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ASSESSING BIOLOGICAL IMPACTS OF IPM ADOPTION BY THE WISCONSIN CRANBERRY INDUSTRY:
FINAL REPORT
Merritt Singleton and Daniel Mahr, Department of Entomology, University of Wisconsin – Madison

Background

Since the initiation of the university’s pilot Integrated Pest Management program in the 1980s, the Wisconsin cranberry industry has become a national leader in the implementation of IPM. Initially, IPM adoption meant using pest monitoring to make economically justifiable decisions on the need for controlling pests at any given time. Using this approach, growers substantially decreased the usage of broad spectrum insecticides. In more recent years, with the availability of more selective types of insecticides, many growers are going this additional step to reduce potential negative impacts associated with older broad spectrum materials. Overall, the adoption of these IPM practices has been beneficial to the industry. When reducing the use of broad spectrum insecticides, one of the expected benefits is the increase in beneficial natural enemies (such as predaceous and parasitic insects and spiders) that are important in biological control of pests.

Although the economic, environmental, and human health benefits of IPM are substantial and well documented in many types of crops, IPM adoption is not totally without risk. One occasional side effect resulting from significant reduction in broad spectrum pesticide use is the increase in numbers of “secondary” or “occasional” pests that had previously been inadvertently controlled. When such cases happen, the pest management program has to be modified to compensate. One possible example of such a situation is the recent reported increase in Massachusetts and New Jersey of bluntnosed leafhopper, a vector of the pathogen causing cranberry false blossom disease.

This report summarizes research that assessed impacts of IPM adoption in Wisconsin cranberry production on populations of beneficial natural enemies. It also reports on a survey to detect the presence of bluntnosed leafhopper. It also introduces the concept that patterns of usage of land surrounding cranberry beds likely have an impact on the beneficial natural enemies found within the beds.

PART 1: PESTICIDE IMPACTS

Methods

To assess the biological impacts of IPM adoption, 14 cranberry farms have been sampled during each of two field seasons (2008 & 2009) (1) to determine the abundance of natural enemies present and (2) to survey for the potential presence of bluntnosed leafhopper. Four of the farms were producing for the certified organic market and 10 were conventional farms. The conventional farms were spread along a continuum of degree of IPM adoption. Three sampling methods were used: (1) sweep sampling for insects and spiders within the cranberry canopy, (2) yellow sticky traps to sample insects flying just above the cranberry vines, and (3) pitfall traps to sample insects and spiders on the soil surface beneath.
the cranberry canopy. Sweep sampling was done every 1-2 weeks until onset of flowering; sticky trap and pitfall sampling was done season-long.

Growers provided their pesticide use records. Cornell University’s Pesticide Environmental Impact Quotient program was used to assess “Natural Enemy Toxicity” scores (NETs) for each farm. Basically, the EIQ uses published research data to assess potential pesticide impacts vs. a diversity of study targets. One target group consists of beneficial natural enemies that are present in agriculture and that help control pest populations. Table 1 is an example of individual pesticide toxicity scores vs. beneficial natural enemies.

Table 1. Examples of pesticide toxicity scores to beneficial natural enemies.

<table>
<thead>
<tr>
<th>Trade Name</th>
<th>Active Ingredient</th>
<th>Toxicity to Beneficials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confirm</td>
<td>tebufenozide</td>
<td>12.2</td>
</tr>
<tr>
<td>Entrust</td>
<td>spinosad</td>
<td>14.9</td>
</tr>
<tr>
<td>Guthion</td>
<td>azinphos-methyl</td>
<td>44.8</td>
</tr>
<tr>
<td>Diazinon</td>
<td>diazinon</td>
<td>47.5</td>
</tr>
</tbody>
</table>

Individual toxicity scores for each pesticide for each farm are calculated based upon rates and frequencies of use, then all individual toxicity scores are grouped together to determine a seasonal total NETs for that farm. Total toxicity scores for all 14 farms for 2008 and 2009 are shown in Table 2. Scores were arbitrarily grouped into “Low”, “Medium”, and “High” categories for data analysis.

Table 2. Season-long insecticide natural enemy toxicity (NET) scores for each of the 14 farms. Organic farms are shaded in gray.

<table>
<thead>
<tr>
<th>Year</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>4</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>34</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>55</td>
<td>82</td>
<td>103</td>
</tr>
<tr>
<td></td>
<td>129</td>
<td>188</td>
<td>233</td>
</tr>
<tr>
<td></td>
<td>256</td>
<td>309</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>2</td>
<td>54</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>31</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>58</td>
<td>95</td>
<td>245</td>
</tr>
<tr>
<td></td>
<td>148</td>
<td>282</td>
<td>226</td>
</tr>
<tr>
<td></td>
<td>77</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Results**

*Results – Natural Enemies.* Natural enemy numbers for 2008, for each of the three sampling methods are summarized in Table 3. For conventional farms, natural enemy numbers ranged from a low of 771 to a high of 2305 with an average of 1454. For organic farms, natural enemy numbers ranged from a low of
999 to a high of 2266 with an average of 1847. Organic farms averaged 27% more natural enemies than conventional farms.

Table 3. Seasonal total natural enemies, all three sampling methods combined, by farm, 2008.

<table>
<thead>
<tr>
<th></th>
<th>Conventional Farms</th>
<th>Organic Farms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Sweep samples</td>
<td>12</td>
<td>41</td>
</tr>
<tr>
<td>Yellow sticky traps</td>
<td>1856</td>
<td>1121</td>
</tr>
<tr>
<td>Pitfall traps</td>
<td>437</td>
<td>670</td>
</tr>
<tr>
<td>Total, all samples</td>
<td>2305</td>
<td>1832</td>
</tr>
</tbody>
</table>

Figure 1 shows the 2008 seasonal natural enemy totals collected per farm for each of the three toxicity categories (1=low, 2=medium, 3=high). The tops and bottoms of each of the three bars are the high and low farms, respectively, and the bold horizontal line is the average for all farms in the category.

Fig. 1. Beneficial natural enemy abundance in 2008 on farms with low (1), medium (2), and (3) high natural enemy toxicity scores.
Although there is a trend for low toxicity farms to have more natural enemies than medium and high toxicity farms, statistically, there were no significant differences for the 2008 season. Therefore, sampling intensity was increased in 2009, and the counts are presented in Table 4.

Table 4. Seasonal total natural enemies, all three sampling methods combined, by farm, 2009.

<table>
<thead>
<tr>
<th></th>
<th>Conventional Farms</th>
<th>Organic Farms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Sweep samples</td>
<td>26</td>
<td>2</td>
</tr>
<tr>
<td>Yellow sticky traps</td>
<td>3972</td>
<td>4447</td>
</tr>
<tr>
<td>Pitfall traps</td>
<td>605</td>
<td>405</td>
</tr>
<tr>
<td>Total, all samples</td>
<td>4603</td>
<td>4854</td>
</tr>
</tbody>
</table>

To summarize 2009 data, for conventional farms, natural enemy numbers ranged from a low of 4552 to a high of 7809 with an average of 5637. For organic farms, natural enemy numbers ranged from a low of 4157 to a high of 10,338 with an average of 8132. Again, it is interesting to note that organic farms had significantly more natural enemies than conventional, 45% more in 2009.

Natural enemy data analysis was conducted in numerous ways. When looking at the simple relationship between toxicity units vs. abundance and diversity of natural enemies, there were noticeable visual trends (such as Fig. 1) but few cases of statistically significant differences. Therefore, over 100 statistical analyses were conducted, each specific to over 20 natural enemy groups, and by sampling method and by year. Only four of these specific analyses showed statistically significant relationships between toxicity category and natural enemy abundance.

In addition to analyzing the data by total toxicity scores, we also looked at the relationship between the number of applications of broad-spectrum insecticides (oranophosphates and carbamates) and the abundance of natural enemies. Here we found that there was a strong statistical trend for fewer natural enemies on those farms that used more broad spectrum insecticides.

We also looked at the numbers of natural enemies present before an application of a broad-spectrum spray vs. after the spray. Again, we found solid evidence that numbers of natural enemies were lower in the samples after broad-spectrum sprays. However, we also found that natural enemy numbers rebounded fairly rapidly.

**Results – Leafhoppers.** Leafhoppers are very common plant-feeding insects. There are many different types and their feeding (host plant) preferences vary. In the two years of this study, over 14,000 leafhoppers were collected during our routine sampling for natural enemies. Most of the leafhoppers sampled were either potato leafhopper or aster leafhopper, both of which have a very broad host range, but are not known to cause any damage to cranberry. Two bluntnosed leafhoppers, the potential
vectors of the false blossom pathogen, were found. This should not cause concern as the insect is native to Wisconsin and it is surprising we did not find more. We only need to continue to be alert for signs of false blossom and take action if necessary. Amongst our newer insecticides there are products known to be very effective in controlling leafhoppers, so pest management tools are already in place should they someday be needed.

**Summary and Discussion of Pesticide Impacts**

Large numbers of beneficial natural enemies are found on Wisconsin cranberry farms.

Annual marsh insecticide toxicity scores had a very broad range, from a low of 2 to a high of 309.

Toxicity scores varied substantially from year to year on some beds, presumably resulting from actions needed to respond to IPM scouting information.

Surprisingly, there were relatively few statistically significant relationships between total insecticide toxicity and natural enemy numbers.

However, there were fewer natural enemies on those farms using more broad-spectrum insecticides (in the organophosphate and carbamate classes). This suggests that broad-spectrum materials are more damaging to natural enemies.

Also, there were often significant declines in natural enemy numbers in those samples taken following a broad-spectrum application. However, natural enemy populations tended to rebound quickly, suggesting that other environmental factors on cranberry farms may be acting to maintain high levels of natural enemies (see PART 2, below).

Two of over 14,000 leafhoppers collected were bluntnosed leafhopper, indicating that the insect is present, but at very low numbers and not requiring attention other than continued vigilance.

**PART 2: THE LAND USE HYPOTHESIS**

**Background**

The large numbers of natural enemies found during our survey, and the ability of the natural enemy community to rebound quickly after insecticide applications, suggested to us that other factors might be important in maintaining natural enemy numbers on cranberry farms.

Research in many cropping and natural systems has shown that land use patterns adjacent to croplands can have a significant impact on the abundance and diversity of natural enemies within the crops. This primarily relates to the needs that natural enemies have to survive as living organisms:

- many predaceous insects will starve or leave the area when pest species are in low numbers; therefore alternate types of prey, that live on alternate (non-crop) plants, can serve as essential food resources for predators when pest species are scarce;
the adults of most parasitic wasps that attack pests need to feed on alternate food sources that provide energy while they are searching for pests to parasitize; important alternate food sources are nectar and pollen derived from flowers; these floral resources need to be present throughout the growing season;

both predaceous and parasitic natural enemies require undisturbed habitat where they can seek shelter from storms or other adversity, rest during their normal daily activity cycles, and be protected from harsh winter weather in appropriate overwintering sites.

We therefore conducted a preliminary study to determine if there were relationships between natural enemy numbers in cranberry beds and the types of potential natural enemy habitat surrounding those beds.

**Methods**

Satellite imagery was used to identify the cranberry farms participating in this study and the specific beds sampled. Geographic Information System (GIS) software was used to categorize the habitat surrounding each of our specific sample sites in radii of 500 m and 1000 m. Land use was classified into three categories: (1) agricultural (crop land, including cranberry), (2) non-habitat (hardscape (buildings, roads, parking lots, etc.) and water), and (3) natural enemy habitat (pasture, forest, herbaceous cover, vegetated wetlands, etc.). The numbers of natural enemies from our samples were statistically compared with the amount of natural enemy habitat adjacent to the sample sites.

**Results and Discussion**

On average, 65% of the area surrounding our sample sites was categorized as natural enemy habitat. This is a very high value compared with many other cropping systems; in some other crops, as little as 2% of surrounding land can be considered ideal natural enemy habitat. Certain statistical relationships between natural enemy abundance and amount of good habitat were found. For example, there were significant relationships for spiders (general predators), the parasitic wasp family Trichogrammatidae (parasites of the eggs of moths and other insects, including some cranberry pests), and the parasitic wasp family Platygastridae (some species in this family parasitize tipworm larvae). Therefore, we feel that natural enemies are favored by the abundance of “natural” habitat land surrounding cranberry farms, and therefore the natural existing biological controls likely are important in our Integrated Pest Management programs.

**ACKNOWLEDGEMENTS**

We thank the Wisconsin Cranberry Board for funding. Additional resources were provided by the Department of Entomology, University of Wisconsin – Madison. Drs. David Hogg and Russell Groves provided valuable assistance with experimental design and data analysis. Anders Huseh (UW – Entomology) assisted with GIS analysis and Steven Krauth (UW – Entomology) assisted with insect identification. Xia Lee and Theresa Cira (UW – Entomology) provided field and lab assistance. Tim Dittl, Leroy Kummer, and Jayne Sojka assisted in identifying grower cooperators and in other ways throughout the study. We are most appreciative to the participating growers for providing research sites as well as access to their pesticide use records.
Fungal diseases are an important component of cranberry culture. The crop is susceptible to a wide variety of diseases that range in impact from severe to benign (Table 1). Some diseases, such as cranberry leaf gall, are extremely rare and when they occur may have little or no economic impact. Other diseases can flare up in certain years and disappear the next. This is certainly the case with cranberry fruit rot in Wisconsin. It is important to understand that although many diseases described on cranberry are found in all growing regions, some diseases such as fairy ring are more limited in distribution (Table 1). Other diseases such as Valdensinia leaf spot have not yet been reported on cranberry but represent a significant threat. As stakeholders in the cranberry industry we need to be aware of the micro-organisms that travel with our crop and take precautions not to introduce novel pathogens into areas where they do not currently exist. Valdensinia leaf spot is a prime example of such a disease.

### Table 1. Some economically important fungal and fungal-like diseases of cranberry and the distribution of those diseases

<table>
<thead>
<tr>
<th>Disease</th>
<th>Causal Agent</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phomopsis Upright Dieback</td>
<td><em>Phomopsis vaccinii</em></td>
<td>WA, OR, MA, NJ, WI, MI</td>
</tr>
<tr>
<td>Fairy Ring</td>
<td><em>Helicobasidium species</em></td>
<td>NJ, MA</td>
</tr>
<tr>
<td>Valdensinia Leaf Spot</td>
<td><em>Valdensinia heterodoxa</em></td>
<td>BC, WA, OR, NS, NB, ME (on blueberry and other Ericaceae)</td>
</tr>
<tr>
<td>Cottonball</td>
<td><em>Monilinia oxyccoci</em></td>
<td>OR, WA, MA, WI, ME, AK</td>
</tr>
<tr>
<td>Rose Bloom/Red Leaf Spot</td>
<td><em>Exobasidium species</em></td>
<td>MA, WA, OR</td>
</tr>
<tr>
<td>Phytophthora root and runner rot</td>
<td><em>Phytophthora species</em></td>
<td>MA, NJ, OR, WA, BC, WI</td>
</tr>
<tr>
<td>Fruit Rot</td>
<td>See below</td>
<td>See below</td>
</tr>
</tbody>
</table>

Many diseases have a unique causal agent and some diseases such as fruit rot may be caused by more than one pathogen. Since each pathogen has unique characteristics in terms of life cycle, sensitivity to pesticides, and response to environmental parameters, each one must be managed using a series of recommendations that are developed specifically to that disease and causal agent. Each set of recommendations is developed for a specific geographic region and applying recommendations outside of that region is risky and may not provide the expected results. Therefore each time a disease is introduced into a region time and money must be spent learning how to manage the disease, and during that time, potential yield will lost.

One of the most important first steps that should be taken in developing disease management programs is diagnosis. Improper diagnosis can lead to wasted time and expense. For example, there are several species that can cause Phytophthora root and runner rot. Each species has distinct temperature optima and fungicide sensitivity and therefore one recommendation does not cover all species. It is often critical to know exactly which pathogen species is present.
Cranberry fruit rot

Cranberry fruit rot is caused by a complex of several fungal species that, with the right environmental conditions, can act individually or in combination to destroy up to 100% of fruit in a cranberry bed. In Wisconsin, prior to about 2003, fruit rot was rare, and fungicides were used by only a few growers. In the past few years, however, fruit rot has become more common and severe, with reports of 20-40% rot at several marshes. Why is this happening, and what can we do about it?

In Wisconsin we have the same set of pathogens that are present in New Jersey, where they would have annual crop failures if fruit rot were left unchecked. We plant many of the same varieties, although perhaps in different proportions. What differs between Wisconsin and New Jersey is the environment. Wisconsin generally has cooler, less humid summers and shorter growing seasons than New Jersey. The 2010 season was an exceptional one in Wisconsin. The month of April was the second warmest on record, which advanced plant phenology, and therefore the growing season, by 3-4 weeks. Although the summer days were not terribly hot, the nights were warmer than usual. In many parts of central Wisconsin, frequent and heavy summer rains left berries underwater for several hours, or at least left beds wet for prolonged periods. *Taken together, fungal pathogens had ideal conditions to rot cranberry fruit, and they had an extra month to do it!*

The weather is the first thing that we think about when discussing “environment.” However, cultural practices also strongly influence environment in a cranberry bed. The open canopies of newer beds tend to be warm, and that may be why diseases such as early rot (*Phyllosticta vaccinii*) are worse in newer beds than in established beds. In the past decade growers have been demanding more from new and older beds alike. New plantings are being pushed hard with nitrogen. This results in plants with lots of leaves that are supported by small root systems. More leaves are favorable for fungi, since the fungi like leaves every bit or more than they like fruit. More leaves means more irrigation is required. Lots of water on a warm, sandy bed with soft, rank runners is the perfect storm for disease. In established beds the new “norm” is 400+ barrels per acre. Such heavy crops mean that berries are packed together deep in the canopy where they remain wet for most or all of the day. In addition to creating an environment ideal for disease, fungicide coverage is more difficult as cultivation practices become more intensive to support a canopy that feeds high yielding beds.

**Recommendations for fruit rot management**

The current recommended control measures rely on five fungicides: ferbam, mancozeb, chlorothalonil, azoxystrobin and fenbuconazole. All of these fungicides work best when applied before infection occurs, and the key to effective fruit rot management is accurate timing of the fungicide applications. We have found that phenology of flowering is the best indicator for timing applications. In Fig. 1 you can see how rapidly control is lost by delaying the first fungicide application. Applications initiated during bloom perform consistently better than those initiated after bloom. In New Jersey the period where fungicide applications are critical range from early to mid-bloom until three weeks post bloom. Maintaining a fungicide residue on the fruit surface during this time will reduce the incidence and risk of fruit rot.
Each of the registered fungicides displays different properties and should be used in a manner that optimizes efficacy and minimizes phytotoxicity. In Table 2 we have summarized the characteristics of each fungicide as it applies to cranberry fruit rot use and control.

