

North Dakota Manure Fertilizer Use Recommendations

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Using livestock manure as a sole fertilizer is not a practice that is commonly done by North Dakota crop producers. Manure contains all the nutrients necessary for plant growth but these nutrients are primarily in the organic form. Microbial breakdown is a natural process whereby manure nutrients are made available for plant growth. The rate at which the nutrients are made available through this process will vary depending on soil conditions and what species of animal produced the manure. The NDSU Carrington Research Extension Center conducted a research program to determine if manure can supply the necessary nutrients for typical crops grown in the upper Great Plains.

Corn, canola, and hard red spring wheat were the three crops used in the research trials. Five trials were conducted with fall- and spring-applied manure as well as spring-applied commercial fertilizer on spring wheat. Spring-applied manure was compared with commercial fertilizer in two studies each on corn and canola. Plots with no fertilizer were the control treatment for all the trials.

Corn yields did not vary significantly when commercial fertilizer vs. spring-applied manure were compared. Canola yields were significantly lower when spring-applied manure was compared with commercial fertilizer. Fall-applied manure vs. commercial fertilizer were statistically similar for the spring wheat trials.

Following are some recommendations for using manure as a fertilizer source.

- Sample the manure that is going to be used to determine the nutrients available. Information about manure sampling labs can be found by going to: www.ag.ndsu.edu/lem/resources/manure-nutrient-sampling-and-testing.
- Credit 50 percent of the total N in the manure analysis as available the first year of application.
- Manure nutrients are a complete substitution for commercial fertilizer for corn production and can be applied in the spring or fall.
- Short-season, high N-demand crops such as spring wheat and canola require 20 to 40 pounds per acre supplemental commercial fertilizer if manure is spring-applied. The same recommendation may be beneficial for fall-applied manure as well.

More information on this study, including data, can be found by going to www.tinyurl.com/NDManureFertilizer.



Spreading manure at the NDSU Carrington Research Extension Center fields.