



## NH Integrated Pest Management Newsletter

April 20, 2005

Volume XI

No. 2

### This week's topics are:

Bud stages/Degree days

Winter moth

Mummyberry fungus

2005 Corrections to New England Apple Pest Management Guide

Leafminer thresholds

Orchard radar

Black knot/lesser peach tree borer

TPB thresholds

Pear psylla

### Tree Fruit Bud Stages and Degree Day Information

Fruit bud stages at the UNH Woodman Horticulture Farm (Durham) were as follows on Tuesday morning, April 19: Pioneer McIntosh Apple: Advanced green tip. Red Haven Peach: swollen buds. Pears: swollen buds. Blueberry: swollen buds.

Degree days are an effective way to measure accumulated heat, and predict some pest events. (Raise your hand if you knew that.) Apple scab degree days (SDD) are computed with a base temperature of 32F. The growing DD figures I expect to be reporting have a different base temperature: 50F. They can be useful to predict events like hatching of SanJose scales, and plum curculio activity.

The biofix point (starting point) for accumulating SDD's is green tip stage on McIntosh. For the Woodman farm, we reached that point on April 15. I'll try to report scab DD in every issue, until we've passed the point where all ascospores should have matured (about 1000 ScabDD). Biofix point for Brentwood and Durham was April 15; I'm waiting for confirmation of biofix points for Westmoreland and Milford weather recorders.

On Monday April 18, Nada Haddad reported 43SDD for Brentwood, and I had similar numbers for Durham. Carl Majewski had 122SDD in Westmoreland, but I've got to correct the biofix for that site. By next time we'll probably have other points set up.

### Thresholds for Leafminers on Apple

If you have set out your red sticky rectangle traps properly, the next step is to count the catch every week, and write it down. Freshly caught apple blotch leafminers (and spotted tentiform leafminers) look like this photo. They are only 3-4 mm long



(roughly 1/8 inch). After being stuck in the trap for ten days or so, they turn black, and are very difficult to identify, so that's why I suggest writing down the catch every week.

How many is too many? For McIntosh, a cumulative average of 4 or more per trap (from silver tip through tight cluster) is enough to warrant control. If you leave the traps up through pink, the threshold is 9 or more per trap. McIntosh is very sensitive to leafminer injury, which is why the threshold is so low. For all other varieties, the figures are 8 moths (ST through TC) and 21 moths (ST through Pink).

One more complication: If you plan on applying RETAIN to your McIntosh trees, you can use the same threshold as for the other varieties. McIntosh often responds to LM injury by dropping its fruit, just as you are about to begin harvest. Retain counteracts this tendency.

## Thresholds: When Versus If You Spray for Leafminers

Crossing the threshold tells you **IF** populations are high enough to warrant control. It does not necessarily mean that you do the spraying then. **WHEN** you apply an insecticide for leafminers depends on the kind of insecticide you plan to use. For example, Ambush, Asana, Pounce, Thiodan or Vydate are materials you would apply pre-bloom, to kill egg-laying adults and their eggs. If you used the insect growth regulator Intrepid, it kills the immature stages, and could be applied at pink or petal fall. Assail (another IGR), Provado, Agri-mek, SpinTor or Lannate can be applied from petal fall until the sap-feeding miners turn into the tissue feeding stage. Once the larvae become tissue feeders, we don't have insecticide choices that are effective. By the way, for this first generation, the transition to tissue feeder stage typically occurs around mid-June.

## Thresholds for Tarnished Plant Bug

Thresholds for TPB catch are a bit more complicated, because there are two options for decision times, and two general targets for fruit quality.

For growers who have a strong market for #1 fruit, I suggest a threshold of 5 TPB's caught per trap from silver tip to tight cluster. If you haven't reached threshold by TC, you could wait and look again at pink. An average of 8 or more per trap by pink would warrant control.

For growers who want to market extra fancy fruit, the corresponding numbers are 3 and 5 per trap.

I expect TPB numbers to be higher in blocks with large acreage of alfalfa or fallow fields nearby. Those are good places to produce lots of TPB's. I'd expect lower numbers in blocks that are surrounded by woods. Warm weather (like we've had recently) really causes an increase in TPB activity.



