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Tissue Testing - Another Tool for Managing Crop Nutrition

by Colin Smith, CCA

Plant tissue testing has traditionally been used in intensive production centres or for “fact” finding purposes i.e. greenhouses or applied when a noticeable plant problem is visually identified in a field. With the increased focus on maximizing returns on minimum inputs, has the time arrived to apply this overlooked tool in our program? Can we use a tissue analysis to assist our crops in reaching the next step on the yield curve?

A plant tissue analysis requires a small investment of time, but has the potential of offering big dividends.

Tissue testing can be applied to assist with the following areas;

1. Diagnosis of visual nutrient symptoms
2. Identifying “hidden” hunger in crop
3. Eliminating the nutrient deficiency / surplus from the list of potential crop performance issues
4. Support and/or verify the soil fertility program effectiveness
5. Manage the nutrition of our crops to move the yield curve higher

The timing of gathering the leaf tissue for the sample is important, as plants under different conditions may not provide an accurate picture of their nutritional status. Avoid sampling during the peak daytime temperature, as plants may have reduced nutrient levels in exposed tissue as a protection from extreme heat. After herbicide application is another period to avoid sampling or during drought stress, as moisture is not as available to trans-locate nutrients within the plants. The best times to select your tissue samples are morning or late afternoon. Most crops have specific leaf or flower parts that are required to be sampled. This information is often located on the sample bag supplied from the laboratory or from the local agronomist. Use a sampling tool with a clean cutting edge to avoid contaminating the sample. It is important to collect only the requested tissue parts for an effective analysis. Within the field gather 25-50 of the individual plant tissue parts required. If the purpose is to understand a poor producing area within the field, gather a tissue sample from the

good and poor area separately. This provides you with more information to understand what is possibly occurring within the field for plant nutrition.

Once the sample is gathered, proper labelling of the sample bag is important.

Information should detail;

1. Crop type
2. Stage of development when sampled
3. Part of plant sampled (i.e. if wheat, “Flag Leaf”)
4. Field / Grower identification

The tissue sample should be sent to the lab while still fresh for best analytical results. Once received, most laboratories provide results within 48 hours. The results will be most often in displayed in a % concentration for the macro nutrients and ppm for the micro nutrients. The analysis will offer a range for each of the nutrients tested of what has been historically determined to be the range of adequate nutrient levels for the plant growth stage.

Now that we have our sample results, what do we do?

If results show good nutritional balances, nothing, if nutrient levels are below optimum, we have the opportunity to apply a foliar nutrient(s). Unlike a soil test, the tissue analysis is a snap shot of the plant’s nutritional levels at the time sampled. If we apply a conventional granular product to the soil, it will not likely be taken up by the plant within the time period to correct a nutritional concern in the current growing season. Taking a granular product and dissolving in solution may help, but often the products are not in a format for optimum plant tissue absorption and may cause further plant stress from leaf burn. There are foliar products specifically for application to address in crop growing needs. Select the required product from a reputable brand name as the supplier of the brand will have the product knowledge and experience to assist in the proper application rate, timing and compatibility with additional spray tank partners.

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This industry driven program helps ensure that Ontario crop producers are well served by those providing their crop production advice. This article was written by one of those CCA’s.