The recommended time to take cranberry tissue samples is August 15–September 15. As Figure 1 shows, it is not until later in the summer when plant tissue levels stabilize so that meaningful year-to-year comparisons can be made. Collecting samples from vegetative and fruiting uprights, approximately the top 2", from at least twenty locations randomly across the bed will help get a representative sample of the mineral status of the current year’s growth. (Figure 2.)

The unusual summer rain pattern that we are experiencing this year may in some instances affect plant tissue mineral levels. On some poorly drained beds, the long-term saturated situation in the soil can be expected to show up in tissue analysis. Manganese, for example, is typically found to be in elevated levels in poorly drained areas. (Table 1.)

A nutrient wheel is used to depict plant tissue analysis on the UW Soils lab report. (Page 2.) The wheel helps to depict balance of nutrients and to show graphically that for tissue analysis sufficiency, normal, or optimum are more desirable goals usually than to be targeting for high levels of nutrients. High levels of some nutrients may impede the uptake of other nutrients or may be a sign of overall lower growth rates to dilute nutrient uptake. Likewise, overgrowth will often show up with low mineral levels. The wheel helps us to visualize balance of mineral composition in normal plant tissue.

Multiple years of plant tissue tests, taken using consistent sampling procedures and paired with crop fertilization records can be a powerful tool. For more details on cranberry tissue testing refer to A3642 Cranberry Tissue Testing in North America which is available at your UW-Extension office if you don’t have a copy available.

From A3642 Cranberry Tissue Testing for producing beds in North America.
From A3642 Cranberry Tissue Testing for producing beds in North America.

PLANT ANALYSIS REPORT

Samples Analyzed By:
UW Soil & Plant Analysis Lab
8452 Mineral Point Rd
Verona, WI 53593
(608) 262-3664

Client:
Sample Report
8452 Mineral Point Road
Verona, WI 53593

Lab Number: 12347
Date received: 7/22/2010
Date processed: 7/22/2010
County: Dane
Sample information
Sample ID: 1
Field: 1
Crop: Cranberry
Growth Stage: Aug 15 - Sept 15
Plant Part: Growth above berries
Appearance: Normal
Soil Submitted: No

SUFIFFICIENCY RANGES

<table>
<thead>
<tr>
<th>Element</th>
<th>Low</th>
<th>Sufficient</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (%)</td>
<td>1.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P (%)</td>
<td></td>
<td>0.44</td>
<td>0.26</td>
</tr>
<tr>
<td>K (%)</td>
<td>0.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ca (%)</td>
<td></td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>Mg (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S (%)</td>
<td>0.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zn (ppm)</td>
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<td></td>
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</tr>
<tr>
<td>B (ppm)</td>
<td>33.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mn (ppm)</td>
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<td></td>
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</tr>
<tr>
<td>Fe (ppm)</td>
<td>120.00</td>
<td></td>
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</tr>
</tbody>
</table>

Al (ppm) 0.50
Na (ppm) 2.10

KEY
- Plant result

High
Sufficient
Low

COMMENTS

Calcium (Ca)
Soil test prior to next growing season and apply recommended amounts of dolomitic limestone to raise pH to crop target level.

Manganese (Mg)
This plant sample is low in magnesium, possibly as a result of low soil magnesium levels. Use of sludge or compost, high soil potassium levels or excessive potassium fertilization. When the soil pH is below 6.4 dolomitic limestone should be used. For situations where the pH should remain acid magnesium fertilizers should be used. Dolomitic limestone should be broadcast and magnesium fertilizers should be row applied.

Copper (Cu)
This plant sample is low in copper. This is most likely a result of low soil copper availability. This is most likely to occur on highly organic soils and on light colored, upland, mineral soils.
Mini Clinics Scheduled For Summer Meeting on August 10

The WSCGA Education Committee and UW Extension will be conducting two mini clinics at the summer meeting on August 10 at Prehn Cranberry, 11400 Highway N, Tomah, WI 54660. The sessions will be held in the lunch area in the shop on the marsh. Look for the signs or check at registration. The topics for the two sessions are as follows:

9:30 a.m. Energy Conservation and Renewable Generation – Tod Planer, WSCGA Project Specialist, Session Chair

WSCGA launched a program earlier this year to provide assistance to growers to analyze energy use on their farms, implement cost savings and to conduct site assessments to determine the feasibility of generating energy from wind, solar or other renewable sources. The results of those efforts and the materials developed will be presented to participants in this session. The Prehn Marsh has an extensive program for energy saving and renewable generation. Information will be presented to growers to consider when looking at wind generation such as site assessments, selecting a wind turbine type, size and capacities. Finally the economics of all this will be discussed including pay backs, tax credits and programs from local electrical suppliers.

