



Impact of Unharvested Pulse Crops on Following Years' Soil Fertility

By Donna Fleury, P. Ag.

Unharvested pulse crops left over the winter in fields where conditions were less than ideal, will face both challenges and benefits in the spring. As good nitrogen fixers, growers can expect pulses to contribute nitrogen benefits to the next crop, along with some phosphorus. However, other factors such as diseases, potential volunteers, and amount of crop residue have to be considered when planning the next crop to be seeded in rotation.

With pulse crops, most of the nitrogen fixed during the growing season will remain in the crop residues and soil. Dr. Jeff Schoenau, P.Ag., Soil Science Professor, and Soil Nutrient Management Chair at the University of Saskatchewan highlights some of the considerations for managing nitrogen in the next crops. For pulses, it is a good news story as there are some benefits that can be realized from the nitrogen fixed by the legume.

With unharvested pulse crops, most of the nitrogen derived from fixation is still in the field, including the approximately 70 per cent that is typically removed in the seed in a normal harvest. However, predicting how large the nitrogen benefit will be to the next cereal or oilseed crop can be difficult and there are many factors that can influence the levels. Soil testing is recommended, and for those unharvested fields, taking soil samples as close to seeding in the spring as possible would be beneficial to account for any nitrogen released in late fall and early spring before the time of crop demand. Fertilizer recommendations can then be adjusted accordingly at seeding. Trying to provide a yield estimate of the unharvested crop can also help in estimating the nitrogen benefit. Moisture conditions and how the residue is handled, whether it was left on the surface or incorporated through a tillage operation, can also have an impact.

Growers will have to assess conditions in their fields and their seeding equipment, but with good direct seeding equipment they can likely seed directly into the stubble. In some fields, some type of tillage or harrowing may be warranted to get through the residue. For example, heavy crops that have flattened into a mat over the field may be a bit more challenging to seed, depending on how fast the residue breaks down. However, growers should be cautious, particularly under dry conditions, as tillage operations can make the soil more susceptible to erosion and impact seedbed quality. Seedbed preparation will depend on individual field moisture conditions, residue amounts, and available seeding equipment.

An unharvested pulse crop is similar to a green manure crop, or even a hauled out crop, instead of being terminated earlier in the season, the crop is more mature. Patrick Mooleki,



Soil/Nutrient Management Specialist with the Saskatchewan Ministry of Agriculture conducted research with colleagues at Agriculture and Agri-Food Canada in Swift Current on green manures and recently with crimping forages. In their research, they did not experience any real problems direct seeding into three different pulse green manures including black lentil, chickling vetch, and forage pea. The results of this project also showed the green manure treatments enhanced soil water storage, provided nitrogen benefits, and increased subsequent durum wheat yields by 19 to 54 per cent more than other preceding crops.

There are other factors to consider in planning the next crop in rotation including diseases, volunteers, and weeds. For example, if a pulse crop was lost due to disease such as sclerotinia, then staying away from another broadleaf crop that may be susceptible is recommended. As well, seed from unharvested crops may germinate in the spring and cause volunteer issues in the next crop. Consider potential weeds and volunteers when selecting crops and recommended herbicides for control in the coming spring.

Mooleki adds that himself and other crop specialists with Saskatchewan Ministry of Agriculture plan to work with growers that have unharvested standing or swathed crops from last fall, to try and provide better information to growers. They plan to go out this spring and assess the state of the unharvested crops and stubble, the quality of the seed, and any seeding challenges. Hopefully these conditions are not repeated any time soon, and the information, observations, and experiences of growers will help provide details for the many unanswered questions. For now, pulse growers with unharvested crops may face some seeding challenges in the spring, but will realize the nitrogen and phosphorus fertility benefits available from the preceding pulse crop, along with improved soil quality, and enhanced yields.