# Cranberry Station Newsletter

**JUNE 5, 2014**

UMass Cranberry Station
1 State Bog Road
P.O. Box 569
East Wareham, MA 02538
**http://www.umass.edu/cranberry**


## FUNGICIDES TO PREVENT FRUIT ROT DISEASE

Carolyn DeMoranville and Frank Caruso

In 2014, we have a newly registered fungicide for use in the prevention of fruit rot. Proline 480SC, active ingredient prothioconazole, is manufactured by Bayer Corp. It is in the same class (mode of action) as Indar. This fungicide has proven highly effective in field trials both here in MA (work of Frank Caruso) and in NJ (work of Peter Oudemans) and WI (work of Patty McManus). This fungicide has a short (12 hour) REI but a fairly long (45 day) PHI. When reading the label - find our American cranberry under the "low growing berry subgroup" - do not confuse this with "highbush cranberry" in the "bushberry" subgroup, a different species. Proline may be applied by chemigation or ground rig but not aerially. The label rate for cranberry is 5 oz. per acre with no more than 2 applications per season. While the label recommends the addition of a nonionic surfactant, the research was conducted without any adjuvant added.

**Choices** - In field trials in MA, NJ, and WI, the most effective registered fungicides for the prevention of fruit rot are Proline, Bravo, Indar, and Abound. Formulations and rates can be found in the 2014 Chart Book. The table below presents the results of field trials in a 'report card' format.

GRADE RANKINGS OF FUNGICIDES IN FIELD TRIALS

| Location | Year | no Fungicide | Bravo | Indar | Indar/ Abound | Proline |
|---|---|---|---|---|---|---|
| MA | 2007 | B | A | | A | A |
| | 2010 | D | B | A | B | A |
| | 2011 | C | A | A- | A- | A |
| | 2012 | F | C | C- | B | A |
| NJ | 2007 | C | | A | A | A |
| WI | 2013 | C | A- | | A | A |

MA - 3 applications starting at 5-10% bloom then every 9-12 days
NJ - 3 applications starting at 50% bloom then 12 days later, then 7 days later
WI - 2 applications starting at 50% bloom then 10 days later

**Cost** - Proline, Bravo, Indar, and Abound are similar in cost per acre ($20-40). Of course, the mix of Indar and Abound is twice the cost of either alone. However, both Indar and Abound have narrow target ranges compared to the broad spectrum Bravo. When Indar and Abound are combined, the range of action is broadened. In field trials, plots receiving the mix had greater yield than those that received only one of the two fungicides, even when rot levels were similar.

**Timing** - Research in NJ has consistently shown that for effective prevention of fruit rots, the first fungicide application MUST go on prior to 60% out of bloom. Further, the best timing for the first application is from 10-50% in bloom (and no later than 90% in bloom). In MA, a total of 3 applications is recommended for most beds with the 2nd and 3rd applications put out at 7-14 day intervals after the first. Beds with a history of high disease pressure should receive applications at shorter intervals. Beds that were held under late water should receive fewer applications (at the lowest recommended rate) - see the Chart Book for a discussion of late water and fungicides.

**Rates** - Proline 480SC is applied at 5 oz. per acre. In most cases, a mid-rate for Bravo is recommended (e.g. 5.5 pt. per acre for Weather Stik). Indar 2F may be applied at 6-12 oz. per acre, the higher rate is recommended. Abound rate is 6.0 to 15.5 oz. per acre. When used alone, the highest rate is recommended but research in NJ has shown that when mixed with the recommended rate of Indar 2F, Abound rates may effectively be reduced into the mid-range of allowed rates.