## Winter Moth??

This is another "new" pest problem for NH apple growers. But actually, WM has been here for a while. It appeared here some time after 1978. They've had it in Atlantic Canada since 1930. Adult male moths look very similar to fall cankerworms and fly in November and December (and

sometimes mild periods of January). Females are wingless, and are often at the base of trees. The larva is an inchworm. This is known as a forest and shade tree pest with apple and oak leaves as the preferred foods. They feed on MANY other hosts, including maples, basswood, ash and blueberry. Problems from winter moth are only being reported from coastal Massachusetts (out to mid-Cape Cod), and Rhode Island.



Joe Elkington and Jeff Boettner have been on top of this in Massachusetts, and Jeff has said that he suspects abandoned apple trees are one focal point.

Bob Childs reported that egg hatch in Massachusetts occurs at 20 to 50 Growing Degree days (base 50F). For those of you who don't monitor GDD's, that should be roughly at quarter inch green to half inch green bud stage. Young larvae disperse by "ballooning", just like gypsy moths. They produce long silk strands, which then blow them aloft on a light breeze and carry them a long ways. Heather Faubert reported that the larvae feed on apple leaves and young fruit. I'll include her photo of fruit injury.

It looks like green fruitworm damage, doesn't it?

Monitoring: checking for the small greenish inchworms pre-bloom is important, but I don't have much more detail than that. Fully grown caterpillars are only 1 inch long.

Control: Oil applications can kill exposed eggs. *Bacillus thuringiensis* sprays, and many chemical insecticides seem to kill the larvae. I guess the real problem is the surprise about this new critter. Once you know that they are giving you a problem, control isn't difficult. Some growers in affected spots may have to return to using an insecticide before bloom. This is so new that none of us have worked out a threshold for apple, to my knowledge.

One problem: young larvae of winter moth look JUST like young green pug moth larvae. You'd get a clue as to identity, based on what they eat. Winter moth larvae apparently prefer leaves. Green pug larvae prefer flower anthers and pistils, sometimes petals. A tougher problem is that winter moth larvae look like Bruce spanworm too (a forest species).

## Orchard Radar

I hope most NH tree fruit growers have already heard of orchard radar, and visited the site. If you haven't, you should. Glen Koehler has set up quite a few predictive tools that can be part of your orchard management decision-making. They are driven by "Skybit" weather data, and refined by observations on the ground of key apple development stages. This year, Glen has received funding to allow two NH sites on orchard radar. It looks as though they will be Hollis and Durham. He is setting things up now, and soon this year's predictions will be available. If they aren't up when you look, check again in a week or two. If you've never visited the site, I think you'll say WOW! Point your server to: <http://pronewengland.org/Content/PROInfoDecisionModels.htm>

## Pear Psylla

Pear psylla overwinters as an adult, and is one of the earliest tree fruit insects to become active. For years I've suggested to growers that they start the pear psylla season by applying one or two oil applications during warm weather, at bud burst. Then an insecticide application



(Ambush, Pounce, Asana) at the whitebud ( “popcorn”) stage would follow. This one/two punch works because the overwintered females that contact the oil, have their egg production shut down for up to 30 days. The insecticide at whitebud finishes off much of the overwintered PP’s, before they can recover and lay eggs.

That method still works, but there are some new materials available to growers now, and they offer different approaches. 1) Esteem is a relatively new insecticide. It is an insect growth regulator, which means that it doesn’t affect adults (just eggs and nymphs). Two applications work very well. Apply the first treatment at bud swell, just before sustained egg laying begins. The second is at petal fall. The notes I saw cautioned not to skip rows. 2) You could use Agrimek plus oil at whitebud stage. 3) you could use the early oil spray(s) followed by Actara at white bud stage. Yeah, I guess that’s the same old method, but just with a newer material substituted. I would expect Actara to work better than one of the pyrethroids, plus be less likely to “nuke” our beneficial insects.

## Mummyberry Fungi Are Starting to Grow

In the last issue, I wrote about raking mulch to dislodge the fungal stipes of mummyberry fungus. Now is a good time for that. Urea application to burn the fungi (and provide nitrogen) might go on soon, in case you planned on this procedure. My photo shows what the fungi look like before the cups have fully opened. For those of you with black and white printers, the fungal stipes are dark brown.



