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Good Crop Rotations Maximize Yield Potential and Income per Acre

Submitted by Bob Thirlwall, CCA-ON

As planting season approaches, growers are finalizing their cropping plans. There are always many details to consider when trying to maximize net income per acre and maintain yield. In light of increased fertilizer prices, yield potential differences, and new seed technology, farmers have to weigh out many options before heading to the field. Cropping rotations are also a piece of the puzzle and can have a positive or negative impact on yields. Maintaining a consistent crop rotation year in and year out offers significant benefits, ensuring the long term success both in the consistency of yield and pest management.

Crop rotations are important because they provide a number of agronomic and economic benefits to the grower.

These can include improved yields, reduced tillage, a reduction in pests (and ease of pest management), improved soil structure, and reduced fertilizer inputs. Continuous cropping of any crop will result in the buildup of diseases and insects specific to that crop, and can cause a reduction in yields. As an example, soybeans following soybeans often experience a drop in yield. Grower comments indicate a 3 to 5 bushel yield hit is common in second year soybeans, especially if the season is cool and wet.

Crop rotations help increase soybean yield potential, in part due to disease management.

Rotation helps decrease the inoculum load of many diseases including Brown Stem Rot, Rhizoctonia and White Mould. In fields where soybean cyst nematodes (SCN) exist they are likely the most consistent and detrimental to yield potential. If SCN are present, there is potential for greatly increased numbers to develop in the soil in a soybeans following soybeans scenario. Even soybeans offering resistance can still allow a few SCN to reproduce under high infestation levels. Non-host crops, such as corn, will cause SCN populations to decline up to 50% in the first year and continue to reduce the population each additional year a non-host crop is grown.

From a nutrient management and utilization standpoint corn, after a legume like soybeans, take full advantage of any residual nitrogen. For this

reason, legume crops proceeding corn in the rotation have become increasingly more valuable, especially with the rising costs of nitrogen. Corn following wheat under seeded with red clover offers an even greater advantage than soybeans in a rotation. Studies conducted by OMAFRA field crop specialists Greg Stewart and Peter Johnson, confirm that red clover offers a significant nitrogen advantage. Even short stands of red clover can supply 40 lb/ac of nitrogen as long as the stand is relatively uniform.

Since establishing a uniform stand of red clover in Ontario can be difficult, some farmers may hesitate in taking advantage of this nitrogen source. But it is important to note that red clover also offers an additional opportunity to improve soil structure, no matter how uniform a stand may be. Improved soil structure is another great benefit of crop rotations and the inclusion of a cereal crop in the rotation is an excellent way to benefit soil organic matter and soil porosity. Improved soil porosity results in increased rainwater infiltration and leads to less water ponding or soil moisture deficits, becoming extremely beneficial in years with less than ideal growing conditions. Planting too many years of soybeans and fewer wheat crops especially can cause serious soil deterioration, increasing the occurrence of soil erosion, and thus limiting long-term productivity. A good crop rotation however can offer a great opportunity to minimize tillage, improving operational efficiency and work scheduling for a grower as well as improved utilization of machinery.

Every winter at this time of year, growers try to balance the short term economic benefits of chasing the higher income potential of certain crops, versus the long term potential demise of a solid crop rotation. Growers feeling pressure to plant more restrictive rotations should do so realizing their options, benefits and risks. It can be difficult getting back to the desired rotation once the economic benefit has passed, and switching back quickly may not be feasible, leaving a grower at risk in the event of a bad economic swing. Taking the appropriate soil samples to determine your soybean cyst nematode risk and making the effort to include winter wheat under seeded with red clover in your rotation can increase the profit potential of all crops in the rotation, even when weather or commodity prices force you into less than ideal rotation decisions.

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