherry: Napoleon – 10mm
Tart Cherry: Montmorency – 10mm
Apricot: 20mm
Plum: European type – fruit set
Grapes: Chardonnay – 4 - 8" shoots

COMMODITY REPORT

Apple: Thinning is now underway. Warm temperatures will certainly help enhance the effectiveness of chemical thinners. Cool weather the past two weeks has delayed **codling moth** flight, but it is now finally getting underway. **Apple scab** symptoms are appearing from earlier infection periods. Recent warm weather has greatly increased the potential for **fireblight** in blocks where bloom is still present.

Cherry: Sweet cherries: The sweet cherry crop is better than the last couple of years in NW MI. Golds generally have not set as well as most other varieties, possibly the result of later bloom timing. Two weeks of cool, wet conditions were favorable for the development of the **bacterial canker** pathogen. Symptoms are quite common on fruit and leaves. **Cherry leaf spot** symptoms are also present in some blocks. Finally, some warm evening temperatures are resulting in **plum curculio** egg laying activity.

Tart cherries: The cold, cloudy weather during the pollination and fruit set time has hurt the tart cherry crop in NW MI. Warm weather this week will help develop the fruit to the point where a more accurate assessment can be made, particularly in the later areas of NW MI. **Cherry leaf spot** symptoms are appearing now from recent severe infection periods. So far this has been a very challenging year to control CLS. **Plum curculio** is beginning egg laying. **Green fruit worm** populations generally appear to be fairly low. **Oblique banded leaf roller** is more common this season than in past years in some area cherry orchards. This is likely the result of the development of OBLR resistance to organophosphates in these sites, though resistance has not been confirmed.

MANAGEMENT OF FIRST GENERATION CODLING MOTH
By David Epstein and John Wise, Dept. of Entomology, MSU

Codling moth (CM) biofix, the start of adult moth activity in the orchard, was recorded around the end of the first week to the middle of the second week in May in most of the fruit growing regions of the state. Biofix is the date at which the first moths are trapped, provided moths are captured on two successive trapping dates. At biofix, the degree day model is set at zero, and we begin accumulating degree days base 50. The codling moth growing degree-day (GDD) model is a far more accurate method of predicting the timing of egg-laying activity, larval emergence, and other important events than are predictions based solely on calendar dates. Use of the GDD model, in conjunction with traps to estimate population levels, and visual scouting of fruit in the tree canopy, will help optimize codling moth management.

Traditionally, newly hatched codling moth larvae have been the primary targets of insecticide sprays. When targeting larvae, apply the first spray at 250 GDD50 following biofix. This timing coincides with the start of egg hatch. Older chemistries, such as Guthion, Imidan, and synthetic pyrethroids would be applied at this same timing when used for codling moth control.

Some of the newer insecticides now available for codling moth control are active not only on larvae, but the egg or adult life stages as well. Assail, Intrepid, and Calypso each has both ovicidal and larvicidal activity against CM. We continue to evaluate these new materials as they become available in attempts at finding a "best fit" into an overall CM control program.

The suggested timing for first applications of Assail and Calypso, a new chloronicotinyl available this season, is for 200-250 GDD, targeting eggs and early hatching larvae. For Intrepid the best fruit protection is achieved when the first application is initiated before egg hatch. Suggested timing for Intrepid is biofix plus 150-200 GDD. Pyriproxyfen (Esteem®) acts by suppressing development within the egg, as well as larvae that consume it. Hatching of eggs laid by treated adults will also be inhibited. Eggs are particularly susceptible to Esteem, thus, the first application is biofix plus 100 GDD (usually close to petal-fall). Diamond, a new IGR, is another ovicide that should be applied at 100 GDD post biofix.