10:15 a.m. (Group will meet and board busses to travel to plots on marsh)

New Bed Establishment – Leroy Kummer, WSCGA Education Committee, Session Chair

The Prehn Marsh is a relatively new marsh so it presents a great opportunity to discuss a variety of management practices on new plantings and bed establishment. This session will take place in the field at a new planting test plot. Jack Perry will talk about the various rates and compounds for weed control and demonstrate their effectiveness. Other UW and crop specialists will provide information on the design of the sprinkler system, plant.

Pre-registration by July 30 for the meal can be done through the Wisconsin State Cranberry Growers Association. Meal charge is $7.00. Make checks payable & send to WSCGA, P.O. Box 365, Wis. Rapids, WI 54495-0365
Watch for Early Rot Leaf Spots
Patty McManus, UW-Extension Cranberry Specialist

Several fungi cause leaf spot diseases of cranberry. Although most leaf spots do not cause economic losses, it’s a good idea to be familiar with the various causes so that you can monitor problems from year to year. Early rot leaf spot symptoms are a greater concern, because they produce spores that infect fruit, leading to rot. The fungus that causes early rot, *Phyllosticta vaccinii*, likes warm conditions, and symptoms tend to show up in early to mid August. In Wisconsin early rot occurs more in newly planted beds where vines have been pushed hard with nitrogen and the bare sand heats up on sunny days. See extension bulletin A3711 at http://learningstore.uwex.edu/Problems-C87.aspx and the attached scouting guide for early rot for photos and additional information. (See article on p. 5)

Observations from the Field
Jayne Sojka – LADY BUG IPM, LLC

At this writing most of our Cranberry Fruitworm and Sparganothis fruitworm insecticide applications should be in place. For the next several weeks we will be out checking on the control of the pests with newer secticide choices. Stay tuned to the continued saga of how well things worked.

Girdler numbers have peaked in most areas. We will continue to trap to see just how prolonged the flight can be this season.

Fall weed species are already popping up. Please be careful with your product choice because of the pre-harvest intervals. Some grass control measures have an extended PHI.

We were SHOCKED to see yellow vine syndrome again this season. It is in very unusual patterns. Some are circular while others are the size of a pickup. Truck. Remember that this yellow may be cause from HEAT stress. With all the rain we’ve been having it is difficult to understand any heat stress, but it does happen.

White Grub trapping is about completed. We captured thousands of June Beetles again this season. We have had an abnormal population of moles invading the support lands of our Cranberry marshes. That is another sign of White grub in the soil. Pay attention to the signs around your property.

Rose Chafer Trapping yielded huge numbers in 2010. One of our growers treated the support lands early this spring and again after the bees were taken out. He feels that his populations are down. Once we find out what the 2011 trapping looks like we will share more of his success story – we just want to be sure.

Mass Trapping threw a curve ball our way this season. The traps did not yield the numbers that we expected - could it be that we are finally gaining on the pests? Could it be that the pheromone has filled the air so much that the pest doesn’t come to the trap anymore? Could it be the rainy weather? Hummm let’s wait to see what 2011 brings.

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.
Watch for Early Rot Leaf Spots
Patty McManus, UW-Extension Cranberry Specialist

What is early rot of cranberry? Early Rot is a cranberry disease that causes leaf spots, premature leaf drop, and fruit rot. Early rot is caused by the fungus *Phyllosticta vaccinii*.

**Left:** Early rot symptoms in a new planting in September. Leaf spots are tan to brown and sometimes have dark red margins. By late summer, significant leaf drop can occur. **Above:** Leaves from plant at left. Tiny black pycnidia (fungal fruiting bodies) form within spots on the upper surface of the leaves.

