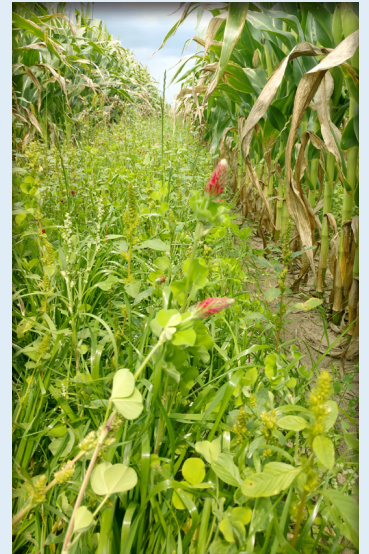


ECONOMIC CONSIDERATIONS FOR ADDING COVER CROPS AS AGRONOMIC PRACTICE

Executive Summary

MAY | 2023



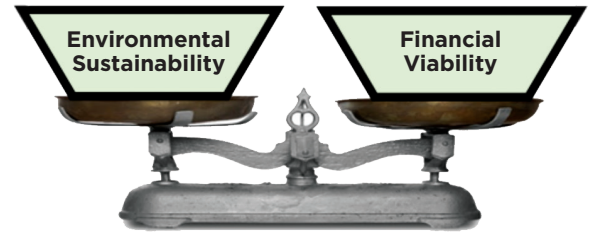
MINNESOTA STATE
Agricultural Centers of Excellence



MINNESOTA STATE
Farm Business Management

EXPLORING THE IMPACT OF SELECTED PRACTICES ON FARM ECONOMICS

There are costs and benefits from implementing farm practices that exceed normal practices to provide greater support in environmental sustainability. Decisions to implement new practices are impacted by the balancing act of Environmental Sustainability and Financial Viability, as shown to the right.



FIRST LOOK AT A COVER CROP ANALYSIS

The data for this executive summary comes from the Minnesota State Farm Business Management Database and the University of Minnesota Southwest MN Farm Business Management Association Database. The cover crop cohort for this report are farmers that have incorporated cover crops into their production practices and have followed established procedures in recording those practices. This first year document

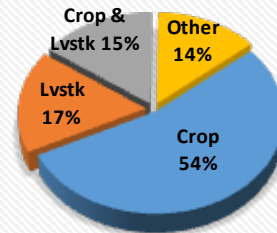
has been designed to provide a broad overview of selected financial and production practices related to the use of cover crops. This report is intended to be a “First Look” into the basic factors that will provide a “window” into the economic considerations for adding cover crops into agronomic practice. This report is not intended to suggest that any long term trend is represented by this data.

DEMOGRAPHICS

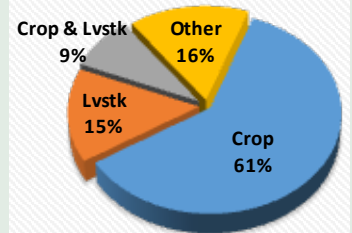
The data for the State Average comes from the 2,154 farms included in the State FBM Database for the 2022 crop year. The data for the Cover Crop (CC) Cohort comes from 121 farms in the two programs noted above. To the right is a general comparison of the demographics for these two groups. This demographic data indicates that farm size, farm type, and the experience of the farmer is very similar in both groups.

<u>Demographics</u>	2022	
	Cover Crop Cohort	Database Avg.
Number of Farms	121	2154
Total Crop Acres per Farm	770	808
Age of Operator	46.9	47.2
Years Farming	22.8	23.0
% Beginning Farmers (<10 yrs)	25%	29%

Type of Farm - Cover Crop



Type of Farm - Average

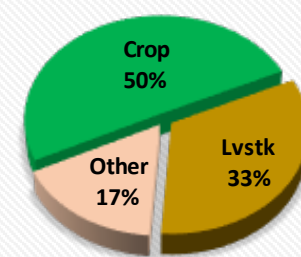


FINANCIALS AT-A-GLANCE

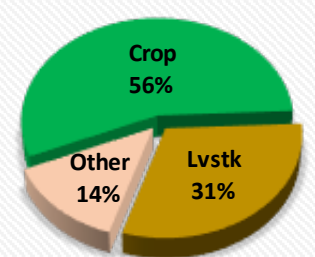
Several factors were selected to provide a brief financial overview for this report. Based on the income and expense data below, the State Average and the Cover Crop Cohort have very comparable numbers. The State database average has a slight advantage in almost all factors listed but the similarity in the numbers is undeniable.

