

Crop Production Costs, Yields, and Returns for South-Central North Dakota for the Years 2007-2011

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As producers analyze the profitability of various crops to select those crops that will maximize farm cash flows, they are encouraged to take a close look at what each of the various major crops have provided over the past five years, in terms of yield, total costs and net return per acre. As all crops have a place in the area, the challenge is to find the right mix of crops and acres that will provide individual producers with the maximum opportunity for increasing profits while maintaining the production, expenses and marketing risks at manageable levels in a time of high demand and high but fluctuating 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, Casselton, Carrington, Jamestown, Napoleon 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 regional report and included with other regional reports that were more reflective of the area where the producers were located.

The data for this study included the crops (Table 1) of corn, barley, soybean, hard red spring wheat (HRSW), oil sunflowers, canola, and hard red winter wheat (HRWW). These crops covered a total of 493,652 acres during the years 2007 through 2011. In addition, pinto bean field data was also analyzed over a more limited acreage for the 2008-2011 time period but it is not included in Table 1. The crops included within the regional report were not separated for such characteristics as conventional or Roundup-Ready®, by tillage practices or by similar items. Irrigated crops were not included in the report. This study summarizes the production, direct and overhead costs and net returns for each of the seven major crops included.

The highest 5-year average gross return as shown in Table 1 was claimed by corn at \$484.59 per acre. The 5-year average price for the corn enterprise was calculated to be \$4.12 per bushel. The crop with the smallest annual average gross return was HRWW which averaged \$319.08 per acre and included a 5-year average price received of \$5.60 per bushel. 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 or other types of government payments, other than loan deficiency payments, were not included in calculating the gross return per acre but are part of the final net return per acre shown on the bottom of Table 1.

In the area of direct expenses, corn was once again the leader with a 5-year average total of \$300.00 in direct costs. Barley, including both feed and malting types, had the lowest average direct costs at \$182.80 per acre. Excluding corn, total per acre overhead costs were quite similar for the remaining six crops with a range of \$35.66 to \$45.86 per acre. With increased storage and machinery costs, additional chattel interest, and higher labor costs, corn accounted for the highest overhead costs of the seven listed crops at \$55.86 per acre. With all costs considered, barley had the lowest average total costs at \$228.66 per acre while corn was the highest with a 5-year average of \$355.86 in total costs per acre. Corn also produced the largest increase in total costs with a 5-year net change, from the end of 2006, of an additional \$190.37 or 82.3 percent increase per acre. Barley costs rose \$133.07 or 89 percent during the same period. The other five crops in Table 1 showed an increase in total production costs ranging from \$94.15 for soybeans to \$135.08 per acre for HRSW. Average per acre total costs for corn and barley in 2011 were \$421.63 and \$282.58, respectively.

The limited acreage of pinto bean data indicated a 4-year average net return of \$159.41 per acre with an average gross income at \$450.10 and direct and overhead costs at \$238.23 and \$52.46 respectively, for total costs of \$290.69 per acre. Average yield was calculated to be 1,615 pounds per acre with an average production cost of \$.18 per pound or \$18.00 per cwt. and an average enterprise value of \$27.87 per cwt. for the 2008-2011 time period. No government payments were included in the net return of \$159.41 per acre.

To provide for a per acre profit number that also included government payments (direct, counter-cyclical, CSP, and some EQUIP), the multi-year average farm program payment, on a per acre basis, was added to the net return per acre for each crop. This payment averaged \$11.85 per acre across all seven of the listed crops, varying from a low of \$10.77 to a high of \$13.31 per acre. With the payment included, the highest calculated average 5-year net return was for corn at \$140.09 per acre. This was followed by barley at \$122.02 per acre, soybean at \$116.38 per acre, HRSW at \$106.61 per acre, oil sunflower at \$100.06 per acre, HRWW at \$93.58 per acre, and canola at \$93.14 per acre.

Producers are always encouraged to consider the potential income, the new and widening 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 they are considering. By comparing the return over direct costs for each crop, producers can get a better look at what amount of income remains to handle the overhead costs for each potential crop. While overhead costs do vary some, particularly with some row crops, the return to overhead is still a good method of judging the potential profitability of selectable 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 crops they may select. By reducing price risk more emphasis can be placed on the production practices needed to ensure yields that produce the best possible annual net returns.

