

Introducing a cover crop in an annual crop production system can increase diversity in the crop rotation. They provide soil coverage, compete with winter annual weeds and increase biodiversity and provide other benefits to the preceding cash crops (Baerg, 2013). Tillage radish has a large, long taproot and can improve soil structure and water infiltration by breaking up hardpan. This is due to the wide channels following decomposition, allowing water to quickly infiltrate. It can also act as a catch crop, utilizing excess N, reducing N losses due to leaching.

The use of tillage radish as a cover crop is limited mostly to the United States in corn, cotton and soybean crops, with little adoption in northern climates or in conventional annual cropping systems. This demonstration will allow farmers to evaluate if tillage radish provides benefits in terms of improvement in soil structure, N availability and preceding crop yield and quality in northwestern Saskatchewan. It will also demonstrate the production practices to maximize productivity of cover crops for those farmers unfamiliar with growing cover crops.

Field trials were conducted at Scott in the 2014 and 2015 growing seasons. A 2 x 5 factorial experiment in a randomized complete block design with four replicates was set up. The first factor was nitrogen rate (100 % and 150 % of soil test recommendation) and the second factor was tillage radish incorporation time (50 % flowering, hard dough, postharvest-drilled-in, postharvest-harrowed and check (no radish). The tillage radish was broadcast into seeded wheat at 50% flowering and hard dough stage.

Tillage radish population and radish root length were both significantly affected by broadcast timing (Fig. 1). Wheat yield was significantly affected by nitrogen rate but not by radish broadcast timing (Fig. 2). This may be because in order for the tillage radish to positively influence the cash crop yield, it requires proper establishment and an extensive rooting system for nutrient cycling.

Both in-crop broadcasts are not significantly different compared to each other, but significantly different from the postharvest broadcasts (Fig. 1). The drilled-in method facilitated seed to soil contact, resulting in a higher emergence compared to the other broadcast methods. Both the postharvest timings did not reach the stages for root length measurements (Fig. 1).

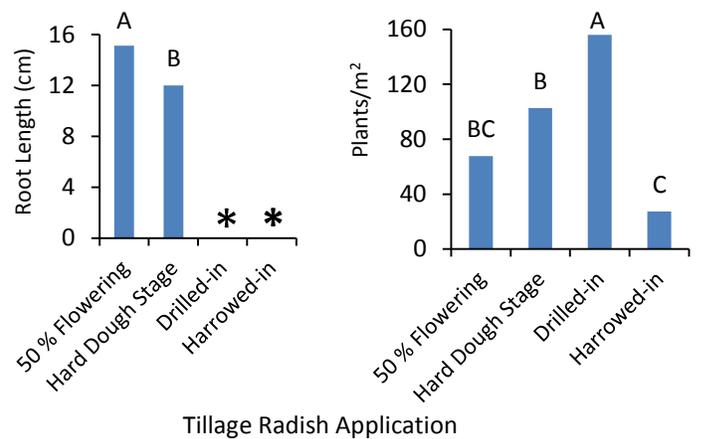


Figure 1: Effects of tillage radish broadcast timing on radish root length and plant density 2015 growing season at Scott, SK. (* represents unavailable data).

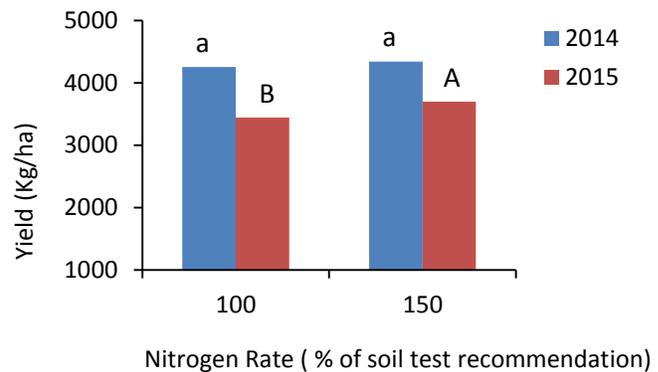


Figure 2: Effects of N rate on wheat yield for the 2014 and 2015 growing season at Scott, SK.

From the study it can be concluded that radish timing does not interfere with the cash crop yield at least in the year of seeding, but variable N rates can effectively alter crop yields. However, the broadcast timing influences radish establishment and root biomass, and thus affecting its function of soil structure improvement. Based on the results and from other studies, farmers can incorporate radish at seeding time (by drilling) up to the hard dough stage (by broadcasting) in cereals. Read the full report at: <http://www.westernappliedresearch.com/research/warc-annual-reports/2015/>

This project was supported by the Agricultural Demonstration of Practices and Technologies (ADOPT) initiative under the Canada-Saskatchewan Growing Forward 2 bi-lateral agreement.