Integrated
Cranberry Crop
Management
for Wisconsin

Cranberry

Crop Management Newsletter

Volume XVII
Number 5
August 5, 2004

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RETIRE THE FUNGICIDES FOR 2004

In this newsletter and at Cranberry School I've written and talked extensively about using fungicides to manage cottonball and fruit rot diseases. As with any pest, be it a fungus, bug, or weed, timing of sprays is critical. We are now past the window of opportunity to use fungicides to manage cottonball and fruit rot diseases. If you've had a problem with these diseases, I hope you got your sprays on during bloom for cottonball and during bloom and/or early fruit set for fruit rot. By this time of the year, you can put the fungicides away and turn your attention elsewhere.

Over the past several years, research by Peter Oudemans at Rutgers University and Frank Caruso at University of Massachusetts has demonstrated that the most critical time to apply fungicides to control field fruit rot is *bloom through early fruit set stages.* In several different experiments, they found that delaying the first Bravo spray until after bloom was much less effective than starting earlier. For example, applying Bravo during late bloom (once at 50% out of bloom and a second time 10 days later at 80% out of bloom) resulted in 8% field rot at harvest, whereas applying Bravo at 10 and 20 days after bloom resulted in 42% field rot at harvest, only slightly better than the 60% rot in the untreated check. Abound has not been as consistently effective as Bravo, but the timing for sprays is similar.

I know some growers of fresh fruit apply copper in August and September, hoping that residues will protect their fruit in storage. There is no experimental data, and I haven't even heard of any convincing circumstantial evidence to justify using copper to control storage rot. In fact, I had a graduate student a few years ago who specifically tested copper for storage rot and found it had no effect. Study after study has shown that how fruit is handled during harvest and packaging is the overwhelming factor affecting storage rot. If fruit is beat up and bruised, it rots. Wet harvested fruit generally decays more quickly than dry harvested fruit.

While I'm slighting copper for not being effective, let me also say that it's not particularly friendly to the environment, despite the acceptance of some copper products for organic

production. It's toxic to fish, which isn't surprising considering that it's a heavy metal. In work I've done on cherry and apple, we find that copper is fairly effective against leaf spotting diseases, but it wipes out *all* fungi and bacteria, bad or good. The role of beneficial microbes on fruit crops including cranberry is not clear, but I think it's probably safe to assume that annihilating all microbial life is not a good thing. As a biocide, I would guess that copper is doing a number on beneficial insects, worms, and other critters, but we haven't tested that.

Patty Mcmanus, UW-Madison Extension Plant Pathologist

CRANBERRY TISSUE TESTING

The only reliable means of assessing the efficacy of a fertilizer program is tissue testing. The correct time to collect tissue and soil samples for analysis is late August through early September. Cranberries require proper amounts of 13 mineral elements in addition to carbon dioxide, water and sunlight. When any of these items are in short supply growth and yield will be reduced. However, if they are in adequate supply, adding additional amounts will not increase growth or yields. Tissue testing is the single reliable means of determining if adequate amounts of the 13 required mineral elements have been supplied and to gauge if your fertility program has been effective.

Good tissue testing requires consideration of three factors:

- Sample at the correct time
- Sample the correct part
- Normal nutrient ranges

Taking a sample

Collect tissue samples during the last two weeks of August through the first week or two of September. The reason to take samples during this time is that the concentrations of the 13 required minerals are stable during this period so the exact date you take the sample is less critical. Also, the standard values against which the results are compared are based on sampling in this time frame. Samples taken at other times are not interpretable based on these standards.

Sample the correct plant part

A good cranberry sample consists of current season growth from both fruiting and non-fruiting uprights. Clip the uprights just above the fruit and be sure to get only current season growth. Collect about 20 tips from about 10 different locations within a bed. Don't collect all the samples from one corner or along one edge. Walk a zigzag pattern throughout the bed, or walk from one corner to the opposite corner collecting samples along the way. Collect from about 10 separate locations within a bed. The total sample will consist of about 200 uprights or about 1 to 1 ½ cups of tissue.

Do not wash or rinse the uprights. Washing will remove soluble nutrients and give you an inaccurate test. Allow the sample to dry overnight before mailing. Use paper bags or envelopes to mail the samples. Please don't use plastic bags. Be sure to label each bag or envelope with a bed number or other identification code. Submit the samples promptly to a reputable laboratory. Your county Extension office can help you locate a suitable lab. If the lab is ASCS certified you can be sure of reliable results and may be eligible for cost sharing.

