I recently had the opportunity to observe cranberry bed establishment in Newfoundland, Canada. While cranberry is a native species to the island, nearly all commercial production is on beds established in the last ten years.

The provincial experiment station evaluated seven varieties thought to potentially be well adapted to this most northerly cranberry commercial cranberry growing region. From this group, four varieties were released to a group of growers for further evaluation on a larger scale. Now, ten years since the release to the growers Pilgrim has consistently been the best performing variety in Newfoundland.

Coastal Newfoundland was settled in the early 1600’s. Possibly because of the long history of unsupervised garden production of vegetables, provincial growers are not allowed to export any root crops from the island due to plant disease concerns from various scab and canker problems.

Realizing the possible opportunity to prevent a similar plant disease problem in cranberry production all vine propagation has been by plugs produced on the island from the evaluated varieties at the provincial experiment station. The station has been a leader in cranberry propagation from plugs. This year, they have on hand enough plugs to establish over 100 acres of cranberry at a one foot by one foot plug spacing.

Propagation by plugs is usually more typical of some of the newer high value hybrids. Provincial growers have not been a part of the licensing and permitting for the new hybrids so all varieties propagated by plugs in Newfoundland would be available as vines in other cranberry growing areas.

The seven varieties evaluated where all DNA fingerprinted. All propagation has been clonal from stem cuttings. The source of the majority of the plant material has been from the state of Michigan.

Newfoundland Island is nearly completely covered in a boreal spruce birch forest. The experimental station has developed considerable capacity to produce rootstock for the commercial forests. To utilize this same facility for cranberry production meant that greenhouses would be available only during the off season from the tree propagation. What to do with the cranberry plugs when they are ready to go but must be put in a holding pattern until the spring planting season? One possible solution that was considered and subsequently proven to be successful is freezing the plugs until needed for planting. Field observations indicate that frozen plug adaption to field conditions is superior to more tender plugs planted directly from the greenhouse.

Station management has found the cranberry plant to be quite agreeable to plug propagation. Peat pot sources are typically of the correct pH, but certainly that is a consideration to be observed for successful clonal propagation of the cranberry plant.

The summer opportunity to plant is a rather short window in Newfoundland. Early season plantings have been observed to be more successful than July plantings. There has been some pull out of plants from winter ice which is more common in the not as well rooted late season plantings.

Continued at Cranberry Bed Establishment p. 2
**Cranberry Bed Establishment from Plugs, continued from p. 1**

**Figure 1.** Identification and lengthy central corridor for the greenhouse complex at the Newfoundland Provincial cranberry propagation facility.

**Figure 2.** Pilgrim mother vines initiating new vegetative vine growth after a trim a few weeks ago.

**Figure 3.** More hanging baskets just trimmed for the new year’s growth.

**Figure 4.** The station was just in the process of discarding excess growth from the previous season. The garbage bags are full of vegetative vines. The few vines on top show the three to four foot growth plants produce that is clipped to produce the segments for each plug.

**Figure 5.** New cranberry plugs well established and initiating new growth.

**Figure 6.** Several freezer rooms are stacked to the ceiling with frozen plugs boxed two flats per box. The plugs need to be just thawed well enough so that they aren’t frozen together at planting time.
Several cranberry growers have reported a relatively new nuisance in cranberry beds, particularly in recent plantings and expansion areas. The culprit, creeping red fescue, isn’t a newcomer to the area at all; it has been a common ingredient in turfgrass mixes for many years and may in fact have been planted around the marsh. In turfgrass, creeping red fescue is a useful component. It is relatively shade tolerant and is considered low maintenance as it tolerates infrequent mowing, fertilization and some moisture stress. Those same attributes, however, can make it difficult to deal with when growing in a cranberry bed. Moreover, the herbicides registered for use in cranberry do not control creeping red fescue.

Although creeping red fescue is relatively slow to establish, it does eventually “creep” from short rhizomes. Once established it forms rather dense clumps that compete well with other plants, including cranberries.

