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SLOPE COUNTY ALTERNATIVE CROP DEMONSTRATION PLOT - RESULTS 1998

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Summary
A non-replicated plot was seeded on the Ernie Holzemer Farm near Amidon, ND to demonstrate to producers that crops other than wheat and barley can be grown under southwest North Dakota growing conditions. Since this was a non-replicated demonstration, no estimate of error due to variable soil and other conditions can be made for proper interpretation of the results. Results are reported as a point of interests and not for a valid comparison of varieties or crops. Replicated results from Research and Extension Centers located in North Dakota should be utilized to help with the selection of crops and varieties. The alternative crop plot would suggest that producers have a number of cropping options that can be grown as an alternative to traditional cereal crops.

Introduction
Producers are looking for alternatives to wheat and barley. Implementation of the Federal Agriculture Improvement and Reform (FAIR) Act of 1996 has freed producers from government regulation of production levels to grow a wide variety of crops. Low prices recently received by producers for wheat and barley and expectations of low prices for these commodities for the next several years has prompted producers to seriously consider the use of alternative crops in their cropping systems. The Research and Extension Centers at Dickinson and Hettinger have shown that alternative crops do reasonably well under southwest North Dakota conditions. Producers are aware of the research conducted at these Centers but question whether they can apply this information to their farms.

The purpose of this demonstration was to provide producers the opportunity to see crops other than wheat or barley grown in the Slope County environment and provide an estimated crop yield for the plots. This was a non-replicated demonstration, therefore, no estimate of error due to variable soil and other conditions can be made for proper

interpretation of the results.

Materials and Methods

Broadleaf Crops

The plots used for this demonstration were located on the Ernie Holzemer Farm about 2 miles east of Amidon and ½ mile south of US 85. Soil type was a Vebar-Tally fine sandy loam with a 3 to 6% slope. The soil fertility test taken March 26 indicated soil pH was 6.9 and that it contained the following levels of nutrients: 26 lbs/acre of nitrate nitrogen; 9 ppm of phosphorous (Olson); 200 ppm potassium; 4 lbs/acre of sulfur; and 10 lbs/acre of chloride. Fertilizer broadcast at the rate of 190 lbs/acre of ammonium sulfate (21-0-0-24), and 50 lbs/acre of mono-ammonium phosphate (11-55-0) was applied. Sonalan 10G herbicide was applied to the plots where broadleaf crops were to be grown at the rate of 7.5 lbs/acre and incorporated on April 17. Immediately prior to seeding pea, mustard, flax, lentil, chickpea, lentil, canola, and sunflower on April 30, the soil was tilled to destroy emerging weeds and to further incorporate the soil applied herbicide. Poast herbicide at 1.5 pints/acre plus 1 quart/acre of methylated seed oil (MSO) was applied post-emergence on May 30 to control volunteer grain and wild oat.

Corn

The same fertilizers and rates used in the broadleaf crops were used on corn. However the herbicide products used to control weeds were different. Roundup herbicide was applied May 6 to "burn-down" volunteer wheat and early emerging wild oat on plots to be seeded with corn. Corn was planted with a two row (36" between rows) corn planter. Accent at 2/3 ounce/acre plus Buctril at 1 pint/acre plus Class Act was applied post-emergence on May 30. Cool, rainy conditions during June brought additional wild oat and volunteer grain emergence and growth prior to canopy closure. An additional 2/3 ounce/acre of Accent plus Class Act was applied on all corn varieties except the Roundup Ready (RR) variety on July 18. Roundup was applied to the RR variety.

Rainfall in inches received from the time that the broadleaf crops were planted until the corn was harvested was: May, 1.85; June, 4.83; July, 1.43; August, 2.03; and September 2.00. Estimated stored soil water was 4.0 inches.

Yield samples were harvested from three representative areas of each plot, threshed, cleaned and weighed. Crops harvest dates were: pea, August 18; mustard, August 26; flax and canola, August 28; lentil, September 8; sunflower, September 18; and corn, September 26.