<u>Income Statement</u>	2022	
	Cover Crop Cohort	Database Avg.
Gross Cash Farm Income	\$1,003,464	\$1,092,140
<i>Gross Crop Income</i>	<i>\$505,024</i>	<i>\$607,954</i>
<i>Gross Livestock Income</i>	<i>\$331,785</i>	<i>\$334,348</i>
<i>Other Income</i>	<i>\$166,655</i>	<i>\$149,838</i>
Total Cash Farm Expense	\$808,831	\$893,176
Net Cash Income	\$194,633	\$198,964
Inv Chg, Deprec, Cap Sales	\$86,777	\$112,288
Average Net Farm Income	\$281,410	\$311,252
Median Net Farm Income	\$171,681	\$176,616

Income Source - Cover Crop



Income Source - Average



COVER CROP ENTERPRISE TABLES

Three enterprises have been selected to provide data for the 2022 crop year: Corn, Soybeans, and Corn Silage. Corn and Soybeans are compared to northern and southern MN data, while Corn Silage is compared to state data. Each table includes five (5) columns of data, which are explained below:

Column 1 - Database average, grown with no cover crop:

This column is the average of all fields for the crop in the given area that were not grown following a cover crop.

Column 2 - Cover crop group, grown with no cover crop:

This column includes enterprises planted by farmers in the cover crop group, but these acres did not have cover crops. This column provides an economic comparison to the combined acres shown in Column 5.

Column 3 - Cover crop group, crop grown after cover crop:

This is the traditional crop that was planted after a cover crop. The acres of this field enterprise and the cover crop enterprise match exactly to ensure any long-term impacts of cover crops in the cropping system can be analyzed in future years.

Column 4 - Cover crop group, cover crop only:

This is the average of the cover crop acres planted. No production data is listed, as various cover crop types were planted. Any cost-share funding is included as other income. The gross return includes production returns, cost-share and other cover crop program payments.

Column 5 - Cover crop group, crop grown after cover crop and cover crop combined:

This is the total income and expense for columns 3 and 4. No production information is detailed here because two distinct types of crop enterprises were combined.

CORN SILAGE:

The Cover Crop Cohort data below is shown with a state average for acres not grown with cover crops. Yield per acre and direct expense per acre were similar in the first three columns. Cost of production and machinery cost per acre varied significantly, as did net return per acre. The total direct and overhead expense per acre was highest for the crop combined with the cover crop (Col 5), as would be expected.

Corn Silage Enterprise Analysis (Owned and Rented Acres Combined) Minnesota Farm Business Management Statewide Data

	State Avg. No Cover Crop	Minnesota Cover Crop Group - Corn Silage			
		No Cover Crop	Grown after Cover Crop	Cover Crop Enterprise	Combined with Cover Crop
Number of farms	339	30	16	16	16
Yield per acre	21.22	22.26	21.17	-	-
Value per bu.	49.84	51.40	51.72	-	-
Other crop income per acre	0.28	0.42	-	5.69	5.69
Gross return per acre	1,064.13	1,147.00	1,094.87	98.55	1,193.42
Direct Expenses					
Seeds & Plants	109.40	102.36	94.39	18.58	112.96
Fertilizer	152.72	195.17	149.28	6.60	155.88
Crop chemicals	53.58	50.26	60.67	0.16	60.83
Crop insurance	25.25	27.99	27.21	-	27.21
Fuel & oil	52.28	36.88	38.09	9.53	47.62
Repairs	71.91	53.78	74.65	17.39	92.04
Custom hire	77.67	71.45	142.54	10.08	152.62
Total direct expenses per acre	697.46	693.90	711.15	71.37	782.52
Return over direct exp per acre	366.67	453.09	383.72	27.18	410.90
Total overhead expenses per acre	142.55	137.92	207.59	35.23	242.83
Total dir & ovhd expenses per acre	840.01	831.83	918.74	106.61	1,025.35
Net return per acre	224.12	315.17	176.13	-8.05	168.07
Net return over lbr & mgt	180.47	268.22	144.23	-17.96	126.27
Cost of Production with labor & mgmt	41.34	39.35	44.90	-	43.96
Machinery cost per acre	258.77	218.66	350.07	59.28	409.35
Land Cost *	160.43	175.33	156.66	-	160.04