*Continued at Identifying Early Rot in the Field p. 6*
Why scout for early rot? Early rot can be severe in some cranberry growing regions of the U.S., requiring the use of fungicides to control the disease. Fortunately, early rot is rare in Wisconsin. Nevertheless, since 2005, this disease has been detected in young plantings at several sites in Wisconsin.

What should growers do? Growers should become familiar with early rot and report suspicious symptoms to their crop consultant or to Patricia McManus, Professor and Extension Plant Pathologist, University of Wisconsin-Madison, (608) 265-2047, psm@plantpath.wisc.edu.

How can you distinguish early rot from other diseases? The fruit rot phase of early rot is often difficult to distinguish from other cranberry fruit rot diseases. However, early rot appears on berries as early as late July, whereas most other types of rot appear in September in Wisconsin. Some other leaf spot diseases and how to distinguish them from early rot are described below.

**End rot.** Symptoms on leaves are rare but very similar to early rot symptoms. Older lesions turn gray. Positive diagnosis requires microscopy.

**Brown leaf.** The cause is not known. Leaves turn brown starting in June. Sometimes just one half of a leaf is affected.

**Red leaf spot.** Bright red spots with yellow borders appear in July. Diseased leaves (right) are sometimes shorter and rounder than healthy leaves (left). Spots turn black later in the summer.

**Cladosporium leaf spot.** Small brown lesions on previous season’s leaves. Spots have white or gray centers.

**Protoventuria leaf spot.** Gray to black circular spots with bull’s eye pattern appear on previous season’s leaves.
Conservation of Native Pollinators

The 2008 Farm Bill made pollinators and their habitat a conservation priority for every USDA land manager and conservationist. This training session provides an overview of the pollinator-specific language within the Farm Bill, and how to translate that language into on-the-ground pollinator habitat conservation.

This day-long workshop will equip conservationists, land managers, educators and agricultural professionals with practical science-based approaches to increasing crop security and reversing the alarming trend of pollinator decline, especially in heavily managed agricultural landscapes.

Introductory topics include the basic principles of pollinator biology, the economics of insect pollination, recognizing native bee species, and assessment of pollinator habitat.

Advance modules will cover farm management practices for pollinator protection, the development of pollinator habitat enhancements, incorporating pollinator conservation into existing NRCS programs, selection of plants for pollinator enhancement sites, management of natural and urban landscapes, and the additional funding sources and technical support available to land managers.

Throughout the workshop these training modules are illustrated by real case studies of pollinator conservation efforts around the country.

Course Training Skills and Objectives:

- Awareness of various state and federal programs and potential funding available for pollinator conservation
- Identify approaches to increase and enhance pollinator diversity on the land how biology plays a role
- Knowledge of the current Best Management Practices (BMP’s) that minimize landuse impacts on pollinators
- The awareness of short and long range management strategies for improving the health of our native bee populations
- Ability to identify bees, and distinguish them from other insects
- Understand the economics of insect-pollinated crops, and the effects of pollinator decline
- Ability to assess the quality of pollinator habitat, and identify deficiencies
- Ability to make recommendations to farmers and land managers that conserve pollinators
- Ability to design and implement habitat improvements that maximize native bee populations, including the establishment of native plantings and artificial nest sites

Conservation of Native Pollinators

August 3rd, 2010
UW Arboretum, Madison, WI
http://uwarboretum.org/

August 5th 2010
Lake Wisota State Park,
Chippewa Falls, WI
http://dnr.wi.gov/org/land/parks/specific/lakewisota/

August 12th 2010
Agriculture & Energy Resource Center,
Bayfield, WI
http://www.wisconsinac.org/researchstation-facilities.html

August 18th 2010
Urban Ecology Center, Milwaukee, WI
http://www.urbanecologycenter.org/

August 19th 2010
Peninsula Agricultural Research Station,
Door County, WI
http://door.uwex.edu/researchstation.html

Cost $25 includes registration materials and lunch

To Register
online go to
http://conservation-training.wisc.edu/
course_listing/
list_sections?course_id=7

For general registration questions call
920-391-4610
or email
iwesd@wisc.edu

Continued next page
Agenda

Module 1 Introduction
- Pollination economics, and the role of native bees in commercial crop production
- Pollination biology
- The role of native bees in commercial crop production
- Colony Collapse Disorder and the loss of honey bees

