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AGRONOMY UPDATE

TISSUE TESTING

In a year like this when the crops look promising, producers often look for ways to give that crop just a little extra bump to try to take advantage of favourable conditions. Top dressing of nitrogen or a foliar application of micro nutrients are tempting options when it looks like there may be a bumper crop on the way. But how do you decide what to apply and how much? This is where tissue testing comes in to the conversation – and boy, are there a lot of labs and retail companies promoting their services out there. I tried Googling “companies offering in-field tissue testing in Western Canada” and found no shortage of options. You can take plant samples and send them off to a variety of labs, or in some instances have in-field testing done with results sent to you the same day. But what do the results like the ones shown here mean and how do they help you arrive at an in-season agronomic decision; or even help you determine how to fine tune your fertility program going forward?

Nitrogen	N	3.38	%	<div><div></div><div>5.35</div></div>
Nitrate	NO3	0	%	<div><div></div><div>0</div></div>
Sulfur	S	0.63	%	<div><div></div><div>1</div></div>
Phosphorus	P	0.29	%	<div><div></div><div>0.42 0.7</div></div>
Potassium	K	3.21	%	<div><div></div><div>3.6 5</div></div>

First of all, before you jump into paying for tissue testing, you need to understand the limitations of the technology. The Canola Council of Canada said it best: "Tissue nutrient levels vary significantly depending on stage of plant growth, plant parts sampled, and the time when samples are collected (e.g. time of day, timing relative to environmental stresses). "So, tissue testing results are very dependent on how and when the sampling was done. Each lab will have its own criteria and instructions on what plant parts they want collected. How the nutrients move in the plants will also impact the results you get. Nutrients like calcium (Ca), sulphur (S), iron (Fe), boron (B), copper (Cu), and manganese (Mn) (which are immobile in plants) could show as adequate on whole plant samples, but deficient on new growth samples. Conversely, the mobile nutrients such as nitrogen (N), phosphorus (P), potassium (K), and magnesium (Mg) would have migrated from the older tissue and concentrate in the newer if the overall plant is deficient.

And then there are the environmental factors. Soil compaction interferes with root exploration, and the plant may show deficiency in nutrients that are immobile in the soil and require root interception for uptake. You may have adequate boron or copper in the soil, for example, but it doesn't help if your roots can't find them. The same thing happens with dry soils. If tissue sampling is done in a field where the A horizon of the soil is dried to the wilting point and the roots have gone dormant, you can bet a variety of deficiencies are going to show up in the tissue test.

So, am I saying not to tissue test? That's not the point I'm trying to make. I just want people to understand that it is a single data point in a much larger picture, and by itself really can't shed light on what is happening with the crop. Tissue testing needs to be combined with soil testing and in-field observations to help cut down on the myriad variables that come with the technology. Only then can it be helpful. Where I personally find tissue testing to be of the most benefit is in diagnosing visual symptoms found in a field. If you see something going wrong in parts of the field, tissue testing the good areas as well as the bad can give you valuable information about what is different between where the crop is thriving vs. where it is struggling. Geo-referencing where the tissue tests were taken for follow up soil testing is likely going yield some usable information that can help with future years.

In conclusion, I want to emphasize that I am not advocating against tissue testing; it can be a valuable tool in evaluating the success of your fertility program and fixing problem areas. But to my mind it contributes a single piece to the jigsaw puzzle that is crop production: it is not a stand-alone solution.



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