**Recommendation** - The table below gives recommendations for the management of fruit rot in MA.

| | **Material** | **Timing** |
|---|---|---|
| 3 applications | Proline<br>Bravo<br>Indar/Abound | 10-20% bloom<br>7-10 days later<br>7-10 days after |
| 2 applications<br>(low rot history) | Proline<br>Indar/Abound OR Bravo | 50% bloom<br>10 days later |
| late water beds | Proline<br>low rate Bravo | 10-20% bloom<br>10-14 days later |
| new beds<br>(2 applications) | Indar OR<br>Indar/Abound | mid-June<br>mid-july |

Indar alone may be used in place of an Indar/Abound mix but the mix gave better yields in field trials.
For late water, a single application may suffice if rot history is moderate to low.

Information in this article is based on the 2014 Chart Book, a presentation at our 2014 winter meeting by Peter Oudemans, and published results from Patty McManus (in Plant Disease Management Reports and the WI Cranberry Crop Management Newsletter).

# SCALE INSECTS in MA CRANBERRY

Martha M. Sylvia and Anne L. Averill
June 3, 2014

Scale are a kind of insect in the order Hemiptera. The species we have are armored scales. They have a waxy covering that protects the immobile yellow female insect underneath. The female feeds on the plant, generally attached to the side of the lower upright, blending in with the bark. The females develop eggs under their scale covering in the spring and release them as tiny crawlers, generally in June.

Keep posted for corrections and updates as we learn more about these cranberry pests.

If you think you have a possible infestation, bring in a bag of uprights including old wood (lowest part of upright), with name, site, and phone number on it to the Entomology Lab at the UMass Cranberry Station.

## Do you have circular areas of red vine or dead spots?

If you have weak, red, or dead circles of vines this spring, perhaps you have scale insect. Two species of 'armored scale,' Putnam scale and the so-called 'Dearness scale' (ID pending), have appeared on about a dozen sites across the MA growing region. Putnam scale is more common. Scales look like bumps on the upright stem. They suck plant juices and weaken the vines.

**On left: Putnam scale injury.**

**On right: 'Dearness scale' injury**

## What you need to know:

1) ***Scout your acreage since you may not be able to see vine injury from a distance.*** The affected areas can enlarge rapidly over the years.

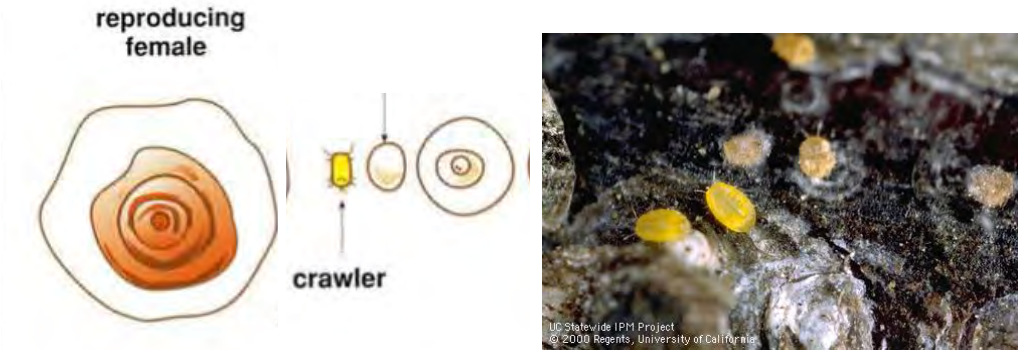
2) Treatments will occur around bloom. A crucial step in scale control is determining when the majority of **crawlers** (immatures) have emerged (see description below). These tiny yellow specks can be seen moving on the stem, perhaps requiring a hand lens to see. The crawler period may last for 2 weeks, likely just before and during bloom. This is the time when the insects spread, and build up to high densities, particularly on thick old stems of the upright.

The crawlers do not have a protective covering and are known to be vulnerable to a number of chemicals. Right now, if you miss the crawler stage, you may miss the boat. In the future, we hope to have an additional option aimed at adults.

3) Carefully check vines for scales. Run your fingers along the stem; scale covers will fall off easily. ***Look for dark or white bumps on the upright's stem, going down to the oldest woody part of vines***. The bumps will be crunchy when crushed. If the insect is still alive, goo will come out. Empty scale covers often hang onto the stem, so it's important to check for the live scales. Where the covers have come off, there may be white spots on the stem.

