

HOW TO TAKE A CRANBERRY TISSUE SAMPLE

Tissue testing is the backbone of any nutrition management plan for cranberry marshes. Taking routine tissue samples for analysis can detect low nutrient concentrations before visible symptoms or yield reduction occurs. Tissue testing can be used to predict the fertilizer needs of your crop, diagnose problems, and to evaluate the effectiveness of your fertilizer program.

Taking tissue samples is easy. Three principles guide collecting tissue samples so that the information from the analysis is interpretable and relevant to the plantings where they were taken. The three principles are:

- Take the sample at the correct time
- Collect the correct tissue
- Take a representative sample

Sample at the right time. The correct time to collect cranberry tissue samples is in late summer to early fall, usually August 15 until September 15. Plants must be sampled at the proper point in time in order to correctly interpret the results. Nitrogen, for example, is relatively high in new leaves in the spring, levels off in midseason and then declines in the late summer and fall. Interpretations are based on knowing the relationship between nutrient levels in a particular part of a "standard" tissue in a specific time in the growing season. A tissue sample taken in the spring could show excess nitrogen compared to late summer standards and a sample taken in the late fall could show a deficiency even if it were adequate in late summer.

Sample the correct plant part. The correct tissue to collect for cranberries is current season growth on both fruiting and non-fruiting uprights, not including fruit. Sampling a different plant part will also lead to incorrect interpretations of the analysis. For example, the nitrogen content of one-year-old leaves is lower than for current season leaves. If one-year-old leaves are included in a sample nitrogen deficiency may be indicated, while if only current season leaves are sampled an adequate amount or an excess may be shown.

Take a representative sample. A representative sample is collected by taking samples across an entire bed, not just in one corner or along one edge. Either begin at one corner and walk diagonally to the other corner, or walk a zig-zag pattern across a bed and collect 10-12 sub-samples

as you go. Each sub-sample consists of 5-15 uprights. The sample should be representative of the planting because the results of the test can be no better than the sample sent in for analysis. The amount of tissue the lab actually tests is less than a teaspoon, so it is very important that the sample be characteristic of the bed. Don't sample diseased, damaged, insect infested or abnormal tissue. If you suspect a nutrient related disorder, sample when you see symptoms. Submit a sample of abnormal appearing tissue along with a sample not showing the symptoms that is collected on the same day. By taking two samples, one from a normal area and one from an affected area you'll be able to compare the two and draw conclusions.

Interpretation:

Within 10-14 days you'll receive a report from the laboratory. You can interpret your report by comparing to the values in Table 1. By taking samples from each management unit each year you can follow upward and downward trends while keeping tissue in the sufficiency range. Downward trends can be mitigated with additional fertilizer. Upward trends may signal concerns about excessive vine growth that can be stopped before it occurs. Tissue samples taken this year guide your fertility program next year.

Table 1. Cranberry tissue nutrient content guidelines for producing beds.

Nutrient	Normal range percent	Nutrient	Normal range ppm
N	0.9 – 1.1	B	15 – 60
P	0.1 – 0.2	Fe	>20
K	0.4 – 0.75	Mn	>10
Ca	0.3 – 0.8	Zn	15 – 30
Mg	0.15 – 0.25	Cu	4 – 10
S	0.08 – 0.25		

Procedure:

Before you begin, gather the supplies and equipment for the job. You'll need a pair of scissors or pruning shears, a permanent marker, and a sufficient quantity of large envelopes or paper bags. Plan ahead of time where you'll take samples so you can walk your pattern on each bed collecting as you go.

1. Begin at the corner of the first bed. Walk into the bed 15-20 feet and collect the first sample. Grab a handful of uprights including both fruiting and non-fruiting uprights.



2. Cut off the uprights where current season growth begins. You may have some fruit attached. These should be removed later.



3. Pick off any fruit remaining on the uprights and place the uprights in a paper bag or envelope.



4. Walk another 30-50 feet and repeat the procedure. Do this until you have collected 10-12 sub-samples in a bed.
5. For each bed you should have collected about a cup of plant tissue.



6. Label the bag with the bed identification, date and farm name.



7. Allow the samples to air dry for a day or two before mailing to the lab. Don't wash the samples. Be sure to fill out the sample information sheet that the lab will provide for you.
8. Promptly mail the samples to the lab of your choice. Mail early in the week to prevent samples sitting in a post office over the weekend. Your County Agricultural Extension office can help you with this.

For more information about cranberry tissue testing please see "Cranberry Tissue Testing for Producing Beds in North America". This publication is available electronically at:
http://www.hort.wisc.edu/cran/mgt_articles/articles_nutr_mgt/Cranberry_tissue_sampling.pdf