## Black Knot and Lesser Peach Tree Borer

A fungus is the cause of the blackened swellings that we commonly see on many plum trees, plus some other stone fruit. The fungal spores that cause this year’s infections come from the knots that you didn’t prune off and burn during the dormant season. Now, you have another reason to do this. Lesser peach tree borers really like to lay eggs in those knots. So pruning out the knots can reduce your borer problems as well. LPTB attacks any stone fruit trees, and prefers limbs and branches as its site of attack.

## Corrections to the New England Apple Pest Management Guide

Thanks go to Lorraine Los, Dan Cooley, and Jon Clements for doing most (all?) of the work on the corrections for the New England Apple Pest Management Guide. The 7 pages of additions and corrections begin at the end of this newsletter.

Those of you who were at the Brookdale twilight meeting on April 13<sup>th</sup> heard me say that I was unsure how many of the new materials are registered here. For the benefit of those who weren't there, I'll explain: the NH Department of Agriculture, Markets and Food has a website, and one of the things on the page for the Pesticide Regulatory Division is a link to the database of NH registered products. You can find out if a product is registered here (or not) by searching the database. That's great, but when I did this on the 13<sup>th</sup>, 10 of the first 11 new products I checked were not listed. I was worried, because I can't recommend a pesticide (and you can't use it) if it is not registered in the state.

Wendy Chapley explained the situation to me. It seems that NHDAMF submitted its list of 2005 registered products to the people who run the NPIRS website on March 3<sup>rd</sup>. For some reason, our '05 data still isn't all compiled on the site. We expect it will be ready, and in the meantime Wendy kindly offered to check my list. I'll share what she finds as soon as answers come back.

A handwritten signature in black ink, appearing to read "Alan T. Eaton". The signature is fluid and cursive, with a long horizontal stroke at the end.

**Alan T. Eaton**  
**Extension Specialist**  
**Integrated Pest Management**

**2005 'Update'**  
**to the**  
**2003-04 New England Apple Pest Management Guide**  
L.P. Berkett, 'Update' Coordinator and Editor  
University of Vermont

**Insect and Mite Management**

Lorraine Los, University of Connecticut

***Cancelled Product:***

**Dimethoate (Digon, Dimate)** – The manufacturers have voluntarily withdrawn this product from use on several crops including apples. Growers may use existing stock in 2005.

***New Products:***

**Calypso (thiacloprid):** 4 lbs./gal F. Use 0.5 –1.0 fl. ozs/100 gals. for aphids, leafminers, leafhoppers and mirid bugs; use 1.0 – 2.0 fl. ozs./100 gals. for apple maggot, codling moth, European apple sawfly, oriental fruit moth, plum curculio and suppression of scale insects. Belongs to the neonicotinoid class of insecticides (as do Provado, Actara and Assail) and offers systemic activity. Comparatively safe on beneficials. Do not apply more than 16 fl. ozs. per acre per year. Allow at least 7 days between applications. **Restricted entry interval 12 hours. Preharvest interval 30 days.**

**Cyd-X (codling moth granulovirus):** 1- 6 fl. oz. per acre. Aqueous suspension of an insecticidal granulovirus for control of codling moth. It must be ingested by larvae to be effective. At least two applications per generation are recommended; the first just before or at the beginning of egg hatch. The use of a spreader-sticker with UV blocking properties may extend the residual activity and enhance weather fastness. Use non-chlorinated water at a pH near 7 in the spray-tank mix. This material is certified by the Organic Materials Review Institute (OMRI) and approved for organic production. **Restricted entry interval 4 hours. Cyd-X can be applied up to and including the day of harvest.**

**Decis (deltamethrin):** 1.5EC. 0.9 – 1.9 fl. oz. per acre (depending on pest-see label). For leafrollers, leafminers, apple maggot, codling moth, Oriental fruit moth, plum curculio, leafhoppers, San Jose scale crawlers, plant bugs, aphids, and European apple sawfly. Do not apply more than 3.6 fl. ozs. per acre in one growing season. Highly toxic to bees exposed to direct treatment. Do not apply it or allow it to drift to crops or weeds on which bees are actively foraging. Extremely toxic to fish and aquatic invertebrates. **Restricted entry interval 12 hours. Preharvest interval 21 days. Registration status may vary within the New England states.**

