No April Fool's Joke -- We may reach 80F this weekend  !!

One word comes to mind to describe this weather … Crazy !!  As I walked through the orchards at the UVM Hort. Research Center today and looked at bud development, I would not be surprised if we are at Green Tip on some cultivars this weekend.  Needless to say, we are getting our sprayer ready to put on a copper spray before this weekend because we had a significant number of fire blight strikes last year and have a higher than usual risk of overwintering inoculum.

Because the growing season is starting, the remainder of this IPM Alert is devoted to important information on changes to pesticide labels that was pulled together by Art Agnello and Debbie Breth and appeared in articles in the March 22 or 29, 2010 issues of Scaffolds newsletter and valuable apple scab management information by Dave Rosenberger that appeared in the latter issue of Scaffolds.

“Product Registration Update”-- Art Agnello, Cornell - Geneva, Adapted from article in the March 22, 2010 issue of Scaffolds.

Label Changes
  • The use of Guthion/azinphosmethyl products this year continues to change slightly from its previous rates, in accordance with the scheduled phase-out guidelines previously established by EPA. In both apples and pears, a total of 4 lb formulated product/A is allowed in 2010 -- a reduction from 2009 in apples, but the same as last year for pears. This will change to 3 lb/A for both crops in 2011–2012, before being completely phased out. In cherries, it's 1.5 lb/A for 2010–2012. Recall that there is a 60–ft buffer required from permanent bodies of water and occupied buildings, and a PHI in Pick-Your-Own operations scaled from 33–44 days, according to use rate. Read your labels carefully. These products had been previously excluded from use on peaches, nectarines, plums, prunes, and apricots.
  • Warrior (1EC), EPA Reg. No: 100-1112, has been phased out. There may be some still in spray sheds and dealers' hands that can be used up, but from this point on, any Warrior shipped to dealers will be Warrior II (2.08EC), EPA Reg. No: 100-1295.
New Labels

- Adament (Bayer) fungicide, EPA Reg. No: 264-1052. This is a pre-mix product containing the strobilurin trifloxystrobin (the a.i. in Flint) and the SI tebuconazole (the a.i. in Elite); registered in pome and stone fruits.
- Altacor (Dupont) insecticide; active ingredient: chlorantraniliprole/ Rynaxypyr, EPA Reg. No: 352-730. This product belongs to a new chemical class, the anthranilic diamides. Altacor is labeled for the control of a range of insect pests in pome and stone fruits, including codling moth, oriental fruit moth, and obliquebanded leafroller.
- Movento (Bayer) insecticide; active ingredient: spirotetratam, EPA Reg. No: 264-1050. Movento is a tetramic acid registered for the control of a number of indirect pests in pome fruits and stone fruits, primarily aphids (including woolly apple aphid), mealybugs, pear psylla, and San Jose scale.
- Portal (Nichino America) acaricide, insecticide; active ingredient: fenpyroximate, EPA Reg. No: 71711-19. Portal is a phenoxypyrazole acaricide and insecticide labeled for use in apples and pears to control European red mite, twospotted spider mite, pear rust mite, leafhoppers, mealybugs and pear psylla.
- Rage (FMC) herbicide, EPA Reg. No: 279-3307. This product is a pre-mix of the active ingredients glyphosate (a.i. of Roundup) and carfentrazone (a.i. of Aim).
- Vintage (Gowan) fungicide, EPA Reg. No: 10163-275, is the new name for fenarimol, previously sold as Rubigan, which it replaces; registered in apples, pears and cherries.
- Centaur (Nichino America) insecticide; active ingredient: buprofezin, EPA Reg. No: 71711-21. This product is an insect growth regulator registered in pome and stone fruits for the control of San Jose scale, mealybugs, leafhoppers and pear psylla.
- Isomate-PTB Dual (Pacific Biocontrol/CBC America) pheromone, EPA Reg. No: 53575-34. This polyethylene "rope" or "tie" dispenser is formulated for mating disruption of both greater and lesser peachtree borer in stone fruits; it replaces the Isomate-LPTB product.
- Voliam Xpress (Syngenta) insecticide; active ingredients: lambda-cyhalothrin, chlorantraniliprole; EPA Reg. No: 100-1320. A pre-mix of the a.i. of Altacor plus the a.i. of Warrior, registered in pome and stone fruits for a wide range of pests.

