...FROM THE DESK OF
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CCA 4R

Between the Rows

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INSIDE THIS ISSUE:

Sulphur

In the last issue of BTR, I discussed the different options for phosphate fertilizer. In this issue I will move on to the next macronutrient: Sulphur.

Sulphur is an essential nutrient required by all crops for optimum production. Plants take up and use Sulphur in the sulphate (SO_4-S) form. Sulphur is very important in the formation of amino acids, enzyme and vitamin development, seed production and the formation of chlorophyll.

When I started in the Agricultural business, we actually did not pay much attention to sulphur. In fact most soil test came back with adequate sulphur levels. Then a few things happened. First countries began to cut back on coal-fired electricity and the use of low-sulphur coal. This significantly reduced the amount of free-sulphur we were getting from acid rain. Then researchers realized that sulphur levels in the soil can be highly variable; one soil core may show 10 lb./ac sulphate, the next one 1,000 lb./ac. The third thing was the development of high yielding canola varieties. The low yields we used to essentially masked the sulphur issues, since they didn't require as much. Today we take these factors into account and recommend sulphur rates based on the crop and a N:S ratio of 5-6:1.

Like nitrate, sulphate is a negatively charged ion and therefore very mobile in the soil and like nitrate it can leach out of the rooting zone in light sandy soils (low CEC), as a result fall application of sulphur on light soils is not recommended. However, unlike nitrate, sulphate is not mobile within the plant. This difference is important when it comes to diagnosing sulphur deficiency symptoms.

A 40 bushel canola crop requires almost 30lb/ac of sulphur. Another crop that has high demands for sulphur is alfalfa. A 5 tonne (DM) alfalfa crop also requires almost 30lb/ac. Cereals and other legumes require less, and are not usually included in blends for those crops, but they do need some. In fact sulphur does play an important role in nodulation for legume crops.

The pH of the soil will have an impact on sulphur availability in the soil. As pH drops below 6.0 less sulphur is available. And a soil with a pH below 5.0 will most certainly have issues with sulphur availability.

In the next issue I will discuss diagnosing sulphur deficiencies and remedies, and sulphur as a problem soil amendment.

Agronomy Research Focus: Hairy Canola

Researchers with Ag Canada are currently developing canola plants with trichomes (hairs). Why you may ask? Well it turns out the plants with hairy stems are less susceptible to small feeding insects like flea beetles.

Flea beetles are picky eaters, they actually follow a strict ritual of steps before eating, such as tapping and probing the plant. If this routine is interrupted, they start the whole process over again. The hairs mess up this sequence and the flea beetles are apt to simply leave without feeding.

Researchers tried using gene modification to introduce hairs, however cost and complexity prevented them from developing a commercial variety.

The researchers also found that by breeding in other characteristics such as anthocyanin (red cabbage pigment) and higher wax levels further feeding from flea beetle was reduced.

So they are now using tradition methods of breeding to someday introduce a hairy canola line.

How does true herbicide resistance develop?

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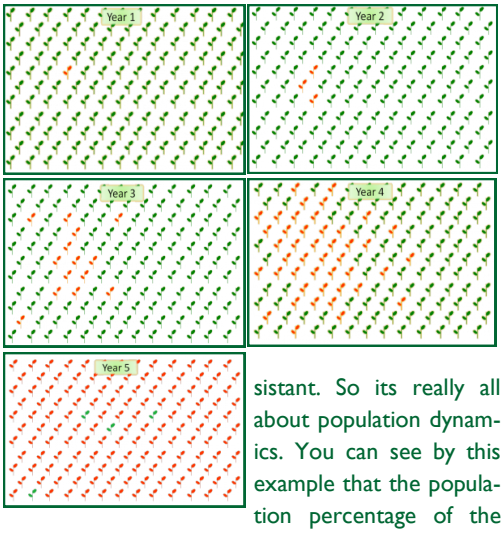
There are many misconceptions out there about how resistance to herbicide develops. Resistance is defined as a change in the sensitivity of a pest population that results in the failure of a correct application of the herbicide to control the weed. It is often thought that weeds change or mutate to become resistant. However it is not the **individual** weed that changes but the **population**.