4) We have insecticide efficacy information coming in, so ***watch for updates***. Our current idea is that **Diazinon**, applied for management of other insects would be the best choice against the crawler stage. *Do not wash* the spray off in the morning; always spray on a **night** when the residue will be dry by morning if bees are foraging. In other crops, crawlers are susceptible to sprays of most insecticides, but these are even poorer choices at bloom!

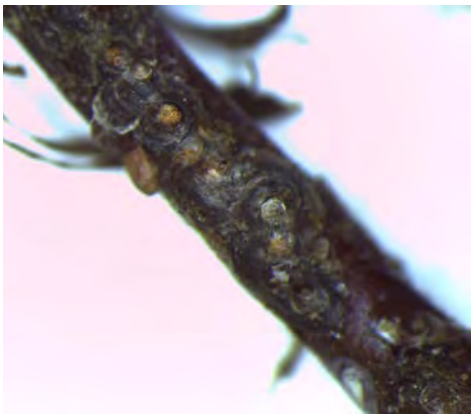
Sprays of broad-spectrum insecticides, such as Diazinon, likely will disrupt the natural enemies (e.g tiny wasps) that often keep scales suppressed. We are working on lower-risk options to avoid this and will report the results.



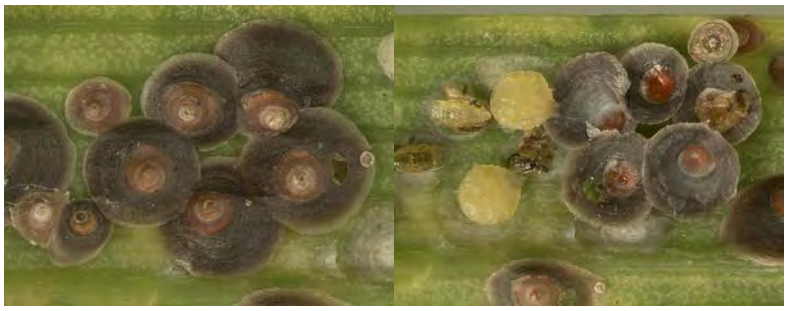

**The blob-like females under their shell produce tiny (mite size) immatures called crawlers. Crawlers move to new sites to settle, insert mouthparts and make their own shell covering, which grows as the scale does. Crawlers can be picked up by the wind (Left figure: G. Conville in Forster et. al University of California pub #21529; Right photo: Jack Kelly Clark)**

# PUTNAM SCALE

In blueberry, there are two generations of Putnam scale, with crawlers appearing again in August. The scales settle in areas where the bark has lifted up; as the bark grows over the developing scale, it makes them more difficult to detect.




**On left: Putnam scales on cranberry stem appear as small, dark discs. Where the scale covering has come off, you can sometimes see some white residue. On right, photo shows how the Putnam scales have integrated into the bark of the older and thicker parts of the stem (on blueberry) (Right photo: Jerry A. Paine, USDA)**



**Florida red scale, shown, is somewhat similar in appearance to Putnam scale. Adult females with intact scale covers on left; adult females with scale covers flipped over are shown on right (Photos: Lyle Buss University of Florida)**

**Putnam scale injury. On left: new spots appear. On right, after several years, vines are recovering at center. Scales would be most dense at the edges of the affected areas.**

## ‘DEARNESS SCALE’

‘Dearness scale’ (below) (species ID is pending) is like a tiny white clamshell and can be seen easily on the woody part of the upright’s stem.