Inclusion of these materials into a CM control program in addition to the larvacides (i.e. Guthion and Assail) offers growers who experienced heavy CM pressure in 2002 the option to target multiple CM life stages as a strategy to reduce those population pressures. An example would be an Intrepid application at 150 GDD50 targeting the adult and egg stages, followed two weeks later with a Guthion, Imidan, or Assail application targeting newly hatched larvae. Good, thorough coverage is extremely important for the optimum performance of all of these new materials.

If you didn't get control last year with Guthion or Imidan, it is possible that OP resistance has become an issue on your farm. Pheromone trap bioassays conducted in Michigan over the past few years have indicated over 10-fold resistance in some farms in the Fruit Ridge area. These orchards are prime candidates for using CM mating disruption combined with some of the new insecticide chemistries or older non-OP, materials such as the synthetic pyrethroids. Careful monitoring of mite populations is recommended when adopting this program, as multiple applications of Assail and the pyrethroids have been linked to mite flare-ups.

Suggested timings of insecticides for CM control	
Insecticide	**Timing**
Mating disruption	Before start of adult activity
Diamond	100 GDD base 50° F post biofix
Esteem	100 GDD base 50° F post biofix
Intrepid	150 GDD base 50° F post biofix
Assail	200-250 GDD base 50° F post biofix
Calypso	200-250 GDD base 50° F post biofix
OPs and Pyrethroids	250 GDD base 50° F post biofix

ACTUAL AND PREDICTED DEGREE-DAY ACCUMULATIONS SINCE MARCH 1, 2004

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Last Revised: 6-8-04

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June 15, 2004

GROWING DEGREE DAY ACCUMULATIONS as of June 14, 2004 at the NWMHRS

Year	2004	2003	2002	2001	2000	14 yr. Avg.
GDD42	847	828	717	965	1027	894.6
GDD50	439	406	384	526	538	486.2

WEATHER

Wetting events occurred in NW Michigan this past week on 6/9-6/10 and 6/13-6/14. Damaging hail was present in at least one storm cell on 6/13. Rainfall amounts varied greatly throughout NW Michigan in both events.

GROWTH STAGES at NWMHRS (6/14/04)

Apple: Red Delicious - 14 mm
Pear: Bartlett – 12 mm
Sweet Cherry: Napoleon – 12 mm
Tart Cherry: Montmorency – 11 mm
Apricot: 24 mm
Plum: European type –11 mm
Grapes: Chardonnay – 10"-16" shoots

COMMODITY REPORTS

Tart cherries: Cherry leaf spot (CLS) lesions are present in many NW Michigan orchards. Infected bract leaves were yellowing and dropping last week from the bloom time infection. Leaves infected during the second infection period are sporulating profusely and are just now beginning to yellow. Lesions are also present on still younger leaves from the third major infection period. Check orchards closely for the presence of CLS. If present, management for the rest of the season will need to be adjusted to avoid further spread (see accompanying article.) Hail damaged fruit should be sprayed as soon as possible after the event with a fungicide that can control **brown rot.** **European brown rot** is present in a few sites. Treatments any time after bloom are too late to control this organism, so we have to live with it for now.

Sweet cherries: CLS symptoms are present on some area orchards. Sweet leaves will tolerate more lesions per leaf prior to causing leaves to yellow, but heavy infections will still result in premature defoliation. If lesions become present, then make sure to use a more aggressive CLS management program for the remainder of the season. Premature defoliation can hurt fruit quality and predisposes trees to winter injury. **Bacterial canker** symptoms are common this season on both fruit and

fruit quality and predisposes trees to winter injury. **Bacterial canker** symptoms are common this season on both fruit and leaves. Always follow hail events that occur when fruit is present at any stage of maturity with a good fungicide for controlling **brown rot.** Even where hail did not occur, be aware that the brown rot can spread in green fruit if conditions are right and if inoculum is present. The threat is much lower, however, than it will be as fruit enters growth stage III (preharvest period.) **Plum curculio** is actively laying eggs now.