### TABLE 2. FUNGICIDE USE RECOMMENDATIONS FOR CRANBERRY FRUIT ROT

<table>
<thead>
<tr>
<th>Fungicide*</th>
<th>REI</th>
<th>PHI</th>
<th>Maximum amount permitted</th>
<th>Suggested use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abound</td>
<td>4 h</td>
<td>3 days</td>
<td>92.3 fl.oz product</td>
<td>Use at early bloom in combination with Indar. Narrow spectrum fungicide with low efficacy to <em>Coleophoma</em>.</td>
</tr>
<tr>
<td>Chlorothalonil*</td>
<td>12 h</td>
<td>50 days</td>
<td>3 applications</td>
<td>Use after full bloom. Very effective broad spectrum fungicide. Can be phytotoxic to flowers and scar fruit.</td>
</tr>
<tr>
<td>Ferbam Granuflo</td>
<td>12 h</td>
<td>Note**</td>
<td>5 applications</td>
<td>Use during early bloom. Moderately effective broad spectrum fungicide.</td>
</tr>
<tr>
<td>Indar 2F</td>
<td>12 h</td>
<td>30 days</td>
<td>4 applications</td>
<td>Use at early bloom in combination with Abound. Narrow spectrum fungicide with low efficacy to <em>Colletotrichum</em> species.</td>
</tr>
<tr>
<td>Mancozeb*</td>
<td>24 h</td>
<td>30 days</td>
<td>See label</td>
<td>Use during mid–late bloom. Broad spectrum fungicide; can inhibit color.</td>
</tr>
<tr>
<td>Mankocide</td>
<td>24 h</td>
<td>30 days</td>
<td>96 lb</td>
<td>Similar use pattern as mancozeb.</td>
</tr>
<tr>
<td>Copper products</td>
<td></td>
<td></td>
<td></td>
<td>Not useful for fruit rot control.</td>
</tr>
</tbody>
</table>

*Additional trade names:
- **Chlorothalonil:** Bravo 90DG, Bravo 720, Bravo Ultrex, Echo, Equus, Ensign 720, Supanil 720, Terranil 6L, Terranil 90DF.
- **Mancozeb:** Dithane DF, Dithane F-45, Dithane M-45, Manex II, Manzate DF, Penncozeb DF or WP, Maneb 75DF, Maneb 80, Maneb + Zinc F4.
- **Ferbam** PHI is 28 days post mid-bloom.
Trouble shooting disease management failures

In 2005 a survey was conducted in New Jersey to determine the magnitude of losses due to cranberry fruit rot. In that survey 200 samples were collected from 31 beds planted to the cultivar Stevens. The total area sampled was 130 acres and the total average yield was 412 bbl/acre. Of that yield there was an average of 24% fruit rot which amounted to 9000 bbl. This result demonstrated that the management strategies were not working and required significant revision. Most of the recommendations were developed using small research plots to test chemical types and timing to optimize a spray calendar. When scaling up from plot work to commercial fields there are several factors that can lead to control failure. In the table below is a checklist of issues to help troubleshoot disease control failures.

<table>
<thead>
<tr>
<th>Table 3. Factors that can reduce efficacy of a fungicide spray program for cranberry fruit rot</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chemical type and properties</strong></td>
</tr>
<tr>
<td><strong>Was the interval between applications too long?</strong> Each chemical will dissipate at a different rate. This property dictates how frequently a fungicide must be reapplied to maintain the appropriate concentration on the plant surface.</td>
</tr>
<tr>
<td><strong>Application</strong></td>
</tr>
<tr>
<td><strong>Timing</strong></td>
</tr>
<tr>
<td><strong>Pathogen</strong></td>
</tr>
<tr>
<td><strong>Distribution (in canopy)</strong></td>
</tr>
<tr>
<td><strong>Distribution (in field)</strong></td>
</tr>
<tr>
<td><strong>Chemical stability and compatibility</strong></td>
</tr>
</tbody>
</table>
Conclusions

Fruit rot control is a critical component to producing healthy, profitable crop. High levels of fruit rot can affect yield as well as quality and create many problems during harvest and delivery. In some regions fruit rot is problematic every year, whereas in other areas such as Wisconsin fruit rot occurs occasionally. It is evident that the fungal load is sufficient in Wisconsin to cause significant loss; however, the environment dictates if it will be a “bad” fruit rot year or not. It is likely that significant expenditure on fungicides and crop loss to fruit rot could be avoided if the threat of fruit rot could be predicted. Such a predictive scheme could likely be implemented through research.
ADDRESSING SUSTAINABILITY IN U.S. AGRICULTURE:
BACKGROUND AND A WAY FORWARD

Jed Colquhoun, Associate Professor and Director, Wisconsin Institute for Sustainable Agriculture

While sustainable agriculture certainly is not a new topic, the use of “sustainability” as a marketing concept is. Despite recessionary times, the interest in sustainability continues to grow at a rapid pace, yet from producers to consumers much confusion exists about the meaning and value of such efforts. With this in mind, it would be prudent for agricultural producers to become engaged in sustainability discussions and take ownership of a way forward that addresses local values, manages economic risk and reduces environmental impact.

Background of sustainability and current efforts in agriculture:

The vast majority of consumers are either unaware of sustainability efforts or are confused by them. While “green,” “eco-friendly,” “fair,” “sustainable” and other terms are very popular within marketing groups, consumers aren’t necessarily engaged at a similar level. A recent International Food Information Council (IFIC) consumer survey indicated that 50% of consumers knew nothing at all about the concept of sustainability in food production, while 23% knew a little (IFIC, 2010). Consumers that are aware of the concept are often confused by it, to the point where the Federal Trade Commission (FTC) is now releasing a revision of their Green Guides – a document that provides guidance on appropriate use of the aforementioned terms in product marketing – for the first time in over a decade. According to FTC chairman Jon Leibowitz:

“In recent years, businesses have increasingly used ‘green’ marketing to capture consumers’ attention and move Americans toward a more environmentally friendly future. But what companies think green claims mean and what consumers really understand are sometimes two different things.” (FTC, 2010)

Thus far, sustainability in food production doesn’t add value – it is an expectation. Much of the effort around sustainability in agriculture adds cost to production, such as additional labor costs that result from increased scouting to the actual process of documenting sustainability and enhancing biodiversity through non-crop habitat improvement. Unlike industrial processes (see below), these efforts often have a poor if any return on investment. Consumers even expect “sustainable” products to be cheaper given that they ideally would require fewer inputs to produce. Authors of a recent Deloitte/Grocery Manufacturers Association (GMA) consumer survey on the subject concluded that:

“...most shoppers would like green products to be price competitive. They often don’t understand or buy into the rationale that a green product should be more expensive. Shoppers don’t understand why a green product should cost more if it was manufactured with less packaging or it was transported less distance.” (GMA/Deloitte, 2009)

This survey and others suggest that there is a strong difference between what consumers say they will purchase and what is actually in their grocery carts in the checkout lane. In the 2009 Deloitte/GMA
survey, 95% of shoppers indicated that they would buy green but only 22% actually did so. Furthermore, only 2% were committed to buying green.

Similar consumer responses were observed in marketing challenges with the Healthy Grown Potato Program in Wisconsin. The program is the result of a unique collaboration of organizations, including growers through the Wisconsin Potato and Vegetable Growers Association, University of Wisconsin, Michael Fields Agricultural Institute, World Wildlife Fund, International Crane Foundation, and Defenders of Wildlife, among others. Research that provided the basis for the standards began in the early 1980s. The developed standards are rigorous and involve all aspects of potato production from seed through crop harvest and storage. They restrict pesticide use, require the adoption of integrated pest management (IPM), and require ecosystem services beyond the agricultural fields that are designed to preserve biodiversity in the landscape. By 2005, IPM adoption among program participants increased 30 to 40% compared to the first certified crop in 2001. In fact, the standards are so rigorous that not all fields enrolled in the Healthy Grown Potato program pass - in 2006, only 35% of the fields enrolled passed the minimum bar for certification. The Healthy Grown certification process is conducted by Protected Harvest, a third-party organization hired by the growers. The investment in research and rigor of the standard have not gone unnoticed - in 2003 the collaborative team received the USDA Secretary Honor Award for Maintaining and Enhancing the Nation's Natural Resources and has since been the recipient of several other accolades. While it may “feel right” to grow potatoes this way, it certainly isn’t cheap. Alternative pest management and production practices are often more expensive, the certification process requires employee time and a hired third-party organization, and growers are required to invest annually in the ecosystems services component of the standard.

An award-winning collaboration among academics, environmental advocates and growers, a rigorous science-based standard that has been documented to improve IPM adoption and preserves ecosystem services - so what’s the problem? First, consumers aren’t convinced about paying for environmental conservation, particularly in this troubled economy. Second, the potato growers have invested in a significant amount of market research and implementation into the project. After hearing about the Healthy Grown story, 70% of consumers indicated that they were more likely to purchase Healthy Grown potatoes. Moreover, of those that were interested in purchasing the product, 88% indicated that they would be willing to pay 25 cents more per bag. In 2004 and 2005, however, just over 1% of product sold was actually sold as Healthy Grown, and certainly not at a value-added price.

Sustainability is measurable in industrial processes, but isn’t easily quantified in agricultural production. Many of the inputs in industrial processes (including food processing) that pertain to sustainability, such as water, energy and fuel use can be measured as easily as reading the utility bill. The impetus is often “measurement leads to management,” and efficiencies or alternative sources are employed that have a rapid return on investment. Regardless of the input, such strategies save money. Cyber communication and monitoring technologies have made this process quite feasible and affordable. In fact, inputs are often monitored by the minute, with a red flag raised when they exceed goals. This technology also allows for direct communication with and participation by consumers. In food processing, for example, the Kettle Brand® web site (www.kettlebrand.com) includes a link to an online public monitoring system that reports electric generation from wind turbines on the roof of their Beloit potato chip plant by the
This alternative energy generation is then equated in terms that consumers understand, such as gallons of fuel saved.

The description of these successes in industrial and food processing is not meant at all to belittle sustainability efforts – but rather to highlight them. The use of technology to improve efficiencies is good for the manufacturer, for the consumer, and for the planet. Unfortunately, we have not been able to report such success stories when it comes to agricultural production. The sustainability parameters of interest, such as biodiversity, soil health and water quality, cannot be measured with a simple meter – they require expensive and cumbersome monitoring. Additionally, agricultural production is extremely variable by crop, production region and season, thus the one-size-fits-all approach is inappropriate. Agricultural sustainability efforts often focus on a practice-based approach given the challenges in measuring outcomes. In other words, while practice-based sustainability programs may not measure soil sediment in water, they instead ask producers about tillage practices. The National Organic Program is an example of such an approach. The challenge here is that practices may not relate directly to outcomes, or in some cases this relationship is poorly understood.

At some point, a buyer or consumer value system guides choices around sustainability. Agriculture is a complex biological system, confounded by broad seasonal variation and overlaid with management systems that vary by farm. Actions taken to improve an individual sustainability metric often affect several other parameters – and not always in a positive manner. For example, reducing herbicide use in favor of increased cultivation may reduce overall pesticide use but may also increase risk of soil erosion.

Greenhouse gas emissions in agriculture provide a striking example of the potential role of consumer values in sustainability metrics. Weber and Matthews (2008) compared the greenhouse gas emissions associated with food production with that of food distribution. They reported that 83% of the household carbon footprint associated with food is in production and only 11% in what is considered “food miles.” Four percent of the greenhouse gas emissions were associated with transport from producer to retailer. Furthermore, the authors report that red meat production is about 150% more greenhouse gas-intensive than chicken or fish. The authors conclude that:

“...dietary shift can be a more effective means of lowering an average household’s food-related climate footprint than “buying local.” Shifting less than one day per week’s worth of calories from red meat and dairy products to chicken, fish, eggs, or a vegetable-based diet achieves more GHG reduction than buying all locally sourced food.”

There currently exists a wide gap between high-altitude metrics programs designed to capture change on a national scale and local, practice-based sustainability efforts. Several national efforts are currently underway that are developing programs that will capture broad change, such as at the watershed level, in typical sustainability parameters such as land and water use, energy and carbon footprint. These programs have made great headway in recent years and will be critical in the efforts to communicate advancements in agriculture to regulators, environmental advocates and the general consumer. They do not, however, instigate local engagement and change at the field level, as the intention has never been to advise someone on how to farm or develop “best management practices.” Local change
requires local grower engagement, regionally- and crop-appropriate best management practices and prioritization of efforts around values that are locally important. For example, 75% of the economic impact from potato and vegetable production in Wisconsin is enabled by irrigation, thus water is held as a high value by the agricultural community. In contrast, labor constraints are of relatively less concern given the mechanized nature of production in this area. The downside to local, practice-based sustainability programs is that the impact of such efforts is often not captured or communicated beyond agriculture. Additionally, the multitude of local sustainability efforts in various crops, by several entities (public and private) and without a consistent framework or process has led to challenges in duplicative programs and messaging (i.e. one production region is unintentionally put forward as “more sustainable” than other regions for the same crop, further confusing all involved).

A way forward

Future sustainable agriculture efforts should be based in the context outlined above: consumer confusion and lack of engagement when filling the grocery cart will likely persist, sustainability programs of some sort will be an expectation and not generate a price premium and local change will require local grower action. While this seems like a lot to ask of agriculture, a reasonable way forward exists that will not be overly burdensome (economically or time-wise), will capture ground-level change and report through respected high-level communication channels and will result in regionally- and crop-appropriate best management practices.

Components of a way forward. Three pieces are necessary in a successful framework: high-altitude, outcome-based metrics and communications programs, a set of rigid guiding principles that frame and facilitate all local sustainability programs and regionally- and crop-appropriate best management practice (BMP) sustainability workbooks (Figure 1). The high-altitude outcome-based metrics programs are far down the road of development, are well-respected and will be integral players in this way forward. Local, practice-based (BMP) sustainability workbooks are also in development or in use in several situations. The local effort represents the appropriately nimble piece in this way forward, but would benefit greatly from the currently missing third piece – the rigid guiding principles that create common ground among programs.
Figure 1. A way forward for sustainable agriculture efforts that combines existing or developing national sustainability metrics, a framework to bridge efforts across common ground and individual sustainability programs.

A framework of guiding principles to bridge local sustainability programs and national sustainability metrics. The rigid framework of guiding principles would be relatively simple and the result of a transparent process of agricultural producer involvement. As such, the guiding principles certainly aren’t set, but could likely include:

Regionally- and crop-appropriate BMPs that are incorporated in workbooks that will guide producer decisions and provide educational materials on alternative practices. Such BMP workbooks should allow for internal or local agricultural community self-scoring, allow for local sustainability values to be emphasized and engage growers, academics and appropriate NGOs. It is reasonable that the BMP workbooks will drive education and change that could later be captured in the national metrics programs. It is important to note that the guiding principles will require BMP workbooks but will not create them, due to the focus on locally-appropriate practices.

Grower involvement in the creation of BMP workbooks in a manner that protects the economic well-being of future farming, while reducing any associated environmental risk. This local agricultural community involvement is absolutely critical given the myriad of players and interests in the sustainability arena.

While grower-involvement in the creation of local sustainability programs is critical, the efforts must also be defendable and verifiable. There are several mechanisms that should be explored, ranging from appropriate environmentally-oriented NGO involvement with groups that appreciate food and agriculture to third-party certification to a simple affidavit of responsible participation.

Local efforts must be science-based. BMPs should be based on repeatable and peer-reviewed research and not on anecdotes or irrational pursuits. Science-based BMPs currently exist or are in development in many crops and regions and would involve cooperation with appropriate land-grant institutions and other agricultural research entities.

Individual local sustainability programs will drive local engagement and change. The efforts of local and national grower organizations should be directed not only to participation in the development of the guiding principles but also in the facilitation of appropriate BMP workbook development. It is not appropriate to dictate what exists in each of these workbooks on a broad scale; that should be based on local values, issues and opportunities. This isn’t to say that local efforts should ignore the parameters included in national metrics as most of these will be commonly held among crops and regions, but the specific manner in which these parameters are addressed should be a local decision. It is important to recognize and avoid potential pitfalls in the development of BMP workbooks:

Choose initial partners wisely. It is important to have a broad portfolio of interests at the table that will take ownership of the process and lend credibility (see “green-washing” below) but also have a strong
appreciation for agriculture and food. Everyone has their own “agenda,” openly broadcast or not, but it is important to share a common goal from the beginning of the process.

Avoid the perception of green-washing. From the outside, potential signs of green-washing might include: complete avoidance of tough issues, the attempt to simply document what agriculture has historically done without the hint of positive trajectory or change, lack of scientific basis for practices and lack of involvement from outside traditional agricultural producers.

Include practices that are defensible and science-based. Avoid anecdotal practices unless they are documented to improve the given parameter, such as “more bird boxes seem to attract more important bird species.”

Recognize that taking several smell steps to improve sustainability in a given area may be just as important as one large step and that these actions are often not independent. As such, avoid the strict ranking of best management practices (such as 1 through 5, with 5 being best), as this pigeon-holes participants into a single “gold standard.” Instead, offer points for a list of acceptable best management practices, allow multiple practices to be selected within a parameter and total the score in that area.

Test-run the BMP workbooks with a few producers to gauge their understanding of the questions, the appropriateness of the answers and the level of commitment required to complete the process. It is important that these documents are modified through time based on new data and growers’ experiences.

References


Canopy management is an important part of perennial fruit crop production. All high-value fruit crops utilize cultural practices and invest significant resources focused on canopy management. The objective of canopy management is to manipulate the canopy to achieve optimal conditions for fruit production. This includes ensuring adequate aeration to reduce disease pressure, opening the canopy and creating an even canopy to improve penetration of light and chemicals, and stimulation of new, fruitful growth. Without any canopy management, cranberry beds can develop a thick layer of unrooted runners which leads to an increasing amount of vegetative growth relying on a limited amount of roots to take up sufficient water and nutrients. Additionally, there will be reduced stimulation of new upright growth, which is critical for fruit production and a dense canopy can lead to conditions that favor disease development. Management practices used by Wisconsin growers to manage canopy growth include; nutrient management, sanding and pruning.

Nutrient Management. Nutrients, especially nitrogen, play a key role in managing the amount of vegetative growth. Increasing amounts of N application to the crop result in increased biomass accumulation (Sandler and DeMorranville, 2009). Over application of N can result in excessive vine growth, reduced reproductive uprights (Sandler and DeMorranville, 2009), increased fruit rot, and reduced yield. Tissue analysis and visual assessment of vine growth are critical to ensure that excessive N is not applied to the bed.

