

CORN AND SOYBEAN YIELDS WITH MANURE AND COMMERCIAL FERTILIZER

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A project evaluating crop rotations substituting manure for commercial fertilizer was initiated in 1979-1980 in South Deerfield research blocks 14 and 15. In late spring of 1979 the experimental area was planted to buckwheat grown as a green manure crop. This was followed in the fall of 1979 by a winter rye cover crop which was incorporated with the manure and commercial fertilizer treatments in the spring of 1980 when the crop rotations were first initiated. Crops grown in 1980 were:

1. Field corn as the first of a continuous corn and winter cover cropping sequence. The winter cover in 1980-81 was winter rye.
2. Soybean followed by winter rye cover and sweet corn in the spring of 1981.
3. Sweet corn followed by a winter cover (wheat), then seeded to spring oats in 1981 for grain.

Soil management practices introduced in 1980 were:

1. Conventional fertilizer check plots with 120-120-120 lbs/acre.
2. 12 ton per acre of dairy manure with bedding sawdust.
3. 30 ton per acre of dairy manure with bedding sawdust.

In 1980 the first year of the fertilized and manured rotations, yields were similar among the three fertility treatments as shown in Table 1. Residual fertility from the previous cropping pattern of green manuring probably contributed to these similar yields in this season. Visual appearance of all crops was similar throughout the season across all soil management treatments.

Table 1. Yield response to manure and commercial fertilizer - 1980.

Fertility Treatment	Silage Yield		Soybean Bu/ac.	Sweet Corn	
	Ton/ac.	30% DM		Ear No./ac.	Total Tipfill %
120-120-120 lb/ac.	19.1a†		57.4a	30,827a	51.8a
12 ton manure/ac.	19.5a		54.9a	26,024a	51.4a
30 ton manure/ac.	19.1a		55.2a	31,274a	55.2a

† Means followed by similar letters in column are not significantly different at P = 0.05.

Fertilizer management for the 1981 spring oat crop was 35 lb N per acre in the spring on commercial fertilizer plots, 12 ton per acre manure on the previous 12 ton plots and 8 ton per acre manure on the previous 30 ton plots. The manure was applied in the fall prior to seeding the wheat crop cover. For the field corn and sweet corn 1981 crops the commercial fertilizer plots received 60 lb N per acre side-dressed in early July. No fertilizer or manure was applied to other plots.