The Lorsban Situation

Keeping current with Lorsban product labels continues to be a challenge. Last year (Issue No. 5, April 20), I printed a table summarizing the use guidelines for each of the three Lorsban products (Lorsban 4E, Lorsban Advanced, and Lorsban 75WG). Any of those products purchased last year that are still in growers’ hands may continue to be used as per their respective labels. However, Lorsban 75WG purchased this year has a new label that 1) eliminates the petal fall use in apples, and 2) eliminates the use of more than 1 application per season. Therefore, unless you are using 2009 Lorsban 75WG, it is now prohibited to apply ANY chlorpyrifos product in apples more than ONCE per season, whether it be as a pre-bloom foliar spray or as a pre- or post-bloom trunk spray. Read the label carefully.

“Additional Label Changes & Notes” - Debbie Breth, Cornell Lake Ontario Fruit Team. This article was in the March 29, 2010 issue of Scaffolds.

Fungicides

- Cabrio (pyraclostrobin) has a supplemental label for use in apples for apple scab and powdery mildew. This strobilurin has no phytotoxicity to sweet cherries. Use pattern is exactly like Flint and Sovran. It will not be effective where resistance to strobys is an issue. Use: 12 oz/A, 4 applications per season allowed, with only 2 consecutive applications.
Indar (fenbuconazole) has an expanded label for use in apples for scab, powdery mildew, rusts, flyspeck/sooty blotch. There is a 14-day PHI. As this is an SI, it may fail to control scab where the fungus has become resistant to SIs.

Inspire Super MP (difenoconazole), was registered in NY last year for control of apple scab, powdery mildew, and sooty blotch/flyspeck. It comes in a multipack with Vangard WG and must be used in combination. It has been shown in research trials to control apple scab where SI resistance is established, but you should not rely on this material for control specifically in SI-resistant orchards.

Insecticides

Centaur WDG (buprofezin) is registered for use in NY as a Group 16 insecticide IGR, in pome fruit and stone fruit. It is active for control of San Jose scale at the early crawler stage, leafhoppers and mealybugs, and early season pear psylla/mealybug control in pears. 34.5–46 oz/A is allowed in 1 application for apples, 2 in pears and stone fruits, not less than 14 days apart. The leafhopper rate in apples is 9–12 oz/A. The PHI is 14 days for all crops. The REI is 12 hours.

Altacor (chlorantraniliprole), labeled for use in pome fruit, stone fruits, grapes, and for raspberry crown borer in caneberry crops. This product cannot be applied within 100 feet of a water body in NY. The REI is 4 hours, and PHI is 14 days.

Voliam Xpress (chlorantraniliprole plus lambda-cyhalothrin) is labeled for use in NY for apple and stone fruit. The PHI on apples is 21 days; stone fruit 14 days; the REI is 24 hours. The PIMS website refers to the registration with a 100 foot buffer with any body of water.

Danitol (fenpropathrin) has been granted a supplemental label for stone fruit and bushberries, beyond the originally labeled apples, pears, and grapes.

Portal (fenpyroximate) was newly registered for use in pome fruit in 2009, and the label has been expanded to non-bearing deciduous fruit (includes non-bearing stone fruit). Portal is recommended at 1–2 pts/A, with 1 application at the 2 pt rate.

Herbicides

Rely has changed from Rely 200 to Rely 280. Rely 200 has 18.9% glufosinate ammonium, and is applied to weeds in apples at 77–115 oz/treated acre, broadcast. Rely 280 (24.5% ai or 2.34 lb/gallon) is labeled for use in apples, grapes and bushberries, 48–82 oz/A, depending on weed height. The taller the weeds, the higher the rate. Rely is not a safe product for use on green bark in tree fruit. Do not use Rely 280 for control of suckers in apples, as the label warns of injury to the trunk. This is a change from the first Rely Herbicide (11% or 1 lb./gallon). Although Rely has been registered for use in apples for several years, it has been overlooked in making corrections in the Cornell Guidelines under Weed Control Section for apples. Please add it to the list of options for applying to weeds that have already emerged in apples. It is not labeled for other tree fruit crops.