**On left : shell covering on upright. On right: the insect underneath the shell is sac-like and legless (photo by J.S. Mann. DM Crop Consulting and Diagnostics, Ltd.).**

**A dead area on cranberry owing to severe ‘Dearness’ scale infestation. The tiny white dots are the shell coverings of the individual scale insects.**

# USING CORN GLUTEN MEAL:
# It's an herbicide, no, it's a fertilizer!

Katie Ghantous and Hilary Sandler

Corn gluten meal (CGM) is a natural product that is typically used as a fertilizer (8-0-0), but can have herbicidal activity against germinating seeds. Its use as a method of preemergence weed control on cranberry farms was evaluated in a recent NESARE On-Farm Research Partnership Grant (ONE13-193). A greenhouse study was conducted to evaluate any potential phytotoxicity or harmful effects of CGM on cranberry plants. A field study was established at two sites on a recently planted organic cranberry farm in southeastern Massachusetts to evaluate if CGM suppressed new weeds. The results of this study showed that CGM was not an effective weed control on new cranberry beds and that the addition of CGM actually led to an increase in weed biomass. However, cranberry plants that received CGM increased in growth, presumably from the additional nitrogen. Providing adequate nutrition to organic cranberry beds is a challenge and CGM may offer organic growers a good fertilizer option, especially when establishing new vines.

**Why did we do this project?**

Corn gluten meal is a byproduct of wet-milling corn, and is a natural product approved for use in organic farming. It has been shown that CGM can provide effective weed control by inhibiting the root formation of germinating plants and affects grasses and broadleaf species. It does not inhibit established weeds. The use of CGM as an herbicide use was pioneered in turf management and has also been used in crops such as onions and strawberries, but its utility as a weed control agent had not been tested in cranberry production. Since CGM has a high nitrogen content (typically 8%), we thought CGM might also provide nutrition for establishing young vines in organic plantings and could be used by conventional growers who incorporate CGM into their weed management program.

**What did we do?**

*Greenhouse Study*. A greenhouse experiment was conducted on potted cranberry plants at the Cranberry Station to evaluate any potential negative effects on cranberry plants. Each plant received one of three rates (untreated, low, and high) of CGM, and treatments were replicated four times. The low rate was 20 lbs/1000 $ft^2$ (manufacturer's recommendation), and the high rate was be 40 lbs/1000 $ft^2$. The plants were visually monitored for signs of damage (1 week after treatment, and monthly thereafter). Five months after treatment on September 3, 2013, the number and length of stems were determined for each plant, and the aboveground portion of the plants was collected. The biomass was placed into paper bags and dried in an oven at 60°C for at least 3 days, then weighed.

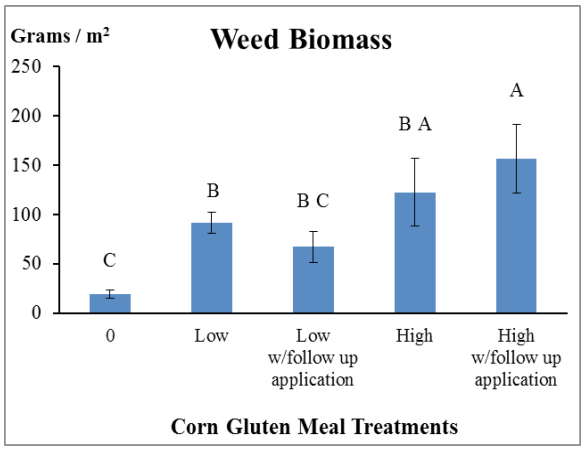
*Field Study*. Two sets of experimental plots were established on an organic farm in Manomet, MA (< 3 yr old) where vines were still not adequately colonizing the surface. In April 2013, the plots were hand weeded to remove existing weeds, and then treated with a granular application of CGM. Each plot received one of five treatments: untreated, low CGM (one application of 20 lbs/1000 $ft^2$), low CGM with a follow up application (one application of 20 lbs/1000 $ft^2$ followed by 10 lb/1000 $ft^2$ four weeks later), high CGM (one application of 40 lbs/1000 $ft^2$), or high CGM with a follow up application (one application of 40 lbs/1000 $ft^2$ followed by 10 lb/1000 $ft^2$ four weeks later). Evidence indicates that CGM will affect germinating seeds for several weeks, so treatment timings were spaced 1 month apart to capture a total of 8 weeks when the majority of annual weeds germinate. All treatments were replicated five times per site. The initial CGM application was made April 15, 2013. The second CGM application was made on May 14, 2013 to plots scheduled to receive two applications. Susceptibility of weeds to CGM may vary by species so plots were evaluated for which weed species were present in each plot, and the relative cover of each weed. Prior to cranberry harvest, all the weeds were collected from each plot and biomasses were quantified by drying and weighing weeds by species.