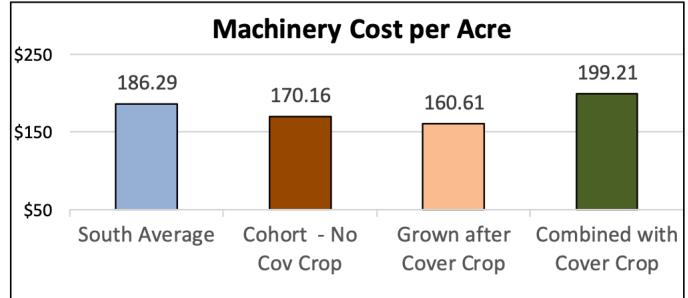
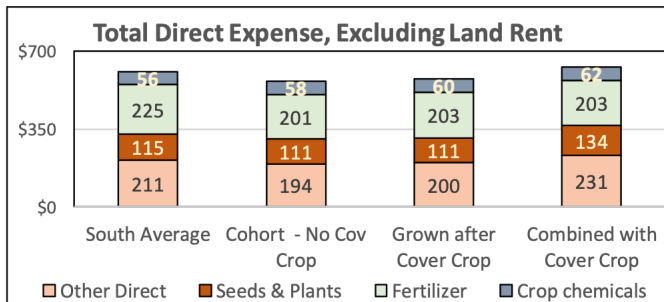
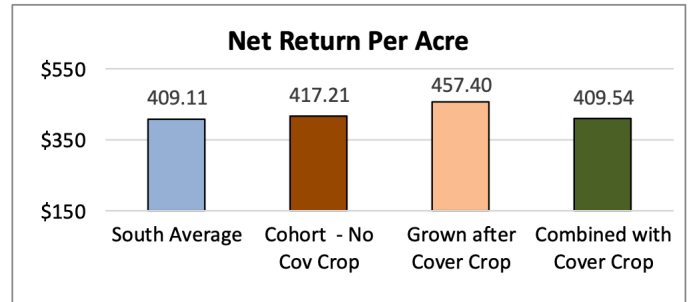
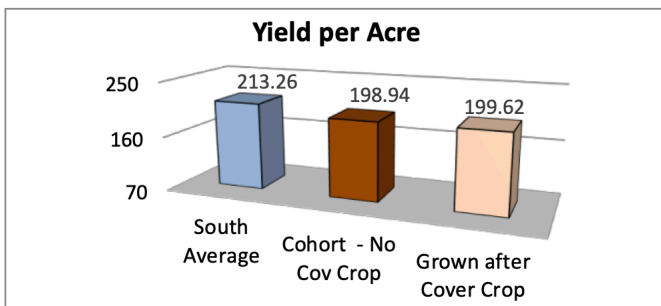
* For owned and rented acres combined, land cost is calculated as the the sum of: Land Rent, Interest, & RE taxes.

CORN - SOUTHERN DATA:

The Southern Average (Col 1) shows a higher gross return, higher direct & overhead expense, and slightly less net return than other primary crop columns. Combined with Cover Crop (Col 5) shows a similar gross return and cost of production as the Southern Average, as well as an almost identical net return per acre. Grown after cover crop (Col 3) has an advantage in direct & overhead expense and net return over the other primary crop columns. Direct expense for crops grown with no cover crop (Col 2) & grown after cover crops (Col 3) for the CC cohort were less than the Southern Average (Col 1). Calculated land cost was higher for the Southern Average (Col 1). Total direct & overhead expense for the cover crop enterprise was \$76.19 for the CC cohort.

