

SOIL PRODUCTIVITY ON SITES WITH VARYING EROSION

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This study was a continuation of a study established in 1987 on a strongly sloping Amor-Cable soil association on the W ½ NE ¼, Section 21, R96W, T143N of the Dickinson Experiment Station. The objective of the study was to measure the effects of varying levels of erosion on crop growth. This field is stripped-cropped in a barley-corn rotation and is conventionally tilled. In two strips, one planted to corn and the other to barley, areas of slightly, moderately or severely eroded soil have been identified and are being characterized for organic matter, total nitrogen, NO_3^- -N, electrical conductivity, pH, carbonates, textural analysis, available water capacity and hydraulic conductivity. Soil moisture at seeding and harvest are also being determined.

Production data for barley and corn are reported in Tables 1 and 2, respectively. Barley grown on the severely eroded landscape position showed significantly lower grain yield, plant height and kernel weight. Protein was significantly higher in the barley grown on the severely eroded site. Corn plant height was significantly influenced by all three erosion levels. Silage yield was significantly higher at the slightly eroded portion while protein was highest at the moderate erosion level.

The data for both barley and corn exhibits strong drought effects and reflects the extremely dry growing season that was experienced in 1988.

Table 1. Residue and Grain Yield, Protein, Plant Height and Kernel Weights for Barley – 1988 Dickinson Erosion Study¹

Erosion Level	Residue Yield² -lb./A-	Grain Yield² -bu/A-	Protein -----%-----	Plant Height -----cm-----	Kernel Weight -ground 1000 kernels-
Severe	328 a	1.5 a	18.98 a	28 a	27.9 a
Moderate	516 a	5.2 b	17.04 b	33 b	31.9 b
Slight	739 a	4.7 b	17.65 b	34 b	33.7 b

¹ Values followed by the same letter are not significantly different at the 5% level.

² Oven-dry basis.

Table 2. Yield, Protein, Plant Count and Plant Height for Silage Corn 1988 Dickinson Erosion Study¹

Erosion Level	Silage Yield² -T/A-	Protein -----%-----	Number of Plants	Plant Height -----cm-----
Severe	0.76 a	10.04 a	14.7 a	52.2 a
Moderate	0.73 a	11.94 b	16.3 a	61.7 b
Slight	1.64 b	9.96 a	15.0 a	88.7 c

¹ Values followed by the same letter are not significantly different at the 5% level.

² Corrected to 70% moisture.