Sanding. Sanding is, by far, the most common practice used by Wisconsin cranberry growers on a regular basis. Every 2-5 years a layer of sand 0.5-2” thick is spread on the ice during the winter and allowed to settle on the canopy as the ice melts. As the sand settles on the canopy, it anchors runners and covers bare wood at the base of uprights, resulting in rooting and stimulation of new uprights. In addition to stimulating new root and shoot growth, sanding can provide other benefits to cranberry production. Application of sand buries leaves which increases the rate of organic matter breakdown and can bury fungal inoculum. If the application of sand is sufficiently heavy, there can be some reduced insect and weed pressure, although the effectiveness of this is dependent on a heavy, even application across the bed. A newly sanded bed can benefit from more rapid warming of soil in the spring. This cultural practice is particularly critical in new bed establishment in order to ensure adequate rooting.

While there are many benefits to sanding, there are some drawbacks. After the application of sand there is often a reduction of yield for 1 or 2 years following the application. The severity of the yield reduction depends on how heavy the sand application is (DeMoranville and Sandler, 2009). A heavy application of sand can result in uneven settling of the subsoil and it can be difficult to ensure the uniformity of the sand distribution across the bed. The cost of sanding can be significant especially if the sand is not readily available on site. Despite these drawbacks, the practice of sanding has been an important part of maintaining the productivity of cranberry beds.

Pruning. Pruning is a technique used to manage the canopy by removing vegetative growth to optimize the canopy conditions for production. In most fruit crops, pruning is the most important practice to
manage the canopy and stimulate fruitful growth. The adoption of pruning as a regular practice is variable among WI cranberry growers with some using it as a regular part of a management routine and other growers that have never pruned. Cranberries are perennial vines and if left unmanaged a cranberry bed can develop uneven growth and excessive amounts of vegetative growth leading to dense canopies. The objective of pruning is to remove excessive runners, stimulate new upright growth, even out and open up the canopy to improve light and chemical penetration and air flow. Heavy pruning is also done to provide cuttings to establish new plantings.

The earliest studies on pruning were conducted in New Jersey and showed improvements in yield in the first or second year after pruning (Chambers, 1918). A more recent study showed that a light pruning (250-500 lb/Acre) had a positive effect on yield and all levels of pruning severity resulted in the same or higher yields compared to sanded beds (Table 1). Pruning of more than 1 ton/acre can result in a yield reduction of 10% or more in the following year, however the stimulation of new fruitful growth can lead to increased yields in later years (Sandler, 2010).

The benefits of pruning may vary depending on the characteristics of the bed. More fertile soils and vigorous vines may benefit the most from regular pruning. Pruning can also be beneficial if the growing conditions during the season led to excessive vegetative growth, as was the case in WI during the 2010 season. Despite reducing the amount of nitrogen applied to the crop, many growers observed excessive vegetative growth resulting in dense, uneven canopies. If the runners are left on the canopy, the fruiting zone will have reduced light penetration, aeration, and poor penetration of chemicals. A light to moderate spring pruning can remove a significant amount of the runners with minimal impact on uprights.

**Table 1.** Yield of cranberry beds in the year of treatment (2006) and the following year (2007). Treatments were control (no treatment applied), light, moderate and heavy sanding and pruning. (Table adapted from Suhayda et al, 2009).

<table>
<thead>
<tr>
<th>Severity of Treatment</th>
<th>2006 Yield (bbl/Acre)</th>
<th>2006 Yld of Pruned vs Sanded beds</th>
<th>2007 Yield (bbl/Acre)</th>
<th>2007 Yld of Pruned vs Sanded beds</th>
<th>Net Yield of Pruned vs Sanded Beds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pruning</td>
<td>Sanding</td>
<td>Pruning vs Sanded beds</td>
<td>Pruning</td>
<td>Sanding</td>
</tr>
<tr>
<td>Control</td>
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<td>209</td>
<td>+23</td>
<td>166</td>
<td>202</td>
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<tr>
<td>Light</td>
<td>349</td>
<td>292</td>
<td>+57</td>
<td>215</td>
<td>215</td>
</tr>
<tr>
<td>Moderate</td>
<td>216</td>
<td>137</td>
<td>+79</td>
<td>140</td>
<td>102</td>
</tr>
<tr>
<td>Heavy</td>
<td>177</td>
<td>109</td>
<td>+68</td>
<td>154</td>
<td>60</td>
</tr>
</tbody>
</table>

There has been a growing interest in using pruning as a complementary practice to sanding, particularly in MA where sand is often required to be transported to the cranberry marsh. When the cost of transporting sand is considered, pruning is a significantly cheaper alternative (Table 2). Although the economic benefit may not be as significant if sand is in close proximity to the marsh, it may present a cost effective compliment to sanding as it can be more effective than sanding in evening out growth in the canopy. In addition, pruning can provide income if the cuttings are sold or used on the marsh to establish a new bed or fill in poorly established areas.
Pruning provides growers with a technique to help manage the canopy with more controlled measures than sanding can provide. While pruning can not fully replace the role of sanding as it does not provide additional rooting medium, adding pruning into a regular canopy management program could provide growers with a technique that would improve the productivity of the bed and increase the grower’s ability to precisely manage the crop.

There are several types of mechanical pruners used by growers but there are a few principles that apply regardless of the equipment (Sandler, 2010):

- Sharpen the knives and conduct regular maintenance on the pruners
- Prune water harvested beds in the spring prior to bud break
- Avoid pruning wet vines as the blade does not cut as well and vines tend to drop more leaves
- Prune in the same direction vines are growing
- If picking fresh fruit, prune at the same time as harvest

Canopy management is not a new concept in cranberry production. Early literature makes reference to the practice of mowing and burning beds that had become “dense, clumpy and tangled” (Darrow et al, 1924) to rejuvenate the productivity of the bed. Pruning was a regular part of production when cranberries were dry harvested to manage runner growth that interfered with the harvest scoops (Darrow et al, 1924). Later, machines such as the ‘Furford’ were developed to harvest and prune at the same time (Furford, 1959). In recent years, the focus of canopy management has been on sanding and nutrient management. Pruning offers a cost effective management technique that could significantly improve the canopy environment for producing a crop, especially in beds that tend to have uneven growth and in years like 2010 when conditions resulted in excessive vegetative growth. In these conditions, there may be benefit to including a light pruning in the regular management of the crop.

References

DeMoranville and Sandler (2009). Implementation of periodic mowing in the management of ‘Stevens’: An alternative to sanding or pruning? Cranberry Station Research Reports.


ROOTS, SHOOTS AND BOOTS: 
THE NUTRIENT MANAGEMENT TRILOGY

Rebecca Harbut, Dept. of Horticulture, University of Wisconsin-Madison

Cranberries are native to low nutrient environments and have evolved strategies which allow them to be efficient at taking up and utilizing nutrients. Compared to other fruit crops, the nutrient demands of cranberries are relatively low. By utilizing diagnostics tools such as soil and tissue analysis and combining these tools with observations and experience, nutrient management plans can be developed to allow for efficient use of applied nutrients that ensures optimal crop productivity.

**Nutrient Sources**

The soil in a cranberry bed contains different ‘pools’ of nutrients that differ in regards to the availability to the plant (Fig.1). The most available nutrients are those that the plant has stored in its own tissue; this is a critical source of nutrients for the early spring growth. All nutrients that are taken up by the plant must be dissolved in the soil solution. When a fertilizer, which is in the form of a salt, comes into contact with the soil solution, the salt dissolves into its ion form. Every nutrient ion has a charge, those that have a positive charge are called ‘cations’ and those with a negative charge are ‘anions’ (Table 1). Therefore when a nutrient is taken up by the plant it is taking up an ion that is dissolved in the soil solution. There are three main mechanisms that these nutrient ions move through the soil to come into contact with the root surface to be taken up:

1) Interception – the root comes into contact with the nutrient as it moves through the soil profile, this is a minor contribution of plant nutrient uptake

2) Mass flow – the movement of ions with the flow of water. This is most important for N, Ca and Mg

3) Diffusion – the movement of ions from an area of high to low concentration. This is a slower movement of nutrients through the soil profile and is the primary transport mechanism for P and K

<table>
<thead>
<tr>
<th>Cations ( + charge)</th>
<th>Anions (- charge)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium (NH₄⁺)</td>
<td>Nitrate (NO₃⁻)</td>
</tr>
<tr>
<td>Potassium (K⁺)</td>
<td>Phosphate (H₂PO₄⁻ and HPO₄²⁻)</td>
</tr>
<tr>
<td>Calcium (Ca²⁺)</td>
<td>Sulfate (SO₄²⁻)</td>
</tr>
<tr>
<td>Magnesium (Mg²⁺)</td>
<td>Borate (BO₃³⁻)</td>
</tr>
<tr>
<td>Manganese (Mn²⁺)</td>
<td>Molybdate (MoO₄²⁻)</td>
</tr>
<tr>
<td>Zinc (Zn²⁺)</td>
<td></td>
</tr>
<tr>
<td>Iron (Fe²⁺)</td>
<td></td>
</tr>
<tr>
<td>Copper (Cu²⁺)</td>
<td></td>
</tr>
</tbody>
</table>
Part 1: Roots

Understanding the soil environment is essential to effectively manage nutrients. Four key factors play a critical role in determining the availability of nutrients to the cranberry plant: soil pH, soil composition, soil moisture and aeration and soil biology.

Soil pH. Cranberries evolved in low pH environments and require a soil pH between 4.2 and 5.5 for most efficient uptake of nutrients. If the soil is outside of the ideal conditions the nutrients are not in a form that is available to the plant. Under these conditions, a nutrient deficiency may not be corrected by adding fertilizer if the problem is due to poor availability of the nutrient, rather than presence of the nutrient in the soil.

Soil composition. A newly constructed bed is composed primarily of sand but as the bed ages, layers of organic material accumulate and the profile of the bed changes dramatically. As organic matter accumulates in the bed, there is an increased amount of nutrients supplied by decomposing organic matter and an increase in the cation exchange capacity (CEC). Soils with high CEC can hold nutrients on exchange sites that are readily available for the plants. Therefore, a soil with low CEC (ie. a new bed) will require smaller and more frequent applications of fertilizer compared to an established bed that has higher organic matter. As the bed matures, there will also be an increasing amount of nutrients that are supplied from the decomposing organic material and the soil profile will be able to retain a large amount of nutrients.

Soil moisture and aeration. As previously mentioned, all nutrients that are taken up by the plant must first be dissolved in the soil solution. Managing soil moisture is a critical component of nutrient management. A constant supply of water is important to ensure the plant can take up nutrients when needed. However, if the soil is too saturated, root growth will be negatively impacted and will reduce the ability of the plant to effectively take up nutrients. Soil moisture probes can be a valuable tool to ensure that appropriate moisture levels are maintained in the bed.

Soil Biology. Cranberries have developed symbiotic relationships with mycorrhizae, which are fungal organisms that live within the roots that benefit the cranberry plant by increasing nutrient uptake. As the bed ages, the number of cranberry roots infected by mycorrhizae increases. A new bed (2-5 years old) has about 5-10% of the roots infected with the mychorrizae, whereas a bed that is 32-38 years old can have over 80% of the roots infected with these beneficial fungi (Scagel, 2003). As the infection rate increases, the plants become more effective at taking up nutrients from the soil. In addition to mycorrhizae, there are other soil bacteria that break down organic matter which provides a source of nutrients to the plants. It is important to manage the soil moisture, avoiding excessively dry or wet conditions and ensure that the bed has adequate aeration to encourage mycorrhizal and bacterial populations.

Soil Analysis

Soil analysis is an important part of nutrient management and should be conducted every 3-4 years. Soil analysis can effectively monitor soil pH, CEC and can help identify trends in soil nutrient levels, such as P.
accumulation or depletion. There are however some limitations to soil analysis in cranberries. Most extraction methods used by the labs are not designed for low pH soils, so the amount of nutrients available to the plant is often overestimated by soil analysis. Therefore, soil analysis and tissue analysis are often not well correlated in cranberries. Despite these limitations, the analysis provides valuable information about soil characteristics such as pH, organic matter content, and nutrient content which can help identify long-term trends. Be sure to keep your records and every time you conduct a new analysis, take out your previous reports and look for changes that may have occurred.

**Part 2: Shoots**

*Tissue Analysis*

Tissue analysis is the most accurate way to determine the nutrient status of the vines and is a critical component of a nutrient management plan. Extensive research has established sufficiency ranges for nutrient levels in the tissue during the sampling period (mid-August to mid-September), there is no benefit to having tissue nutrient levels above the sufficiency range. Annual samples should be collected to inform nutrient management strategies for the following season. When collecting tissue samples, it is important to collect samples from distinct ‘management blocks’, areas that you manage in a similar way. Be sure to track the changes that may occur in your tissue analysis by looking at previous years reports and record the relationships between nutrient status and crop performance. Keeping good records will allow you to evaluate the impact changes in your nutrient management may have on crop performance. Remember that the tissue analysis is only as good as the sample you collect!

While tissue analysis is perhaps the most important tool for nutrient management, the information provided by the report should not be the only source of information used when making decisions. Consider the results together with soil analysis, previous experience, observations in the field and crop performance.

**Part 3: Boots**

While soil and tissue analysis are extremely valuable tools, there is nothing that can replace time spent in your boots walking the beds and observing the vines. There is a great deal of complexity in the cranberry system and cranberry vines will perform differently from year to year, across a marsh and sometimes across a bed depending on factors such as weather, soil type and water status. It is critical to have good records of your observations throughout the season so that you can best utilize the information generated by the soil and tissue analysis. For example, in 2010, many tissue analysis indicated that vines had low nitrogen levels. However, if you took one step into many beds the growth of the vines clearly indicated otherwise!

**Summary**

- When making nutrient management decisions, consider the WHOLE story: roots (soil conditions), shoots (tissue nutrient status) and boots (observations from the field)
• Be sure to collect tissue and soil samples properly – the data is only useful if the sample was collected properly
• Keep your tissue and soil reports from previous year and take them out every time you get a new report – this will help you track trends
• Consider the impact of environmental conditions – you may have to make in-season adjustments to your plan based on weather conditions and your observations
• Monitor the soil moisture status in the bed to ensure optimal conditions for nutrient uptake and microbial activity
• Spend time with your vines!

References

UW-MADISON CRANBERRY BREEDING PROGRAM HIGHLIGHTS
Brent McCown and Eric Zeldin, Department of Horticulture, University of Wisconsin-Madison

Over the past several years and expected to continue into the next several years, our program has focused on a number of initiatives:

- Support ‘HyRed’ growers
- Facilitate scale up and release of new cultivar ‘Sundance’
- Work with grower/cooperators to scale up and evaluate other promising selections
- Perform and evaluate a limited number of new crosses aimed at enhancing resiliency in response to climate change
- Continue to evaluate how to handle tetraploid cranberry
- Other assorted more risky activities including the association of cranberry and naturally occurring bacteria.

This brief article will focus on the new introductions.

Hyred planting status

The number of growers planting HyRed continues to slowing increase:

<table>
<thead>
<tr>
<th>Year and location</th>
<th># licenced growers</th>
<th>Total acres on record</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>30</td>
<td>120</td>
</tr>
<tr>
<td>2010</td>
<td>37</td>
<td>200+</td>
</tr>
<tr>
<td>% in WI</td>
<td>75</td>
<td>80</td>
</tr>
</tbody>
</table>

Encouragingly, we have not received any information of major problems in the last two years.

New release status:

In 2010, WARF filed a patent application for A-X14, commonly called ‘Sundance’. Details can be seen in the patent application that is attached to this article. In summary, the traits claimed include:

- Excellent yearly bud set
- Large berry size (early and late berry bulking)
- Color development ahead of ‘Stevens’
- Very good vigor that results in uniform plantings
- High tolerance to low and high N fertilization
- Reliable and performance over multiple seasons

With these traits, ‘Sundance’ promises to duplicate ‘Stevens’ in flexibility and reliability but be an improvement in yield, fruit size, and earlier coloration. Over 14 acres have been planted for propagation purposes and availability of planting stock is anticipated in 2012.
**‘Sundance’ Patent Application**


**BACKGROUND OF THE INVENTION**

Latin name of the genus and species of the plant claimed: *Vaccinium macrocarpon* Ait.


The present invention relates to a new and distinctive cranberry clonal variety having significantly higher yields, larger fruit size, more favorable bud set traits, tolerance to high levels of fertilizer, high red pigmentation and ability to produce excellent crops at an early age as compared to the leading commercial cultivar, ‘Stevens’.

The American cranberry, *Vaccinium macrocarpon* Ait., is a small fruit grown commercially in the temperate regions of North America and Chile. The United States is presently the major producer of cranberries, with the combined Wisconsin and Massachusetts harvests accounting for the majority of U.S. and world annual production. Currently Wisconsin produces over half of the U.S. crop.

The American cranberry is well known for its tart flavor and its red pigment. The importance of adequate pigment content (measured as total anthocyanins or Tacy, and expressed as mg per 100 grams fresh fruit) is recognized by most processors as they are known to give a reduced value to poorly colored fruit. Cranberry selections widely grown today have generally not experienced the extensive breeding as seen in other fruit-bearing species. Many selections were derived directly from native areas or from managed beds of mixed origin. For example, ‘Ben Lear’ (unpatented) is a cranberry selection taken directly from the wild in Wisconsin in the early 1880’s, and is widely grown in short-seasonal areas due to its early fruit development and high color content. The U.S. Department of Agriculture undertook, in cooperation with state experimental stations, one generation of breeding in an attempt to improve U.S. cranberry cultivars. The breeding resulted in the introduction of the ‘Stevens’ (unpatented) variety in the 1950. The ‘Stevens’ variety is today the most widely grown cultivar and is characterized by dependably good yields, but only moderate color development, especially in short-seasonal regions such as Wisconsin.

**BRIEF SUMMARY OF THE INVENTION**

The present invention relates to a new and distinct cranberry variety. The variety is designated “WI92-A-X15” and was produced through controlled breeding performed in 1990 at the University of Wisconsin-Madison. Cranberry variety “WI92-A-X15” is derived from a controlled cross of the ‘Stevens’ variety and a selection designated “Boone’s BL8” (originally derived from an open-pollinated population of seedlings of ‘Ben Lear’).
“W192-A-X15” cranberry was initially selected based on large berry size in August of 1992 and was clonally propagated for field trials planted in 1994. “W192-A-X15” demonstrated continued production of large berries and favorable bud set traits, including both good fruit bud set in general and excellent bud set on fruiting stems (‘uprights’) specifically. “W192-A-X15” was been compared to ‘Stevens’ both in plots within common beds (2004 and 2009 data presented below) and in full beds utilizing a 0.66 acre dedicated bed planted in 2006 and on a 2 acre portion of a larger bed planted in 2007. In late September of 2009, four years after planting, the 0.66 acre bed was harvested and in mid-October of 2009, three years after planting, the 2 acre bed was harvested. The yields were compared to established beds of ‘Stevens’ harvested in the same time period (Table 1).