Corn Enterprise Analysis (Owned and Rented Acres Combined) Southern Minnesota Farm Business Management Data

	Southern Avg.	Southern Minnesota Cover Crop Group - Corn			
	No Cover Crop	No Cover Crop	Grown after Cover Crop	Cover Crop Enterprise	Combined with Cover Crop
Number of farms	1,061	63	25	25	25
Yield per acre	213.26	198.94	199.62	-	-
Value per bu.	6.34	6.37	6.40	-	-
Other crop income per acre	2.72	4.97	27.82	26.31	54.13
Gross return per acre	1,355.20	1,292.41	1,309.51	28.33	1,337.84
Direct Expenses					
Seeds & Plants	115.06	110.79	110.84	23.09	133.93
Fertilizer	224.84	201.33	202.98	-	202.98
Crop chemicals	55.90	58.33	60.42	1.59	62.01
Crop insurance	36.43	36.30	33.86	0.33	34.19
Fuel & oil	39.39	29.56	22.93	5.72	28.65
Repairs	64.86	62.27	66.36	15.18	81.54
Custom hire	18.73	21.41	26.65	6.56	33.21
Total direct expenses per acre	798.25	761.19	744.93	55.51	800.44
Return over direct exp per acre	556.95	531.22	564.58	-27.18	537.40
Total overhead expenses per acre	147.84	114.00	107.18	20.68	127.85
Total dir & ovhd expenses per acre	946.09	875.19	852.11	76.19	928.30
Net return per acre	409.11	417.21	457.40	-47.86	409.54
Net return over lbr & mgt	341.59	358.32	387.21	-65.01	322.21
Cost of Production with labor & mgmt	4.74	4.57	4.46	-	4.80
Machinery cost per acre	186.29	170.16	160.61	38.60	199.21
Land Cost *	225.60	219.60	197.48	-	198.76



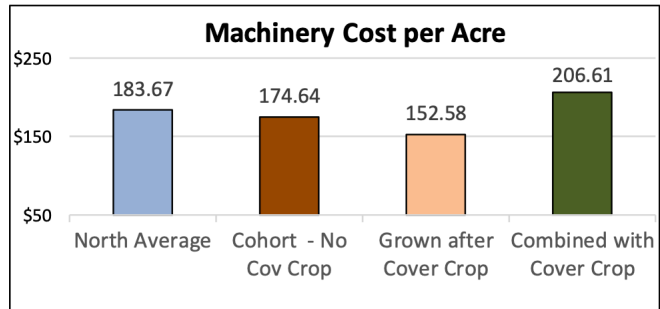
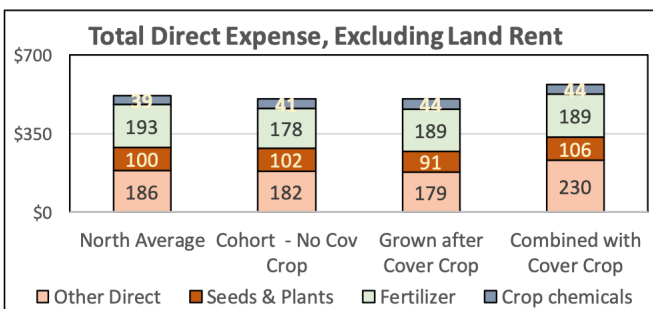
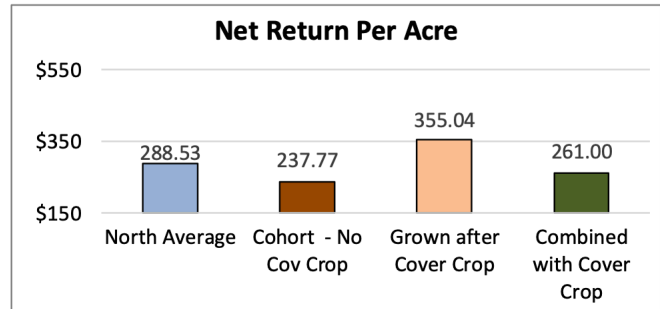
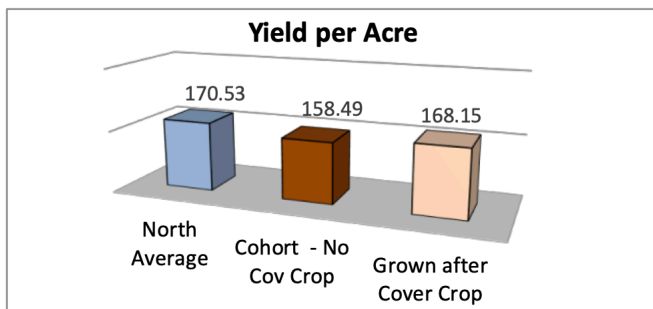
* For owned and rented acres combined, land cost is calculated as the the sum of: Land Rent, Interest, & RE taxes.

