

# North American Tissue Test Standards

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The “standard” ranges for mineral nutrient content of cranberries has been published as different values for different growing areas. Many of the ranges being expressed are the result of research in a growing area. However, at the 1993 North American Cranberry Research and Extension Workers Conference, in Richmond, BC, the research scientists who work on cranberry mineral nutrition agreed that it was time to come up with uniform standards. Looking at the different regional research, we recognized that the values from region to region or by variety are not different enough to suggest different standards.

In November 1994, the Cranberry Mineral Nutrition Working Group met again and worked together to establish the standards. These are resultant from research on the major cultivars and in all of the growing areas. Work done by retired researchers was also considered. The values listed in the table below are the normal ranges for cranberry tissue nutrient content in a mid August to mid September sample, where only this years growth is taken. Please note that the ranges are expressed relative to normal. This does not mean that above or below normal means an excess or a deficiency - but that some attention to these levels should be given in planning future fertilizer practices. A fact sheet with these numbers and some guidelines on sampling will be printed and made available during the late spring or early summer of 1995.

In looking to use these guidelines, here are a few things to keep in mind:

- + The guidelines are for producing beds.
- + The guidelines are for a tissue sample taken in the late summer/early fall.  
 We recommend tissue sampling between 15 August and 15 September.
- + Tissue samples taken during this time period should be this year's growth only and not include any fruit, flower or pinhead material.
- + Sample throughout the bed to adequately represent the entire bed in the sample.

There are a few things to bear in mind when looking at these values and the results of a tissue test. If you have used any pesticides which contain plant nutrients, you may see elevated levels of the nutrients in your results. For example, the fungicide KOCIDE contains copper, and late season use of this material may show up as high copper in the tissue. If you are trying to troubleshoot a problem, it is better to take samples from the area in question and a “good” area in the same or an adjacent bed and compare the results - this way you will get a better indication of what the status quo for the bed should be. Another problem situation that often occurs is that tissue samples from areas with vine overgrowth may show up as low. DO NOT assume that the plants need more fertilizer. Overgrowth may “dilute” the nutrient content in the plant and extra fertilizer will only serve to make this situation worse.

## CRANBERRY TISSUE NUTRIENT CONTENT GUIDELINES FOR PRODUCING BEDS

NUTRIENT	BELOW NORMAL	NORMAL	ABOVE NORMAL
Nitrogen (%)	< 0.90	0.90 - 1.10	> 1.10
Phosphorus (%)	< 0.10	0.10 - 0.20	> 0.20
Potassium (%)	< 0.40	0.40 - 0.75	> 0.75
Calcium (%)	< 0.30	0.30 - 0.80	> 0.80
Magnesium (%)	< 0.15	0.15 - 0.25	> 0.25
Sulfur (%)	< 0.08	0.08 - 0.25	> 0.25
Boron (ppm)	< 15	15 - 60	> 60
Iron (ppm)	< 20		
Manganese (ppm)*	< 10		
Zinc (ppm)	< 15	15 - 30	> 30
Copper (ppm)	< 4	4 - 10	> 10

\* Manganese content over 300 ppm may be an indication of poor drainage. If tissue MN is at or above this value, please check soil drainage conditions and if it is poor or there are numerous wet spots, you may want to consider improving soil drainage through ditching or tile drains.