**Deliver (*Bacillus thuringiensis*, subsp. *kurstaki*)** is another Bt product labeled for orchard use. As with other Bt products, its activity is primarily against early larval stages of fruitworms and leafrollers. **Restricted entry interval 4 hours. Preharvest interval 0 days.**

**FujiMite (fenpyroximate):** 5 EC. 1 – 2 pts. per acre. For European red mite, two spotted spider mites and white apple leafhopper. For resistance management, it should not be applied more than once per season, even though the label allows 2 applications per season. It should be rotated with products having a different mode of action where additional control is needed. Fujimite, Nexter and Kanemite have similar modes of action. **Restricted entry interval 12 hours. Preharvest interval 14 days.**

Note: This product is also labeled for pear psylla control in pears. **Registration status may vary within the New England states.**

**Kanemite (acequinocyl):** 15 SC (suspension concentrate). 21 - 31 fl. oz. per acre. For European red mite and two spotted spider mite. For resistance management, it should not be applied more than once per season, even though the label allows 2 applications per season. It should be rotated with products having a different mode of action where additional control is needed. Fujimite, Nexter and Kanemite have similar modes of action. **Restricted entry interval 12 hours. Preharvest interval 14 days.**

Note: This product is also labeled for mite control in pears. **Registration status may vary within the New England states.**

**Nexter** is a new formulation of pyridaben which is the same active ingredient as Pyramite. It will replace Pyramite, which is being discontinued by BASF. Existing stock of Pyramite may still be used. The Nexter label has similar wording to Pyramite; however, Nexter can only be used **once per season**. The restricted entry interval and preharvest interval are the same for both products. Add the following to the Pyramite entry on Page 94 of the NEAPMG:

**Nexter (pyridaben):** 75% WS. 4.4 – 5.2 oz. per acre for European red mite; 8.8 – 10.67 oz. per acre for twospotted spider mite (TSM). **Do not exceed 1 application per year. Restricted entry interval 12 hours. Preharvest interval 25 days.**

**Proaxis (gamma cyhalothrin):** 0.5 lb./gal. CS (capsule suspension). 2.56 – 5.12 fl. oz. per acre. For aphids, apple maggot, codling moth, green fruitworm, Japanese beetle, leafhoppers, leafrollers, lesser appleworm, Oriental fruit moth, plat bugs, plum curculio, San Jose scale (fruit infestations), and leafminers. Highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Extremely toxic to fish and aquatic organisms and toxic to wildlife. See label for spray drift precautions when spraying in vicinity of aquatic areas. Do not apply more than 1.6 pts. per acre per year; no more than 1.28 pts. per acre per year postbloom. **Restricted entry interval 24 hours. Preharvest interval 21 days. Registration status may vary within the New England states.**

**Warrior (lambda-cyhalothrin):** 1 lb./gal. CS (capsule suspension). 2.56 – 5.12 fl. ozs. per acre. For leafrollers, internal fruit feeders, green fruitworm, leafminers, apple maggot, stink bugs, leafhoppers, plum curculio, Japanese beetle, plant bugs, periodical

cicada, apple aphid, Rosy apple aphid, spirea aphid, and San Jose scale fruit infestations. Highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. See label for spray drift precautions when spraying in vicinity of aquatic areas. Do not apply more than 1.6 pts. per acre per year.; no more than 1.28 pts. per acre per year postbloom. **Restricted entry interval 24 hours. Preharvest interval 21 days.**

**Zeal (etoxazole):** 72% WDG. Miticide. 2.0 – 3.0 ozs. per acre. Effective against eggs and immature European red mite and twospotted spider mite. Not effective against adult mites. Does not control rust mites. Comparatively low toxicity to insect and mite predators. Maximum of 1 application per season. **Restricted entry interval 12 hours. Preharvest interval 28 days.**

**Label Changes:** In the 2003-2004 NEAPMG, we indicated that label changes were pending for **Diazinon, Guthion** and **Imidan**. The Guthion label (see below) has been revised, but Diazinon and Imidan labels remain the same for 2004 and 2005.