“W192-A-X15” exhibits significantly higher yields (up to approximately two times higher than variety ‘Stevens’), larger fruit size, more favorable bud set traits, tolerance to high levels of fertilizer, earlier and higher red pigmentation, and an ability to set excellent crops at an early age as compared to ‘Stevens’.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1. WI92-A-X15 uprights with fruit, Monroe County, Wisconsin, Sept. 30th, 2009. Note the large size and good pigmentation of the fruit and the presence of flower buds on the fruiting upright tips.

DETAILED BOTANICAL DESCRIPTION

The distinctive characteristics of the new “WI92-A-X15” variety are shown in Tables 1 and 2 and described in detail below.

Visual analysis of “W192-A-X15” cranberry samples taken between early September and early October 2009 demonstrated fruit color development and fruit size exceeding that of parent cultivar ‘Stevens’. “W192-A-X15” fruit from the four-year-old, 0.66 acre bed and the three-year-old, 2 acre bed were harvested at the beginning of October and mid-October of 2009, respectively, and comparison ‘Stevens’ was harvested over the course of several weeks in October. Yields from each “W192-A-X15” bed were compared to established beds of ‘Stevens’ over the whole farm and specific beds as indicated (see Table 1 for harvest dates). Yield is expressed as barrels per acre or B/a, 1 barrel = 100 lbs. As shown in Table 1, cranberries from the four-year-old “W192-A-X15” bed out-performed the established variety ‘Stevens’ by about two-fold, yielding 476 B/a versus a farm average of 243 B/a for 66 acres of ‘Stevens’. Examples of individual beds of ‘Stevens’ show a range from 217 to 278 B/a. The three-year-old “W192-A-X15” had a yield similar to that of established ‘Stevens’ with 242 B/a. In contrast, the yields produced from two beds of ‘Stevens’ planted in 1995, produced 153 and 156 B/a as three-year-olds, respectively, and 192 and 204 B/a as four-year-olds, respectively (data not shown).

“W192-A-X15” was not only able to produce higher yields, but the fruit color was favorable when compared with ‘Stevens’. The 0.66 acre bed of “W192-A-X15” was harvested eight to fifteen days earlier than the ‘Stevens’ beds listed, yet had nearly equivalent fruit color (Table 1). The 2 acre area of “W192-A-X15” was harvested only a few days later than the ‘Stevens’ beds, yet had fruit color approximately 50% greater.
Table 1. Yield comparison of “W192-A-X15” and ‘Stevens’ cranberry varieties in 2009 at a commercial cranberry farm in Wood County, Wisconsin. Data are based on Ocean Spray receipts of usable berries and are provided courtesy of Rocky Beigel, Dempsey Cranberry Co., Wisconsin Rapids, WI.

<table>
<thead>
<tr>
<th></th>
<th>“W192-A-X15”</th>
<th>‘Stevens’</th>
<th>Specific ‘Stevens’ beds (all at least 10-yr-old)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4-yr-old</td>
<td>3-yr-old</td>
<td>Overall</td>
</tr>
<tr>
<td>Yield (B/a)</td>
<td>476</td>
<td>242</td>
<td>243</td>
</tr>
<tr>
<td>Size (acres)</td>
<td>0.66</td>
<td>2.00</td>
<td>66</td>
</tr>
<tr>
<td>N applied (lbs/acre)</td>
<td>74</td>
<td>74</td>
<td>42</td>
</tr>
<tr>
<td>Harvest date</td>
<td>10/1</td>
<td>0/17</td>
<td>-</td>
</tr>
<tr>
<td>Tacy (mg/100g)</td>
<td>26</td>
<td>47</td>
<td>-</td>
</tr>
</tbody>
</table>

High rates of nitrogen can cause excessive vegetative growth, or “overgrowth”, resulting in numerous non-fruiting stolons growing over the top of the canopy. ‘Stevens’ is particularly susceptible to such nitrogen induced overgrowth, which can be associated with reduced yields. Unlike ‘Stevens’, “W192-A-X15” displays little overgrowth, no reduced yields, and no changes in berry size or upright average growth when treated with high levels of nitrogen; instead “W198-A-X15” displays an increase in flower bud set under high nitrogen fertilization. The tolerance of cranberry variety “W192-A-X15” to high levels of fertilizer can be seen in Table 2. The effects of increased fertilizer and the tolerance thereto displayed by “W192-A-X15” is also demonstrated in Table 1 as the yields shown for “W192-A-X15” were not adversely affected by the significantly higher units of nitrogen applied than what was used for ‘Stevens’.

In early October of 2009 the tolerance of “W192-A-X15” to increased nitrogen was evaluated at a testing site near Tomah, WI. Plots of “W192-A-X15” were fertilized with nitrogen levels used throughout the bed or received additional fertilizer from three extra applications of ammonium sulfate as well as a slow release fertilizer. Table 2 shows the resulting effects of nitrogen treatment of five samples of “W192-A-X15”. In particular, the high nitrogen treated plot of “W192-A-X15” did not display overgrowth, reduced yields or differences in berry size or upright average growth; instead a slight increase in yield and a large increase in flower bud set was observed.
Table 2. Effects of low and high nitrogen (N) fertilization on yield and other characteristics in “W192-A-X15” cranberry variety in 2009 near Tomah, WI. (numbers in parentheses denote standard error)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Units N (lbs/acre)</th>
<th>Yield (B/a)</th>
<th>Avg. berry weight (g)</th>
<th>Avg. upright fresh wt. (g)</th>
<th>Flower bud set (%)</th>
<th>Shoot N content (%DW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low N</td>
<td>32</td>
<td>559 (36)</td>
<td>1.65 (0.05)</td>
<td>0.11 (0.01)</td>
<td>28.5 (5.7)</td>
<td>0.87 (0.04)</td>
</tr>
<tr>
<td>High N</td>
<td>66+</td>
<td>612 (27)</td>
<td>1.64 (0.03)</td>
<td>0.10 (0.01)</td>
<td>57.8 (8.0)</td>
<td>1.16 (0.08)</td>
</tr>
</tbody>
</table>

The red pigment of cranberry is located almost entirely in the epidermal layers of the fruit. One factor which can contribute to high extractable fruit color in cranberry is small fruit size, due in part to the influence of surface area to weight ratio on the total pigment content for each fruit. A negative correlation between yield and fruit color has also been suggested. However, “W192-A-X15” demonstrated better coloration in combination with increased fruit size and greater yield potential. Thus, “W192-A-X15” appears to be able to produce high yields and large fruit size simultaneously with good fruit coloration (Table 1 and Figs. 2-4.).

Thus, “W192-A-X15” appears to be able to develop high levels of extractable pigmentation simultaneously with increased fruit size and yield.

![Fig. 2. Fruit color (anthocyanin) accumulation in fruit from plots of ‘Stevens’ and “W1-A-X15” during the late growing season of 2004 in a common bed in Wood County Wisconsin. “W192-A-X15” pigmentation is consistently above ‘Stevens’. Data presented is the average of six replicates for each time point for each variety. Data courtesy of Dr. Rodney Serres, Ocean Spray Cranberries, Inc.](image)
Fig. 3. Average berry size of fruit from plots of ‘Stevens’ and “WI-A-X15” at two points of the growing season of 2004 in a common bed in Wood County, Wisconsin (same plots as Fig. 2). “WI-A-X15” displays both early and late berry bulking that leads to a larger berry size compared to ‘Stevens’. Values are the average of six replicates for each harvest date for each variety.

Fig. 4. Average berry size of fruit from plots of ‘Stevens’ and “WI-A-X15” at two points of the growing season of 2009 in a common bed in Wood County, Wisconsin (different location from Fig. 3). “WI-A-X15” uniformly has larger average berry size than ‘Stevens’, consistent with its original selection. Values are the average of three replicates for each harvest date for each variety.
The combination of the above “WI92-A-X15” characteristics easily differentiates “WI92-A-X15” from both its parents. The above characteristics also provide the “WI92-A-X15” variety with benefits not recognized in other commercially grown and established varieties. For example, the increased yield and flower but set of “WI92-A-X15” provides the potential to increase both the current year’s crop and the next year’s crop through fertilizer regime. “WI92-A-X15” additionally provides beneficial and distinct aspects over other cranberry cultivars as evidenced by its high yields. For instance, the observed approximately two times greater yield than the most planted ‘Stevens’ cultivar demonstrates a great advantage of the “WI92-A-X15” variety.

Scientific name: *Vaccinium macrocarpon* Ait.

Parentage: The variety is a cross of the ‘Stevens’ variety and a selection designated “Boone’s BL8”, which was derived from an open-pollinated population of seedlings of ‘Ben Lear’.

Reproductive structures - The cranberry variety has both asexual (stolons) and sexual reproductive (fruit) structures.

Propagation - Cranberries can reproduce both asexually and sexually. For instance, stolons readily root when contacted with soil or reproduction may occur from seeds. Cranberry cultivars are propagated asexually through rooting of stolons and vertical shoots. Cranberry growers typically reproduce cranberries with either rooted or unrooted cuttings, or vine prunings that are broadcast and then pressed into the soil surface.

Productivity - “W198-A-X15” has out-yielded ‘Stevens’ by two-fold. In a four-year-old, 0.66 acre bed “W198-A-X15” yielded yielding 476 B/a while ‘Stevens’ produced a multi-bed farm average of 243 B/a. In a three-year-old, 2 acre bed “W192-A-X15” yielded 242 B/a, which was comparable to the yield observed for the established much older ‘Stevens’ beds, but yields were greater than from three and four-year old beds of ‘Stevens’ planted which produced an average of 154.5 B/a and 198 B/a, respectively. Yield data shown in Tables 1 and 2.

WHAT IS CLAIMED IS:


ABSTRACT

A new and distinct cranberry variety “W198-A-X15” is described. The variety is distinguished by significantly higher yields, larger fruit size, more favorable bud set traits, tolerance to high levels of fertilizer, higher and earlier red pigmentation, and ability to set excellent crops at an early age as compared to ‘Stevens’, the most widely grown cranberry cultivar. “W198-A-X15” was derived from a controlled cross of the variety ‘Stevens’ and an open-pollinated seedling selection of the variety ‘Ben Lear’ designated as “Boone’s BL8”.

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2011
Winter Meeting

January 25, 2011

Holiday Inn Hotel & Convention Center
Stevens Point, WI

WSCGA Mission Statement

The mission of the Wisconsin State Cranberry Growers Association is to enable the cranberry industry in Wisconsin to prosper through the provision of grower information, responsible environmental stewardship, sound governmental policies and effective public communications.
Welcome

The WSCGA Board of Directors, Staff and Committees would like to welcome you to the 2011 Winter Meeting and Trade Show. We have combined our events with the Wisconsin Cranberry School to provide you with information and training that you and your employees need to be successful in farming the state’s largest fruit crop. Our business meeting will discuss regulatory compliance, communications and opportunities for environmental conservation. The Trade Show is designed to provide you with the latest in goods, services and technologies.

We also want to thank all of our supporters this past year. Your participation in the WSCGA has made it possible for us to succeed in meeting our mission to serve the cranberry industry in Wisconsin. Whether you come to an event, support us through your dues or serve on a committee the participation by WSCGA members – grower and associate – united the industry around a number of issues this year. It is the reason we have been successful in the past. We will need more of it in the future.

This book is to serve as both a report on our activities for the past year and to lay out our program plans for the future. The year has been a successful one for the organization. We plan to continue our success in meeting the mission of the organization to allow you to prosper through the provision of high quality programs.

Again Welcome!
**Program**

**Trade Show**
The Trade Show runs concurrent with the Wisconsin Cranberry School on Tuesday, January 25. The Trade Show hours are:
- 8:00 a.m. - 9:30 a.m.
- 10:30 a.m. - 11:00 a.m.
- 11:30 a.m. - 1:00 p.m.
- 2:30 p.m. - 3:30 p.m.

**Lunch**
Lunch on Tuesday and Wednesday is included with your school registration fee. Tickets are included with your registration materials. The lunch will be served in Section 1 of the Expo Center.

**Social Hour**
A social hour will be held on Tuesday, January 25th from 5:00 PM – 6:00 PM. School participants were provided with a ticket for a complimentary beverage as part of their school registration. Hors d’oeuvres will be provided.

**Pesticide Applicator Training and Certification**
The training program is being conducted on Tuesday, January 25. Pre-registration was mandatory for the session and, hence, no walk-ins can be allowed.

We appreciate your cooperation in allowing us to start events on time to keep the meeting on schedule.

**Wisconsin Cranberry School**
The school begins on January 25 at 9:30 AM with a general session and continues throughout the day, Tuesday and Wednesday, adjourning on January 26th at 3:30 PM. A detailed grid is included in your school registration materials. We ask that you wear, or present your name badges as you enter the school sessions as they will be required for admission.

**WSCGA Winter Business Meeting**
The business meeting will be held concurrent with the Wisconsin Cranberry School and will begin at 1:00 PM on Tuesday, January 25th. Elections will be held for the WSCGA Board of Directors. Grower members should pick up their ballots at registration. The session will focus on issues facing the industry in 2010 and strategies to address those challenges.

The presentations will include a report on activities from the WSCGA Executive Director Tom Lochner and a presentation by Kris Naidl of Zeppos and Associates on the communications program implemented by WSCGA in 2010.

Representatives from the St. Paul District of the US Army Corps of Engineers will speak about meetings this past year with the industry. The Wisconsin Department of Natural Resource will also present the specifics on how growers will report water withdrawals under the recently adopted NR 856.
On behalf of your WSCGA, I would like to welcome you to the 2011 WSCGA Winter Meeting and Trade Show. This past year has brought significant change to our industry and the state’s economy, and 2011 will surely bring additional change and uncertainty into our lives. Through the good and bad times the WSCGA has had a long history of providing stability to our industry. For more than twenty years the WSCGA has been proactive in adapting to changes in legislation and new standards for our industry. The WSCGA has been there for growers in the past and will continue to support its members with whatever the future holds.

The Education Committee has done a great job in preparing for the school. They went the extra mile to make available the opportunity for our growers to be heard.

They took into careful consideration your thoughts and concerns from the surveys of this past year and did their best to provide pleasing results. Please take time to thank the Education Committee, the Associate Members, and our executive staff for all of their efforts.

Thank you for allowing me to serve this past year. I look forward to seeing all of you in Stevens Point.
From Your Executive Director

Tom Lochner

In 2010 WSCGA began to implement portions of the Strategic Plan that was developed and adopted in 2009. We placed more resources toward Public Policy Advocacy and Communications efforts designed to highlight the environmental stewardship of the cranberry industry as we implement sustainable production practices. We also started planning for a new grower leadership development program and upgraded the cranberry research program through the hiring of two new USDA Agricultural Research Scientists who are members of the UW Madison faculty.

You will hear more details of the association efforts on your part over the next two days and we have also described them in this program book which serves as our annual report. All of our programming is designed to implement our mission statement which is to allow the industry to prosper though the provision of grower information, responsible environmental stewardship, sound governmental policies and effective public communications.

Our success this past year is due to strong participation by Wisconsin growers as members of the WSCGA. Grower membership provides the majority of our financial resources but more importantly our members are active in our programs. You turnout at grower meetings such as the Wisconsin Cranberry School, Winter and Summer Meetings, training workshops, mini clinics, public policy hearings and lobby days in Madison. You serve on committees that advise the board and help to develop policies and programs that we then implement.

This past year the board also reached out to our Associate Members and the various cranberry handlers to utilize their skills, expertise and resources to assist in our public policy program. Working together we were able to talk about the economic contribution of the cranberry industry to the state as well as the environmental stewardship practiced by growers. This enabled us to demonstrate to urban and rural legislators the importance of the industry to them in terms of jobs and the need to support a strong and vibrant cranberry industry in the state.

We face challenges in 2011 and also have opportunities to make the industry stronger here in Wisconsin. WSCGA will continue to serve as a vehicle for all growers regardless of geographic location or handler affiliation to unite in common interests. When we do that we have demonstrated that we will be successful.

Have a safe and successful growing season.
Agenda

Tuesday
January 25, 2011

Holiday Inn Hotel & Convention Center
Stevens Point
Wisconsin

1:00 PM

2011 WSCGA Business Meeting

1:00 PM   Call to Order

Minutes From 2010 Summer Meeting
  - Jim Van Wychen, Secretary

Report of the President
  - Mike Moss, President

Report of the Executive Director
  - Tom Lochner
    Executive Director

Report of Legislative Counsel
  - Ron Kuehn
    DeWitt, Ross & Stevens S.C.

Report of the Committees

Election of Directors
  - Nominating Committee

Miscellaneous Business

  - Water Use Reporting, Wisconsin DNR

  - WSCGA Communications Program Report

  - Wetland Permitting Update, U.S. Army Corps of Engineers

2:30 PM   Adjourn
The 2010 Wisconsin State Cranberry Growers Association Summer Meeting was called to order by President Mike Moss on August 10, 2010 at 1:15 PM at Prehn Cranberry Co., Tomah, Wisconsin.

Recognition was given to Jere Downing, Executive Director of the Cranberry Institute for his service to the cranberry industry. A recognition plaque was presented to the Dr. Fred Prehn of Prehn Cranberry for hosting the event. Legacy Bogs Associates East Division marsh was recognized for celebrating 75 years of production and their Meadow Valley marsh for more than 125 years of production.

Secretary’s Report: Phil Brown moved and Diane Moss seconded a motion to waive the reading of the minutes from the January 20, 2009 Winter Meeting and to approve the minutes as printed. Motion carried. The WSCGA Board of Directors were introduced and thanked for their work throughout the year.

Special guests were introduced: Kim Cates from Senator Herb Kohl’s office; Lora Klenke, Noel Favia & Julie Specht from WDATCP Marketing Division; and the Warrens Cranberry Festival Royalty.

Executive Director, Tom Lochner extended his thanks to the hosts of this year’s event and to Jane Anderson for her extra efforts in organizing and set up for this year’s Field Day. Thanks were also extended to Bruce Anderson, Tod Planer, Leroy Kummer, Jack Perry, Jed Colquhoun, Endurance Wind Power, the WSCGA Education Committee, and Tomah FFA for their help with today’s event. Updates were provided on governmental advocacy, NR 151, ARS scientist positions, sustainability in cranberry production, research station, the year around communications program efforts and association membership.