All weed management programs start with accurate identification, particularly when a newcomer is involved. Creeping red fescue has very fine, almost thread-like leaves that are folded. The leaves are tightly clustered in what often appears as a distinct, dark green, glossy clump. The plant has short membranous ligules that appear like a small piece of wax paper where the grass leaf meets the sheath. Once established, look for short rhizomes between clumps.

As mentioned earlier, control options are limited in cranberry beds, so if you see a few clumps along the edges of beds, get them out now before the plant becomes established or begins creeping!

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![Creeping Red Fescue](image)
As we start our season, we are finding some leaf drop. In some cases, it appears to be on the extreme edge perhaps from snow accumulation. Yet some areas of leaf drop could have been caused by sanding early and a blanket of snow on top of that. When our plants cannot get any sunlight for a period of time, they are indeed stressed. This stress is expressed in leaf drop.

With the growing degree days far short of the 30-year norm, we are finding far less insects than this time last year. We have been sweeping some Black Spanworm/Blueberry looper, some Green Spanworm, cutworm, and early BHFV in hot spots. So far, nothing has been at economic threshold levels and we have not had to take action. After this cold snap, that all could change!

We are observing many more trash floods than we have seen in the past several years. I commend growers for reviving this cultural practice especially after some of the rot issues of 2010. There is merit in getting rid of debris, mummy berries and leaves that may be carrying a disease. That kind of practice decreases the chances of having disease pressure again this season.

It appears that we will have plenty of water this spring for flooding for 1st generation insects. I cannot say enough about the kind of control we get with this flood. We not only get the larvae that we target but we seem to pull Adult June Beetles from their burrows and bring them to the surface as well. Remember that there are no resistant issues with a spring flood! I strongly encourage growers that have never flooded for insect control to try at least part of the marsh. Prove something to yourself on your own property – what do you have to lose?

Here is hoping we all have a great growing season!

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Figure 7. These flats were available for planting last season but were unused. They have been successfully out wintered. There is some concern about weeds that have started on the plugs that have been outside for a year.

Figure 8. The planting pattern is easily observed in this 2010 planting.

Figure 9. A closer view of the same bed. Many plantings were later last season due to weather challenges during the summer.
Cottonball Control

Patricia McManus
UW-Extension Fruit Crops Specialist

Cottonball, caused by the fungus *Monilinia oxyccoci*, reared its ugly head on several marshes last year. This fungus overwinters in infected, mummified berries that didn’t get scooped out with harvest. The amount of disease that develops this year will depend in part on the weather, but growers who had a cottonball problem last year should be prepared to do battle this year. In addition to this article, see UW-Extension bulletin no. A3194, available at www.learningstore.uwex.edu.

To our knowledge, all the popular cranberry varieties are susceptible to cottonball, but the disease tends to be worse in older, peat-based beds. The first line of control is cultural: removing diseased fruits and mummies through harvest and subsequent “trash” floods. There is some evidence that shoots subjected to freezing are susceptible to infection, so spring frost protection is critical. Cottonball tends to be worse in mossy areas of beds and areas in which sand remains saturated in the spring. Therefore, moss and water management should be considered.

The sterol inhibitor (SI) fungicides are the most effective group for controlling cottonball. These include propiconazole (Orbit, Tilt, Propimax) and fenbuconazole (Lindar). The actual products labeled for use on cranberry have varied over the past few years, so be certain that cranberry is listed on the label before using it. The wording on product labels varies, but four sprays of SI fungicides are permitted: two during shoot elongation (to prevent tip blight) and two during bloom (to prevent fruit infection). Azoxystrobin (Abound), a strobilurin fungicide, is permitted for use during bloom, but it is not as effective as either propiconazole or fenbuconazole under moderate to high levels of cottonball (i.e., greater than about 15% cottonball berries at harvest). Field tests conducted in the late 1990s and early 2000s showed that under low to moderate disease pressure (i.e., less than about 15% cottonball berries at harvest), making two sprays during bloom was just as good at reducing cottonball at harvest as making two sprays during shoot elongation plus two sprays at bloom.

