1997 Winter Manure Management Progress Report

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Materials and Methods

Plots were established in 1994 to determine what type of previous crop residue would reduce runoff into waterways on slopping ground. Manure is applied to approximately six inches of snow during the winter to corn, soybean or alfalfa plots. Plots are on a 7% slope between two terraces. Water is collected in the terrace channel below the plot when the snow melts. Each manure plot is replicated three times with one check plot for each crop.

Manure was applied to each field at approximately ten tons per acre on January 10, 1996, with an end unloading manure spreader. The days following were warm causing melting and runoff. Manure and runoff water were analyzed at the ISU Analytical Service Laboratory.

Results

Table 1. Presents the water quality results from the runoff study. Water quality compares the ten ton manure application to check plots that receive no manure.

Total Kjeldahl Nitrogen (TKN) Concentration in Runoff Water		
Residue	First Runoff	Second Runoff Water
Corn	33.5	83.3
Soybean	24.4	4.7
Alfalfa	126.0	61.1
Average Check	4.0	2.5
Manure Sample	1300.0	

The results demonstrate that some of the manure is running off with the snow melt. The amount of snow on the soybean plot is slightly less than on the alfalfa and corn plots, which may explain why the runoff concentration seems to be higher on alfalfa or corn residue. This work would support a similar study in Ames showing smaller losses when manure is applied to frozen ground than when applied to deep snow.

Table 2. Crop yields. Corn is adjusted to 15.5% moisture.

	bushels/acre
Corn with manure	149.3
Corn without manure (140 lbs. - N as urea)	131.2
Soybeans with manure	63.1
Soybeans without manure	46.7
	ton/acre
Alfalfa with manure	4.2
Alfalfa without manure	4.4

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