Integrated Cranberry Crop Management for Wisconsin

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Cranberry

Crop Management Newsletter

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Nutrient Management Plans

UW-Extension, WSCGA, and NRCS have been working for a couple of years to prepare growers to produce nutrient management plans. Nutrient management plans will be required of all cranberry growers beginning in 2008. Some growers will need to have plans in place sooner. In the meantime, growers participating in the EQIP program will need to have nutrient management plans to receive the incentive payments associated with nutrients.

The primary driver for nutrient management plans is manure management in animal agriculture. Thankfully we don't apply manure to cranberries, but the requirement for nutrient management plans covers all of agriculture. I believe we have little to fear in producing nutrient management plans.

Nutrient management plans serve several purposes. One is to document your practices. Another is to write down what you think will happen on the marsh during the coming year. Another is to document what you actually did. I believe the most important part of the document is to write down the process you use to make decisions about fertilizer applications. During the winter you could write down how much fertilizer you anticipate applying in the coming season and almost invariably that will change as the season progresses. The question then is: "why did it change?" How did you make that decision? What information did you use to make the decision? How did you interpret that information? Just off the top of my head sitting in my office I can think of at least 10 conditions that would lead to changes in fertilizer application amounts and timings.

The process to develop nutrient management plans is not meant to be as much regulatory as educational. If you are developing a nutrient management plan to fulfill the requirements of a voluntary conservation program, you will retain the only copy of your plan. NRCS will review the plan with

you prior to the growing season, and again after the season, before issuing an incentive payment. NRCS won't keep a copy on file. The nutrient management plan is primarily for your benefit.
The first part of the plan is to set the stage. Where is the property located? What amount of the property consists of beds, water storage, forest, operational area, etc.? How are the beds physically arranged? When were the groups of beds planted? What beds are planted to which cultivars? Are groups of contiguous beds managed similarly for nutrients? How are the groupings organized and why? What is the water supply? Where does tailwater go? What are the underlying soils? How were the beds constructed? Is there a sand lift? Who is on the management team? Who is involved in making decisions?

The next section might be some production history. Are there some beds that are consistently high producing and others that are consistently lower? Yield records could be referenced here. Can you identify reasons that some beds produce more than others? This might include cultivar, bed age, bed condition, lack of pests, and fertilizer program.

Records of fertilizer applications including (commercial fertilizer, organic byproducts i.e. fish, soil amendments i.e. sulfur) could be referenced here. What do the historical late summer tissue test reports show? What do soil tests show? Do you have other sources of data that could be used to guide you in planning your fertilizer applications? Include those here as well.

A nutrient management plan should have a plan for the coming season. Based on last years crop, tissue test results, vine vigor, cultivar, etc. predict how much fertilizer will be applied and when. This should be done for each management unit. This part of the plan would necessarily vary somewhat from year to year. Most of the rest of the plan would be static.

The next section, and this is the one that I think is most important, is how you will decide to vary from the plan. What conditions would cause you to vary from the plan? I would think about things like weather. If a substantial rainfall occurred within 1-3 days after a fertilizer application an additional application might be warranted. If an unexpected frost took your crop then fertilizer applications would be reduced, perhaps substantially. If you have an exceptionally heavy crop the vines might need more fertilizer. Observations of vine growth and color based on experience might suggest a need for more nitrogen.

The draft NRCS document that is guiding the initial plans includes some specific recommendations for plans. Most of these "standards" are things you are already doing. For example, growers use sulfur to manage soil pH and most growers make several small applications rather than one large one.

The draft document has some specific recommendations for amounts

of nitrogen, phosphorus, and potassium for cranberries. We believe that under most circumstances these amounts should be sufficient for a full crop. We recognize that there are conditions where application of fertilizer exceeding these recommendations might be warranted. Your plan should allow such applications and, more importantly, what process you will follow to decide to exceed the recommendations.

If you are not participating in NRCS incentive programs your nutrient management plan does not need to be reviewed or approved by anyone. It is for your own benefit. If you are developing a nutrient management plan and would like me to review it please send it to me and I will offer my comments. Some counties may decide to review the plans. If they should do that you can simply pull yours off the shelf and provide it to them. To date there is no move to audit farmer compliance with their nutrient management plans.

Again, the most important part of nutrient management plans is to document the process you use to make decisions about applying fertilizer, not specifically how much fertilizer you will apply. It is also useful to think about the form of fertilizer you will use and why. What benefits do you intend to garner from one fertilizer opposed to another? For example, why do you use a standard dry granular product as opposed to an organically derived material such as fish fertilizer? I think it is important to think very clearly about those sorts of questions. If you have a consultant who advises you on nutrient management I urge you to have a conversation about how the recommendations were arrived at. It is healthy to ask 'why'—and to expect understandable, data driven answers.

While there are still some unanswered questions and there are clearly data gaps, developing nutrient management plans can be a good exercise for all cranberry growers. Over time we'll work through the weaknesses and at the same time I think everyone will improve their ability to manage nutrients. This will usually save growers money and will help protect the environment.

Teryl Roper, UW-Madison Extension Horticulturist

I conceive that books are like men's souls; divided up into sheep and goats. Some few are going up, and carrying us up, heavenward; calculated, I mean, to be of priceless advantage in teaching,--in forwarding the teaching of generations. Others, a frightful multitude, are going down, down; doing ever the more and wider and wider the mischief. Keep a strict eye on the latter class of book, my young friends!

