

Crop Production Costs, Yields, and Returns for South-Central North Dakota for the Years 2010-2014

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As producers analyze the potential profitability of various crops, they are encouraged to closely review how each of the crops have performed over the past 5 years in terms of yield, total costs, and net return per acre. As all crops may have a place in the area, the challenge is to find the right mix of crops that will provide individual producers with the best opportunity for increasing farm profits while maintaining the production, expenses and marketing risks at manageable levels in a time of changing demand and lower or decreasing crop prices.

Data for this study was gathered directly from producers enrolled in the North Dakota Farm Business Management Program in Region 3 at Bismarck, Carrington, Fargo, Jamestown, Oakes and Wahpeton. Each of these sites collected and summarized the data for its own area using the FINPACK farm analysis program. After summarization, the data was combined into an annual regional report. Farms located within the Red River Valley or west of Bismarck were typically deleted from the Region 3 report and included with other regional reports that were more reflective of the area where the individual producers were located.

The data for this study included the crops (Table 1) of pinto beans, corn, barley, soybeans, hard red spring wheat (HRSW), canola, and oil sunflowers. These crops covered a total of 615,804 acres during the 2010-2014 time period. In addition, hard red winter wheat field data was also analyzed over a more limited acreage for the same time period but it is not included in Table 1. If it had been included, it would have ranked eighth out of eight crops in net return both before government payments and with the payments included. The crops included within the regional report were not separated for such characteristics as conventional or Roundup-Ready®, by tillage practices or by other similar items. Irrigated crops were not included in the report. This study summarizes the production, direct and overhead costs and net returns, without Direct, Agricultural Risk Coverage (ARC) or Price Loss Coverage (PLC) payments for each crop.

The highest 5-year average gross return as shown in Table 1 was claimed by corn at \$601.17 per acre. The 5-year average price for the corn enterprise was calculated to be \$4.76 per bushel. The listed crop with the smallest annual average gross return was oil sunflower which averaged \$350.51 per acre and included a 5-year average price of \$23.53 per cwt. The gross return per acre included the value of the raised crop, any loan deficiency payments received, and any additional insurance or miscellaneous crop income. Direct, ARC, PLC or other types of government payments, other than loan deficiency payments, were not included in calculating the gross return per acre.

In the area of direct expenses, corn was once again the leader with a 5-year average total of \$375.06 per acre. Barley had the lowest average direct costs at \$222.76 per acre, followed closely by soybeans at \$225.75 per acre. Excluding pinto beans and corn, the total per acre overhead costs were quite similar for the remaining five crops with a range of \$44.26 to \$59.47 per acre. With increased machinery and storage costs, additional chattel interest, and higher labor costs, corn accounted for the highest overhead costs of the seven listed crops at \$79.58 with pinto beans close by at \$71.62 per acre. With all costs considered, soybeans had the lowest average total costs at \$280.82 per acre while corn was the highest with a 5-year average of \$454.64 in total costs per acre. When comparing 2009 costs to those of 2014, corn increased by \$127.32 per acre or 34.9 percent over the 5-year period. This was followed by

canola with an increase of \$82.48 or 32.8 percent and soybeans at an increased \$74.40 or 32.2 percent. Sunflowers increased 29.3 percent in total costs followed by pinto beans at 27 percent, HRSW at 25.8 percent, barley at 23.2 percent and HRWW at 7.9 percent. The highest 5-year average net return was for pinto beans at \$205.72 per acre followed by corn at \$146.53, HRSW at \$128.70 and soybeans at \$115.70 per acre.

The data from the limited acreage of winter wheat of 7,941 acres, indicated a 5-year average net return of \$31.18 per acre with an average gross income at \$311.67 and direct and overhead costs of \$236.48 and \$44.01 respectively, for total costs of \$280.49 per acre. Average yield was calculated to be 49.5 bushels per acre with an average production cost of \$5.66 per bushel and an average enterprise value of \$6.11 per bu. for the 2010-2014 time period.

Government payments in the form of Direct payments, prior to 2014, and now in the form of ARC or PLC payments are not included in the net return per acre since they are decoupled and are now paid for each commodity only at the end of the crop marketing year. Prior to 2014 the direct payments were usually in the \$10.00 to \$13.00 per acre range with an average of approximately \$11.30 over the 5-years prior to 2014. The new ARC and PLC payments will vary more from farm to farm as they are based mainly on county production numbers and are not reflective of the crops grown in the same production year. Producers are encouraged to look at their total ARC or PLC payments and to calculate what they are per acre for all crop acres on the particular farm unit. This can serve as a comparison to past years. This calculated amount can then be added to the net income per acre for a total net income including all government payments.