To the extent possible, spray a variety according to its developmental stage, rather than treating early and late varieties at the same time. If spraying during bloom, be certain that the first spray goes on at 10-20% bloom. These early flowers are the ones most likely to set fruit; and therefore, are the most important ones to protect. Never spray fungicides to control cottonball after bloom. Infection has already happened, and it is too late for fungicides to work.

The fact that the SI fungicides, which have a single mode of action, have been used frequently and often exclusively to control cottonball for the past 28 years is reason to be concerned about fungicide resistance developing in *M. oxyccoci*. Research in the late 1990s indicated that resistance had not yet developed at sites where the SI fungicides had been used for 16 years. To further delay the onset of resistance, try to minimize the number of SI sprays so that on average, you use them three or fewer times per season. So, for example, if you spray a sterol inhibitor four times in 2011, then in 2012, you should back off to just two SI sprays during bloom. Alternatively, in 2012 you could use the SI during shoot elongation but switch to Abound for the bloom sprays.

Cottonball: To spray or not to spray?

(See p. 6)
McManus Sabbatical Leave

After 16 years at UW-Madison, I have been awarded a sabbatical leave for July 1, 2011 through June 30, 2012. During that time I will be accessible by email and telephone, but because of extensive travel, there may be some delays in my response. For disease diagnosis, I encourage you to work through your county UW-Extension office or directly with the UW Plant Disease Diagnostic Clinic, (608) 262-2863, email bdh@plantpath.wisc.edu, website: pdcc.wisc.edu. My graduate student Lindsay Wells will be assisting the clinic with cranberry samples.

I have several goals for the sabbatical. Most directly relevant to cranberry growers is that I plan to write a grant proposal for fruit rot prediction based on weather and previous disease occurrence. I will also update curriculum for a course in chemical control of plant diseases, which will bring me up to speed on fungicide chemistries and how they are used most effectively.

—Patty McManus

Cottonball: To spray or not to spray?

References to products in this publication are for your convenience and are not an endorsement of one product over similar products. You are responsible for using pesticides according to the manufacturer’s current label directions. Follow directions exactly to protect the environment and people from pesticide exposure. Failure to do so violates the law.

<table>
<thead>
<tr>
<th>Situation</th>
<th>Recommendation</th>
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<tbody>
<tr>
<td>No history of cottonball in the bed; little or none on the marsh.</td>
<td>Do not spray.</td>
</tr>
<tr>
<td>No history of cottonball in the bed; a minor problem in neighboring beds.</td>
<td>In general, do not spray the bed with no history. But if this is a particularly valuable bed (e.g., high-yielding new variety) consider bloom sprays.</td>
</tr>
<tr>
<td>Cottonball a chronic but minor problem, with less than 5% of fruit infected most years.</td>
<td>Fungicides are imperfect and not likely to bring that 5% level down much. But consider spraying during bloom to keep the problem in check. If not every year, then every other year.</td>
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<tr>
<td>About 5-15% cottonball in last year’s harvest.</td>
<td>Spray twice during bloom, first at about 10-20% bloom and again at full bloom.</td>
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<tr>
<td>More than 15% cottonball in last year’s harvest</td>
<td>Spray during shoot elongation, starting when about half the shoots show ½” new growth and again about 10 days later. Also spray during bloom, first at about 10-20% bloom and again at full bloom.</td>
</tr>
<tr>
<td>Tip blight symptoms are easy to find.</td>
<td>Spray during bloom during the current year and watch cottonball levels closely at harvest. If fruit cottonball is more than 15%, then spray during shoot elongation and bloom the following year.</td>
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I thought I would share a few observations from my recent travels to Newfoundland Island, the easternmost part of Canada. It, along with Labrador, make up the province of Newfoundland and Labrador. Ninety-four percent of the population of the province lives on the island. The island is about three quarters the size of Wisconsin but with only one tenth of our population. Lying at the same range of latitude found between Duluth, Minnesota and Edmonton, Alberta, Canada its northerly location finds the average winter temperature about the same as Wisconsin but with a summer that is ten degrees Fahrenheit cooler than we typically experience here. The island dubbed “the rock” by its inhabitants has been repeatedly scoured by glacial advances and has very little topsoil development and massive rock formations throughout. This lack of arable land and the short and cool summer has resulted in little agricultural development on the island.