Old Business: None

New Business: None

Announcements: A reception for Jere Downing will be held at the Wisconsin Cranberry Discovery Center following Field Day; the WSCGA Sporting Clay Shoot will be August 18 at Woods & Meadows Hunting Preserve in Warrens, the Wisconsin Cranberry Discovery Center raffle drawing will take place at the end of the day, WSCGA Winter Meeting and Wisconsin Cranberry School will be January 25-26, 2011 at the Holiday Inn Hotel & Convention Center in Stevens Point.

There being no further business the meeting was adjourned.

Respectfully submitted,

[Signature]

Secretary WSCGA
James V. Wychwow
This year the Board has selected two recipients for the Service to Industry Award.

Molly Jahn

Molly Jahn was the first woman named to serve as the Dean of the College of Agricultural and Life Sciences at the UW Madison. She was named to the position in 2006 and stepped down on January 2, 2011. Jahn, a plant geneticist who came to Wisconsin from Cornell University, assumed her faculty position in the departments of agronomy and genetics in January 2011. She will serve half time as a special adviser to the provost and chancellor for sustainability sciences, a post she will hold through July 31. At that time, she will return to the faculty full-time.

Jahn is noted for her research on breeding new vegetable varieties for use around the world and on gene discovery in crop plants such as peppers and cucumbers with a focus on economically important plant traits.

She recognized the cranberry industry as an important partner with the College. She lead efforts to fill the faculty position in Horticulture to work with Fruit Crops such as cranberry. She also was a strong supporter of industry efforts to secure Federal funding to place two USDA Agricultural Research Service Cranberry Scientists on the faculty on the UW Madison Campus. She placed a priority on incorporating mainstream agriculture into sustainable farming research and education programs at CALS.

During Jahn’s time as dean:
- The college’s structural deficit was erased.
- The college’s extramural funding increased by 71 percent (from $80.7 million in 2006-07 to $138.2 million in 2009-10).
- She led the effort to secure a $130 million grant from the U.S. Department of Energy to establish the Great Lakes Bioenergy Research Center on campus.
- She oversaw several key building projects, including construction of a new dairy facility at CALS’ Arlington Research Station, a new addition to the Biochemistry Building, the remodeling of Babcock Hall and the opening of the Microbial Sciences Building, and recently led planning of the soon-to-be-constructed Wisconsin Energy Institute.
The college’s degree structure was revised, consolidating multiple pre-existing degree paths into one bachelor of science degree. Jahn was instrumental in supporting a campus-level initiative to add a major in environmental sciences and stronger intercollege partnerships in the biology curriculum.

- She oversaw the hiring of 52 CALS faculty members.
- She created the Wisconsin Rural Youth Scholarship Fund to ease the financial burden for rural students to enroll in UW-Madison. To date, more than $100,000 in need-based aid has been raised as part of this fund. In addition, more than $1.5 million has been raised to support graduate study in fields such as plant breeding and genetics.

Jahn recently took a brief leave from the university to provide interim leadership as deputy and acting undersecretary of research, education and economics for the U.S. Department of Agriculture.

**SERVICE TO INDUSTRY AWARD**

**Harold Mezera**

**Harold Mezera** was born and raised in Southwest Wisconsin. His parents operated a family trucking business, hauling mostly Ag produce and supplies over a period from horse drawn to trucks. He grew up working on dairy farms during high school and graduated from the University of Wisconsin-Madison in 1949 with a Bachelors of Science degree in Soils.

He and his wife Ethel were married in 1949 and have five children and eight grandchildren.

Harold started working for DuBay Cranberry Company in June of 1949, ending up managing the marsh and packaging fresh fruit. Now most of the crop goes to processing.

Most of his Ag career has been devoted to the cranberry industry. He worked with researchers from UW-Madison, UW-Stevens Point, Rutgers University and Ocean Spray Cranberries, Inc. while serving as the Manager at DuBay. Research included fertilization, pathology, herbicides, insecticides and photosynthesis, frost tolerances and variety plots. For years Harold maintained the different variety plots at DuBay that were the source for much of the genetic material now used in all breeding programs in the US.

During his tenure DuBay hosted the Wisconsin State Cranberry Growers Association Summer Meeting in 1950, 1961, 1976 and 1995 when DuBay Cranberry Co. celebrated its 50th anniversary.

Harold has given tours to grade school students, cub scouts, church groups, college classes, Finland strawberry growers, The International Symposium for Cranberries and Blueberries, and many foreign visitors from Canada to Chile. He still enjoys giving tours to groups when asked.

He enjoys gardening, woodworking, metal fabrication, fishing, watching and enhancing the wildlife on the marsh and working for his church.

He enjoys spending his retirement in his garden, fishing and woodworking, especially intarsia projects.
Committee Activity Reports

In the next section of the program book we have tried to briefly summarize the activities of the Association committees over the course of the past twelve months. They are organized according to the various advisory committees of the WSCGA which provide support and guidance for the Board of Directors on programming.

Associate membership in the WSCGA is open to any non cranberry producing individual, firm, organization or institution. In general, associate members are companies or individuals that provide products or services to growers. They become members to support a strong industry in the state and participate in marketing opportunities provided by the WSCGA. These programs include the two trade shows and advertising programs. In 2010 the WSCGA had a record 187 Associate Members.

The Associate Member Committee advises the WSCGA Board of Directors on services for the associate membership. The committee meets with staff during the year to work on trade shows, advertising programs, mailing services and the WSCGA Buyers Guide.

Revenue from trade shows helps to cover the costs of the summer and winter meetings. 94 exhibitors participated in the 2010 Winter Trade Show at the Holiday Inn Hotel & Convention Center in Stevens Point and 98 displayed at the 2010 Summer Trade Show in Tomah, WI.

Advertising by associate members helps cover the costs of publication of the WSCGA NEWS and the Summer Program Book. Associate Members also provide support through sponsorships of the WSCGA Winter Meeting and the Wisconsin Cranberry School. The Associate Members have been enthusiastic supporters of the Cranberry Open and Sporting Clay Shoot which raise money to be used to enhance the scholarship funds at UW-LaCrosse, UW-Madison, Western Wisconsin Technical Colleges and UW-River Falls, support the establishment of an experiment station in Wisconsin and provide support for the Wisconsin Cranberry Discovery Center.

Each year the WSCGA Buyer’s Guide is published and distributed at the Summer Meeting. The guide contains a complete listing of Associate Members and a breakdown of the various services and products that they provide.
The Development Fund Committee is responsible for efforts by the association to raise funds for scholarships for students attending post high school educational institutions. Since the committee held its first event in 1991 it has raised over $213,000 to endow scholarship funds at the UW Madison Foundation, the UW Stevens Point Foundation, the Western Wisconsin Technical Foundation and the UW LaCrosse Foundation. In 2007 the committee established a new endowed fund for students at the UW River Falls Foundation.

The 20th Annual Cranberry Open was held on June 22, 2010 at Bull’s Eye Country Club in Wisconsin Rapids, WI. One hundred thirty-eight golfers participated in the best ball scramble and attended the post outing social.

The committee also sponsored the eleventh annual WSCGA Sporting Clay Shoot on August 18, 2010 at the Woods and Meadows Game Farm in Warrens. The shoot had a total of 193 shooters participating.

The 2011 Cranberry Open is planned for June 21st at Bull’s Eye Country Club in Wisconsin Rapids, WI and the Sporting Clay Shoot will be held in August at Woods and Meadows in Warrens, Wisconsin. This year we were able to raise over $23,000 to be used to complete the scholarship fund at UW-River Falls, to support the Wisconsin Cranberry Discovery Center and the project to establish an experiment station for cranberries in Wisconsin.

The Administration Committee advises the WSCGA Board on the internal operations of the association. Its major responsibility is development of a recommendation for an annual budget for the WSCGA.

The budget is developed in August and September for presentation to the board at their September meeting.

Over the last several years the committee has been able to develop budgets that provide the necessary funds to operate the organization. The operational budget for the organization has remained fairly stable over the past five years.

The 2010-11 budget presented a challenge for the committee again this year. During its discussions the committee identified additional sources of revenue for the association to pursue to enhance the financial picture. The committee also reviewed and adjusted all expense items to allow for operation of the organization while limiting expenditures as much as possible.
The main emphasis of the WSCGA mission is education, both of growers and the general public on cranberry growing. A large portion of this responsibility is assigned to the Education Committee, making it one of the key committees in the association. The committee meets with UW Extension faculty and others during the year to review and plan the various education programs for the association.

In January of 2010 the WSCGA Winter Meeting, Trade Show and Wisconsin Cranberry School were held in Stevens Point. The event is the marquee program for the committee each year. Attendance over the two days exceeded 450 people from across North America. The school curriculum provided specialized sessions for the audience based on their job responsibilities with general sessions covering topics of interest to all. There was a special emphasis on overall cranberry crop management at the 2010 School.

The school also included a pesticide applicator training and certification session to allow growers to use the event as a one stop training program for themselves and employees. The grower roundtable discussions were expanded this year. These are informal yet structured discussions about topics of interest to growers.

The committee distributes a number of brochures that have been developed in the past. The most popular are the recipe brochures and Activity Books for elementary students. A new recipe brochure was developed in 2008, re-printed twice in 2009, again in 2010 and features suggestions on how to use a variety of cranberry products in recipes all year round. The Activity Book focuses on fourth grade social studies curriculum and includes a variety of activities such as word searches, puzzles and creation of a cranberry rake. WSCGA is also completing work on a new interactive, web based curriculum material for introduction in 2011. The project incorporates the platform developed by the Cape Cod Cranberry Growers Association with Wisconsin specific activities and videos produced as part of the Into the Outdoors series. Pam Walker has been working with Zeppos and Associates on the new site.

The WSCGA NEWS remains the main vehicle for communication with the members. Regular features of the newsletter include research updates and legislative reports. Each month UW Extension faculty and staff from the Cranberry Institute contribute articles to provide up to date information on their programs. The committee continues to look for ways to improve the editorial content of the NEWS.

The WSCGA/UW extension Summer Meeting, Field Day and Trade Show was held on August 9 at Prehn Cranberry near Tomah, Wisconsin. In addition to the marsh tours and exhibits two mini clinics were held. The first covered energy conservation and generation from alternative sources. The second covered field trials and management practices for new plantings.

Many of the projects initiated in the area of education are funded in part by grants from the Wisconsin Cranberry Board, Inc.
The Public Relations Committee is responsible for generating a positive image of the industry in the state. That responsibility includes working with the media to tell the industry’s story and working with other groups to help promote the state’s largest fruit crop. The committee also works on the association exhibit and booth at the Wisconsin State Fair and with the various cranberry festivals held in the communities of Eagle River, Manitowish Waters, Stone Lake, and Warrens.

In 2010 the committee implemented an expanded program to communicate the environmental stewardship of the Wisconsin cranberry industry. The WSCGA website was modified to include a section on sustainable cranberry growing and environmental stewardship. Videos were added and links to stories on cranberry growers and wildlife habitat enhancement.

The committee also worked with USDA NRCS to prepare media stories around cranberry conservation efforts. Work was also done with UW Madison on the release of the results of Jed Colquhoun’s study on sustainable cranberry production in Wisconsin.

In August the Wisconsin State Fair offers promotion opportunities for the industry. The association utilizes a grant from the Wisconsin Cranberry Board, Inc. to support a portion of the cost of its state fair promotion program. The WSCGA secures space for a booth in the Wisconsin Products Pavilion. The booth features educational exhibits on cranberries and cranberry growing, a model of a cranberry marsh, a videotape and sales of specialty cranberry products and cranberry juice drinks. WSCGA made drops of products to the various media outlets at the fair and participated in radio and television interviews. The association also conducted cooking demonstrations on the stage in the Wisconsin Products Pavilion.

As the fall harvest season approached the association utilized materials and messages from the national effort in its fall communications program. Media kits and releases were sent in September statewide and follow up releases were sent in October. The releases focused on economic and health messages.

In October the WSCGA held two media events on cranberry marshes. Wisconsin DATCP Secretary Randy Romanski announced the awarding of four Specialty Crop Block Grants to the cranberry industry, three of which addressed sustainable cranberry growing practices. A helicopter was provided for media to see harvest and growers were also available for interviews.

Utilizing grants from the Wisconsin Cranberry Board, Inc. the association entered into an advertising agreement with the Milwaukee Brewers Baseball Radio Network. The ads promote the health benefits and great taste of cranberries and cranberry products. Through the sponsorship with the Milwaukee Brewers a “Cranberry Night at Miller Park” promotion was held on September 8.

The association also provides financial support for Ducks Unlimited through co-sponsorship of “Duck Camp”. Under this program select Greenwing members are participants in a camping experience to learn more about wetlands and their role in providing wildlife habitat.

WSCGA also provides scholarships for students to attend Trees for Tomorrow, and co-sponsors two FFA Proficiency Awards.

As part of the focus for the future programs members have asked that the WSCGA place more emphasis on communication efforts. As a result the board of directors has directed additional resources to develop a year round program on sustainable cranberry production. The committee will play a key role in the expansion of the communication efforts.
The WSCGA Research Committee was established by the Board of Directors to provide growers with a forum to discuss research needs with University of Wisconsin research faculty and the cranberry research community on a national basis. The committee works cooperatively with the Wisconsin Cranberry Board, Inc. (WCB), The Cranberry Institute (CI), and others to identify grower research needs, coordinate projects to avoid duplication and to help establish priorities.

The Research Committee provides direction and input to the WSCGA Weather Forecasting Service. In 2009 the committee made a recommendation to change providers of the service. After selecting Great Lakes Weather Service the committee worked with the new provider to identify the needs of growers in a forecasting service beyond the usual frost forecast. The committee also assisted in the transition and fine tuning the forecasts for accuracy.

The WSCGA participates in the Cranberry Institute Horticulture and Environmental Working Group to help identify and prioritize needs for research projects that lead to development of Best Management Practices and pesticide registrations. The Wisconsin Cranberry Board, Inc., CI and WSCGA also work with other regional grower groups to coordinate research programs to avoid duplication and to enhance and compliment efforts elsewhere.

The committee members also participate in the Annual Cranberry Research Roundtable. This session is held on the UW Madison Campus with faculty, crop consultants and growers to review current research efforts, discuss observations from the previous growing season and to identify potential areas for new research efforts.

The committee participated in the November meeting of the Wisconsin Cranberry Board, Inc. Participants reviewed funding and research priorities and discussed industry needs for the future with research faculty and others. The session helped the WCB and industry to identify future needs in terms of research, education and promotion as well as funding. The results of the discussion will be reviewed at the next meeting of the WCB and be used to guide the board in making its funding decisions in 2011.

The WSCGA provides administrative services to the Wisconsin Cranberry Board, Inc. under a contract. Under the agreement the Association staff performs a number of administrative functions such as collection of assessments, recordkeeping, making arrangements for meetings, preparation of annual reports, issuing calls for proposals and answering requests for information. The Wisconsin Department of Agriculture, Trade and Consumer Protection maintains oversight of the WCB to insure compliance with the marketing order and to conduct elections.
The Committee is responsible for the development of recommendations on policy related to environmental issues as well as other state and federal regulatory and legislative actions that arise as part of the public policy advocacy program. The committee also makes recommendation of disbursements from the restricted account for water and wetlands. This past year was especially challenging and saw the committee become highly active in the public policy arena bringing together growers, associate members and handlers to work together for the common good of the industry.

The committee works with the WSCGA Legislative Counsel to review issues and make policy recommendations. The committee members also participated in Ag Day at the Capitol and a special lobby day in Madison as well as meetings in the districts with elected representatives.

**Water Use Issues**

As detailed in the report from the WSCGA Legislative Counsel, water use and access was a big issue in the last issue of the state legislature. The committee participated in Ag Day at the Capitol in February and a Cranberry Lobby Day in April. At both events committee members met with legislators to outline concerns with the proposals and also presented testimony at a hearing on the bills. A second effort was made to conduct tours of cranberry marshes and processing facilities back in legislative Districts. These efforts lead to the defeat of the bills.

WSCGA also worked with DNR on new water withdrawal reporting requirements under the Great Lakes Compact. This effort was aimed at making the reporting as easy as possible for growers while providing the information required under the statutes.

**Water Quality**

Wisconsin DNR proposed a sweeping rewrite of the state’s rules regulating non point source pollution. The committee mobilized grower and associate members to participate in the hearings held around the state. As a result DNR made significant modifications in the proposal to accommodate the concerns of the cranberry industry.

WSCGA also began work in 2010 to develop information to be used to comply with the new rules and to assist growers in complying with any Total Maximum Daily Load requirement that may be developed in the future.

Continued on Next Page
Public Policy - Continued

Wetland Issues
WSCGA held a series of meetings with Wisconsin DNR and St. Paul District Army Corps of Engineers staff to address issues surrounding wetland permitting. The ongoing discussions focused on the challenges growers face in obtaining permit to conduct their farming activities in wetlands. Wetland permits have been difficult to obtain and for many growers limit their ability to produce a crop in an economically efficient manner. There remain many issues to be resolved but meeting on a routine and regular basis with agency personnel provides the association the opportunity to present information that will hopefully provide some regulatory relief for growers.

Local Issues
Whether it was an issue with a local zoning ordinance, questions about dam regulation, a highway expansion plan, issue with a drainage district board or concern about wetland permitting WSCGA provided support in response to requests from growers.
WSCGA convened a group of grower members to develop a consensus position on a proposal to rebuild a state highway in Wood County. As a result of the meeting comments were provided to Wisconsin Department of Transportation to recommend alternatives to the proposed route to protect cranberry farmers’ ability to farm.

WSCGA also worked with the Portage County Drainage district as they removed dams form district ditches to make sure the profiles established were maintained. These profiles were essential for management of water on cranberry farms located next to the district ditches. Structures were designed to be installed to protect the integrity of the ditch profile and protect growers’ ability to maintain the groundwater table at needed levels.

A number of growers received letters from DNR about regulating cranberry dams. WSCGA was able to contact the department and protect growers’ rights under the cranberry laws.

USDA Agricultural Research Service Cranberry Research Positions Filled

As part of a national effort to enhance cranberry research the WSCGA has secured funds for USDA’s Agricultural Research Service to create three research programs on cranberry. Two of the programs will be based on the UW Madison Campus and one will be housed at the Massachusetts Cranberry Experiment station.

During the summer of 2010 USDA and UW conducted a National search and interviewing process. WSCGA participated in the process by hosting the candidates for the Plant Breeding and Genetics position and the Cranberry Entomologist position.

In August the USDA Agricultural Research Service and UW Madison named Dr. Juan Zalapa to the Cranberry Geneticist/Research Molecular Biology position. Zalapa currently holds a post doctorate position with the USDA ARS Dairy Forage Research Lab in Madison where his work focuses on genetic improvement of switch grass for a bio fuel.

Zalapa earned his PhD in Plant Breeding and Plant Genetics from the UW Madison in 2005. He begins his new position on October 12.