Producers are always encouraged to consider the total potential income, the level of expenses, and the level of production risk when selecting crops based on the 5-year averages as shown in Table 1. Producers are encouraged to look at the return over direct costs, or as it is also known, return to overhead for each crop that they are considering. While overhead costs do vary some, particularly with some row crops, the return to overhead is still a good aid in judging the potential profitability of various crops.

While there is no precise method of forecasting the weather or possible weather related production problems, producers may be able to take advantage of multi-year pricing opportunities for the major crops such as corn, soybeans and wheat. By taking advantage of various marketing opportunities through the use of cash forward contracts, futures, options, and combinations of these tools, producers can greatly reduce the pricing risk for selected crops.

References

Region 3 - South Central ND Farm Business Management Annual Reports, 2010-2014, North Dakota Farm Business Management Program.

Table 1. Crop Production 2010-2014 in Region 3, South Central North Dakota.

Years 2010-2014 Region 3		Pinto Bean	Corn	Barley	Soybean	HRSW	Canola	Oil-Sunf.
Number of Fields		79	353	100	566	435	70	126
Number of Farms		55	280	83	341	239	49	76
Acres per field		350.68	355.96	373.94	435.62	322.81	180.71	201.75
Total Acres of Crop		27,704	125,653	37,394	246,562	140,421	12,650	25,420
Yield per Acre		17.29	122.93	72.83	33.31	51.92	16.16	13.23
Operator Share		100.00	100.00	100.00	100.00	100.00	100.00	100.00
Value per Unit, includes LDP	\$	31.48	4.76	5.43	11.54	6.98	20.90	23.53
Total product return/acre	\$	544.36	585.00	395.58	384.30	362.29	337.77	311.26
Misc. Income per acre	\$	13.71	16.17	15.35	12.22	12.92	20.81	39.25
Gross Return per Acre	\$	558.07	601.17	410.93	396.52	375.21	358.58	350.51
Direct Expenses/Acre								
Seed	\$	46.21	82.06	16.75	60.68	21.21	50.66	37.25
Fertilizer	\$	36.44	104.81	63.33	16.61	75.38	73.10	56.09
Crop Chemicals	\$	57.78	22.12	28.07	18.70	32.87	26.30	45.50
Crop Insurance	\$	23.16	21.60	15.61	18.15	16.02	12.51	15.64
Fuel and Oil	\$	18.52	34.14	17.84	17.51	16.66	18.08	18.12
Repairs	\$	25.54	34.55	20.12	21.47	18.45	18.14	18.64
Custom Hire	\$	6.89	7.50	4.84	5.80	6.33	5.42	10.18
Land Rent	\$	60.00	61.70	54.09	62.73	52.89	44.76	41.12
Misc.	\$	1.15	0.92	0.37	0.60	0.74	0.42	0.33
Operating Interest	\$	5.04	5.66	1.74	3.50	2.89	2.68	3.38
Total Direct Costs/Acre	\$	280.73	375.06	222.76	225.75	243.44	252.07	246.25
Return over Direct Exp.	\$	277.34	226.11	188.17	170.77	131.77	106.51	104.26
Overhead Expenses/Acre								
Hired Labor	\$	13.37	15.51	9.21	9.03	8.06	7.36	5.81
Machinery & Building Leases	\$	4.52	5.10	1.07	2.80	3.48	1.45	2.20
Farm Insurance	\$	4.08	3.98	4.28	3.95	3.43	2.95	3.25
Utilities	\$	3.81	3.27	2.99	2.67	3.10	2.36	2.88
Interest	\$	3.63	3.60	1.56	3.18	2.52	2.17	2.00
Mach. and Building Depreciation	\$	34.39	41.34	30.73	26.54	24.60	22.87	26.54
Miscellaneous	\$	7.82	6.78	9.63	6.90	6.49	5.10	6.50
Total Overhead Expense/Acre	\$	71.62	79.58	59.47	55.07	51.68	44.26	49.18
Total Listed Expenses/Acre	\$	352.35	454.64	282.23	280.82	295.12	296.33	295.43
Net Ret./Acre, No Direct, ARC or PLC	\$	205.72	146.53	128.70	115.70	80.09	62.25	55.08
Direct Expense per Unit	\$	16.24	3.05	3.06	6.78	4.69	15.60	18.61
Total Listed Expense per Unit	\$	20.38	3.70	3.88	8.43	5.68	18.34	22.33
Net Return per Unit	\$	11.90	1.19	1.77	3.47	1.54	3.85	4.16
Breakeven Yield per Acre	\$	10.76	92.14	49.14	23.28	40.44	13.18	10.89
without Direct, ARC or PLC Payments								

* Data Source, Region 3 Reports, 2010-2014, North Dakota Farm Business Management Program