**Actara – The 2004 label revision again includes use on apples produced east of the Mississippi River. The label also includes stone fruit.** As you may recall, these were not on the 2003 Actara label. Other pome fruit such as pear, crabapples, loquat, mayhaw and quince also remain on the label.

There is also a new supplemental label for Actara, *Supplemental Directions for Use on Pome Fruits: Pollinator Precautions*. This Supplemental Label must be in the possession of the user at the time of pesticide application. Actara is highly toxic to bees exposed to direct treatment or residues on blooming crops. The supplemental label outlines correct timing for apples and pears, spray drift precautions, and other tactics to avoid contact to pollinators.

**Assail** - There is a new Supplemental Label for Assail which adds more target pests. The additional pests and rates include: 1.7 – 3.4 ozs. per acre for mullein plant bug and mealybug; 2.3 –3.4 ozs per acre for oriental fruit moth, European apple sawfly and Japanese beetle; and 3.4 ozs. per acre for apple maggot, plum curculio and San Jose scale (suppression only). The addition of a horticultural oil is recommended for improved performance especially for oriental fruit moth and San Jose scale.

Note: Pear psylla is also on the supplemental label because the rate has changed to 1.7 – 3.4 ozs. per acre.

**Avaunt** - The Preharvest Interval has changed from 28 days to 14 days.

**Guthion** – Guthion will now only be sold as Guthion Solupak 50% which is a water soluble packet. Growers may use up their existing stock of older product according to original label directions.

The following significant changes have been made to the Guthion Solupak 50% label for apples.

- Maximum allowable use is 8 pounds of Guthion Solupak per acre per year

- The **restricted entry interval is 14 days, but is reduced to 7 days for fireblight pruning (provided workers are thoroughly protected as per label).**
- **Preharvest interval is 14 or 21 days. 14 days if the last application does not exceed 2 pounds per acre. Otherwise, 21 days.**
- **The re-entry for the general public into Pick-Your-Own blocks is 30 days.**
- There is new language with regard to reducing spray drift, especially to protect aquatic habitats. There is a list of 12 “Requirements for Reducing Spray Drift”. This includes restrictions on wind speed (Apply only when the wind speed is less than 10 mph) and applications near water (Do not apply within 25 feet of permanent water bodies). Review this entire list before applying Guthion.

Note: The new Guthion label does not include plums. The tree fruit crops listed include apples, crab apples, pears, cherries, nectarines, and peaches.

**Lorsban** – A new formulation, Lorsban 75WG (water dispersible granule), will replace Lorsban 50W, which is being phased out. It is described as an encapsulated “dry EC” and is a low-odor material. Currently, it is only labeled for pre-bloom use on apples.

### ***Other Insecticide Corrections:***

There is a typo on the Lorsban 50W rate for dogwood borer trunk sprays on Page 139. The rate for Lorsban 50WP should be 1.5 lbs. per 100 gals. However, this formulation is being phased out (see above).

## **Disease Management**

Daniel Cooley, University of Massachusetts

**Agri-Fos (phosphorous acid): 46%.** See phosphorous acid.

**Agri-Mycin 17, Bac-Master (streptomycin sulfate):** streptomycin sulfate. Agri-Mycin 17 is a 17 WP (4–8 oz/ 100 gal, see label for other rates); Bac-Master is a 17% product as well, but labeled in ppm (50 – 100 ppm = 4-8 oz/100 gal). Bactericide used to prevent fire blight. Effective if used the day before, or the day of, a fire blight infection period. Where fire blight is expected to be a problem, the first spray is made after the first blossoms open when weather conditions favorable for the disease are present or predicted within 24 hours. Must be absorbed by the blossoms to be effective, should not be applied just before or during rain. The frequency of repeat applications depends on weather, blossom opening and disease pressure. Routine use to control shoot blight is not recommended. However, application within 24 hours after the beginning of a hail storm is recommended for *fire blight-threatened* orchards. Thorough coverage is essential for control. Application at concentration greater than 6X is not recommended. **Restricted entry interval 12 hours. Preharvest interval 50 days.**