In September Shawn Steffan accepted an offer to fill the Cranberry Entomologist position. He currently holds a similar position in fruit entomology at the Washington State University Tree Fruit Research & Extension Center. He did his graduate work at UW Madison and received his PhD from Washington State. Although he does not begin his duties on January 31 he has participated in the cranberry research roundtable in November and is scheduled to speak at the 2011 Wisconsin Cranberry School.
USDA/DATCP Announce Block Grant Awards in Support of Cranberry Industry

In 2010 the Wisconsin Department of Agriculture, Trade and Consumer Protection awarded the funding for four Specialty Crop Block Grant projects approved by USDA for funding. The projects will look at water use and conservation, sustainable cranberry production and promotion of Wisconsin cranberry products through a new web based initiative.

The Wisconsin Cranberry Discovery Center will receive a grant of $56,000 to be used to establish a “Wisconsin Cranberry Electronic Marketplace”. The objectives of the project are to create a new market outlet for Wisconsin-made cranberry products, increase sales of these products and educate the consumer on the many uses for cranberries through utilization of these specialty products. This grant will be used to create and manage a virtual marketplace for Wisconsin-made cranberry products, conduct a comprehensive promotional campaign to make consumers aware of the web-site and provide small companies that produce these products with a new market outlet. The current retail store section of the www.discovercranberries.com website will be rebuilt and feature only Wisconsin made cranberry products for purchase by consumers via the web. Criteria for the placement of product on the site will be developed and an outreach program to solicit companies for participation will be conducted. This will create a new market outlet for these specialty products generally produced by small companies with limited marketing resources. The new site will connect consumers to the growers and the people who produce these high quality specialty cranberry products by providing easy access to them. The project will create a gateway to connect consumers to farmers and a host of information on ways to incorporate the healthy and nutritious cranberry into their diet with great tasting products. The project is designed to bring these three parties together through the world-wide web.

Jed Colquhoun of UW Madison received funding of $49,500 for a project “Grower-driven Sustainability Standards for Cranberry Production.” Sustainability has rapidly become a market differentiator throughout the retail supply chain, including food products. As a result, sustainability standards have been developed or are proposed for food production, focusing primarily on large-acreage grain crops such as corn or soybean. These standards are typically driven by marketing, and as such, don’t involve significant producer input. The project is unique in that it is driven by growers, represents a collaboration of growers, processors and handlers, and is focused on the long-term feasibility, including producer economic sustainability. A panel of growers, handlers, processors and retailers will be assembled to prioritize sustainability parameters, determine the appropriateness of currently available or developed metrics, and “test-run” a customized program that reflects the uniqueness of cranberry production. The end product will be a grower-driven sustainability program that is realistic for growers yet fulfills retailer objectives for improved methods to quantify the impacts of the supply chain.

Rebecca Harbut received funding for two proposals. The first for $26,700 is titled “Evaluation of Automated Cycled Sprinkler Irrigation System for Frost Protection in Wisconsin Cranberry Beds: Impact on Water Use and Flower Bud Development”. Spring frost is a major concern for Wisconsin cranberry growers. Insufficient protection during frost can lead to reduced productivity or complete crop loss. Current standard practices utilize sprinklers which are turned on at the onset of frost and run continuously until temperatures are above a critical threshold. This method of crop protection is used in many fruit crops and provides adequate protection for the crop. However, running the irrigation for long periods of time is costly and applies excessive amounts of water to the crop. Cranberry growers rely heavily on water for many aspects of production and are constantly looking for new management practices and technologies that will increase water use efficiency. The use of automated cycled irrigation systems may allow growers to reduce the amount of time the irrigation systems are running during frost events resulting in cost savings and significant reduction in water use. This research will conduct on-farm field trials to evaluate the impact of automated cycled irrigation systems on flower bud development and water use. Results of this study will develop recommendations for utilizing automated cycled irrigation systems to reduce production costs and increase water use efficiency in cranberry production.

The second proposal received $26,630 for a project titled “Evaluating Use of Soil Moisture Probes to Increase Water Use Efficiency in Irrigation of Cranberry Beds”. Cranberry production
requires large amounts of water for frost protection, harvest, winter protection and irrigation. Due to their reliance on the availability of adequate water resources, growers understand the importance of utilizing this resource efficiently and are constantly improving production practices to improve efficiency. A potential avenue to increase water use efficiency is the use of soil moisture probes to schedule irrigation. While soil moisture monitoring equipment has been used in the past, they have not been extensively utilized due to logistical or cost limitations. New technologies that have recently come available may provide growers with affordable monitoring systems that would allow irrigation to be scheduled based on precise soil moisture data ensuring adequate water supply to the crop without over irrigating. This could reduce the amount of water utilized for irrigation in cranberry beds and reduce potential nutrient leaching due to over irrigating. In order to develop recommended practices for growers, research is needed to determine optimal placement in the soil profile, spacing across the bed and to determine any impacts on yield.

The projects total $158,800. Letters of support were provided by the WSCGA and Wisconsin Cranberry Board, Inc. Funds for the Block Grant program come from USDA to the Wisconsin DATCP.

WSCGA/NRCS Conservation Program Working Group

In the fall of 2010 the WSCGA named a working group to evaluate the current WSCGA/NRCS Cranberry Conservation Program, to make recommendations for the program for the future and to recommend a set of Best Management Practices for cranberry production in Wisconsin.

The program was initiated in May 2002 with $300,000 Congressional Earmark through the efforts of Senator Kohl and Representative Obey. The purpose of the funding was to develop an environmentally sound; science based conservation planning process for cranberry growers in Wisconsin. The initial objective was to develop a template for Whole Farm Conservation Plans for cranberry farms in Wisconsin through the USDA NRCS. The WSCGA and NRCS would also conduct an information and education program about the conservation program available to growers.

Additional funding was secured as follows:
- 2003 - $240,000
- 2004 - $285,000
- 2005 - $232,700
- 2006 - $297,000
- 2008 - $214,985
- 2009 - $211,500
- 2010 - $211,500

Total – $1,991,985

WSCGA and the Wisconsin State NRCS office entered into Cooperative Agreements to implement the plan. WSCGA agreed to provide a Project Coordinator and a Grower Advisory Group to work on the project. NRCS provides an administrative fee to WSCGA for the program costs and for office space for the NRCS Resource Conservationist named to work with growers and serve as a liaison to the industry. Tod Planer was named as coordinator in 2002. NRCS placed a Resource Conservationist in the WSCGA offices in 2004. Julie Ammel currently fills that position.

In 2004 Wisconsin revised rules relating to non point pollution requiring farmers who apply fertilizers to do so under an approved nutrient management plan. The program made a strategic change to focus on nutrient management. Funding was provided to UW to conduct research on phosphorous and the development of a Technical Note to the NRCS 590 Standard to cover nutrient management planning for cranberry farms. The Note allowed growers to use tissue analysis for phosphorous management instead of soil analysis.
WSCGA also worked with NRCS to create a statewide Cranberry EQIP sign up pool. The pool was in place from 2004-2006. The statewide pool was necessary for a number of reasons. The local work groups did not share resource priorities consistent with cranberry production. As a result growers were not being able to access the local EQIP pool of funds. Local Resource Conservationists also did not have the background needed to understand cranberry production practices. As a result the State Technical Committee agreed to create the statewide pool. In 2006 the process was amended to shift the responsibility back to the local work groups with support from the cranberry liaison. NRCS then went to four area wide sign up pools for Specialty Crops in 2010.

In 2007 WSCGA developed a Whole Farm Planning Incentive Program (WFPIP) to supplement EQIP funding for cranberry conservation practices.

**Project Coordinator Activities**

The initial step was to review the different components of a Whole Farm Plan and the various practices available for cost share funding. That resulted in identification of several conservation practices and collecting data to make needed changes to be applicable to cranberry farms. The data collection included costs and designs of various practices such as tailwater recovery, stream bank stabilization irrigation system uniformity, etc. As a result of data collected from pilot projects, WSCGA and NRCS are able to offer a suite of practices for cost sharing available to growers.

A major area of emphasis has been nutrient management. The project supported work on phosphorous nutrition for cranberries conducted by Teryl Roper of UW Madison. This work resulted in a Technical Note to the NRCS 590 Standard to recognize the unique aspects of cranberry nutrient management. The next step in the process was to conduct educational sessions for growers to qualify them to write their own nutrient management plans under ATCP 50. Numerous sessions have been held and close to 400 growers have been trained and qualified to write plans. Individual plans are reviewed by NRCS or UW personnel to determine their consistency with the 590 standard. As a result cost sharing was provided to plans covering 9,600 acres in Wisconsin. Additional plans which did not apply for the cost share make the industry more compliant than any other crop with well over 60% of the acreage under an approved plan.

In recent years there has been an increased emphasis on water use and conservation. An intern was hired to conduct system assessments for growers. Practices such as mainline improvement, sprinkler head replacement and system design and upgrade have been encouraged and received cost sharing dollars. The next step in the program is to develop the template for a whole farm plan based upon the individual components.

**Resource Conservationist Activities/EQIP and WFPIP Programs**

Currently NRCS provides cost sharing for a number of practices for cranberry growers. They Include:

- Irrigation Water Conveyance – 430DD
- Irrigation System Sprinkler – 442
- Irrigation Water Management – 449
- Irrigation System - Tailwater Recovery – 447
- Pumping Plant – 533
- Streambank and Shoreline Protection – 580
- Critical Area Planting – 342
- Field Border – 386
- Tree/Shrub Establishment – 612
- Nutrient Management – 590
- Pest management – 595
- Agrichemical Handling Facility – 309
- Agricultural Energy Management Plan – Headquarters – 122
- Agricultural energy management Plan – landscape – 124
- Nutrient Management Plan – Written – 104
- Irrigation Water Management Plan – Written – 118
- Forest management Plan – 106
- Organic Agriculture Transition Plan – 138

A copy of the eligible practices and payment schedule are available online through the [www.wiscran.org](http://www.wiscran.org) website or through the WSCVGA offices.

In discussing the practices available the group suggested that Wetland Wildlife Habitat Management be looked at as a practice to add. The group thought there would be grower interest in any other wildlife habitat management or enhancement programs.

EQIP funding totals from 2004 through 2010 are $2,232,117 on 54 contracts. WFPIP accounted for 66 contracts and $367,011. Most of
the WFPIP funding and contracts were for nutrient management. Irrigation Mainline, Irrigation System and Irrigation Water Management accounted for the other funding areas in WFPIP. The total cost sharing under both programs is almost $2,600,000.

Ongoing Research In Support of Program
Rebecca Harbut has received funding for two projects that could lead to information to support additional practices for growers to receive costs share. Both are funded through the USDA/DATCP Specialty Crop Block Grant program.

The first one is an effort to collect data on different soil moisture monitoring systems. The outcome should lead to management recommendations for use of probes including placement, variability and how to understand data they are providing and incorporate that into management decisions. The results should also allow NRCS to make decisions on cost sharing practices for soil moisture probes and monitoring.

The second focuses on answering the question about the feasibility of auto start and cycling systems for use in Wisconsin. Use of these systems may provide water quantity conservation and energy savings. There are concerns about the impact on the vines and crop under Wisconsin conditions. The study will help to answer questions about the impacts of the practice on plant physiology.

Program Evaluation and Discussion
The participation numbers have been impressive in terms of dollar amounts of cost sharing and 120 contracts. However, there has been a decline in applications recently which has caused the board to ask; what are the barriers to more participation by growers in the programs? The following points were made during the discussion.

- Paperwork is challenging and intrusive. Providing all of the information requested is troubling for some growers’ especially personal financial information for all partners and shareholders in family farms who may have a very limited role in the operation.
- Some project designs and costs are higher than they would be if the growers simply did the work according to their own design. This is true especially for tailwater recovery projects. Rip rap requirement. Pump specifications and slopes on berms and areas all make the costs of the projects escalate.
- Cranberry dams are not subject to regulation by DNR and therefore growers have been denied funding for stream bank funding because of lack of state regulation.

The group also mentioned that having a large number of applications not funded in a year could also lead to frustration by growers so having a high chance of success when applying is a positive thing for participation.

The group also felt that water use was going to be the biggest challenge in the future and therefore should be a priority for the programs. Decisions on how and when to apply water are crucial. Providing growers with the best tools available to make decisions is important. As a result the group felt WSCGA should consider providing growers with irrigation system evaluation and information on soils. Either current staff or an intern could conduct this work and provide the growers with baseline data for making decisions on improving management practices.

The group felt that a useful tool would be some type of model for evapotranspiration. Models exist for other crops but the development of a crop coefficient for cranberry is lacking and challenging.

Best Management Practices
The group also expressed support for the concept of Best Management Practices that take an approach as a decision making process rather than a certain specific activity. A decision tree would allow growers to evaluate their particular situation and based upon a certain set of facts select the best management practice to meet their needs. This will be the subject of future meetings as Rebecca Harbut will be putting together an initial draft of Best Management Practices.
Cranberry Research Roundtable

The Wisconsin Cranberry Board, Inc. is a national leader in funding research for the cranberry industry. The WCB has a lengthy and thorough process to identify projects for funding that meets the needs of growers and the marketing order.

As a first step in the process the industry crop consultants, WCB members and the WSCGA Research Committee members were asked to participate in a meeting with UW Madison CALS and UW Extension faculty to look at needs and priorities. This year the two new USDA Agricultural Research Service (ARS) faculty members were asked to participate. The objectives of the meeting were:

1. Discuss the most recent growing season.
2. Discuss progress on research projects conducted during the past year.
3. Identify the future needs of the industry and faculty.

Those participating in the meeting included:
- Brent McCown
- Eric Zeldin
- Jess Reed
- Jack Perry
- Patty McManus
- Jed Colquhoun
- Beth Workmaster
- Juan Zalapa
- Shawn Steffan
- Lindsey Wells
- Tim Dittl
- Leroy Kummer
- Nicole Hansen
- Julie Ammel
- Jayne Sojka
- Tod Planer
- Carl Salzwedel
- Mike Moss
- Suzanne Arendt
- Stephen Brown
- Tom Lochner

The agenda included presentations by faculty on their current research programs as well as plans for the future. Juan Zalapa and Shawn Steffan were introduced to the group as the two new USDA ARS scientists who will be stationed at the UW Madison to work on cranberry genetics and entomology. The group also had a lengthy discussion on the growing season. At the meeting the following topics were identified as those that could be considered for research and education programs.

1. Pesticide screening, evaluation and registration remain a top priority for the industry. Increasing the number of tools available for growers to use in an IPM program will continue to be important for the industry.
2. Disease management has moved into a higher position of priority with the recent growing season. Many feel that 2010 was an aberration in terms of weather conditions but there is still a need for an integrated approach to disease management that includes nutrient management, cultural practices, sanitation practices and fungicides where appropriate. Growers could benefit from improved phenology models, a review and possible revision of the “fresh fruit keeping quality index”. We also need to be careful about over reacting to a weather anomaly.
3. Insect management with the new and existing compounds needs to continue to be refined and cultural practices such as flooding for insect control should continue to be evaluated for timing, duration and efficacy.
4. Soil insects, flea beetle and Lepidoptera such as fruit worm continue to be the major insect pests of concern.
5. Variety improvement for yields, disease resistance, cold tolerance and insect resistance remain important. Identifying the cranberry genome is a high priority.
6. Plant nutrition and nutrient management are important. Tools such as tissue analysis and standards can be refined. There is also the question of appropriate nutrient levels for new varieties. Soil pH management in new plantings is an issue as well.
7. Weed management for dewberry, maples, willows, popples and oaks remain a priority.
8. Sustainable cranberry production practices that are grower driven and focus on economic sustainability along with risk assessment are important.
9. Practices which contribute to water and energy conservation are always needed.
10. Best Management Practices for new plantings have been discussed and a coordinated and integrated approach to renovation and new plantings that includes all aspects of production is needed.
Whole Farm Conservation Planning

Tod Planer, Coordinator
Whole Farm Planning Program

Commencing in 2002 with funding through the efforts of Senator Kohl and Representative Obey, this program has seen much progress since its inception. The purpose of the funding was to develop environmentally sound, science based conservation planning efforts for the Wisconsin cranberry industry.

The initial effort focused on the development of a plan that would look at conservation efforts and their integration into cranberry production practices. In aligning with the USDA Natural Resource Conservation Service (NRCS), the industry would be able to establish working documents could be used in establishing standards and guidelines for cost share funding for various cranberry production practices. While numerous conservation practices existed for crop and livestock producers, little if any were available for cranberry production. Hence the program worked to develop standards that would open funding opportunities for growers.

As the program developed, other factors were coming into place that gave it additional direction. Regulating fertilizer use and non point source pollution set the stage for the project to move forward the development of Nutrient Management Plans currently in place. Additional efforts investigated phosphorus use and fertilizer blends being used in the industry. While much anxiety existed with growers concerning the standard for fertilizer use, 5 years later we are adjusting quite well and production has seen little if any impact from the changes in nutrient management.

Through program, standards for tail water recovery systems, irrigation retro-fit, and irrigation management have been adopted by the industry. Looking now at water and its role in production, numerous potential program opportunities exist. With recent funding to investigate water use, and phosphorus impacts within the state, growers need to fine tune efforts to keep pace with potential changes.

Recently, the grower committee that addresses the program met to discuss where we have been, and where we want to be, with regard to the future of the program. There was a clear consensus to continue to work on related issues of the water use, water management, irrigation system evaluation, soils education, and wildlife management. These are all ambitious objectives and certainly attainable goals for the program.

As we move forward on these efforts, one important link to achieve positive returns on our efforts is grower participation. Without your cooperation on various efforts, progress would be limited. Having you involved gives you and your industry, ownership of the program. We look forward to continuing these exciting program successes!
Cranberries & Conservation

Environmental Quality Incentives Program (EQIP) contracts through FY 10 include:

- 2,100 acres of nutrient management.
- 1,820 acres of pest management
- 710 acres of irrigation water management
- 14 tailwater recovery systems
- 768 acres of high uniformity irrigation systems
- 9.6 miles of buried irrigation mainline

Conservation Accomplishments

Cranberry growers continue to be ahead of the game with their dedication to conservation and sustainable agriculture. Growers can be proud of their contributions to the protection of our natural resources which are cherished by the residents of this beautiful state. Whether people enjoy partaking in the many outdoor activities available or just enjoy the visual aspects, cranberry producers can be confident that the way they manage their production area and the surrounding lands contributes to this. The cranberry community provides more wildlife land than any other agricultural production farming group in the state. In fact, most of your land supports habitat for a variety of wildlife species compared to the amount of land that is dedicated to production. This knowledge should be shouted from the rooftops in this current environmental awareness society, but yet there is still a great deal of ignorance concerning this concept. Let’s make it a goal of 2011 to inform the public of your conservation and environmental accomplishments.