Module 2 Basic bee biology
- Bee identification
- Identifying pollinator nest sites

Module 3 Pollinator-friendly farming
- The role of farm habitat
- Mitigating pesticide damage
- Protecting ground-nesting bees in cultivated fields

Module 4 Open Laboratory
- Field observation and land-use discussion (outdoor activity)
- Examination of pinned specimens, artificial nests and display materials

Module 5 Habitat Restoration
- Habitat design considerations
- Plant selection and seed sources
- Planting techniques for native wildflowers
- Long-term habitat management
- Artificial nest sites

Module 6 2008 Farm Bill provisions
- Using NRCS programs and practices for pollinator conservation
- Conservation case studies

Module 7 Additional resources

Instructor Bios

Regina Hirsch, PhD. Regina Hirsch, PhD. is the Native Pollinator Outreach Specialist for the University of Wisconsin-Madison, Center for Integrated Agricultural Systems (CIAS). She is working with the Xerces Society in conjunction with NRCS and their Environmental Quality Incentives Program (EQIP) to develop native pollinator plant lists and habitat establishment guidelines appropriate for farmers growing pollinator-dependent crops. Regina also works with her colleagues at CIAS on the Eco-Fruit Project which brings a team of fruit growers, University researchers, grower associations, NRCS, and consultants to develop educational and funding opportunities to aid growers in reducing their reliance on high-risk pesticides and research new approaches to pest management. Regina received her PhD in Wildlife Ecology with a minor in Entomology from the University of Wisconsin-Madison.

Jennifer Hopwood is the Xerces Society’s Midwest Pollinator Outreach Coordinator. In this role she works to provide resources and training for pollinator habitat management, creation, and restoration to agricultural professionals and land managers. Jennifer holds a Master’s in Entomology from the University of Kansas, where her research focused on bee communities in roadside prairie plantings and prairie remnants. Contact: jennifer@xerces.org.

Co-sponsored by
The Xerces Society
The Xerces Society is an international non-profit organization that protects wildlife through the conservation of invertebrates and their habitat. Xerces Society’s Pollinator Conservation Program was initiated in 1996 as part of the Forgotten Pollinator campaign, and, today, is a growing collaboration with scientists around the world to translate the latest research findings into conservation practices that can be implemented in agricultural, urban, and natural settings.

Center for Integrated Agricultural Systems (CIAS) Provides leadership for building a diverse, sustainable agriculture in Wisconsin. We seek creative production and marketing solutions for small and medium agricultural and food enterprises.

7/7/2010
How to collect cranberry tissue samples

Sample collection

- Collect tissue samples between August 15 and September 15.
- Do not collect samples from weak, weedy, or diseased areas unless the entire bed has a problem.
- Do not mix varieties in a sample.
- Collect tissue randomly across the bed.
- Clip current season growth from above the berries on fruit-bearing uprights or from approximately the upper 2 inches of growth on non-fruitful uprights.
- Do not collect berries, growth below berries, or growth below the point of bud break.
- Collect 20 upright pieces each from 10 locations representative of the bed.
- The total sample will consist of 200 upright pieces per bed or 1 to 1½ cups of plant material.
- One composite sample per bed is adequate if field condition and yield are uniform.
- Multiple samples may be needed if field size is more than 10 acres.

Sample handling

- Do not wash or rinse the sample.
- Allow the sample to air dry at room temperature before mailing to the laboratory. This should take a few days, depending on temperature and humidity.
- Put samples in paper bags or paper envelopes for mailing. Vented plastic bags such as Ziploc™ brand vegetable bags also may be used.
- Label each bag with the bed number or another identification code.
- Do not put samples in unvented plastic bags as the samples may mold in transit.
- Avoid mailing after midweek as the samples may sit in the post office or laboratory over the weekend.

Laboratory analyses

Request determination of: (N) nitrogen (B) boron (S) sulfur (if available at no additional cost) (Ca) calcium
(Mn) manganese (K) potassium (Cu) copper (Mg) magnesium (P) phosphorus (Zn) zinc
UW-Extension Cranberry Specialists

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