Apples: Apple scab (AS) lesions are present in some area orchards. Check blocks for symptoms and adjust plans for summer AS management if present. Recent rains almost certainly ended the primary scab period. Only low levels of **fire blight** have been found so far. Hail and high winds on 6/13 will have caused the potential for fire blight infection during a "trauma" event where it occurred. Many area apple orchards biofixed for **codling moth** between 5/29 and 6/6, though a few were earlier and some later. The cool weather during late May delayed flight. The desired degree day accumulation between biofix (sustained) and desired spray timing varies with the selection of control options. See the article in the May 25, 2004 Fruit CAT Alert for suggested spray timing. Actual plus or minus one week predicted degree day accumulations since biofix are available for each MAWN weather station are available on the MIFruit web site **(**http://www.mifruit.com/).

Grapes: Shoot growth has been rapid during the past week. Growers should be suckering and cleaning off trunks as soon as possible. Very little **powdery mildew** has been reported. Insects which will need attention now are **potato leafhopper** and **rose chafer**. Potato leafhopper has been in the area long enough that nymphs may now be present. Rose chafers made their first appearance early in the week; they will probably be active over a long period this year if the predicted cool weather arrives. We have had one report of a unique **climbing cutworm** that feeds on leaves and clusters. This species can cause heavy damage, especially to newly planted and one year old vines.

UPCOMING EVENTS:

June 17 -- Organic Apple Project Field Day
Clarksville Horticulture Experiment Station
June 24 -- USDA Chery Estimate
June 28 -- CIAB Grower Meetings:
9:00 – 11:00 a.m. Traverse City
1:00 – 3:00 p.m. Kewadin
7:00 – 9:00 p.m. NWMHRS

SWEET CHERRY VARIETY SHOWCASE REMINDER

Wally Heuser and Wanda Heuser Gale of International Plant Management, Inc. are hosting a Sweet Cherry Variety Showcase on July 15th, in Lawrence, MI. For information and to register, please call International Plant Management Inc. at 1-800-424-2765.

BRACING FOR A POSSIBLE CHERRY LEAF SPOT EPIDEMIC

George Sundin and Tyre Proffer, Plant Pathology
Jim Nugent, Northwest Michigan Horticultural Research Station

This article is also available as a PDF file (click here)

We've been receiving samples and hearing reports of cherry leaf spot infections in tart cherry blocks throughout the state of Michigan. Leaf spot is a cause for major concern at this time with harvest still several weeks away in much of Michigan. The occurrence of symptoms right now indicates that leaf spot will be exceedingly difficult to control this year. The initial symptoms of cherry leaf spot are small (1 to 3 mm) red-to-purple leaf spots on the upper leaf surface (Looking at leaves with back-lighting is helpful.). These spots will then turn brown **(**Photo 1). In heavy infections, spots can overlap producing larger areas of dead leaf tissue. Leaves accumulating lesions will soon begin to turn yellow. On the underside of these leaves, whitish spore masses are usually visible on each lesion (Photo 2). These spore masses are a sign of the pathogen and represent inoculum for new infections. It does take a few days after leaf spot is visible for spore masses to become evident. We've recently received samples showing leaf spot symptoms with no sporulation. After incubation in the laboratory, viable spores were produced from these lesions. Leaf spot symptoms are also showing up on pedicels of fruit (Photo 3); we currently do not have data to know if these lesions affect fruit size or quality.

Leaf spot is usually effectively controlled early in the season. In years with extended drier weather, such as in 2003, leaf spot symptoms were not initially seen in most orchards until August-September. We recommend scouting the tops of trees for yellow leaves because infections are usually initiated there due to spray coverage problems. However, in this season, symptoms are not necessarily limited to the tops of trees and may be observed throughout the foliage. The occurrence of leaf

symptoms are not necessarily limited to the tops of trees and may be observed throughout the foliage. The occurrence of leaf spot infection on bract leaves (Photo 4) is also evidence of early season infections. Record rainfall combined with several extended wetting periods this season has fostered the rapid proliferation of leaf spot.