The commitment of the Natural Resources Conservation Service (NRCS) to all cranberry growers in Wisconsin officially began in 2004 when they signed a cooperative agreement with the Wisconsin State Cranberry Growers Association (WSCGA). As part of this cooperative agreement, NRCS agreed to provide a liaison position to address the specific conservation resource concerns of marshes in the state. This position was first filled by my predecessor, Michael Stinebrink, and is now happily filled by me since mid 2008, but I began working with cranberry growers over 4 years ago. A major achievement of this liaison position has been to adapt NRCS conservation practices to cranberry production. Another has been to sign 54 EQIP contracts totaling over $ 2.2 million, allowing growers to receive cost-share funds for installing conservation practices that addressed specific resource concerns. In addition, countless hours have been dedicated by other NRCS staff in providing technical and engineering assistance. But the work is ongoing and NRCS is dedicated to a continuing effort to improve and provide support to the cranberry growers in this state, helping them to conserve our natural resources. To assist with this improvement, growers are encouraged to provide input on how NRCS can better serve you. Your feedback is important to the progress of this relationship between NRCS and the cranberry industry. Help us help you to continue your efforts of resource conservation and environmental accomplishments.
2010 began with the end of the 2009-2010 legislative session in Wisconsin. 2010 ended with the beginning of an entirely new Legislature, new Governor and new Administration for our State.

At the end of last session, Wisconsin cranberry growers were facing a myriad of changing water regulations. The Legislature was proposing a fundamental re-write to Wisconsin’s groundwater law; the Department of Natural Resources was considering critical changes to Wisconsin’s nonpoint source pollution performance standards and working on finalizing several rules related to implementation of the Great Lakes Compact; and the U.S. Army Corps of Engineers was working with the Association on the use and availability of several General Permits and exemptions from the Clean Water Act. In addition, we saw an about-face by the U.S. EPA with regard to requiring National Pollutant Elimination Discharge Permits (NPDES point source permits) for the application of pesticides to jurisdictional waters as the result of a U.S. Court of Appeals case.

Importantly, the Association navigated all of these proposals with diligence and grace. We were part of the reason the Legislature ultimately abandoned the groundwater law proposal at the end of the 2010 legislative session. That proposal, while well-intentioned, lacked, in our opinion, a well-researched science-based approach to amending Wisconsin’s groundwater regulatory framework. In short, the legislation appeared to pose more questions than it answered and the growers and their partners in the Wisconsin processing community were instrumental in working with legislators to reveal those issues. We do expect changes to Wisconsin’s groundwater law to be proposed again this session. However, we also expect those changes to be more targeted toward specific problems and to incorporate the comments from stakeholders, like Wisconsin farmers, from the very beginning of the legislative process.

In addition, the growers worked extensively with us to provide the DNR with meaningful and well-researched feedback on the proposed changes to Wisconsin’s nonpoint source pollution rule, NR 151. As a result, we had excellent turnout at public hearings and were able to work with DNR to amend the rule into a document that is not only protective of Wisconsin’s water resources, but is technically and economically achievable for Wisconsin cranberry farmers. Of course, the true test of the technical achievability of these new standards will be further developed at the Department of Agriculture, Trade and Consumer Protection (DATCP) drafts its counterpart to DNR’s rule during this legislative session. In ATCP 50, the DATCP is charged with creating the technical standards and conservation practices that will be used by farmers to meet the new performance standards established by DNR.

The DNR also spent much time in 2010 drafting and finalizing rules that will be used to implement the Great Lakes Compact. The rule of most interest to Wisconsin growers is NR 856, which creates a statewide water use and reporting program.

NR 856 applies to anyone who has the capacity to withdraw water from “waters of the state” (surface or groundwater) of 100,000 gallons per day or more in any 30-day period statewide. The withdrawal capacity for a property is the total capacity in gallons per day from all water sources on the property. (A “property” or “one property” means “all contiguous land controlled by one owner, lessee or any other person having a possessory interest. Lands under singer ownership bisected by highways or railroad right-of-ways are considered contiguous.”)
Although this rule was authorized under the Great Lakes Compact, it is NOT limited to water users in the Great Lakes Basin. It applies to all water users across Wisconsin. The rule requires those persons who meet the capacity definition described above to: (a) register their withdrawal with the DNR; (b) measure the volumes of the withdrawal monthly; and (c) report those monthly totals annually. The Association and several growers are continuing to work with DNR on a plan to implement this rule for growers in a way that recognizes the unique aspects of cranberry production and also respects the growers’ need for a simply, efficient system. We expect this protocol to be finalized in 2011.

Early in 2010, the U.S. EPA was forced to change its course with regard to regulation of pesticides applied to waters of the United States after a 6th Circuit Court of Appeals ruled that the agency could no longer exempt applications of pesticides that are applied in accordance with the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). The Clean Water Act (CWA) prohibits the discharge of any “pollutant” into navigable waters from a “point source” without an NPDES permit. The National Cotton Council Court found that “dischargers of pesticide pollutants are subject to the NPDES permitting program” under the CWA. The EPA has until April 9, 2011 to develop a permitting program to cover these discharges. The WSCGA worked with both DNR and the U.S. EPA throughout 2010 to hopefully ease the implementation of this ruling.

November 2010 brought a dramatic election result in Wisconsin with the flip from Democratic majorities in both the State Senate and the State Assembly and the election of a Republican Governor. The 2011-2012 legislative session began with a 19-14 Republican majority in the State Senate and a 60-38 majority in the State Assembly, with one independent. Several Assembly Republicans, including Representative Mike Huebsch (R-LaCrosse) and Representative Scott Gunderson (R-Waterford) resigned from the legislature to take appointments within the Walker Administration. Scott Gunderson is serving as the Executive Assistant to the DNR Secretary, Cathy Stepp, and Mike Huebsch is serving as the Secretary of the Department of Administration.

Former Milwaukee County Executive, Scott Walker (R) is now the Governor of Wisconsin. His first pieces of legislation, which were introduced the first week of January 2011, focus on tort reform and regulatory reform initiatives that are aimed at increasing job growth and creation in Wisconsin. Soon, Governor Walker will begin writing a budget bill that addresses the projected $3 billion structural deficit. It is anticipated that 2011 will be characterized by governmental restraint and attention to policies that impact growth of jobs and the economy in Wisconsin.

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Cranberry Scholarships Available

For the past twenty years the WSCGA has conducted a number of fundraising activities which endowed scholarship funds for students attending UW Madison, UW Stevens Point, UW LaCrosse, UW River Falls and any school within the Wisconsin Technical College system. The criteria for each scholarship vary slightly from institution but all are for students in good standing in fields or majors related to the cranberry industry. A special preference or priority is given to those students who have a history or relationship with the industry. That would include members of the families of growers, employees or others associated with the industry. We would encourage you to have interested students contact the institutions to get more information on applying.

The contacts for the scholarships are:

**University of Wisconsin – La Crosse**

This scholarship is available to junior or senior students in good standing pursuing a degree in the following majors: Marketing, Management, Community Health Education, School Health Education. Recipients are selected by UW – La Crosse. For more information and application materials, contact Sara Olson, 615 East Avenue North, La Crosse, WI 54601, 608-785-8491.

**University of Wisconsin – Madison**

This scholarship is available to junior and senior students pursuing a bachelor’s degree in a field related to cranberry production. Undergraduate students in the departments of Horticulture, Entomology, Soil Science and Plant Pathology are eligible, as are other appropriate students. The recipients are chosen by the College of Agricultural and Life Sciences based on academics and need. Students with a background or previous experience in cranberry production receive special consideration. Information and application forms can be obtained from Scott Johnson, 116 Ag Hall, Room 103, Madison, WI 53706, 608-262-3001.

**University of Wisconsin – Stevens Point**

This scholarship is available to a junior or senior student in good standing pursuing a degree in the following majors: Biology, Environmental Communication, Environmental Education, Forestry, Natural Science, Resource Management, Water Resources or Wildlife. Preference may be given to students who have a background in cranberry production. Recipients are selected by the College of Natural Resources at UW - Stevens Point. Information and applications can be obtained from the College of Natural Resources, University of Wisconsin – Stevens Point, Stevens Point, WI 54481-3897, 715-346-4617.

**Wisconsin Technical Colleges**

This scholarship fund is housed at the Western Wisconsin Technical College Foundation, but is available to students attending any of the state’s technical colleges. To qualify, applicants must be full-time students enrolled in one of 18 programs provided by the technical college system. For more information, contact the scholarship office at your technical college or Lynn Reister, WWTC Foundation, 304 Sixth Street North, P.O. Box C-0908, La Crosse, WI 54602-0908, 608-785-9487.

**University of Wisconsin - River Falls**

This scholarship if available to a junior or senior undergraduate student in good academic standing pursuing a degree in the following majors: Agricultural Business, Agricultural Engineering Technology, Agricultural Studies, Biotechnology, Crops & Soils, Food Science and Technology, Horticulture or marketing Communications. Preference will be given to a student who has been personally involved or has immediate family members who are involved in the production and/or processing of cranberries as an agronomic crop. Recipients are selected by the scholarship committee of the College of Agriculture, Food and Environmental Sciences. Information and applications can be obtained from the UW-River Falls Foundation, 410 S. Third Street, River Falls, WI 54022, 715-425-3505.
Cranberry Night at Miller Park

On September 8 the Milwaukee Brewers and Miller Park celebrated the state’s number 1 fruit crop by hosting “Cranberry Night at Miller Park”. Activities included an appearance at the park by WSCGA mascot Cary Cranberry, the opportunity the throw out the first pitch and promotions during the in game radio broadcast by Bob Uecker and Cory Provis.

This year WSCGA had to go deep into the bullpen to secure someone to throw out the first pitch. Bob Winter of Vilas Cranberry was the lucky winner of a raffle to support the Wisconsin Cranberry Discovery Center. The first prize in that raffle was the right to throw out the pitch. Because of a late injury Bob was not able to make the start and his son, Christian was scheduled to replace him but developed a nasty virus which kept him on the physically unable to perform list. WSCGA then called on Damen Gnewikow who blistered a fastball strike over the plate to start the festivities. The Brewers went on to post an 8-2 win over the St. Louis Cardinals.

Wisconsin cranberry growers have had a relationship with the Milwaukee Brewer Radio network for 7 years as sponsors of the nightly “Umpire Report”. Funding for the sponsorship is provided through a grant from the Wisconsin Cranberry Board, Inc.

Wisconsin Cranberry Growers and UW Badger Sports Form Partnership

UW Badger men’s basketball coach Bo Ryan will serve as a spokesperson for the Wisconsin cranberry industry under an agreement between UW Badger Sports Properties and the Wisconsin State Cranberry Growers Association. The communications effort began in the fall of 2010 when cranberries were added as a regular part of the UW football radio broadcasts. Additional messaging will occur on Badger basketball radio broadcasts and in support of UW men’s hockey. The industry will also provide support for the coaches’ radio shows for the two winter sports.

As part of the effort UW men’s basketball coach Bo Ryan will serve as an industry spokesman. In eight seasons as head coach at Wisconsin, Bo Ryan has unquestionably established himself and the Badger program among the elite in all of college basketball. Under his direction, Wisconsin has compiled five Big Ten titles, the five winningest seasons in school history and an NCAA tournament appearance every season.

With a career mark of 193-73 (.726), Ryan already ranks third on Wisconsin’s all-time wins list. He will be featured in the radio spots for all three sports and be available as a spokesperson in the WSCGA communication efforts this year.

Watch the website and listen to the radio beginning this fall!
Cranberry Growers Renew Partnership with Brewer Radio Network

The Milwaukee Brewers are celebrating the 40th anniversary of their move to Milwaukee this season and Wisconsin’s cranberry growers are part of the celebration. For the sixth year theWSCGA received a grant from the Wisconsin Cranberry Board, Inc. to be a sponsor on the statewide Brewer Radio broadcasts. The broadcasts feature title sponsorship of the “Cranberry Grower Umpire Report”.

The program includes a ten second radio commercial in 162 of the Brewer games on the statewide network. The ten second announcement will include the umpire line up announcement by Brewer radio voice Cory Provis.

In addition the WSCGA participates in the annual “Cranberry Night at Miller Park”, set for September 8. A grower or industry representative will throw out the first pitch. Cary Cranberry will participate in the festivities around the Sausage Race and at the beginning of the game. The mascot will also be around the stadium greeting fans. Cranberry products would be provided to the press box as part of the evening events.

The promotion also includes positioning on the website www.sportsbubbler.com a website that WTMJ developed for Brewers, Packers and Bucks as well as local and regional sports. WSCGA will be able to add recipes for tailgating; promote upcoming activities and projects on the site. Promotional merchandise will be available for activities such as fundraisers, golf outings, etc. “Drop in” messages during games and regular product drops in the press booth on certain home game days would also be added to the promotion to expand the discussion of the industry and products during the broadcasts.

Sporting Clay Shoot and Cranberry Open Fundraisers
Net Over $23,000

The WSCGA held two fundraisers during the year conducted by the Development Committee of the organization. The Sporting Clay Shoot held August 18th and the WSCGA Cranberry Open Golf Outing held June 22nd raised a total of over $23,000.

The proceeds of the events were used to complete the endowment of an undergraduate Scholarship Fund at the UW River Falls Foundation, to provide equipment in support of the on-going mission of the Wisconsin Cranberry Discovery Center and the efforts to develop an Experiment Station for Cranberries in Wisconsin. Thanks to the committee members who worked so hard on the events and to all of the growers and associate members who supported them through participation or sponsorship.
2010 WSCGA Summer Meeting, Field Day and Trade Show

It was a hot and muggy day but still a large crowd turned out for the 122nd edition of the WSCGA/UW Extension Summer Meeting, Field Day and Trade Show at Prehn Cranberry in Tomah. Over 920 lunches were served to the crowd. 104 exhibit spaces were occupied and more than an estimated 1,200 people from the industry attended.

Energy conservation and alternative energy generation were the themes for this year’s event. Prehn Cranberry features two wind turbines and a number of solar panels used to generate electricity for all of the needs of the marsh. They sell excess power back to their local electric cooperative. A mini clinic provided growers with information on energy audits and site assessments available through a program at the WSCGA. The association has also put together materials for growers on cost share opportunities for alternative energy generation.

A second mini clinic was held to discuss field trials for management of new plantings. Jack Perry and Jed Colquhoun led this session on a plot in a new planting on the marsh.

At the business meeting WSCGA recognized Jere Downing, Executive Director of the Cranberry Institute for his service. The Prehn family also received recognition for serving as the hosts for the event. Legacy Bogs’ Associates East Division marsh was recognized for celebrating 75 years of production and their Meadow Valley marsh for more than 100 years of production.

The 2011 summer event will be held at Cranberry Lake in Phillips, Wisconsin on Tuesday, August 9th.

2010 WSCGA Winter Meeting, Trade Show and Wisconsin Cranberry School

2010 started with the annual meeting of cranberry growers from across North America at the Holiday Inn Hotel and Convention Center in Stevens Point. This year attendance grew to over 475 participants in the educational programs, awards presentations and trade show.

Three growers were re-elected to serve three year terms on the WSCGA Board of Directors. David Amundson Heidi Dobbs and Mike Moss.

The Association presented recognition to a number of individuals at the Wisconsin Cranberry School. The awards were presented in appreciation for their efforts in support of the industry and Association.

AgriView Agri Communicator: Heidi Dobbs was presented with this year's award by Jane Fyksen a regional editor for Agri View, a statewide farm paper. Dobbs was recognized for her work with WSCGA by participating in numerous media events and fall harvest communication efforts.

WSCGA Summer Meeting: The 2009 Summer Meeting Field Day and Trade Show was hosted by Gardner Cranberry and Cold Storage. An aerial photo taken the day of the event was presented to the host.

WSCGA President’s Award: The President’s Award is presented to a member who has provided service to the WSCGA over the course of the past year. Vicki Nemitz was presented with the honor by President Ed Sabey.

WSCGA Service to Industry: Gary Dempze and Jere Downing were awarded the Service to Industry Award for their lifetime contributions to the Wisconsin Cranberry Industry. The service to Industry Award is the highest recognition that the association provides.
WSCGA Conducts Media Day on October 6

Each year as part of the communications program the WSCGA Public Relations Committee conducts an event to provide media the opportunity to see cranberry harvest and talk with growers about the crop and latest news and trends in the industry. This year two events were held on marshes in central Wisconsin. Gaynor Cranberry in Cranmoor and Prehn Cranberry near Tomah served as the two host marshes for the events.

The events were used to announce funding approved by Wisconsin DATCP for four cranberry projects under the USDA Specialty Crop Block Grant Program. DATCP Secretary Randy Romanski along with DTCP staff Lora Klenke and Juli Speck were on hand to make the announcement and experience the fall harvest. Rebecca Harbut, the recipient of two of the grants, was also present to talk about her projects on water use and conservation. Fred and Linda Prehn, Heidi Dobbs and WSCGA Executive Director Tom Lochner were also present to answer questions on the crop and the development of sustainable practices for cranberry growing. WSCGA also provided a helicopter for media and others to view harvest from the air.

The event sparked a great amount of media coverage from all sources – print, television, radio and internet. These efforts are designed to promote the cranberry industry and to communicate messages about the environmental stewardship of Wisconsin growers as they practice sustainable cranberry production.

Cranberry Institute Names New Executive Director

After an extensive search process, the Cranberry Institute Board of Directors is both pleased and excited to announce the hiring of Terry Humfeld to become the CI's new Executive Director. Terry will officially begin working with the Institute on November 1 under Jere Downing’s expert tutelage (our retiring executive director), formally stepping up to the role of Executive Director on January 1, 2011.

Terry will maintain his primary office at his residence in Delaware and work from the Institute's Massachusetts office several days each month. Full contact information will be made available after November 1.

Terry brings to the CI and to the cranberry industry substantial professional experience with association management for horticultural and produce trade organizations. We are excited to begin working with Terry and believe that he will provide tremendous value to the cranberry industry through his leadership at the Institute. We are confident that you will share in our welcome of Terry to the cranberry industry as you get to meet and work with him over the coming months and years.

Terry Humfeld began his career in association management in 1984 with a greenhouse growers association and moved to the Produce Marketing Association in 1993 where he has worked in a variety of roles, most recently as Vice President of International Chapter Relations.

He earned the Certified Association Executive designation from the American Society of Association Executives in 1997 and a Certificate in 1998 from the Institute for Organizational Management, a program of the US Chamber of Commerce. He has served on the Produce for Better Health Foundation board of trustees and was a member of their executive committee for 8 years.

