Gen7-2011 - Fall Compost Project

CROP ADVANCES

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Field Crops Team, Agriculture Development Branch
Ministry of Agriculture, Food and Rural Affairs
In partnership with
Ontario Soil and Crop Improvement Association
And other Agricultural Organizations and Businesses

http://www.ontariosoilcrop.org/cropadvances.htm

Fall Compost Project

Purpose:

To test the effect of fall compost application on following corn crop with respect to soil fertility, plant establishment and final yield.

Methods:

The same hybrid wasplanted in strips where compost was fall applied and no compost applied, comparing plant establishment, yield, and the effects on soil fertility.There are two sections in the field, one spread with 8-10T/ac of compost and the other with no application. Within the section that compost was applied, a portion was fall-tilled with the majority of the test strips being spring tilled. Assessments were taken on treated and untreated areas. One further factor thrown into the project was variable side-dress nitrogen applications. Three levels of side-dress application were used; 0lbs, 50lbs and 110lbs, each on treated and untreated strips. We had two additional strips of variable nitrogen on section of field that was fall tilled at 0lbs and 110lbs N.An assessment was taken pre-plant to determine the consistency of product application and calculate accurate application rate. At 2 to 5 leaf, populations, and plant staging were observed.At 6 leaf stage, N tests were taken in both treated and untreated areas.At harvest, yield data (including test weight and moisture) were taken in both treated and untreated areas, as well as the section that was fall tilled, totaling 8 strips weighed off at harvest.

Results:

Soil fertility levels were measured in fall 2009 and then again in fall 2011 after compost application in fall 2010:

Table1. Soil Test Levels At Sampling Times 2009 and 2011

Soil Fertility	Test Yr	pH	P	K	Mag	OM	CEC
D1-1	2009	6.2	148	116	195	4.6	18
D1-2	2009	6.3	20	131	255	4.6	19
D1-3	2009	6.5	11	135	318	5	22
31-1a&1b	2011	6.7	9	115	285	5.3	22
31-2	2011	6.3	9	105	238	4.4	18
31-3	2011	6.4	7	102	249	4.4	20

As seen above, no major changes in OM in two year period. It is not expected to see a change in OM that quickly, especially with high OM soil.

Below are harvest results, including populations:

Table 2. Results from Treatment Comparisons

Application	Tillage timing	Fertility Treatment	Moisture (%)	Yield (bu/ac)	Test Weight (lbs/bu)	Harvest Population
No compost	Spring	Full rate 110 lbs/ac	16.8	195.1	58.2	31,670
No compost	Spring	Half rate 50 lbs/ac	16.7	197.3	58.3	29,670
No compost	Spring	Zero nitrogen	17.0	184.4	57.8	30,333
Compost	Spring	Full rate 110 lbs/ac	16.9	188.7	58.2	31,170
Compost	Spring	Half rate 50 lbs/ac	16.9	187.7	58.5	31,670
Compost	Spring	Zero nitrogen	16.5	183.5	57.1	31,170
Compost	Fall	Full rate 110 lbs/ac	16.9	199.1	57.5	31,333
Compost	Fall	Zero nitrogen	16.6	170.2	57.0	31,176

In the no compost section of field, highest yield and population came from section with full nitrogen rate. In area that had compost applied, highest yield came from section that was fall tilled with full rate of nitrogen. From the data, it appears there was more of a response to the application when it is fall tilled versus spring tilled. The spring tillage section of the field both treated and untreated were side by side. The area of the field with compost did not respond as well to nitrogen application as section of field that did not have compost applied. Yield range in treated section was 4.2 bu/ac highest to lowest whereas yield range in untreated section was 10.7 bu/ac. As with N test results, it seems as though the compost may be tying up some of the nitrogen in the soil. The C/N ratio for sample of compost used on this property was 14.5 which may suggest incomplete composting.

Summary:

Yields were similar in the zero N applied areas where compost was applied and where it was not. Compost applied in a relatively high organic matter field showed a nitrogen response up to half of the recommended rate in 2011. The response was reduced to only a few bushels by the use of the compost product. With compost, the nitrogen retention and release in the soil showed a lowered yield response to nitrogen application. Populations were not influenced by the compost application. Fall tillage of compost product showed a greater overall impact on yield improvement.

This was not a scientifically predetermined method test. Variables do exist within the field sampled areas. More testing is needed.

Next Steps:

Project will be presented at Ontario Soil & Crop Annual Meeting Feb 7th& 8th. Report will be sent to RCC Shirley Munro to be included in newsletter. Presentation was made at Ottawa-Carleton Annual meeting on December 19, 2011.

OCSCIA would like to repeat the project however no growers in the same area have applied the product in fall 2011 for 2012 crop. OCSCIA may approach grower in another area of the county to reproduce the project however grower does not currently sidedress nitrogen so project may not be viable.

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Location of Project Final Report:

Ottawa Carleton Soil & Crop Improvement Association.