

# Cranberry

## Crop Management Newsletter

  
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### 2013 Cranberry Fungicide Update

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This is an update on the current cranberry fungicide arsenal. Those of you with good memories will say, “This all looks familiar.” But the careful reader will notice updates. It is possible that I have overlooked products and/or brand names; exclusion of a product should not be viewed as a negative endorsement. This is especially likely when many products are based on the same active ingredient (e.g., copper) or when the patent on an active ingredient expires and generics enter the market (e.g., propiconazole). On some fungicide labels you will see a listing for “Berry” which includes a long list ending with “and other berry crops.” Surprisingly, this does not include cranberry, even as an “other” berry. Cranberry is usually (but not always) in its own category on labels, and unless you see it by name, the product is not registered on cranberry. Labels do change, so be sure to follow the instructions on the label of the product that you will be using.

**FRAC—not talking about sand!** Most new products now list a Fungicide Resistance Action Committee (FRAC) code on the label. All products with a common mode of action have the same number. This is supposed to help users forestall fungicide resistance by rotating among unrelated classes. Many fungicides are vulnerable to resistant pathogens, and some cranberry pathogens are probably adept at overcoming fungicides. For example, *Colletotrichum* species, which are serious fruit rot pathogens, have developed resistance to fungicides in other cropping systems. Fortunately, in Wisconsin fungicides have not been used all that much on cranberry, and so far we haven’t documented resistance. But it will happen with the newer fungicides, if we’re not careful. In general, any fungicide listed below in FRAC groups 3 or 11 should not be used more than twice in a row. If you need a third spray, use something in a different FRAC group. The “M” in FRAC M stands for “multi-site.” These products

are not vulnerable to resistance, because they act on many different molecular sites and metabolic pathways in fungi.

**About (FRAC 11).** Active ingredient is azoxystrobin, which is in the strobilurin (also called QoI) class of fungicides. It has relatively low toxicity toward mammals, but it is toxic to certain aquatic organisms, earning it an onerous 14-day water-holding requirement. This product is primarily for control of fruit rot, which is caused by a complex of at least six fungal species. Sprays start at early bloom and then are applied at 7- to 14-day intervals. Its performance in controlling fruit rot has been inconsistent, working well in some situations and not in others, even when used at the highest rate. Although we have never had intense disease pressure when we’ve tested it for cottonball control, it does have some efficacy. However, in our trials, it has not been as good as Indar or Orbit/Tilt for controlling cottonball.

**Aftershock (FRAC 11).** When is a new fungicide not new? When its active ingredient is the same as an existing product. The active ingredient, fluoxastrobin, is the same thing at the same concentration as in Evito. We have not tested Aftershock in Wisconsin, but we can assume it will be similar in performance to Evito (see below). Look for “cranberry” on both the Aftershock and Evito labels under “low growing berries.”

**Bravo, Echo, Equus (FRAC M).** Active ingredient is chlorothalonil, a broad-spectrum fungicide. In almost all fruit rot trials, chlorothalonil products have topped the competition. The different names and formulations appear to perform equally well. The cloud behind the silver lining, however, is toxicity to the cranberry plant. Applied during bloom, chlorothalonil sometimes reduces fruit set.

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## 2013 Cranberry Fungicide Update (Continued from p. 1)

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If applied to pinhead sized berries, it can cause red flecks and burns. These problems are worse if chlorothalonil is applied on hot days (temps reach 85 F or more) or in low spray volumes (less than 50 gallons/acre). In 2008 we put out several trials to compare the products for efficacy and toxicity. While the various chlorothalonil products were equally effective, we saw no phytotoxicity in 2008. However, in several other years, when we tested Bravo WeatherStik only, we did see flecks on fruit. Frank Caruso conducted trials in Massachusetts where more fruit scarring occurred with Bravo WeatherStik than Bravo Ultrex in one year, and then the reverse happened the following year. He reports, however, that other field observations indicate that the Ultrex formulation is more phytotoxic.

**Copper-based fungicides (FRAC M).** Several different formulations are registered on cranberry, but I don't know why. They have consistently been at the bottom of the pack (often not better than the untreated check) in fungicide trials for fruit rot and cottonball. Since copper has some bactericidal activity, some growers have used it the year following a bad outbreak of stem gall (sometimes called "canker"). The bacteria that cause stem gall, however, amass deep inside stems where copper can't reach them. Stem gall comes and goes unpredictably on its own, regardless of copper. Copper is a great fungicide for many crops, and some forms are acceptable in organic production, but I do not see a role for it on cranberry.

**Evito (FRAC 11).** Active ingredient is fluoxastrobin, same as the "new" fungicide Aftershock (see above). As a strobilurin fungicide, it is in the same general class as Abound, but neither Evito nor Aftershock has a water-holding requirement. We tested Evito for fruit rot control in 2009-2012, with mixed results. However, when used at the high end of the label rate, it usually has been as good as Abound for fruit rot control.