Terry holds B.S. and M.S. degrees in Horticulture from Kansas State University and has held positions in university level teaching and extension programs prior to his work in association management. Terry and his wife, Gail, live in Newark, Delaware and have three adult children and one grandson.
Wisconsin Loses Ag Leader

In 2010 Wisconsin farmers lost a good friend and leaders in DATCP Secretary Rod Nilsestuen. He passed away unexpectedly while swimming in Lake Superior near Marquette, Mich., on July 21, 2010. With his wife, Carol, he was volunteering with his church's Habitat for Humanity team.

Rod was remarkably compassionate, intelligent, witty, playful, and generous. He went out of his way to make others feel included and respected. He led by example, caring for his wife and sons, helping the less fortunate, and honorably serving the people of Wisconsin.

Born on July 1, 1948, Rod grew up on his family's dairy farm in Norway Valley, near Arcadia. The son of Gerhard and Margaret, he was the fourth of six children. Norway Valley, its people, and their Scandinavian roots shaped Rod's character, career, and life. Rod attended UW-River Falls, where he studied political science and was elected student body president. He served as president of the United Council of UW Students from 1972 to 1973. Rod was also involved in a college church group, where he met Carol Virginia Dombrock. When Rod asked Carol what his chances of dating her were, Carol told him that he had a one percent chance. They were married on October 10, 1970.

Despite the countless professional accolades and accomplishments, Rod was most proud of his family. Rod and Carol formed a lifelong partnership and still held hands almost forty years later. They were often seen going for walks around DeForest, their home for more than 30 years. With Rod's humor and Carol's good cooking, their house served a constant meeting place for friends and neighbors. Rod and Carol were active members of Norway Grove Memorial Lutheran Church, forming the church's Habitat for Humanity team.

Rod and Carol raised three wonderful sons, Joel, Mark and Ryan. Rod loved spending time with his boys - shooting hoops on the driveway, playing hop-on-pop, or teasing one another. He served as a constant mentor and role model for his boys, always listening and offering support. He was a "kid magnet" for kids of all ages, an irrepressible tease and universally adored by nephews, nieces, and neighborhood children.

Rod was an international leader in the cooperative movement. He led the Wisconsin Federation of Cooperatives for 24 years. Rod strongly believed in the cooperative movement and its ability to help improve the lives of people around the world. He launched numerous initiatives to strengthen cooperatives and was inducted into the National Cooperative Hall of Fame.

In 2003, Rod received a call from Governor Jim Doyle, asking him to serve as Secretary of the Department of Agriculture, Trade, and Consumer Protection. Under his leadership, Wisconsin saw unprecedented growth, reinvestment, and diversification in agriculture. He was most proud of his Working Lands Initiative, which protects Wisconsin's farmland. Rod cherished the opportunity to serve the state of Wisconsin and its dedicated farmers. He was a loving family man, dedicated church member, selfless volunteer and honorable public servant.
WSCGA Communication Efforts in 2010

The following news releases were prepared by WSCGA and its communication consultants to generate positive stories on the environmental, economic and historical importance of the cranberry industry to the state. These were issued throughout the year to generate stories outside of the traditional harvest season.

STATE CRANBERRY INDUSTRY MAKES STRIDES IN SUSTAINABLE AGRICULTURE

Six-year effort results in 10,000 acres of sustainably managed marsh land
More federal cost-share dollars to assist with water quality practices expected this spring

WISCONSIN RAPIDS, WIS. – The Wisconsin State Cranberry Growers Association (WSCGA) and the USDA Natural Resources Conservation Service (NRCS) today announced that a six-year effort to improve grower participation in NRCS conservation programs and water quality on cranberry operations shows significant strides toward sustainable agriculture. The review looked at 51 environmental projects begun by state cranberry growers since 2004 that were funded in part through the NRCS Environmental Quality Incentives Program (EQIP).

“There has been a dedicated effort in Wisconsin’s cranberry industry over the last six years to improve conservation program participation and we at NRCS are pleased that EQIP has become an effective tool in this effort,” said Patricia Leavenworth, state conservationist with the NRCS. “When the program was first introduced, few if any Wisconsin cranberry growers were involved in these kinds of efforts. Now, the growers have embraced this program, and they are a great example of how we can adapt ag conservation practices to meet the unique needs of specialty crops.”

EQIP, funded through the U.S. Department of Agriculture (USDA) Farm Bill, offers financial and technical help to implement conservation practices on agriculture land. Fifty-one EQIP contracts have been awarded to dozens of Wisconsin cranberry growers in the last six years, bringing the total amount to nearly $2 million allocated for conservation projects. In addition to EQIP, WSCGA launched its own conservation funding effort, the Whole Farm Planning Incentives Program (WFPIP), in 2007 to supplement conservation work left unfunded through EQIP. An additional $376,000 to date has gone toward that effort.

According to Leavenworth, in the coming weeks, more than $14 million is expected to be awarded statewide to Wisconsin farmers for EQIP projects in 2010. EQIP is open to all types of agriculture, and according to WSCGA, five cranberry marshes have applied for new funds in 2010. Growers were able to submit applications for the 2010 EQIP through mid-February, and they will be notified by April 1 if their conservation projects have been chosen for funding.

“More than half of Wisconsin’s cranberry acreage, approximately 10,000 acres, has these new conservation practices in place,” said Mike Moss, president of WSCGA. “Wisconsin is fortunate to have a relationship with the NRCS to specifically work with our industry to maximize our environmental commitment.”

Moss said EQIP projects on cranberry marshes range from nutrient management practices to tailwater recovery systems. In fact, he has been awarded EQIP funding for soil moisture and temperature monitoring for his Elm Lake Cranberry Company near Wisconsin Rapids. Moss said the system, which can give readings every 10 minutes, measures pressure and tension in the soil. From there, Moss said he can decide how much or how little to water his cranberry beds.
Additionally, this spring, Valley Corporation near Tomah will complete the final phase of its three-year project funded by both EQIP and WFPIP by installing the last parts of its high uniformity irrigation system on the cranberry marsh. Owner Ed Grygleski said the new system allows water to be applied more evenly and efficiently over the cranberry beds in less time, which in turn uses less water and energy.

“My family has been in the cranberry business for three generations, and the environmental practices we have been able to put in place helps our business grow and ensure we’ll be here for the next generation,” said Grygleski. “Programs that help fund environmental projects are valuable to encourage our growers to keep ‘growing green.’”

Additionally, NRCS has worked with Wisconsin cranberry growers to plan and implement funding support for:

- 2,100 acres of cranberries managed by nutrient management systems
- 1,800 acres of cranberries with pest management systems in place
- 710 acres of cranberries grown using irrigation water management systems

“In an effort to sustainably manage their marshes, Wisconsin cranberry growers really stepped up to the plate to go above and beyond what is necessary for a sustainable crop,” said Tom Lochner, executive director of WSCGA. “That’s a great result for the NRCS to see from such an important crop in our state’s history, economy and environment.”

WSCGA was founded in 1887 and is committed to developing and implementing programs that will assist growers in doing a better job of growing cranberries and strengthen the public support of the industry in Wisconsin. For more information, visit www.wiscran.org. Also, for more information on the domestic and international marketing of cranberries visit, www.uscranberries.com and health and research information on cranberries is available at www.cranberryinstitute.org.

NRCS is the lead federal agency for conservation on private working lands. NRCS’s primary mission is to help landowners plan, design and implement conservation practices on agricultural land. In addition, NRCS implements the conservation programs in the federal Farm Bill including financial assistance, stewardship, wetland restoration, farmland protection, wildlife habitat, and others. For more information, visit www.wi.nrcs.usda.gov.

**SUSTAINABILITY, UW SURVEY FINDS CRANBERRY GROWERS MAKE GAINS IN ADOPTION OF SUSTAINABLE PRACTICES**

Wisconsin’s cranberry growers have made significant gains in the adoption of sustainable management practices over the past two decades, a new University of Wisconsin-Madison survey indicates.

That survey queried 114 producers who manage about 70 percent of the state’s cranberry acreage about their use of practices that bolster sustainability from an economic, environmental and social standpoint.

Among the most significant improvements were in nutrient management, says Jed Colquhoun, associate professor of horticulture, who surveyed producers in late 2009. Seventy-three percent of growers say they now follow a nutrient management plan, while 13 percent say they were doing that in 1989. Eighty-eight percent are basing fertilizer inputs on soil tests; fewer than 60 percent were doing so 20 years ago.

“This is impressive,” says Colquhoun. “Following a nutrient management plan greatly reduces the risk of excessive application of nutrients. It means that growers are applying only the nutrients the plant needs, based on soil sampling and plant tissue tests.
“They’re not doing this because they have to,” he adds. “They’re sincere about reducing environmental risk and also economic risk. Measurement allows for management. They now have real-time information on how to make their production decisions.”

Wisconsin’s 250 cranberry growers have more than 17,000 acres in production. Cranberries are the state’s leading fruit crop, valued at about $250 million in 2008.

Colquhoun says the survey offers both an inventory of current practices and a reference point for gauging further improvements in use of sustainable practices.

“Sustainability is a continuum and not an end point, and this survey suggests that cranberry growers have made great strides along this continuum in the past 20 years,” Colquhoun says “This survey sets a benchmark for assessing future improvements in environmental, social and economic metrics, as well as to identify areas of opportunity for the development of more grower-driven best management practices.”

Mike Moss, president of the Wisconsin State Cranberry Growers Association, sees the study as a step toward identifying new and enhanced best management practices.

“Cranberry growers in Wisconsin have been working for years to implement farming techniques that maximize business while at the same time conserve land, water, resources and wildlife found on the marsh, and we hope to do even more,” Moss says. “The UW-Madison report provides an excellent baseline to measure growers’ environmentally friendly methods of farming and the industry’s economic sustainability for the long run.”

- Among other survey findings:
- Eighty-eight percent of growers use non-chemical practices, such as flooding and weather monitoring to predict insect life cycles, to control pests.
- Ninety-seven percent say they make spraying decisions based on pest thresholds rather than spraying by calendar. That’s up from 68 percent in 1989.
- Seventy-seven percent hire integrated pest management consultants to focus on biological and ecological approaches to pest management, up from 55 percent in 1989. Cranberry acreage is scouted for pests an average of 14 times per season.
- Growers maintain more than 6.3 acres of support lands, including natural wetlands and conserved wildlife habitats, for each acre of cranberry marsh.
- Ninety-eight percent of the state’s cranberry operations are family owned. The average operation has been producing for 39 years and involves two generations of family members.
- The state’s growers average two year-round employees and three seasonal employees. About 70 percent of year-round employees receive health and retirement benefits.
- Wisconsin’s cranberries travel an average of 35 miles from field to receiving facility.
- About 40 percent of growers either host or conduct research on their farms.

The research was funded by the Wisconsin Cranberry Board, Inc., which administers the state’s cranberry marketing order. Under that order, growers are assessed 10 cents per barrel of fruit sold, which is used to fund research, education and marketing programs.

The full report is available at [www.cals.wisc.edu/downloads/SustainableCranberry.pdf](http://www.cals.wisc.edu/downloads/SustainableCranberry.pdf)
The Wisconsin State Cranberry Growers Association (WSCGA) today announced that the U.S. Department of Agriculture (USDA) National Agricultural Statistics Service (NASS) projects that Wisconsin will yield 4.35 million barrels of cranberries during the 2010 fall harvest – an increase of 10 percent over 2009. Based on the projections – and with cooperation from Mother Nature during the next four to six weeks – Wisconsin will be the country’s top cranberry-producing state for the 16th consecutive year.

Tom Lochner, executive director of WSCGA, said the projected crop is due to a warm and wet growing season. The crop also shows the growers’ increased commitment to growing the cranberries in a sustainable way.

“Wisconsin growers are looking forward to another bountiful crop this year,” said Lochner. “It’s been a good summer for all things green and growing, and it’s a positive sign that the state’s largest fruit crop continues to grow and flourish.”

NASS, which bases its crop estimates on grower surveys, also made crop projections for other top cranberry producing states. Those projections are: Massachusetts at 1.95 million barrels, New Jersey at 530,000 barrels, Oregon at 385,000 barrels and Washington at 135,000 barrels.

According to Lochner, the warm summer and the significant rainfalls in the state contributed to this year’s good crop in Wisconsin. Because of that, Lochner says the growers haven’t needed to irrigate as much on the marshes as much this summer for crop needs or frost, which also contributes to the sustainability practices many growers have in place. For instance, many growers have water conservation systems that measure tension and pressure in the soil so they know how much or how little to irrigate their cranberry beds.

Lochner also added that growers are already noticing berries are larger in size this time of year than in recent seasons.

“While size doesn’t affect the taste of the tart cranberries, it is a positive sign of a good crop,” he said. “We still have six weeks to go until harvest begins, so it will be interesting to see how much bigger the cranberries will get in that time. The quality of the 2010 crop should be exceptional.”

The 2010 crop is also expected to produce an over-supply of cranberries. In 2008, the Wisconsin cranberry industry announced efforts to increase production of cranberries to help meet rising domestic and international demand, as well as bring more jobs and economic activity to Wisconsin. In the first year of that expansion effort, approximately 1,500 acres of new marshes were planted. Higher yields, that new acreage in Wisconsin as well as Canada and the overall slowed economy have contributed to this over-supply and building inventories.

“Due to the current economy, both the national and international demand is down,” said Lochner. “We want to step up our marketing efforts to demonstrate the quality and health of Wisconsin cranberries and get the demand going again.”

Right now, Wisconsin’s cranberry industry currently has an annual economic impact of $350 million and supports 7,200 jobs from its 18,000 acres of cranberries grown in 19 counties in central and northern Wisconsin.

The U.S. Cranberry Marketing Committee (CMC), part of the USDA, has marketed cranberries in other countries since 1999 and reports that cranberry industry exports overall have increased by 1.7 percent over the last year in what it classifies as a
tough global economy. The international markets the CMC specifically targets, including Germany, France, South Korea, Australia and others, are seeing an increase in cranberry exports of 24 percent over the last year. In the coming year the CMC is looking at potential new international markets to target, including countries in the Middle East, Turkey and India to help offset the over-supply.

“There are so many factors that contribute to the increased demand of cranberries, including research that demonstrates the cranberry’s health benefits and disease fighting and prevention abilities, and creativity by manufacturers to introduce cranberries and sweetened dried cranberries into a variety of products,” said Lochner. “It’s all in the name of growing the industry on a statewide, nationwide and worldwide scale.”

Wisconsin’s annual cranberry harvest will begin in late September or early October. Cranberries have been harvested in Wisconsin since the 1830s, even before Wisconsin was a state.

WSCGA was founded in 1887 and is committed to developing and implementing programs that will assist growers in doing a better job of growing cranberries and strengthen the public support for the industry in Wisconsin. For more information, visit www.wiscran.org. WSCGA is also on Facebook and Twitter.

Also, for more information on the domestic and international marketing of cranberries visit, www.uscranberries.com and health and research information on cranberries is available at www.cranberryinstitute.org.

WISCONSIN 2010 CRANBERRY HARVEST GOING STRONG

The Wisconsin State Cranberry Growers Association (WSCGA) and the Department of Agriculture, Trade and Consumer Protection (DATCP) today announced that three U.S. Department of Agriculture (USDA) specialty crop block grants have been awarded to cranberry industry researchers to enhance and further measure sustainability efforts on Wisconsin marshes. The announcement was made as researchers and state officials today toured harvest operations at two marshes in central Wisconsin.

DATCP assists organizations in applying for specialty crop block grants, which are awarded by the USDA to help states increase the competitiveness of their specialty crops, such as Wisconsin’s cranberries. Research focused on conservation and environmental outcomes, such as sustainable cranberry production, is one way the USDA urges states to focus on continuously improving the industry.

“Wisconsin’s cranberry industry is a leader for specialty crops nationwide in how farmers can grow crops in a sustainable manner,” said Agriculture Secretary Randy Romanski. “Grants like these play important roles in keeping Wisconsin farmers on the competitive edge as the agriculture industry continues to evolve and compete worldwide.”

USDA specialty crop block grants were awarded to Rebecca Harbut, an associate professor of horticulture at the University of Wisconsin-Madison, to study how to use soil moisture probes to conserve water on cranberry marshes. She will also conduct a separate study on how automated irrigation systems that are used for frost protection can be used to reduce production costs and increase water use efficiency in cranberry production. A third grant was awarded to Jed Colquhoun, also an associate professor of horticulture at UW, to develop new and test existing sustainability standards for cranberry production. Additionally, a grant was awarded to the Wisconsin Cranberry Discovery Center to create an online marketplace for Wisconsin-made cranberry products.
“Some of the largest food retailers in the world are asking for sustainability metrics for food production and that interest is growing,” said Colquhoun. “Though sustainable agriculture is certainly not a new topic, it is high on the radar of consumers, buyers and retailers, and as an industry it’s important that cranberry growers provide measurable standards of sustainability.”

Many state growers are actively involved in sustainable growing efforts, such as implementing nutrient management plans, integrated pest management projects, using moisture monitoring to conserve water and using alternative energy sources. In fact, Fred Prehn who owns Prehn Cranberry Company outside of Tomah, Wis., uses two wind turbines and solar panels to power his marsh.

“Cranberry growers rely completely on the land, water and other natural resources,” said Prehn. “As we continue to learn more about sustainable growing options, we have a responsibility to embrace those options and be good stewards of the environment.”

Colquhoun and Harbut’s studies will further advance the way in which Wisconsin cranberry growers are using sustainable methods to produce a high-quality fruit crop.

“These grants come on the heels of an important survey released this year by the University of Wisconsin on how state cranberry growers have made great strides in sustainability over the past 20 years,” said Tom Lochner, executive director of the WSCGA. “At harvest time we are reminded that ultimately, we’re putting food on the grocery store shelves, and now more than ever, people want to know that those foods are produced in an environmentally, socially and economically sustainable way. That’s what we are aiming to do.”

The 2010 harvest, which began Sept. 20, is expected to run through mid-October. Wisconsin is projected to produce a crop of 4.35 million barrels this harvest season, a 10 percent increase over the 2009 crop. The state produces more than half of the world’s cranberry supply and has been harvesting the berries since the 1830s.

Cranberries, the official state fruit, are Wisconsin’s largest fruit industry in both value and size, and accounted for more than 80 percent of cash receipts to Wisconsin’s fruit growers in 2008. More than 250 growers produce cranberries on approximately 18,000 acres of land throughout 18 Wisconsin counties in central and northern Wisconsin. More information on Wisconsin’s cranberry industry, its history and recipes, is available at www.wiscran.org.

WSCGA was founded in 1887 and is committed to developing and implementing programs that will assist growers in doing a better job of growing cranberries and strengthen the public support for the industry in Wisconsin. For more information, visit www.wiscran.org. WSCGA is also on Facebook and Twitter.

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