What is the best action plan to attempt to manage leaf spot in orchards with visible leaf spot infections? We recommend the use of a sterol-inhibitor (SI) fungicide (i.e., Elite, Indar, Nova, or Rubigan) at the maximum label rate combined with Captan used at the maximum (4 lbs. / acre) rate for your next cover spray. The SI fungicides have some back action in controlling new infections and will greatly reduce sporulation from existing infections. Captan is a protectant that is also used for fungicide resistance management concerns. **Because of the extremely high disease pressure conditions, it is critical to use the maximum label rates of fungicides and also to cover entire orchard blocks; i.e., do not use an alternate middle row spray plan.** Dodine could be substituted for Captan as the tank mix since dodine is a better leaf spot fungicide than Captan. However, we do not know the current status of dodine resistance in the cherry leaf spot fungus population, therefore, dodine should be used with caution. If dodine has been used with success in your orchards and used sparingly, this fungicide could be used as a mixing partner with an SI.

We recommend using two consecutive applications of the SI/Captan or SI/dodine cover spray keeping the interval to seven days, using the maximum label rates, and covering entire orchard blocks. These sprays should be followed up with a strobilurin at the full label rate that would be effective for prevention of new infections. The interval should be kept to seven days unless we experience significantly drier weather that would allow stretching the interval to no more than 10 days. Again, with the high pressure we are experiencing, cover entire orchard blocks.

Leaves currently exhibiting a number of lesions are almost sure to defoliate. The amount of leaves remaining on trees is a critical factor for fruit ripening. A rule of thumb is that trees need at least two healthy (non-yellow) leaves per fruit to properly mature the fruit. If the ratio is less than two leaves per fruit, maturity may be delayed and trees with ratios of less than one leaf per fruit may not produce mature fruit. The goal of this management plan is to limit the infection of currently healthy leaves by eradicating new infections and protecting against subsequent infections. The cherry leaf spot spore load will probably be high in most orchards for the remainder of the season. These blocks must be intensively managed for the next several months.

ACTUAL AND PREDICTED DEGREE-DAY
ACCUMULATIONS SINCE MARCH 1, 2004

Please send any comments or suggestions regarding this site to:

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Last Revised: 6-16-04

Northern Michigan FruitNet 2004

ALERT

NW Michigan Horticultural Research Station

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June 17, 2004

CHERRY FRUIT FLY TRAPPED

On June 16, a Cherry Fruit Fly was trapped in the Entomology planting at the NW Research Station. If you haven't put your traps out yet, you should do so as soon as possible and if you're not trapping, but are in a high pressure area, sprays should be applied in about 7 days. More on CFF in next week's FruitNet.

ACTUAL AND PREDICTED DEGREE-DAY ACCUMULATIONS SINCE MARCH 1, 2004

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Last Revised: 6-17-04

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June 22, 2004

GROWING DEGREE DAY ACCUMULATIONS as of June 21, 2004 at the NWMHRS

Year	2004	2003	2002	2001	2000	14 yr. Avg.
GDD42	987	983	862	1148	1181	1064.6
GDD50	524	506	474	653	636	601.5

WEATHER:

Rain on June 17 & 18 resulted in disease infection periods in most locations in NW Michigan. Degree day accumulations remain behind the last 14 year average at the NWMHRS.

GROWTH STAGES at NWMHRS (6/18/04)

Apple: Red Delicious— 18 mm
Sweet Cherry: Napoleon – 12 mm
Tart Cherry: Montmorency – 11 mm
Apricot: 24 mm
Plum: European type – 15 mm
Grapes: Chardonnay - 10" – 16" shoots