**Ferbam (FRAC M).** Active ingredient is ferbam, with a lowercase "f." This is an old-time fungicide with a chemistry somewhat related to mancozeb (see below). It has been used in New Jersey for fruit rot control for many years. However, it may not be applied later than 28 days after bloom, and it leaves a black residue on plants. We've never tested it in Wisconsin but expect it would be similar to mancozeb for fruit rot control and not effective on cottonball.

**Indar (FRAC 3).** Active ingredient is fenbuconazole, which is in the sterol demethylation inhibitor class of fungicides, same class as propiconazole (see below). The best use of Indar in Wisconsin is for control of early rot and cottonball. Indar is equal to or just a shade better than Orbit/Tilt for

cottonball control. Like Orbit/Tilt, pre-bloom sprays are permitted to control the tip blight phase of cottonball and bloom sprays directly prevent fruit infection. Indar is effective on *Phyllosticta vaccinii*, the early rot fungus but it does NOT perform well on the fruit rot complex in general, and *Colletotrichum* in particular. For this reason, we recommend Indar to treat new plantings, especially those of Rutgers varieties, where early rot is often a problem. In established beds with fruit rot, other fungicides should be used. If the bed had early rot in its early years, but now is filling in, you might hedge your bets by combining Indar with Abound. However, in Wisconsin trials, the combination has not been more effective for fruit rot control than Abound alone, and we have not seen the yield increase reported in New Jersey.

**Mancozeb (FRAC M).** Mancozeb is marketed as Dithane, Penncozeb and some other names. These are old, broad-spectrum fungicides. In our trials and in trials conducted in the eastern U.S., mancozeb has been very effective in controlling fruit rot. In our trials it lags just a bit behind Bravo, but it has been a more consistent performer than Abound. The downside is that it can reduce fruit color if applied during bloom and/or fruit set stages, and that's when you need to apply it to control fruit rot.

**Orbit, PropiMax, Tilt, Topaz (FRAC 3).** Active ingredient is propiconazole, which is in the sterol inhibitor class of fungicides. In recent years, the Syngenta product labeled for cranberries has been marketed as both Orbit and Tilt. Orbit and Tilt are identical, but cranberry MUST be on the label for whatever product you are using. When the patent on propiconazole expired, PropiMax and Topaz came on the market. We have not tested PropiMax or Topaz, but I would expect them to perform as well as Orbit/Tilt. Propiconazole and fenbuconazole (Indar) are both excellent fungicides to control cottonball, but because they belong to the same chemical class, fungicide resistance is a concern. These products each are permitted in four sprays per season, but you should not apply more than a total of four sprays of sterol inhibitor fungicides in a season. The best shot at controlling cottonball comes with spraying during bloom. So, unless you have serious cottonball problems (greater than 10% of fruit affected), you should probably forego the budbreak sprays and focus on bloom, especially early bloom, since those are the flowers most likely to set fruit. In over 10 years of testing both Orbit and Indar we have never seen a negative effect on yield or fruit quality. **YOU CANNOT CONTROL COTTONBALL BY SPRAYING AFTER BLOOM.** PropiMax, Tilt, Topaz, and Orbit are not effective on fruit rots other than cottonball.

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**OBSERVATIONS FROM THE FIELD**

Jayne Sojka  
Lady Bug IPM, LLC

**PESTICIDE AWARENESS WORKSHOP**

Wisconsin Pesticide Applicator Training Manual has a section VII under applying pesticides that I would like to focus on today. Page 147 —there is a paragraph entitled: “Information supplied to custom applicator or crop consultant.” “The agricultural owner hiring an application or crop consulting service MUST inform the handler’s employer of the location of any area that may be treated or under and REI while the commercial handler is at the agricultural establishment if there is a likelihood that the handler may be in or walk within ¼ of a mile of such areas.”

Wait a minute.....Let’s see – a mile has 5280 feet. So a ¼ mile would be 1320 feet - If a bed was 150’ wide – we would not be able to walk within nearly 8 beds from a treated site. WOW.....8 beds or 1320 feet! Granted there are the dikes and such but you do get my POINT!

Page 148 continues talking about notification. I once again quote, “The WPS requires the agricultural employer to give notice of pesticide application to all workers who will be in a treated area, or walk within

¼ of a mile of a treated area, during the pesticide application or an REI. Notification is of two types: oral warnings or posting of treated sites. Sometimes, both forms of notice are required.”

Page 150 has the flow chart that I have already shared with you. On the flow chart it also shows ¼ of a mile for both WPS and ATCP 29 rules.