Results and Discussion

This was a non-replicated demonstration and therefore interpretation of the results is limited. Broadleaf crop yield, test weight, and estimated gross returns are listed in Table 1, sunflower in Table 2 and corn in Table 3. Prices used to calculate the gross returns were obtained soon after harvest. Prices per pound used were: canola, $0.115; chickpea, $0.18; flax, $0.083; lentil, $0.08; yellow mustard, $0.135; pea, $0.05; sunflower, $0.09; and corn, $0.036.

Sunflower stands were variable and final plant stand counts were taken where each sample was harvested. Yields tended to be greatest when stand counts were 17,000 to 20,500 and lowest when stand populations were 25,000 and greater. Plant populations for oilseed sunflower should be between 15,000 to 25,000 plants per acre with adjustments made for row width, yield goal, and available moisture (Berglund, 1994). Excessive seeding rates tend to reduce test weight and oil content of the seed produced.

Corn yields were greatest (62.5 bu/acre) when weed control was adequate through the first six to eight weeks after emergence and lowest (6.1 bu/acre) where weed control was less than adequate during the same time period. This wide range in corn yield points to the importance of planning and implementing a weed control program that controls weeds early.

Alternative crops may fit well and can be profitable in dryland systems in southwest North Dakota. Alternative crops can be used to break insect, weed, and disease problems commonly associated with monoculture systems relying exclusively on wheat, barley, and durum in the rotation. Profitable management of alternative crops will require additional knowledge of how these crops grow and where, when, and how these crops are marketed.

Alternative crop selection should be based on replicated trials such as those that are conducted at various Research and Extension Centers in North Dakota. Results from such trials are available from your county extension agent or the Research Extension Centers. The web address for the NDSU-RECs is: <http://www.ag.ndsu.nodak.edu/recenthp.htm>.

The authors wish to thank Ernie Holzemer for providing the use of his land, initial tillage, and preparing the plots for the tour. The authors also want to thank the following organizations for donating seed, fertilizer, chemical and other materials used in the demonstration. Tom Zahn, Pioneer Seed Co., New England; Byron Richard, Dakota Ag

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Trade names have been used for simplicity and their usage does not imply endorsement of one product over another nor discrimination against any product by the North Dakota State University Extension Service or the Research Extension Centers.

Literature Cited

Berglund D. 1994. Planting *In* Sunflower Production. Extension Bulletin 25. NDSU Extension Service, Fargo, ND.

Table 1. Slope County broadleaf crop demonstration, Ernie Holzemer Farm, Amidon, North Dakota, 1998.

Crop	Yield	Test weight	Gross return
	lb/acre	lb/bu	$/acre
Canola, Hyola 401	1145.4	51.0	130.58
Chickpea (Garbanzo)	841.4	60.0	151.45
Flax, Linton	1166.2	55.8	96.84
Lentil	1426.0	60.0	114.08
Mustard	989.1	55.0	133.53
Pea, Carneval (semi-leafless)	1702.6	65.0	85.13
Pea, Trapper (vine)	1998.8	64.0	99.94

Table 2. Slope County sunflower demonstration, Ernie Holzemer Farm, Amidon, North Dakota, 1998.				
Crop	Yield	Test weight	Plant Population	Gross return
Sunflower, Oil	lb/acre	lb/bu	no./acre	$/acre
Average yield	1190	24.4	22,007	107.10
High yield	1681	25.0	20,419	151.29
Low yield	480	23.0	35,393	43.20

Table 3. Slope County corn demonstration, Ernie Holzemer Farm, Amidon, North Dakota, 1998.			
Crop	Yield	Test weight	Gross return
Corn	bu/acre	lb/bu	$/acre
Average yield	25.4	58.1	50.80
High yield	62.5	55.5	126.00
Low yield	6.1	--	12.20

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