Matrix (rimsulfuron) is a pre-emergence, early post-emergence herbicide in pome and stone fruit. The PHI in pome fruit is 7 days, in stone fruit 14 days. Rainfall is needed to incorporate; it breaks down rapidly if not incorporated. Can be applied as a single application at 4 oz/A or 2 times at 2 oz/A. See the label to review the list of grasses and broadleaf weeds. If weeds are emerged, include a burn-down material such as glyphosate, paraquat or glufosinate.

“Optimizing Fungicide Programs for Apples” - Dave Rosenberger, Cornell - Hudson Valley Lab. This article was in the March 29, 2010 issue of Scaffolds

Optimizing fungicide programs for apple scab gets more complicated every year as new fungicides gain registrations, fungicide resistance diminishes the reliability of some key chemistries, and changes in fungicide pricing necessitate annual reassessment to
determine the most cost-effective programs. The difficulties are compounded by the fact that scientists still do not fully understand all of the intricacies of how new products work. Additionally, we cannot accurately predict when and where fungicide resistance will occur and how fungicide-resistant populations will respond to various mixtures and seasonal alternations in fungicide chemistry.

Despite these uncertainties, this article will summarize some factors to consider in selecting apple fungicides to control scab, rust, and mildew during the period between green tip and first cover. We start by reviewing broad categories of fungicides and then suggest some early season strategies at the end of the article.

**Contact fungicides** include the mancozebs (Dithane, Penncozeb, and Manzate), Polyram, Captan, Ziram, sulfur, and copper. They are sometimes called "protectant fungicides" because they protect leaves by killing spores before or during germination. They do not penetrate leaves and therefore cannot arrest infections after fungi have entered leaves or fruit. However, they are still effective when applied after the start of a wetting period, so long as they are applied before a Mills infection period has been completed. Thus, these products are sometimes listed as having a "kickback" of 12–24 hr from the start of a rain, depending on temperature. However, their reach-back is directly correlated with the times required for completing a Mills infection period.

Copper is both a bactericide and a fungicide, but its usefulness on apples is limited because applications after quarter-inch green tip can cause phytotoxicity to apple fruit. Except for sulfur, none of the contact fungicides control powdery mildew. Mancozeb, Polyram, and Ziram are effective against rust diseases, but Captan and sulfur are not. Both Ziram and sulfur are rapidly removed by rainfall, so these are not the best choices for scab control where residual activity through rains is important. Captan controls black rot, whereas the other contact fungicides are less effective.

Fungi cannot develop resistance to any of the contact fungicides because these fungicides attack multiple metabolic sites in germinating spores. As a result, fungi would need to develop simultaneous mutations to bypass all of these action sites, and that has not occurred during the more than 60 years that some of these chemistries have been in use. Fungicides in all of the other groups discussed below work by arresting fungal metabolism within a single pathway, and they have therefore been called single-site inhibitors. Fungi can develop resistance to all single-site inhibitors.

**Strobilurin fungicides** include Sovran, Flint, and the pyraclostrobin component found in Pristine. Sovran and Flint are often called stroby fungicides and are very effective for controlling scab, mildew, and black rot. They provide adequate control of rust diseases when applied ahead of rains, but they have very little post-infection activity against rust diseases. For apple scab, they can provide roughly 48 hr of post-infection activity, but they are not effective for arresting apple scab after lesions are visible on foliage.

All stroby-containing fungicides carry labels stating that combined usage for any product in this group is limited to four applications per year. Thus, one can apply a maximum of four sprays per year that contain Sovran, Flint, or Pristine. For example, if Flint is applied three times to control scab, then Pristine can be used only one time during summer.

