

1997 Compost Applications on
Field Corn, Barley, and Apples

Farmer Demonstrations Using Composted
Poultry Manure from Kreher Farms
Clarence, New York

Northeast SARE Farmer Grant #: FNE 97 176
601 Main Street
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Summary provided by Nathan Herendeen, Cornell Cooperative Extension,
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for
Kreher Farms, Brett Kreher
5411 Davison Road
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1997 Kreher Farms Compost Application Project

Cooperator: Steve Porter Farm, Elba (Genesee County) Spring Barley

Spring barley grown for an organic market, used for organic milk production. Compost used to supply nutrients to improve production per acre and still meet the organic certification standards. Plots were established with approximately 1000 lbs/acre and 2000 lbs/acre, broadcast with a fertilizer spreader in late April. Ontario barley planted on May 5 at a seeding rate of 2.5 bu/acre (120 lbs/acre). A cover crop mixture of clover and alfalfa was planted at the same time to be plowed down next spring. Compost was incorporated after application by one pass of a chisel plow and one field cultivator. No chemical weed control was used in order to maintain the organic certification. Weeds were a minor problem, but not severe thanks to cool, dry weather in May.

Harvest was completed August 9, 1997. This was about a week later than ideal and some of the heads had broken over or whole plants had lodged. This reduced yields slightly especially in the treated plots as compared to the check plot. A test weight check done by Nate Herendeen showed 48 lbs/bu, the standard for barley.

There was a variation in the length of each strip so each was measured separately. One 16 foot wide strip was harvested in the center of each strip. Yields for each strip were weighed on sealed scales at Byron Enterprises/L-Brooke Farms.

RESULTS:

Check (No Compost): 1190 lbs on 0.4867 acres, **50.9 bu/acre**

1000 lbs/ac Compost: 1695 lbs on 0.4959 acres, **71.2 bu/acre**

2000 lbs/ac Compost: 1730 lbs on 0.4907 acres, **73.5 bu/acre**

Cost of the applied compost at 1000 lbs/acre was about \$35, assuming \$25 for the compost \$5 transportation and \$5 application. The 1000 lb rate produced a 20.3 bu/acre response. Assuming \$2.70/bu for barley, the value is \$54.81, net improvement is \$19.81 per acre.

At the 2000 lb/acre rate, the cost would be about \$65/acre, assuming \$50 for compost and \$10 transportation and \$5 application. The yield response was 22.6 bu/acre worth \$61.02, or a net loss of \$3.98 per acre.

The barley may have a higher value since it can be marketed as a certified organic crop.

by: Nathan Herendeen, Area Extension Educator, 08/13/97

Compost Application on Apple Trees being Grown Organically

Cooperator: Singer Farms 1997 - James Bittner, Farm Manager
1091 Quaker Road, Barker NY 14012

Compost was applied in early April, 1997, on Block G11, cultivar Rome. Compost was surface applied, there was no incorporation.

Apples were harvested 10/27/97

<u>Alley #</u>	<u>Compost/acre, lbs</u>	<u>Bins</u>	<u>Bu/acre</u>	<u>mean</u>
1	900	30	500	533.5
2	900	34	567	
3	700	30	500	500
4	450	22	367	367
5	450	22	367	
6	0	22	367	
7	0	26	433	400

These are old trees. The data are difficult to analyze. We believe there was no significant difference in the harvested yields. It will take another year to see the full effect of the compost on the fruit trees.

There was no visual or processing quality effect on the apples between the treated and untreated strips.

1997 Compost Application on Field Corn

Cooperator: Jeff Toussaint, Beeton Farms, 1997
Culvert Road, Medina NY 14103

Compost was applied May 6, 1997, and incorporated with a field cultivator. Corn was planted May 14. Harvest was on Dec. 2 by Jeff Toussaint, James Capron, and Nathan Herendeen.

Starter fertilizer was applied on all but one strip, it consisted of 250 lbs/acre of 9-18-28 for a total application of 22 (N), 45 (P₂O₅), and 70 (K₂O) lbs/acre at planting.

Plots were 8 rows (20 feet) wide across the length of the field, 1576 feet. Four rows were harvested out of each strip, a total of 0.36 acres. There were no significant differences in harvest moisture content of the grain. Unfortunately, it was not possible to replicate the strips.

Treatment 1, no compost, starter only	88 Bu/acre
Treatment 2, 1000 lbs/acre of compost plus starter	125 Bu/acre
Treatment 3, 1000 lbs/acre of compost, no starter	108 Bu/acre
Treatment 4, 2000 lbs/acre of compost plus starter	178 Bu/acre
Treatment 5, 2000 lbs/acre of compost, no starter	146 Bu/acre
Farmer field, starter plus 140 lbs/acre Nitrogen sidedress	172 Bu/acre, avg. of 2 strips

The test area of this field was damaged early in the season by dry weather and significant weed growth. Weeds were controlled using a post-emergence application of Accent plus Atrazine plus Buctril, but the weeds and annual grasses had made significant growth by the time they were controlled and died back. The early competitive effect of the weeds likely reduced yields.

Application of compost was accomplished with a lime spreader. The technique used was not as reliable as desired, controlling the width of spread was difficult. Harvest data was questionable due to weighing problems. It appears that there was significant yield response from the 1 ton rate of compost, but not equal to the farmer applied nitrogen fertilizer.

