Fall Cover Crops for Sequestering Manure Nitrogen
(Georgian Triangle SCIA – Partner Grant Interim Report)

Purpose:

The Georgian Regional Soil & Crop initiated a project in the fall of 2012 to evaluate the potential uptake of soil residual nitrogen and fall applied manure nitrogen with fall established oilseed-cereal cover crop mixture.

Methods:

In fall 2012, five cover sites were established (Walkerton, Chesley, Wallenstein, Borden, Arthur) with 2 replications of either a rye or rye – oilseed radish cover crop. The cover crops were spring incorporated, and in June corn was side dressed with either a partial or full rate of nitrogen. Soil samples were collected after the cover crop was established, late fall 2012 and PSNT timing. Stalk nitrate tests were completed from lowest and highest N rate treatments

Results:

Late wheat harvest in 2012 and subsequent dry weather delayed establishment of cover crop at 3 of 4 sites until mid- August. Cover crop height by late fall was 6-12 inches in most cases. Results from 3 of the sites indicated that corn yields were N limited. Corn yield following the cover crop were generally less than following no cover crop at each of the N rates. At the Walkerton site, the cover crop was incorporated in the spring prior to planting. Regrowth of rye in the corn was delayed due to wet weather until the 2-3 leaf stage, and this had a visual impact on corn growth. Corn stalk nitrate samples collected at maturity did not indicate clear differences between treatments.

Table 1. Corn Yields Comparison Between No Cover and Cover Crop Plots

Location	N Rate (lb/ac)	Cover Crop	No Cover
		Corn Yield (t/ac[1] or bu/ac[2])	
Wallenstein (corn silage)	25	13.3[1]	14.7
	50	14.7	15.5
	100	15.8	15.3
Walkerton	50	188[2]	190
	128	183	199
Arthur	50	133	148
	140	162	168

Summary:

Soil nitrogen in late fall 2012 was lower under the cover crop. In 2013, corn following cover crop yielded less at the lowest nitrogen rates . At the Walkerton site, competition from the cover crop resulted in lower yields. Sites appeared to be N limiting, and in retrospect a higher non-limiting rate of nitrogen should have been included in the trial.

Project Contacts:

Ray Robertson, Georgian Regional Soil & Crop. ray@greyagservices.ca
Brian Hall, OMAF/MRA, brian.hall@ontario.ca