**Anilinopyrimadine or AP fungicides** include Scala and Vangard. These fungicides are useful for apple scab, but not for mildew, rust, or black rot control. They do not protect fruit, do not redistribute very well, and work best in cool weather. As a result, they are most useful from green tip to bloom. They provide 48 to 72 hr of post-infection activity, counting from the start of rains and depending on temperatures during the
wetting period. This attribute makes them especially useful where post-infection activity is needed during the very early part of the season. The AP fungicides should always be combined with a protectant fungicide, because the latter is needed to maintain coverage on expanding leaf surfaces during the week following the application.

**DMI or SI fungicides** can be subdivided into 1st generation products (Rally, Rubigan/Vintage, Procure) and 2nd generation products (Inspire Super, Indar, Teburol). The 1st generation products were very active against scab, mildew, and rust diseases, but they provided very weak protection against fruit scab and were ineffective against black rot. The 2nd generation group generally has greater toxicity against scab and black rot, but slightly reduced activity against mildew. The 2nd generation group is moderately effective for protecting fruit from scab and black rot, and they also suppress early season flyspeck infections, whereas the 1st generation DMIs did not. Some of the differences between these two groups of DMIs may be attributable to differences in actual toxicity of the products to various pathogens. However, I suspect that much of the difference in the way that these two groups of DMIs perform is attributable to how quickly the products penetrate host tissues after they are applied. The 2nd generation DMIs tend to remain more "surface active", whereas the 1st generation products are rapidly translocated through leaves after application.

**Syllit** (dodine) is an older fungicide that really does not fit well within any of the categories noted above. Syllit is primarily a protectant scab fungicide. It was widely used in the 1960s until fungicide-resistant strains of scab reduced its effectiveness. Although Syllit was rated as having only about 48 hr of kickback activity, it proved very effective for arresting early season scab infections even when applied more than 48 hr after the start of rains. Its ability to arrest scab development was probably attributable to the fact that it redistributed very well, it moved into leaves to arrest mycelial growth within leaves, and it inhibited sporulation on leaves. Syllit can still be useful as a prebloom spray in many orchards, but it should always be combined with mancozeb or captan as a precaution for cases where dodine-resistant scab may be present. For post-infection activity, Syllit rates must be adjusted to above the mid-point of the rate range listed on the product label.

**Designing a coherent scab program** requires careful selection of the best combinations and sequences of fungicides based on past weather, predicted weather, and the diseases expected in specific orchard sites.

1. For early season sprays, combinations of mancozeb plus captan are highly recommended, except where the captan component interferes with oil sprays. (Oil and captan are not compatible!) Mancozeb fungicides will stick to trees better during heavy rains, whereas captan will redistribute better than mancozeb during periods of light, misty rain. The latter capability is especially critical when warm temperatures cause rapid leaf expansion between sprays. However, if sprays are applied just ahead of weather fronts that are predicted to bring 3–4 inches of rain (such as the current wetting period), then higher rates of mancozeb alone may perform better than lower rates of mancozeb mixed with captan.

2. Mancozeb plus Vangard or mancozeb plus Scala should be used if there is a need for 48–72 hr of reach-back activity at the time the sprays are applied. Based on trials conducted at the Hudson Valley Lab, it appears the lower rates of Vangard and Scala listed on product labels for tank-mix combinations will provide about the same level of reach-back activity as the high end of the label rates. The higher rates are needed for protectant activity if Vangard and Scala are applied alone, but we do not recommend using these products alone because of their limited redistribution capabilities.

3. Work in Michigan more than 20 years ago showed that 1st generation DMI fungicides sometimes provide disappointing results when applied under cool conditions at
the green tip to half-inch green bud stages. This probably occurs because there is very little green tissue available to absorb the fungicides at those early growth stages. We don't know if 2nd generation DMIs will show the same limitations. However, Inspire Super may work better at low temperatures than the other products because Inspire Super contains both a DMI (difenoconazole) and Vangard, and the latter works well early in the season.