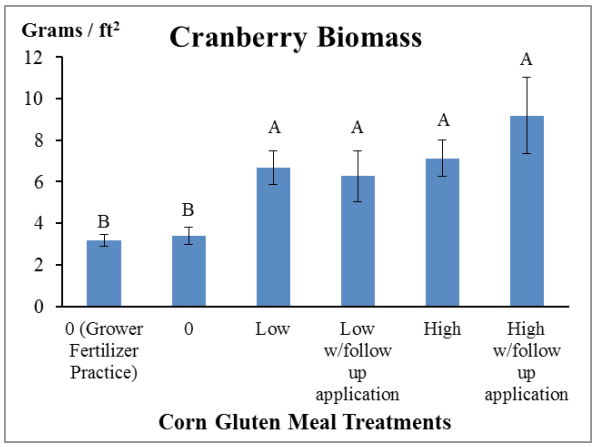
**Results**. CGM did not negatively affect cranberry vines grown in the greenhouse. Plants that received either the low or the high rate of CGM were significantly larger (Table 1) than untreated plants.

**Table 1. Greenhouse Study**. Average stem length and biomass for potted cranberry plants treated with three rates of CGM. Means followed by similar letters within a variable are not significantly different.

| Corn Gluten Meal | Ave Stem Length (cm) | Ave Biomass (g) |
|---|---|---|
| 0 | 26 a | 0.5 a |
| Low | 102 b | 1.4 b |
| High | 136 b | 1.9 b |

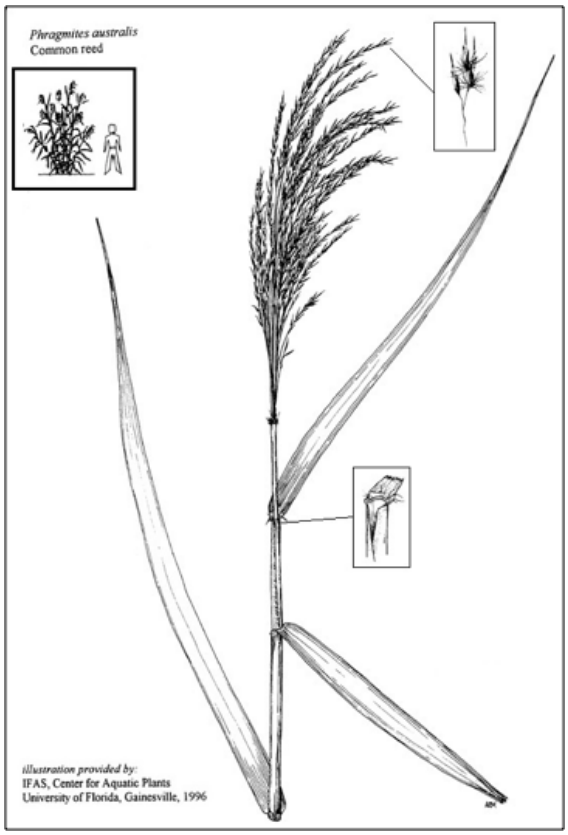
The field study showed that CGM is not effective for preemergence weed control on cranberry plantings. The plots that received CGM had significantly more weeds than untreated plots (Fig. 1). Despite the lack of weed control, CGM may be a good fertilizer option for organic cranberry growers. Plots that received CGM treatments had significantly more cranberry biomass than either untreated plots or samples obtained from areas receiving standard grower management (Fig. 2). Providing new cranberry plantings with sufficient nutrients to quickly establish a continuous canopy is important, and is especially challenging with organic fertilizers.