## PROTECT YOUR EMPLOYEES AND PROTECT YOURSELF.

## POST – POST – POST



## 2013 Cranberry Fungicide Update (Continued from p. 1)

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UW-Extension Fruit Crops Specialist and Plant Pathologist

### Phosphorous acid products (FRAC 33).

**Aliette**, which is an aluminum salt of phosphorous acid, was the first in this group. Now we have **Phostrol** and **Prophyt**. These are effective in controlling *Phytophthora* on many different woody plants, including cranberry in the eastern U.S., but we have not tested them on cranberry in Wisconsin. The active ingredients in phosphorous acid products are one or more phosphite salts (potassium phosphite, sodium phosphite, ammonium phosphite). From a practical standpoint, you can consider these products all the same. However, these fungicides do not contribute to P nutrition. Phosphorous acid releases the phosphite (also called phosphonate) ion, which is transported in the plant to the roots. While the phosphite ion is fungicidal to *Phytophthora*, it does not provide P for the plant. Phosphorous acid products do not release the phosphate ion, which is the form of P that plants use.

**Regalia**. Active ingredient is an extract of *Reynoutria sachalinensis*, giant knotweed, which when applied to plants supposedly turns on defenses. This is a relatively new “soft” chemistry that is approved for use in organic production. I am not aware of any tests on cranberry, but nevertheless, cranberry is listed on the label under “bushberries and caneberries.” In tests on other crops, it has not been very effective in controlling pathogens related to some of our fruit rot fungi. However, it has shown some promise in controlling mummy berry of blueberry, which is similar to our cottonball. We will likely test it for cottonball control this year.

**Ridomil, Ultra Fluorish (FRAC 4)**. Active ingredient is mefenoxam, which is a slight modification of Ridomil’s old active ingredient, metalaxyl. Mefenoxam is effective on some species of *Phytophthora* but not the ones that predominate in Wisconsin, according to a survey we did in the early 2000s in collaboration with Peter Oudemans of Rutgers University. Things change in the field,

however, so I would not be surprised if our *Phytophthora* complex is different now from then, or if it differs across the state. However, improving drainage is the first step in *Phytophthora* management, and often the problem goes away without fungicide input.

**Serenade**. The active ingredient in this biocontrol product is the bacterium *Bacillus subtilis*. Promising results from blueberry research inspired us to test Serenade on cranberry, especially for cottonball control.

Unfortunately, it did not control cottonball as well as the standards, propiconazole and fenbuconazole, and in some cases, not better than the non-sprayed check. In separate tests, it did not control the fruit rot complex. The ads for this product are lovely, but I don’t see a good fit on cranberry.

Additional information on fungicides and their uses can be found in several bulletins listed on the UW-Extension website at <http://learningstore.uwex.edu/Berries-C84.aspx>, the Pesticide Chart from Cranberry Institute, and in further articles in this newsletter.

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### Address Correction

If you have any address corrections, additions, or deletions, please let us know.

Please call 715-421-8440 or e-mail:

[mspencer@co.wood.wi.us](mailto:m Spencer@co.wood.wi.us)

Thank you!

## Purple Martins on Cranberry Marshes

Suzanne Arendt  
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Purple Martins, the largest member of the swallow family, are one of many animals that may be seen on cranberry marshes. Purple Martins are completely dependent upon man-made housing for survival. If you've walked anywhere near a purple martin colony, you've heard their various chirps and vocalizations. Like many other species, Purple Martins suffered a population crash due to invasive species.

Many of the people that put up purple martin houses do so as a hobby. Martins have a few very specific habitat requirements. They prefer open spaces, 30-120 feet from human housing and 40+ feet from any tall trees. The houses themselves should be 10-20 feet off the ground and



Live trap for starlings, placed near a bulding to deter purple martins

multiple houses can be placed near each other. The open spaces of the cranberry marsh often provide just what a martin prefers as habitat. Many cranberry growers have active colonies that regularly return every April.

If you do decide to make a go at being a Purple Martin landlord, there

are a few responsibilities you will have. European starlings and house swallows often make their way into Martin housing and defend against the Martins. If Martins have already



Homemade purple martin houses

nested, these birds will break their eggs and kill nestlings. To control these invasive birds, clear out their nests and you may want to try trapping or shooting. There are also starling resistant holes that can be placed on the nest openings. Before the Martins return in Spring, the nests should be cleaned out. Many landlords check their nests throughout the season and remove any dead nestlings.

Purple Martin houses can be purchased in many stores or constructions plans can be found online. This year the Martin scouts have already returned and have likely found nesting sites, but next spring there will be another group of yearlings depending on human housing for survival. The Purple Martin Conservation Associate at [www.purplemartin.org](http://www.purplemartin.org) sells CDs for attracting martins and has more information on how to have a successful colony.

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