At a price of \$50 per ton, it is not feasible to apply more than one ton per acre. A two ton/acre application would have come closer to meeting the crop nitrogen requirement. The nitrogen in compost exists primarily as organic nitrogen. Typical assumptions for organic nitrogen are that 30 percent is mineralized and made available to the growing crop in one season. At the application of one ton per acre and 5 % nitrogen in the product, this would mean only 100 lbs/acre of nitrogen. If only 30 % is available (30 lbs/acre), the crop was short of nitrogen. The benefits of this product will be more obvious in subsequent seasons as organic matter content is improved and residual nitrogen becomes available.

The challenge in marketing this compost is to have farmers understand the long term benefits of organic sources of nitrogen. It will likely take three years of continuous application to see the real benefits. Most field crop farmers are not willing to make that amount of up-front investment.

1997 Compost Trial, Field Corn at Porter Farm

Cooperator: Steve Porter, Genesee County, Elba, New York

This field is being prepared for certified organic production so compost was the only source of nutrients for the corn production. No commercial fertilizer was applied through the planter. Weed control was by tine weeder cultivation at emergence which was not completely successful. Weeds reduced yields in several areas of the field.

Compost treatments were applied and incorporated by Steve Porter prior to planting. The corn was planted on May 24, variety was Fielder's Choice 8190, a 90 day relative maturity hybrid. Seed drop was 26000 per acre. Yields are the result of **hand harvest**, 2/1000th acre, repeated at three locations in each treatment area. These strips had not been set up to be statistically analyzed.

Treatment 1	Wegman's poultry compost, 2 tons/acre				
	Population at harvest	23670	Yield	59.6 Bu/acre, dry shelled corn basis	
Treatment 2	Kreher's poultry compost, 1 ton/acre				
	Population at harvest	24170	Yield	62.0 Bu/acre, " " " "	
Treatment 3	Kreher's poultry compost, 1/2 ton/acre				
	Population at harvest	24170	Yield	65.2 Bu/acre, " " " "	

Yields were measured by hand harvest and weighing of ears from the harvest areas, correcting for moisture content, and assuming an 80 % shelled corn yield from the ears harvested. Based on the variation within harvest areas, these are not significantly different yields.

All yields were limited by weed competition and nutrient availability. We limited the compost application to 1 ton per acre to keep the costs realistic. At \$50 per ton, it is unrealistic to apply more than one ton per acre. However, to see the benefit from this sort of application, three years of history would be needed. This would allow total nitrogen and phosphorus availability to approach the crop needs as a result of residual nutrients from prior years along with the current year's supply.

Steve Porter will continue to use these products to build soil fertility and provide a supply of nutrients for his organically grown crops.

Sustainable Agriculture Research and Education Program
Farmer/Grower Grant Final Report

- 1) The goal of this project was to demonstrate that composted Poultry Manure can be used on other farms as fertilizer which provide vital nutrients for various crop production operations at a price competitive with commercial fertilizers. This project also will demonstrate the added value of organic sources of nutrients (compost) on crop farms.
- 2) We are a multi-partner family farm, presently seven family members are involved in the production and marketing aspects of the egg and compost business. We raise corn, wheat, and soybeans for our laying flocks. We own 700 acres and rent 900 acres of land in Erie and Genesee Counties of Western New York.
- 3) Cooperators:
 - Nathan Herendeen-Area Extension Specialist, Cornell Cooperative Extension.-716-433-2651
Data Collection/tabulation, Facilitator of cooperators, Outreach Programs, Crop Advisor.
 - James Bittner, Singer Fruit Farms, Barker NY - 716-795-3709
Allowed us to apply compost to a small portion of his apple orchards. These areas were where he was trying to produce organically grown apples.
 - Steve Porter Farms, Elba NY - 716-757-6823
Used compost on his Spring Barley which is grown organically; the crop is then sold to the organic market or used to feed a dairy herd which produces organic milk..
 - Jeff Toussaint, Beeton Farms, Medina, NY - 716-798-1012
Grows field corn for sale. Tested compost in various strips with no commercial fertilizer and in addition to commercial fertilizer to see which brought the best yield.
 - Grady Vincent, L-Brooke Farms, Byron, NY
L-Brooke was a last minute addition to the field trial. He grows field corn for sale. Tested compost in various strips with commercial fertilizer to see which brought the best yield.
- 4) Demonstration strips were established on cooperating farms to show that comparable yields of crops can be grown using the by-product compost as the principal nutrient source, compared to commercial fertilizers.
- 5) The findings were mixed. Generally, the compost did provide essential nutrients which helped increase yields, but did not reliably do as well as commercial fertilizers. The most promising place to market this compost would be to certified organic farmers. The compost significantly increased yields over untreated plots.
- 6) NA

7) The compost could be used in place of the starter on field corn but the cost @ \$50.00/ton would limit its application to 1 ton/acre.

8) Unknown, We believe that this project helped us to sort out the most viable markets for this product. This spring, for the first time in the three years we have been making this product, we have been able to market ~~the~~^{our} entire production. The two new markets for us are, Pelleted bagged organic fertilizers, and large 1,000 acre Certified Organic farms.

9) Yes. On Certified Organic Farms. The product has limited applicability to non-organic farms.

10) Organic Fertilizer has long-term benefits, they are organic matter content in the soil is improved, and residual nitrogen becomes available.