**Agrisolutions Topaz (phosphorous acid): 53%.** See phosphorous acid.

**Aliette (fosetyl aluminum): 80% WDG or 80% WSP.** Foliar application for control of Phytophthora crown and root rot on bearing and nonbearing apple trees and blister spot

on fruit. Also labeled for control of fire blight, but is not recommended for that purpose. The material is absorbed by the foliage and transported to the roots. Avoid conditions that limit leaf absorption. Adjuvants which enhance pesticide penetration may cause phytotoxicity when mixed with Aliette. Do not apply within 2-3 weeks of leaf senescence on bearing trees. Under moderate disease pressure, apply 3 to 4 times at 5.0 lbs./100 gals. at a 60 day spray interval, or at 2.5 lbs./100 gals on a 30 day interval. Use no more than 5 lbs. Aliette per acre. Do not exceed 20 lbs. Aliette per acre per season. Should **not** be used as a season-long solution to wet soils which can lead to *Phytophthora* root rot, but rather as a way to maintain production until longer term solutions such as drainage or raised beds can be installed. Do not tank mix with copper compounds. If used prior to or after copper applications, adjust pH to 6.0 or above with an alkaline buffer such as potassium carbonate. **Restricted entry interval 12 hours. Preharvest interval 14 days for Bearing trees; 12 months for Non-Bearing trees.**

**Allude (phosphorous acid):** 45.8%. See phosphorous acid.

**Apogee (prohexadione calcium):** 27.5%. (6-12 oz/100 gal). Growth regulator that reduces shoot growth and reduces fire blight infections on shoots. Should only be used in those blocks with a history of fire blight, as applications need to be made when shoots are 1 to 3 in., which is before shoot symptoms generally show. Apogee has no effect on blossom blight, and no antibiotic activity. Instead, it makes the apple tissue less susceptible to fire blight. Refer to label for rates.

**AS 50:** see Agri-Mycin.

**Bac-Master:** see Agri-Mycin.

**Bordeaux Mixture:** a mixture in water of copper sulfate (bluestone) and hydrated spray lime used as a spray for fire blight. A good mix for apples is Bordeaux 10-10-100. The first number of the Bordeaux formula is lb copper sulfate, the second is the lb spray lime, and the third is gal water. The mixture is prepared by dissolving copper sulfate snow (not fixed copper) in about 1/2 tank of water. Once the copper sulfate is completely dissolved, the spray lime is added slowly with constant agitation, and the tank is filled with water. Bordeaux mixture is generally unsafe to use on apples after the 1/4-inch green stage, as it can cause severe russet on fruit and damage leaves. Adding 1 qt spray oil per 100 gal reduces the chance that Bordeaux will accumulate on foliage edges and burn leaves.

**Captan:** The **Captan 80WDG** from MicroFlo has a 24 hour re-entry period for apples. Other captan products still have a 96 hr. re-entry period. **Read the label carefully to determine the restricted entry interval for the product you are using.**

**coppers:** Use as an early season scab protectant and as a bactericide to reduce the population of fire blight bacteria. Generally these products are too phytotoxic and cause significant fruit russet if applied after 1/4 in. green. Some formulations are labeled for use as a drench to prevent *Phytophthora* crown rot, but efficacy for this has not been evaluated. Sold under many trade names and formulations. Types include copper hydroxide (Champ, Champion, Kocide), copper oxychloride sulfate (COCS), and basic copper sulfate (Basic Copper 53, Cuprofix Disperss, Basicop, Blue Shield). These formulations are called “fixed,” because the copper ion is relatively insoluble and less

phytotoxic than in other coppers, such as copper sulfate (bluestone) used in Bordeaux mix. Application must be made as early as possible, no later than full green tip due to fixed copper's ability to damage young foliage or cause russetting on fruit. To further reduce russetting, use the lowest labeled rate of copper. See specific labels on adding hydrated lime to the tank-mix to reduce crop injury. **Restricted entry interval 24 hours for Basic Copper 53, Basicop, Champ, Champion, COCS, Cuprofix Disperss and Kocide.**

**Fosphite (phosphorous acid):** 53%. See phosphorous acid.

**Messenger (harpin protein):** a biological pesticide that stimulates the plant's pest resistance systems. It does not directly attack pathogens. Messenger has shown variable efficacy against fireblight. It takes 5 – 7 days after application for the plant to develop resistance. Do not use with chlorinated water, or at pH below 5.0 or above 10.0.