References

Region 3 - South Central ND Farm Business Management Annual Reports, 2006-2011, North Dakota Farm Business Management Program.

Table 1 Crop Production 2007-2011 in Region 3, South Central North Dakota

Years 2007-2011 Region 3	Corn	Barley	Soybean	HRSW	Oil Sunf.	Canola	HRWW
Number of Fields	242	148	400	515	179	75	75
Number of Farms	192	103	245	260	109	47	66
Acres per field	280.21	270.47	402.32	299.33	210.43	227.15	213.68
Total Acres of Crop	67,812	40,029	160,927	154,155	37,667	17,036	16,026
Yield per Acre	115.90	70.51	32.39	48.52	15.49	15.58	56.39
Operator Share	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Value per Unit, includes LDP	\$ 4.12	4.65	9.83	6.58	20.70	19.01	5.60
Total product return/acre	\$ 476.99	327.76	318.46	319.46	320.63	296.23	315.58
Misc. Income per acre	\$ 7.60	12.09	14.47	14.36	17.91	28.85	3.50
Gross Return per Acre	\$ 484.59	339.85	332.93	333.82	338.54	325.08	319.08
Direct Expenses/Acre							
Seed	\$ 63.11	13.61	46.61	17.78	30.72	39.19	14.54
Fertilizer	\$ 76.57	48.87	11.07	56.12	44.10	57.61	61.01
Crop Chemicals	\$ 18.80	22.86	16.84	29.38	41.15	21.54	30.67
Crop Insurance	\$ 21.24	14.43	18.11	15.88	15.88	14.58	15.78
Fuel and Oil	\$ 30.11	15.27	15.29	14.18	16.76	15.57	13.56
Repairs	\$ 28.76	17.82	18.86	15.41	15.44	14.88	14.91
Custom Hire	\$ 7.22	4.55	6.04	5.80	9.13	3.08	9.02
Land Rent	\$ 46.67	42.75	47.16	42.39	36.11	36.61	40.37
Misc.	\$ 1.51	0.18	0.72	0.59	0.23	0.23	0.43
Operating Interest	\$ 6.01	2.46	3.60	3.47	3.37	2.36	2.86
Total Direct Costs/Acre	\$ 300.00	182.80	184.30	201.00	212.89	205.65	203.15
Return over Direct Exp.	\$ 184.59	157.05	148.63	132.82	125.65	119.43	115.93
Overhead Expenses/Acre							
Hired Labor	\$ 11.14	7.43	7.20	5.35	5.95	5.31	5.53
Machinery & Building Leases	\$ 3.75	1.79	2.79	3.14	1.78	1.39	1.79
Farm Insurance	\$ 2.86	3.11	2.92	2.61	2.16	2.87	2.66
Utilities	\$ 2.54	2.26	2.07	2.07	2.23	1.74	2.38
Interest	\$ 3.52	2.17	3.05	2.60	2.12	1.67	2.04
Mach. and Building Depreciation	\$ 26.58	22.14	19.34	17.71	19.67	19.29	16.40
Miscellaneous	\$ 5.47	6.96	5.65	5.05	4.77	5.31	4.86
Total Overhead Expense/Acre	\$ 55.86	45.86	43.02	38.53	38.68	37.58	35.66
Total Listed Expenses/Acre	\$ 355.86	228.66	227.32	239.53	251.57	243.23	238.81
Net Return per Acre, No Direct or CC	\$ 128.73	111.19	105.61	94.29	86.97	81.85	80.27
Direct Expense per Unit	\$ 2.59	2.59	5.69	4.14	13.74	13.20	3.60
Total Listed Expense per Unit	\$ 3.07	3.24	7.02	4.94	16.24	15.61	4.23
Net Return per Unit	\$ 1.11	1.58	3.26	1.94	5.61	5.25	1.42
Breakeven Yield per Acre	84.62	46.59	21.65	34.20	11.29	11.28	42.05
Other Government Payments/Acre	\$ 11.36	10.83	10.77	12.32	13.09	11.29	13.31
Net Return Including Farm Payments	\$ 140.09	122.02	116.38	106.61	100.06	93.14	93.58

* Data Source, Region 3 Reports, 2007-2011, North Dakota Farm Business Management Program