Thomas Carlyle

Nothing is more terrible than to see ignorance in action.

Johann Wolfgang von Goethe

Nutrient Standards

Standards are a critical part of modern life. Cell phones work because various manufacturers have collaborated to create uniform technology across states and even nations. Alcohol breath testers are considered reliable because they are calibrated against known standards. The fertilizer you apply is analyzed against known standards so you can be sure it meets minimum analysis standards. In science we constantly use standards and measure unknowns against the standards. However, standards are only useful if we use the correct standard for comparison. If my standard is wrong then the conclusions I could draw from the data might also be wrong.

Several different studies have looked at changes in the nutrient content of leaves over time in various perennial crops, including cranberries. The general pattern is that nutrients are high in the spring and then decline into mid-summer and then are stable into the fall (Figure 1).

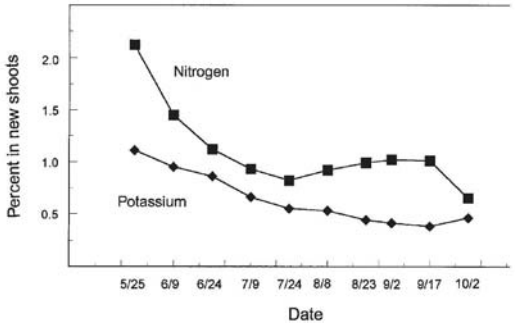

Figure 1. Nitrogen and potassium percent in new shoot tips of 'Early Black' cranberries in Massachusetts, 1988. (DeMoranville, 1992).

The reason for the change isn't that the amount of nitrogen or potassium changes, but rather that it is diluted in a greater amount of tissue. Your tissue test results are reported as percent dry weight. Thus, as the uprights grow the amount of dry weight increases and the *concentration* of nutrients declines.

Taking multiple tissue samples through the course of a year is not recommended. Why? The tissue test standards published in the Extension bulletin "Cranberry Tissue Testing for Producing Beds in North America" (A3642) are based on taking samples during the last 2 weeks of August and the first 2 weeks of September. So, if samples are collected in early June, for example, comparing them to standards based on late summer testing might give erroneous results.

Why hasn't the University created tissue test standards for use throughout the growing season? Because weather and growing conditions are different every year it would not be possible to base such standards on calendar date. Further, the dilution effect shown in Figure 1 shows that the date a sample is taken has a profound effect on the concentration of Nitrogen and Potassium. Matching sampling date to an appropriate standard would be difficult at best. We just aren't sufficiently sophisticated at present to be able to make such recommendations.

If I take tissue samples only in the late summer an entire season might have gone by without knowing a deficiency had occurred and that could have reduced yield. My experience suggests that a tissue deficiency does not occur in a short period of time—particularly in perennial plants. If you take a sample each fall the fall test will guide your fertility program the following year. Rather than arguing that late season samples are too late to make changes for the current year, think that the late season samples are very early data for the following season—because that is exactly what is happening.

For most of agriculture the season runs from May to October. For perennial fruit crops like cranberry, the crop cycle is actually 14 or 15 months, not 5 months. The buds that will produce this year's crop were initiated last year and the fertilizer you applied last year in large measure was to support this year's crop. The fertilizer you apply this year will be to support next year's crop and so forth.

The results of tissue samples submitted to the University lab confirm that most growers are doing an excellent job in maintaining plantings within the sufficiency range. Please see my article in the Proceedings of the 2005 Wisconsin Cranberry School for details. In short, for most nutrients most Wisconsin growers' tissue samples showed sufficient amounts of the macronutrients (N, P, K, Ca, Mg, S). Low samples were rare. Of micronutrients copper was the only element commonly low.

If taking early leaf tissue samples won't give me interpretable data, how can I decide about fertilizer applications during the season? Grower experience is extremely valuable. Subtle changes in color can indicate a need for nitrogen. The amount of new growth on an upright is a signal for adding or withholding nitrogen. The amount of crop setting and beginning to grow is also an indication for a need for fertilizer. Your experience will tell you when and how much fertilizer to apply.

Where did the nutrient standards come from? The current nutrient standards for cranberry are based on a combination of empirical data and researcher experience. The empirical data includes results from rate trials and summary statistics from samples submitted to testing labs correlated with yield data. The standards are not absolute, but are researchers' best knowledge of what nutrient concentrations would be required to grow a full crop.

While tissue testing is a powerful tool, we must be careful to not carry it beyond its ability to provide meaningful, interpretable data. The recommendation for late summer samples will provide data that is interpretable based on the published standards.

Teryl Roper, UW-Madison Extension Horticulturist

Nutrient Management Listening Sessions

Growers are understandably interested in the proposed nutrient management standards for cranberry production in Wisconsin. These standards will guide creation of nutrient management plans and will be the basis for incentive payments for voluntary NRCS programs like EQIP for which cranberry growers are currently eligible.

Three additional listening/discussion sessions have been planned for early June. Please put these dates on your calendar and plan to attend a session near where you live.

Friday June 3, 1:00 pm
Bartlings Manitowish Cranberry Company, 484 Alder Lake Road, Manitowish Waters

Monday June 6, 9:30 am
Valley Corporation, 7857 Hwy 173, Valley Junction

Monday June 6, 1:30 pm
Gaynor Cranberry Co. (Cranmoor marsh) 5695 Hwy 54, Wisc. Rapids