CROP REPORTS

Cherries: Eastern Cherry Fruit Fly (CFF) was first trapped at the NWMHRS on Wednesday, June16. Emergence typically occurs later in commercial sites with low populations. However, high populations, which generally equate with earlier trap catches, may occur in abandoned cherry sites, orchards near alternate wild hosts, and in first year bearing orchards where some fruit developed in past years on non-bearing trees that were not treated for CFF. Also, high populations can develop in orchards where the decision was made prior to harvest the previous year to not harvest the block (due to markets, hail, wind, etc.), where CFF controls were not applied or were discontinued very early. If trapping, place traps as soon as possible. If not trapping, control should be initiated by June 24 in areas where higher populations are suspected, if you are using a traditional insecticide for control. Attached is an article that describes control options for CFF and PC. Note that the traditional

insecticides are contact poisons, whereas the new neonicotinoids must be injested. Because of this mode of action, the neonicotinoids should actually be applied earlier in the interval between first emergence and egg laying, to give time for the material to be injested by the adult flies prior to egg laying.

Plum curculio (PC) continues active egg laying. Most of NW Michigan is now advanced enough (over 375 DD50 after bloom) that any egg laying in tart cherries from now until the end of PC activity may result in larvae in fruit at harvest. This information for your area is available at www.MIFruit.com**Cherry leaf spot (CLS)** lesions are commonly found in area orchards. In orchards where CLS symptoms are present, plan to use a good protectant program at closer spray intervals for the rest of the season. Rose chafer emergence has increased this week. Reminder: Dodine has been found to be phytotoxic to Balaton.

Apples: Sprays for first generation **codling moth** (CM) should have been applied in many locations, but some later biofix blocks or blocks in cool areas may not be quite at recommended timing. Check www.MIFruit.com for details if you know the biofix date based on trapping in your orchard. CM trap catches are quite variable at this time, but they are still actively flying in some sites. A few **white apple leafhopper** and **potato leafhopper** are present. **Aphid** populations are generally fairly low.

See accompanying article on enhancing return bloom with summer NAA applications. This technique could be useful on varieties which tend to biennial bear.

Grapes: Shoot growth is quite rapid at this time. **Powdery mildew** is light. **Downy mildew** has been observed on wild vines, but has not been reported to date in commercial plantings. Keep a close watch for **potato leaf hopper** in all vineyards, as this pest got a very early start in NW Michigan this season. **Rose chafer** activity is increasing.

Strawberry harvest is getting underway.

MANAGING INTERNAL FEEDING FRUIT PESTS OF CHERRY

John Wise and Larry Gut, Entomology
Jim Nugent, District Horticulturist

There are two primary internal feeding insects that infest cherry fruit, plum curculio and cherry fruit fly (including eastern cherry fruit fly and black cherry fruit fly). The plum curculio (PC) is active earlier in the season than the cherry fruit fly (CFF), but there is often significant overlap in mid- to late June where both pests are a threat to the cherry crop. The PC overwinters as an adult and can be present in orchards as early as bloom time, but usually will not begin laying eggs into fruit until shuck-split or shuck-off period. The CFF emerges as an adult from the soil around mid-June. Females will begin seeking ripening fruit to lay eggs into 7 to 10 days later; this oviposition activity lasting through cherry harvest and after.

Control options for CFF include OPs (Guthion and Imidan), synthetic pyrethroids (SPs) (Asana and Warrior), neonicotinoids (Actara and Provado), and some other options for organic producers (Fruit Fly Bait, Entrust and Surround.) The OPs and SPs are contact materials. SPs provide only moderate control, while OPs provide excellent control. The neonicotinoids have performed well in trials for CFF; Actara has the advantage of also controlling PC. Because of their mode of action, the nicotinoids should actually be applied earlier in the interval between first emergence and egg laying, to give time for the material to be ingested by the adult flies.

PC control options include insecticides in the organophosphate (OP) class, synthetic pyrethroids and more recently the neonicotinoids. One or more sprays are generally applied beginning at shuck fall, or earlier if PC adults are detected in the orchard or densities are suspected to be high. From second cover to a few weeks before harvest is a critical time for PC control. At this time, adults are continuing to lay eggs and the hatching larvae will be present in fruit at harvest. The OP's, like Guthion and Imidan, have generally been the standard for control because of their strong contact activity on PC and long stable residues. The synthetic pyrethroids, like Asana and Warrior, also have the strength of being contact poisons and are very fast acting, but their residual activity is generally shorter than the OPs.