Soil Testing

Take a soil test at the same time you collect tissue samples. Use a trowel or soil probe to sample to six inches. Collect the soil samples in the same area where you collected tissue samples. The UWEX lab will run a routine soil test accompanying a tissue test at no additional fee ($18.00).

Interpreting the results

Once the results come back from the lab you should compare the results against the nutrients standards for North America and against previous results for the bed or section.

In addition to the lab results you should pay attention to vine growth. Vigorous growth or weak growth may be explained by your test results and will help you alter your fertility program for the following year.

The report will **not** tell you how much fertilizer to apply next season, but will allow you to monitor the efficacy of your current program and point out potential concerns to watch out for later. If you plot the results of tissue testing over time you can begin to see patterns of nutrient changes over time and work to prevent deficiencies.

Table 1. Cranberry tissue standards for producing beds in North America

Nutrient	Normal Concentration[1]
Nitrogen (N)	0.90-1-10%
Phosphorus (P)	0.10-0.20%
Potassium (K)	0.40-0.75%
Calcium (Ca)	0.30-0.80%
Magnesium (Mg)	0.15-0.25%
Sulfur (S)	0.08-0.25%
Boron (B)	15-60 ppm
Iron (Fe)[2]	>20 ppm
Manganese (Mn)[2]	>10 ppm
Zinc (Zn)	15-30 ppm
Copper	4-10 ppm

1. *Normal levels are based on samples taken between August 15 and Sept. 15.*
2. *Cranberry researchers have not found a normal range for Fe and Mn.*

More information about tissue sampling is found in the bulletin A3642 "Cranberry tissue testing for producing beds in North America". Copies are available at your county Extension office or via the web:
http://www.hort.wisc.edu/cran/Publications/a3642.pdf

Teryl Roper, UW-Madison Extension Horticulturist

PRE-HARVEST INTERVALS

While harvest is still some time off, now is the time to think about pre-harvest intervals to assure that any pesticide residues remaining on fruit are within the legal tolerances. A listing of the pre-harvest intervals and re-entry intervals for pesticides labeled for use in Wisconsin is found on page 11 of *Cranberry Pest Management in Wisconsin* (A3276). You'll want to review this information throughout the year as you make decisions about what pesticides to apply and when. Part of the table is reproduced below.

Pesticide	Preharvest interval (days)
Aliette	3
Abound	3
Bravo	50
Carbamate	<28 d after mid bloom
Confirm	30
Diazinon	7
Dithane & EBDC's	30
Funginex	60
Fusilade 2000	365
Guthion	21
Imidan	14
Lorsban	60
Mancocide	30
Marlate	14
Orbit	45
Orthene	75
Poast	60
Ridomil gold	45
Roundup	30
Select	30
Sevin	7
Stinger	50
Touchdown	365

Please note that most of the pre-emergent herbicides are not listed in this table because if applied during the dormant period either in late fall or early spring the pre-harvest interval is not relevant.

Teryl Roper, UW-Madison Extension Horticulturist

On This Day

Mend a quarrel, search out a forgotten friend. Dismiss suspicion, and replace it with trust. Write a love letter, Share some treasure. Give a soft answer. Encourage youth. Manifest your loyalty in a word or deed.

Keep a promise. Find the time. Forego a grudge. Forgive an enemy. Listen. Apologize if you were wrong. Try to understand. Flout envy. Examine your demands on others. Think first of someone else. Appreciate, be kind, be gentle. Laugh a little more.

Deserve confidence. Take up arms against malice. Decry complacency. Express your gratitude. Worship your God. Gladden the heart of a child. Take pleasure in the beauty and wonder of the earth. Speak your love. Speak it again. Speak it still again. Speak it still once again.

Author Unknown

ORBIT USE REPORTING

Later this month you should receive a form for reporting any use of the fungicide Orbit in 2004. This year the Section 18 label limited sprays to before June 15, so I suspect very few people used Orbit. Every year a few folks seem offended that they receive the form, despite having never used Orbit. However, I need to send it to everyone to be sure that we get complete reporting. If you did not use Orbit, you need not reply. Simply toss the form into the trash, recycle it, or roll a cigar with it. If you did use Orbit, please fill out the form as instructed and return it by September 30. My contact information will be on the form.

Patty McManus, UW-Madison Extension Plant Pathologist