**OxiDate, StorOx (hydrogen dioxide):** similar to hydrogen peroxide, kills fungi, bacteria and other microbes it contacts. OxiDate is labeled for use in the field, StorOx for use in post-harvest treatments. **Field applications to apples are not recommended because the product can severely russet fruit.**

**Phosphorous acid:** Comes in several formulations and concentrations including Agri-Fos, Agrisolutions Topaz, Allude, Fosphite, Phostrol and Phos-Phyte. Foliar applications for control of Phytophthora crown and root rot on apples. Also labeled for scab control and fire blight, but these uses are not recommended because efficacy is not high. For crown and root rot, foliar applications should be made at 30 to 60 day intervals. Application rates of 1 1/4 to 2 1/2 quarts per acre, applied in water sufficient to wet foliage and allow uptake of the material. Where disease pressure is high, use the higher rates and shorter intervals. This material is very similar to fosetyl-Al (see Aliette). **Restricted entry interval 4 hrs. Preharvest interval 0 days.**

**Phostrol (phosphorous acid):** 53.6% solution of phosphorous acid and ammonium phosphite. See Phosphorous acid.

**Pro-Phyte (phosphorous acid):** 54.5%. See phosphorous acid

**Scala (pyrimethanil):** *As of the date this is written, Scala was not registered in Massachusetts, though it has cleared EPA registration.* 54.6% SC. Scala is a new fungicide, an anilinopyrimidine with the same type of activity as Vanguard. Risk of resistance development is rated medium, and there is some evidence that resistance to DMI fungicides (Nova, Rubigan, Procure) also transfers to anilinopyrimidines. It is therefore recommended that Scala be tank-mixed with captan, an EBDC or another broad-spectrum fungicide. Do not exceed 5 applications per season. In a tank mix, Scala is recommended at 5 fl oz/A. **Restricted entry interval 12 hr. Preharvest interval 72 day. Registration status may vary within the New England states**

**Serenade (*Bacillus subtilis*):** a biological control bacterium labeled for control of fire blight, scab, and powdery mildew. Serenade alone has not proven effective against these diseases. However, it has shown good activity against fire blight when used in alternating applications with streptomycin, and some activity against scab when used in

alternating applications with other fungicides. Serenade has low activity against fungal diseases in New England conditions. It should be used as a preventative.

**Topsin M, Thiophanate Methyl (thiophanate methyl)** : Formulated as a 70W WSB, 85 WDG or 4.5 FL. While rates for the 70% formulation are the same as previously described, rates for the 85% are labeled at 3.2 oz. to 4.8 oz. per 100 gal., and the 4.5 FL rates are 3.5 fl. oz. to 5 fl. oz. per 100 gal.

### ***Other Disease Management Corrections:***

Page 129 (and subsequent pages): “Dilute” defined on page 128, not on p. 126 as indicated.

Page 88, Table 14: Please note that mancozeb products have a 77 day preharvest interval.

## **Weed Management**

Jon Clements, University of Massachusetts

### ***New Product:***

**Chateau Herbicide WDG:** a contact and residual herbicide that controls both grasses and broadleaf weeds in **NON-BEARING** orchards (365 days pre-harvest interval). Therefore, it is only useful in young orchards. Note that it can be used the year-of-planting if trees are shielded, and it can be used on apples and all stone fruit. It is most effective as a contact herbicide on very young weeds, but it is recommended to apply in a tank mix with another contact herbicide for maximum effectiveness. It appears to be a very effective residual herbicide. Application rate is 6-12 oz per treated acre, using the lower rate on sandy soil. **Restricted entry interval 12 hours. Preharvest interval 365 days.**

***Addition to Notes on Herbicides, page 119:*** The statement "For non-bearing apples only." should be added to Fusilade.

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Always read the label before using any pesticide. **The label is the legal document for the product use.** *Disregard any information if it is in conflict with the label.*