The newest control option on the market is the neonicotinoid, Actara, which has performed very well in field efficacy trials at the MSU Trevor Nichols Research Complex and Northwest Michigan Horticultural Research Station. This compound is unique in that it is lethal to PC as a nerve poison when initially applied, but then as a translaminar (i.e., locally systemic) material provides long lasting fruit protection. Organic cherry growers may want to consider use of Surround WP (kaolin).

Field trials have shown it to provide measurable fruit protection when used on large blocks when coverage is maintained.

Cherry fruit fly control options include insecticides in the organophosphate (OP) class, synthetic pyrethroids, and more recently the neonicotinoids, Fruit Fly Bait and Particle Film. The OP's, like Guthion and Imidan, have been the standard for control because of their contact activity on CFF and long stable residues. The synthetic pyrethroids, like Asana and Warrior, also have contact poisons activity on CFF adults, but generally provide only moderate control because of short residual activity.

Two new control options on the market are the neonicotinoids Provado and Actara, which have performed well in field efficacy trials. Provado has a 7-day pre-harvest interval, while the PHI for Actara is 14 days. Thus, Provado provides a good option for CFF control at that critical window of a week or so before harvest. Additionally, it is registered for use in both sweets and tarts. Since Actara is also active on PC, economical options for using this material would be a single application at 4.5 to 5.5 ounces/acre at second cover or a few weeks before harvest when control of both pests is often needed. Organic cherry growers may want to consider use of GF120 Fruit Fly Bait, Entrust (organic formulation of SpinTor) or Surround WP (kaolin). GF120 Fruit Fly Bait has been shown to provide effective control on various fruit fly species, but requires precise timing (CFF pre-oviposition period) and specialized application equipment. Entrust has shown to be active on fruit fly species but starting sprays during the pre-oviposition period on a 7-day interval is important for good performance. Field trials with Surround WP have shown good fruit protection from CFF when used on large blocks when coverage is maintained.

ENHANCING RETURN BLOOM WITH SUMMER NAA

Philip Schwallier, District Horticulture Agent
Fruit Crop Advisory Team Alert, May 18, 2004

Some years it is desirable to try to enhance return bloom on apple varieties that tend to be biennial. This is especially important on trees that have a heavy crop load. Most years treatments of summer NAA applied at four, six, and eight weeks after bloom (WAFB) will increase return bloom even on varieties that have heavy crop loads and tend to have poor return bloom. This timing is after any potential thinning from NAA has pasted. Fruits are often one-inch in diameter and won't respond to any NAA thinning action. Flower bud initiation has already begun but can be enhanced by NAA treatments during the next 30 days after the thinning period ends.

Summer Ethrel can also enhance return bloom by treatments of 200 to 300 ppm made at the same timing of four, six, and eight WAFB. However, summer Ethrel can some years thin one-inch diameter fruit and later summer Ethrel can advance maturity of early maturing varieties.

Summer NAA

Apply 5 ppm (2 oz/100 of Fruitone N) of NAA starting four WAFB and apply two additional spray treatments at six and eight WAFB. These sprays can be added right to the cover sprays during that time period. Some years, these treatments do not perform well especially during drought years. Varieties that should be considered for bloom enhancement sprays are listed in Table 1. Summer NAA treatments will not cause any adverse affects to the trees or crop. Treatments during extremely hot temperatures (maximum temperatures above 95° F) should be avoided.