4. The DMI and stroby fungicides should always be used in combinations with either mancozeb or captan to slow selection for resistance to the at-risk fungicides and to ensure some degree of protection where resistance may already be present in the population. Where Inspire Super is used, this means that three fungicides will be combined in the tank, since Inspire Super itself is composed of two active ingredients.

5. There is ongoing debate about how to position DMI and stroby sprays during the interval between tight cluster and first cover. My initial thinking was that DMI applications should be delayed until petal fall and first cover because of concerns about using them during the peak scab season (tight cluster to bloom) in orchards that may have DMI-resistant scab. However, Inspire Super is more effective against scab than first generation DMI fungicides, and field experience last year in western NY showed that the best scab control was obtained where Inspire Super plus mancozeb was applied at tight cluster and pink, with stroby fungicides (plus mancozeb) being used in later sprays. The benefit of this approach is that the power of the DMI fungicide is applied before any scab infections missed in early sprays can begin to produce conidia. When DMIs are applied before bloom, they will be acting on a smaller population of spores than would occur if applications are delayed until petal fall when at least a few sporulating lesions are often present.

6. The strategy of using prebloom sprays of Inspire Super plus mancozeb will probably work in most orchards, but it should NOT be applied in blocks of highly susceptible cultivars (e.g., McIntosh) with known resistance to DMI fungicides. For those cases, Flint or Sovran should be used with mancozeb in prebloom sprays and then a DMI plus contact can be used in petal fall and first cover sprays to control mildew and rust.

7. Using DMIs at petal fall and first cover may also be desirable where maximum protection against quince rust and cedar apple rust is needed. In some cases, it might make sense to apply Inspire Super plus mancozeb at tight cluster and pink, and then follow up with Rally plus mancozeb or Rubigan plus mancozeb at petal fall and first cover, to get maximum activity against mildew and rust diseases with those post-bloom sprays.

8. As noted earlier, the 2nd generation DMIs are slightly less effective against mildew than the 1st generation DMIs. In western NY last year, several consultants noted that Inspire Super failed to provide the mildew control expected of a DMI fungicide. It seems likely that populations of powdery mildew in some orchards have shifted toward DMI resistance. This fits with the observation that Bayleton was initially effective at 1.5 oz/A, whereas rates of 4 oz/A were required in the last years that Bayleton was available. Thus, Rally at 5–6 oz/A may still control mildew, but Inspire Super, with slightly less activity, may perform less well. Given this scenario, it makes sense to use Inspire Super during the prebloom, when there is less mildew pressure, and then use stroby fungicides at petal fall and first cover when mildew pressure reaches its peak.

9. Inspire Super MP is sold as a unit that contains one jug of Inspire (difenoconazole) and one jug of Vangard. The label requires that both of these products be combined in the tank. Separating these two products and using them at different times is a violation of pesticide law and also negates the built-in resistance management strategy that derives from using the products together.
Reminders:

Order Now…. The 2010 New England Tree Fruit Management Guide have arrived.

The order form for the 2010 New England Tree Fruit Management Guide has been posted on the UVM Apple website at: http://orchard.uvm.edu/2010NETFMGOderForm.pdf. Please download and mail in your order. The price is the same as last year -- $35.00 per Guide.

Initial Pesticide Certification Meeting Scheduled for April 13

An upcoming initial pesticide certification meeting for people wanting to review the Core pesticide materials and take the private, commercial, or non-commercial exam the same day has been scheduled for April 13. The Vermont Pesticide Applicator License is necessary for those using restricted use pesticides, or those spraying any pesticide for hire. I strongly urge anyone using any pesticides to get their certification and be fully knowledgeable on the safe use and storage of pesticides. If you have any questions, please contact Ann Hazelrigg at Ann.Hazelrigg@uvm.edu. A brochure describing the meeting is at: http://orchard.uvm.edu/2010PesticApplicCertMeeting.pdf

Where trade names or commercial products are used for identification, no discrimination is intended and no endorsement is implied. Always read the label before using any pesticide. The label is the legal document for the product use. Disregard any information in this newsletter if it is in conflict with the label.

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