When a herbicide is applied to a crop, a tiny portion of the weed population (one weed in 10 million) may survive due to its genetic makeup. In other words its specific genetic makeup prevents the herbicide's mode of action to kill it. That weed then passes this genetic trait of resistance on to the next generation. The non-resistant population is killed by that specific mode of action and does not reproduce. Then when you apply the same herbicide again to the field, resistant individuals expand their percentage of the population. After years of applying the same mode of action over and over, the percentage of the resistant population of that weed becomes the dominant percentage of the population and eventually the population is said to have become resistant. So its really all about population dynamics. You can see by this example that the population percentage of the resistant weed (red plants) has gone from a single plant to almost the entire population in 5 years. Remember its not that **individual plants** have mutated, it's the **resistant population** that is increasing, when the susceptible is not. (My apologies to colour –blind people that can not see the red/green in the pictures).



One of the misconceptions about resistance development is that consistently using cut rates of herbicides will promote resistance. The use of cut rates actually just results in sub-lethal doses and poor control overall, resistant individuals will escape, but so will some of the susceptible individuals. So the use of cut rates doesn't actually promote resistance more than full rates, it just results in **poor weed control overall**. Cut rates do not have any affect on resistance development one way or the other, and I definitely **do not recommend cut rates**.

What does promote resistance development, is the continued use of products with the same mode of action, year after year. Remember it is the mode of action, **the actual way the product kills the plant** that matters, not the product name or the rate.

A couple of common local practices I am concerned about may increase the chances of weed resistance. One is the common use of glyphosate alone in the spring as a burn off. Several broadleaf and gassy weeds have developed resistance to glyphosate in Alberta. We don't believe we have them here and we don't want them. **Adding a different mode of action to your glyphosate** in the spring is easy and inexpensive. Tank-mix products suitable for pre-seed application for every crop grown here are available. Just ask me.

Another common practice is always adding a Group 1 wild oat with our canola herbicide. Group 1 is our grassy herbicide of choice in cereals (the only one in barley). We may need to sharpen the grass control in canola, but I would rather it be done on a **"as needed" basis, not a standard practice.**

As a Professional Agrologist, I can help you develop a **"Game Plan"** that will scout your fields. identify your weeds, recommend solutions with the right rates and timings to increase your economic returns and reduce the chances of herbicide resistance developing on your farm.

2025 Agronomic Packages

Interested in having a professional Agrologist scout your field, provide instant updates and recommendations? We have 3 different levels of Agronomic packages available for 2025.

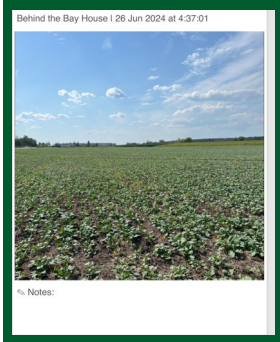
B (Basic) Plan includes 4-5 scouting visits at key timings during the season such as : pre-seed burn off, in-crop herbicide application, fungicide/insecticide timings and pre-harvest timing. The plan can also be customized to suit your needs. Are you planning a month long fishing trip or holiday during the season? You can rest easy knowing that I am your eyes and ears back on your farm. This package also gives you 24hr access to me for any agronomic questions you have. This plan is $2.00/ac.

Plan 50 is a guarantee of scouting visits to each field at least every 2 weeks and more often during "crunch" times like fungicides and pre-harvest timing. This level of protection allows me to really get to know your field corner to corner and to ease your mind and protect your crop input investment. This plan is available for $3.50/ac.

Plan 65 is the Cadillac plan that guarantees a weekly scouting visit to each field, comprehensive reporting and updates. This plan is well-suited for high value crops or problem fields that just need more watching.

In 2024 we purchased access to the Ag Grow scouting app that allows me to instantly create pdf files: listing my observations, recommendation and pictures right from the field to your email or text messages. This app also allows me to put together all of the data from your fields for a comprehensive overview of the entire season. Aa a grower we can also set up the app to allow you to input field operations as they occur, so field record keeping is accurate, consistent and stored safely. For more information or to sign up for our Agronomy packages call Courtney at the Fort Office or myself.

2025 Agronomic Packages



Farming is Fun

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