Extensive spruce and birch forest have supported a paper and pulp industry which has seen several mill closures during the last decade. Cranberry production has been considered as an economic alternative for the island. Government project funding has gone into researching the viability of cranberry production in this unique climate and to fund grants to assist growers to establish themselves in cranberry production.

**Figure 1.** An established bed in Newfoundland.

**Figure 2.** This bed (pictured below) is nearly ready for planting. Much bed construction is done during the winter with snow removed to assist frost penetration to get the peat soil to carry large equipment.

**Figure 3.** Rock content is common even when screened; large gravel-sized particles are typical.
Cranberry Development in Newfoundland, continued from p. 7

With the cool and moist climate and the rock near to the surface, peat soils may develop in very shallow basins that would appear to be an upland site from the position in the landscape. Some peat-based cranberry beds are literally on the top of the hill. Many of the cranberry projects are occurring in peat soil with a layer of sand for the plants to be started in. Growers have challenges with the stability of the roads in the marsh when made from peat.

Growers are not experienced. The most established grower has about ten years of production experience with the cranberry crop. With their cultural practices and local conditions, Pilgrim has been their most satisfactory variety. They have not utilized pruning or sanding extensively; they may not have the equipment or the experience on how to do these things. There was considerable overgrowth in Stevens with less vegetative mat in the Pilgrims possibly explaining the grower’s strong preference for Pilgrim at this time. Pilgrim has been averaging in the 200-250 barrel per acre yield. Without other alternatives, growers are quite satisfied with the yield potential they have experienced so far and seem to be interested in expanding production.

Continued p. 9
The area is without cranberry infrastructure. I observed a boom fabricated in Spooner, WI and harvest equipment from Wisconsin Rapids. There are no receiving stations. Fruit is loaded directly from the bed into 1,000 pound totes. Buyers from Quebec have an export market for fresh fruit in Europe. Fruit in Newfoundland colors well but has not been very large in size. Honey bees are not readily available on the island and bumble bees have been utilized extensively. Most purchases come to the island by ferry which can be expensive for larger pieces of equipment.

Newfoundland is largely an undeveloped land. There are many reasons limiting its development for agriculture although somewhat less so for cranberry production. There is high motivation for economic development because the unemployment rate in Newfoundland is chronically the highest in Canada, currently at 11.1%. This is, however, the lowest it has been in the province for over thirty-five years. Low prices for the crop at this time will discourage expansion, but more production is already on line to be realized over the next several years.
Address Service Requested

UW-Extension Cranberry Specialists

Jed Colquhoun
UW-Extension Fruit Crops Weed Scientist
1575 Linden Drive
Madison, WI 53706
(608) 890-0980
jed.colquhoun@ces.uwex.edu

Rebecca Harbut
UW-Extension Fruit Crops Specialist
297 Horticulture; 1575 Linden Drive
Madison, WI 53706
(608) 262-6452
rebecca.harbut@ces.uwex.edu

Patty McManus
UW-Extension Fruit Crops Specialist
319B Russell Labs; 1630 Linden Drive
Madison, WI 53706
(608) 265-2047
patty.mcmanus@ces.uwex.edu

Matthew Lippert, Agricultural Agent
Wood County Courthouse
400 Market Street; P. O. Box 8095
Wisconsin Rapids, WI 54495-8095
(715) 421-8440
matthew.lippert@ces.uwex.edu

Brent McCown
UW-Madison Cranberry Plant Breeder
393 Horticulture; 1575 Linden Drive
Madison, WI 53706
608) 262-5201
bhmccown@wisc.edu

R. Chris Williamson
Interim State Fruit Entomologist
246 Russell Labs; 1630 Linden Drive
Madison, WI 53706
(608) 262-4608
rcwillie@entomology.wisc.edu