Table 1. Apple variety biennial tendency

Variety	Biennial bearing tendency
Cameo	Moderate
Cortland	Low
Empire	Moderate
Fuji	High
Gala	Low
Golden Delicious	High
Honeycrisp	High
Jonagold	High
Jonathan	Low
Macoun	Moderate
McIntosh	Low
Mutsu	High
Northern Spy	Moderate
Paulared	Moderate
Red Delicious	High

Red Delicious	High
Rome	Low

ACTUAL AND PREDICTED DEGREE-DAY
ACCUMULATIONS SINCE MARCH 1, 2004

Please send any comments or suggestions regarding this site to:

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Last Revised: 6-23-04

Northern Michigan FruitNet 2004
Weekly Update
NW Michigan Horticultural Research Station

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June 29, 2004

WEATHER:

Cool weather persisted this past week. Wetting periods from light rain events on June 24 and 28 were generally not scab or leaf spot infection periods. (Benzie and Manistee areas had a light scab infection period on 6/24). Degree day accumulations continue behind the average for recent years.

GROWTH STAGES at NWMHRS (6/28/04)

Apple: Red Delicious— 27 mm
Sweet Cherry: Napoleon – 15 mm
Tart Cherry: Montmorency – 12 mm
Apricot: 25 mm
Plum: European type – 20 mm
Grapes: Chardonnay – 10" – 16" shoots

CROP REPORT:

Cherries: The USDA crop estimate for tart cherries is 145 million lbs. in Michigan and 215 million lbs. for the U.S. This would represent the third smallest U.S. crop in the past 20 years. The sweet cherry crop in MI is predicted to be 60 million lbs. (30,000 tons), which would tie for the second largest crop in 15 years. The U.S. sweet crop is forecast at a record 276,550 tons. **Cherry leaf spot** remains a challenge in many orchards where inoculum from earlier infections is present, but fortunately, few orchards are showing serious defoliation at this time. **Oblique banded leaf roller** (OBLR) is present in a few orchards where organophosphates (OPs) have not provided control. The larvae spin webs that attach leaves to fruit clusters. This provides ideal habitat, especially in sweet cherries, for **brown rot** to develop in the fruit clusters, because it is so difficult to get effective fungicide coverage on fruit. Larry Gut suggests that SpinTor would be a good choice in this situation, to manage OP resistant OBLR at this time in cherries. **Cherry fruit fly** adult trap catches have remained low. **Plum curculio** is still active.

Apples: Codling moth trap catches are way down. **Mite** populations are generally low. **Spotted tentiform leaf miner** trap catches are generally increasing.

Apples have been brought to the Research Station with damage caused by ***Campyloma* (or Mullein bug)**. The fruit has small, dark bumps that are generally surrounded by a shallow depression. This injury occurs from fruit feeding during a short period at bloom and shortly thereafter. After this period, it switches its feeding to become a predator that feeds on aphids, mites and pear psylla. No further feeding injury to fruit will occur during the season. *Campyloma* has definite varietal preferences , with Red Delicious being a favorite and McIntosh being unaffected. Other damaged varieties include Northern Spy, Empire, Spartan, Gala, Cortland, Jonagold and Golden Delicious. Amy Irish-Brown put together a very nice handout on

Spy, Empire, Spartan, Gala, Cortland, Jonagold and Golden Delicious. Amy Irish-Brown put together a very nice handout on this insect, which we can send to you upon request via email, fax, or U.S. mail. A shortened version was published in the June 8, 2004 CAT Alert, which is available on the web at: http://www.ipm.msu.edu/CAT04_frt/F06-08-04txt.htm, or contact the NWMHRS to receive a copy. We'll talk about control next season.

Grapes: The foliage and crop development look great in most NW Michigan vineyards. In general, most growers expect full crops. Very little **powdery mildew** has appeared so far. Bloom for vinifera varieties should be underway soon. Growers need to be finishing sucker removal and getting shoots tucked as soon as possible. The adults of **sphinx moths** and **forester moths** are active; the first caterpillars for these should appear within a few weeks. Although it has been a minor problem so far, growers should be scouting for **potato leafhopper**, as this pest can cause a lot of injury quickly.

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