**Take-Home Message.** The original focus of this study was preemergence weed management with CGM. The product was not effective for weed control on cranberry plantings, but future work may focus on the use of this product as a fertilizer for new cranberry plantings, especially for organic farms. Another outcome from this work is that we have identified other organic cranberry growers in the region, and hope to host a brainstorming/discussion group in the near future to bring together the small population of organic cranberry growers to discuss the challenges of organic production in the region.
A full report on this project will be available soon through NE SARE. Please check their web site (http://www.nesare.org/Reports/Search-Report) or give us a call if you have more questions 508.295.2212, x43 and x21.

Thanks to McGeary Organics Inc. for donating the CGM for this project.




# Do you have Phragmites?

*Phragmites australis*, also known as cord grass or common reed, is an invasive species, meaning it is not native and is spreading. If you have noticed that it has been encroaching into bog production areas or actually on the bog, please let us know. *Phragmites* can appear as a small bright green leafy sprout a foot or two tall and grow to be between six and twenty feet in height. We are interested in mapping where it occurs and if it is becoming a more common weed on bogs.

If you have (or think you have) *Phragmites*, please call or email Dahlia and leave your name and phone number.

(508) 295-2212 x51
dlmedeiros@umass.edu

## WORKER PROTECTION TRAININGS CRANBERRY STATION LIBRARY, 2-4 PM

Worker Protection Trainings for cranberry workers in the handler category will be offered in 2014: June 25. There is a $5 fee to cover the cost of the WPS training manual. If you have a pesticide license, you do not need this training. **Contact Martha Sylvia:** 508-295-2212, ext. 20 to sign up or for additional information.

Carolyn DeMoranville

**Carolyn DeMoranville, Director**

## SCALE CLINIC AT CRANBERRY STATION LIBRARY MONDAY JUNE 16: 4:00 – 6:00 PM

Serious pest alert: this new insect pest (Putman scale and 'Dearness scale') has been observed at over a dozen sites. We will present an introduction to scale insects, showing slides of symptoms plus describe the biology of the insect and what may manage the infestation. Piles of infested vines will be available for viewing.

If you have vines that may have scales, bring them for us to check during the clinic. When sampling, cut the vine at the bases, since the greatest number of scales is often on the thicker, old wood. If you cannot come to this meeting, put the vines in a plastic bag and drop them off at the Entomology lab. Label the bag with your name and phone number, and we will check them.

Martha Sylvia and Anne Averill

## Final Keeping Quality Forecast

Carolyn DeMoranville

The keeping quality forecast for June 2014 is for POOR keeping quality.

We calculated 4 of a possible 16 points to arrive at this forecast. We were awarded 2 points for cool March temperatures, 1 point for low rainfall in April, and 1 point for low rainfall in May.

This is the fourth consecutive year (2011-2014) for poor forecast keeping quality. What does this mean? It is likely that fruit rot fungal inoculum has built up over this period. If no steps are taken to manage fruit rot disease by using late water and/or fungicides, one can expect a high incidence of fruit rot at harvest and particularly in fruit that is stored post-harvest. We can also predict that inoculum will be high going into the 2015 season.

What to do? Careful management can overcome the predicted quality problems.

- If you held your bog under late water, one or two mid-rate applications of fungicide should suffice. In research studies, we were able to skip fungicides entirely in the late water year. However, since the forecast is not good, some use is probably warranted.
- If you did not hold late water, and particularly if you have a history of high fruit rot, use three fungicide applications beginning at 10-20% bloom.
- See the article about fungicide choices on page 1 of this newsletter.

UMASS EXTENSION
UNIVERSITY OF MASSACHUSETTS
P.O. BOX 569
EAST WAREHAM, MA 02538

OFFICIAL BUSINESS