

Managing Fertility and Rotations at Lumec Farms Ltd.

A Producer Perspective

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Lumec Farms Ltd. is owned and operated by John Coté and Barb Stefanyshyn-Coté along with our four children, Josh-11, Erin-9 Morgan-6 and Lyndon-5. It is a 3200-acre grain farm located in the black soil zone near Leask, Saskatchewan. The land base is divided into two main parcels with the first consisting of 1500 acres right near Leask and the remainder located 25km away nearer Blaine Lake. Soil texture varies from silty clay loam to a clay loam. Cropping choices are fairly traditional with wheat, barley, and canola being the mainstays. Peas, oats, flax, canary seed and perennial ryegrass have also been tried.

Crop Rotations

In general we have two rotations that we tend to follow, either cereal/pulse/cereal/oilseed or oilseed/cereal/cereal. We have found that the addition of a pulse crop is beneficial on land where previous yields were less than stellar. We are not sure if this is due to the nitrogen fixation or improved nitrogen availability from crop residue or an amendment of the soil. No matter what, we find that it is beneficial to us. In our area the only viable pulse crop so far is peas. Beans may be a consideration in the not too distant future but our growing season tends to be only a mere 110 days, which limits crop selection.

In deciding on the best rotations for our farm we have made use of the Crop Sequence Calculator developed by the Northern Great Plains Research Laboratory in Mandan, North Dakota. Following extensive crop rotation experimentation, they have developed a calculator to determine which crops best follow each other. Factors taken into consideration include crop yield, disease, weeds, effect on surface soil properties, soil water and insect problems. The program is simple to operate and understand. Crop production estimates are stated as a percentage of the best rotation for the crop. Disease, weed and insect problems (if any) are identified. They have also included a quick economic calculator to determine your return per acre. This calculator is available at <http://www.mandan.ars.usda.gov/Crop-Seq/CropSeq.htm>.

Although crop rotation is important, we are not bound by it. The main goal on our farm is to increase profitability and in some years that means planting a crop that was not planned for. When this scenario arises the only hard and fast rules that we abide by are avoiding back-to-back plantings of any crop to reduce the risk of disease. Weed control is less of an issue since there are a variety of herbicides to choose from. We do however keep records on herbicide use and application and are in the process of inputting all of this information into the FieldMate program developed by Settler.

Soil Fertility Program

Our fertilizer program is somewhat unconventional. One rule of thumb that we follow is if we have the money, we spend it on fertilizer. This works for us, since we have found that fertilizer application provides us with the biggest return on our investment. We normally soil test half of our fields each fall. When economics are tight we diligently test every field. The reason we spend the extra money is to ensure that our fertilizer application is as accurate as possible. The cost of the extra soil tests is minimal to what we can save by reducing nitrogen application by a few pounds per acre.

This past fall we experimented with the soil analysis provided by Western Ag Labs. They utilize a model root membrane to determine actual uptake of nutrients rather than total availability. The theory is sound and we are interested in the field results we will see next year.

Another strategy we follow is to provide the nutrients that the crop will extract. There are many calculators available to determine the actual pounds of nitrogen, phosphorus and potassium needed by a crop. One example is found on the MFA Crop Advantage website <http://www.mfaincorporated.com/agronomy/wheat/plantfoods/grainremoval.asp>. This strategy along with the results of our soil tests help determine our fertilizer inputs. To prevent mining the soil, it is always important to put back what you take out.

In the summer we send away tissue samples for evaluation. This is a means for us to correlate the previous fall's soil tests with what is actually happening in the field. Tissue testing is a snapshot of what is actually happening with the crop. For example if tissue results suggest an iron deficiency yet soil tests reveal sufficient iron, we have probably identified a rooting problem. It could be compaction or disease but it is something that merits investigation.

Looking specifically at our fertilization program, our largest nutrient input is of course nitrogen. This is applied in anhydrous form in the spring. Phosphate is applied with the seed, however in the last few years we have lowered our phosphorus applications having built up a significant labile pool of phosphorus. We also make use of JumpStart (a commercial phytase) with our canola and peas. Potassium is rarely applied as we are naturally blessed with it. Through tissue testing, we have established that our fields are deficient in sulfur and we apply elemental S with the seed.

We realize that there is a lot of very good science behind soil analysis and recommendations, however knowledge of your situation and common sense also have to be taken into account. There is no doubt that nitrogen application will increase yields, but hundreds of thousands of dollars spent on nitrogen could be wasted if it doesn't rain. Likewise for us, we recognize that phosphorus application does little for crop yield however it is important for maturation. We also recognize that optimal fertilizer application depends not only on determination of the correct amount but also on the precision of the application equipment.

Field Tillage

Our first attempt at zero tillage began in the early nineties. Unfortunately it was not very successful. At the time we were using split depth banders and experienced double shootings of seed and poor fertilizer placement resulting in poor germination. Therefore we adopted minimum tillage for a time with anhydrous ammonia being applied in the fall and phosphate and sulfur applied in the spring with the seed. We have now upgraded to mid row banders and have returned to zero tillage with very positive results. Again however, we are not bound by this technology and if our fields need an extra cultivation or discing to smoothen them out, then we will do it. The expense of possible equipment damage has to be taken into account.

Since compaction is a challenge on our farm, fields being planted to canola will have nitrogen applied before seeding. In an attempt to reduce compaction we have modified our anhydrous wagon from four narrow tires to three 30" wide tires mounted in tricycle fashion. This works well and after only a thousand acres we found that reducing the tire pressure worked even better.

Challenges

We are very fortunate in Saskatchewan to have access to leading edge research. There is significant information available on zero tillage, fertilizer application rates and placement. However with the dire predictions of natural gas supplies and cost, we need to seek out alternative sources of nitrogen, possibly through biologicals, vermi composting or extraction from the air. Farming is constantly changing and there is no doubt that Saskatchewan farming will look a lot different in the next decade.

With many countries in the world having similar soil, better climates and cheaper labour, we need to seek out better uses for our soil rather than commodity crops. Or else we need to find an even cheaper method of producing them. Possible areas to address may include the benefits of intercropping, perennial cropping or strip planting. Farming will continue but lets keep striving for a sustained environment and profitability for all farmers.