Crop Production Costs, Yields, and Returns for South-Central North Dakota for the Years 2008-2012

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As producers take time to analyze the profitability of various crops, in order to select those 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 best opportunity for increasing farm profits while maintaining the production, expenses and marketing risks at manageable levels in a time of changing demand and 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, Carrington, Fargo, Jamestown, Napoleon, 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 regional 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), oil sunflowers, and canola. These crops covered a total of 525,644 acres during the years 2008 through 2012. In addition, hard red winter wheat field data was also analyzed over a more limited acreage for the 2008-2012 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 before government payments and seventh 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 similar items. Irrigated crops were not included in the report. This study summarizes the production, direct and overhead costs and net returns, with and without government payments, for each of the included crops.

The highest 5-year average gross return as shown in Table 1 was claimed by corn at $562.43 per acre. The 5-year average price for the corn enterprise was calculated to be $4.70 per bushel. The crop with the smallest annual average gross return was canola which averaged $346.76 per acre and included a 5-year average price received of $20.52 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 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 $333.34 in direct costs. Soybeans had the lowest average direct costs at $202.74 per acre, followed closely by barley at $203.00 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 $39.54 to $49.46 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 $62.04 per acre with pinto beans close by at $56.73 per acre. With all costs considered, soybeans had the lowest average total costs at $249.28 per acre while corn was the highest with a 5-year average of $395.38 in total costs per acre. Pinto beans produced the largest percentage of increase in total costs with a 5-year net change, from the end of 2007, of an additional 43 percent or an increase of $115.62 per acre. Corn had a slightly larger dollar increase at $117.78 per acre but it represented an increase of 34 percent in total costs over the same 5-year period. Oil sunflowers costs rose $53.23 or 22 percent during the same period. The other four crops in Table 1 showed an increase in total production costs ranging from $66.47 for soybeans to $76.47 per acre for HRSW. Average per acre total costs for HRSW and barley in 2012 were $264.60 and $252.46, respectively.

The data from the limited acreage of winter wheat, at 13,438 acres, indicated a 5-year average net return of $81.32 per acre with an average gross income at $340.08 and direct and overhead costs at $220.74 and $38.03 respectively, for total costs of $258.77 per acre. Average yield was calculated to be 57 bushels per acre with an average production cost of $4.54 per bushel and an average enterprise value of $5.91 per bu. for the 2008-2012 time period. Winter wheat had the largest average government payments of the eight crops, at an average of $14.77 per acre for an all-inclusive net return of $96.09 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 $11.49 per acre across all seven of the listed crops, varying from a low of $10.58 to a high of $13.38 per acre. With the payment included, the highest calculated average 5-year net return was for pinto beans at $201.90 per acre. This was followed by corn at $178.30 per acre, barley at $149.54 per acre, soybeans at $128.30 per acre, HRSW at $114.45 per acre, oil sunflowers at $106.57 per acre, and canola at $93.46 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 that 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 select 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, 2007-2012, North Dakota Farm Business Management Program.

Table 1 Crop Production 2008-2012 in Region 3, South Central North Dakota								
Years 2008-2012 Region 3		Pinto Bean	Corn	Barley	Soybean	HRSW	Oil Sunf.	Canola
Number of Fields		62	286	150	443	475	164	77
Number of Farms		47	224	106	275	253	95	48
Acres per field		332.81	283.58	281.05	421.92	304.75	205.80	212.09
Total Acres of Crop		20,634	81,105	42,157	186,911	144,755	33,751	16,331
Yield per Acre		16.93	118.00	72.86	32.08	50.55	15.84	15.30
Operator Share		100.00	100.00	100.00	100.00	100.00	100.00	100.00
Value per Unit, includes LDP	$	29.33	4.70	5.21	10.96	6.97	21.77	20.52
Total product return/acre	$	496.53	554.84	379.88	351.66	352.36	344.84	313.95
Misc. Income per acre	$	4.00	7.59	11.54	15.29	14.44	19.38	32.81
Gross Return per Acre	$	500.53	562.43	391.42	366.95	366.80	364.22	346.76
Direct Expenses/Acre								
Seed	$	39.23	70.17	14.94	51.25	20.25	33.09	43.75
Fertilizer	$	33.94	89.96	56.97	13.79	66.24	52.85	64.91
Crop Chemicals	$	51.01	20.46	25.58	17.98	30.82	44.81	20.65
Crop Insurance	$	22.11	22.34	15.71	19.39	16.86	16.68	15.30
Fuel and Oil	$	18.62	31.80	16.70	16.30	15.16	17.71	17.40
Repairs	$	24.04	31.60	19.96	20.71	16.73	16.41	17.34
Custom Hire	$	7.85	8.00	4.85	6.52	6.43	9.33	3.04
Land Rent	$	50.77	52.07	45.85	52.79	46.59	35.91	40.51
Misc.	$	0.06	1.51	0.20	0.71	0.54	0.23	0.30
Operating Interest	$	5.00	5.43	2.24	3.30	3.01	2.63	2.15
Total Direct Costs/Acre	$	252.63	333.34	203.00	202.74	222.63	229.65	225.35
Return over Direct Exp.	$	247.90	229.09	188.42	164.21	144.17	134.57	121.41
Overhead Expenses/Acre								
Hired Labor	$	10.19	12.26	7.88	8.01	6.08	6.11	6.01
Machinery & Building Leases	$	4.37	3.63	1.18	2.56	3.06	1.48	1.30
Farm Insurance	$	3.23	3.19	3.54	3.23	2.79	2.38	2.52
Utilities	$	2.57	2.54	2.38	2.08	2.19	2.33	1.77
Interest	$	2.83	3.21	1.90	2.86	2.41	1.71	1.76
Mach. and Building Depreciation	$	27.03	31.03	24.98	21.44	19.86	22.31	20.32
Miscellaneous	$	6.51	6.18	7.60	6.36	5.58	5.06	5.86
Total Overhead Expense/Acre	$	56.73	62.04	49.46	46.54	41.97	41.38	39.54
Total Listed Expenses/Acre	$	309.36	395.38	252.46	249.28	264.60	271.03	264.89
Net Return per Acre,No Direct or CC	$	191.17	167.05	138.96	117.67	102.20	93.19	81.87
Direct Expense per Unit	$	14.92	2.82	2.79	6.32	4.40	14.50	14.73
Total Listed Expense per Unit	$	18.27	3.35	3.47	7.77	5.23	17.11	17.31
Net Return per Unit	$	11.29	1.42	1.91	3.67	2.02	5.88	5.35
Breakeven Yield per Acre		10.41	82.47	46.21	21.35	35.89	11.56	11.31
Other Government Payments/Acre	$	10.73	11.25	10.58	10.63	12.25	13.38	11.59
Net Return Including Farm Payments	$	201.90	178.30	149.54	128.30	114.45	106.57	93.46

* Data Source, Region 3 Reports, 2008-2012, North Dakota Farm Business Management Program