CORN - NORTHERN DATA:

The Northern Average (Col 1) shows a higher fertilizer expense and a higher calculated land cost per acre than other primary crop columns. Combined with Cover Crop (Col 5) shows a similar gross return and cost of production as the Northern Average and slightly more (4%) direct & overhead expense per acre. Grown after cover crop (Col 3) again has an advantage in direct & overhead expense and net return over the other primary crop columns. Direct expense for crops grown with no cover crop (Col 2) & grown after cover crops (Col 3) for the CC cohort were also less than the Northern Average (Col 1). Total direct & overhead expense for the cover crop enterprise was \$95.09 for the CC cohort.

Corn Enterprise Analysis (Owned and Rented Acres Combined) Northern Minnesota Farm Business Management Data

	Northern Avg.		Northern Minnesota Cover Crop Group - Corn		
	No Cover Crop	No Cover Crop	Grown after Cover Crop	Cover Crop Enterprise	Combined with Cover Crop
Number of farms	364	25	10	10	10
Yield per acre	170.53	158.49	168.15	-	-
Value per bu.	6.11	6.07	6.16	-	-
Other crop income per acre	3.10	3.73	4.39	0.59	4.98
Gross return per acre	1,050.42	979.28	1,049.76	1.04	1,050.81
Direct Expenses					
Seeds & Plants	100.34	101.66	90.79	15.57	106.36
Fertilizer	192.62	177.62	189.24	-	189.24
Crop chemicals	39.36	41.36	44.19	-	44.19
Crop insurance	29.51	32.01	30.61	-	30.61
Fuel & oil	41.66	42.41	45.71	14.06	59.77
Repairs	69.18	61.62	64.47	24.65	89.12
Custom hire	10.49	10.13	1.80	0.68	2.49
Total direct expenses per acre	624.37	610.67	601.15	66.20	667.35
Return over direct exp per acre	426.05	368.60	448.61	-65.15	383.46
Total overhead expenses per acre	137.52	130.83	93.57	28.89	122.46
Total dir & ovhd expenses per acre	761.89	741.51	694.72	95.09	789.81
Net return per acre	288.53	237.77	355.04	-94.04	261.00
Net return over lbr & mgt	230.02	195.39	302.33	-114.11	324.71
Cost of Production with labor & mgmt	4.76	4.84	4.37	-	5.05
Machinery cost per acre	183.67	174.64	152.58	54.03	206.61
Land Cost *	136.65	126.11	102.36	-	103.70



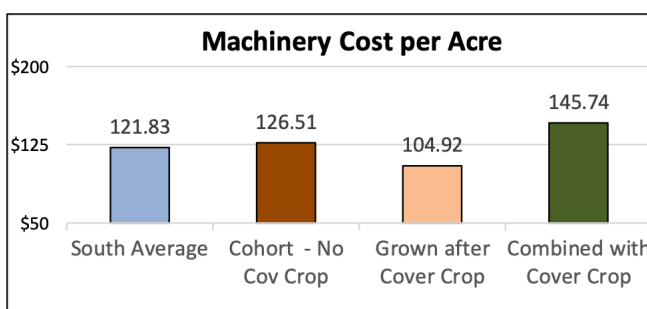
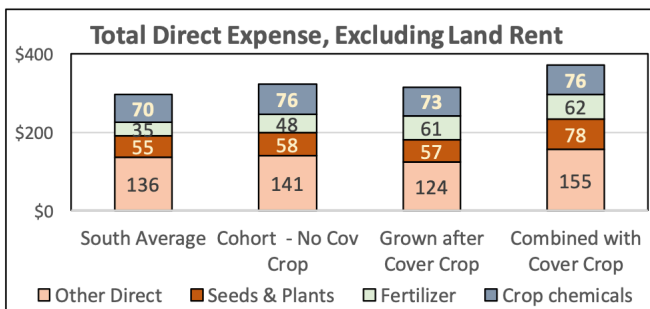
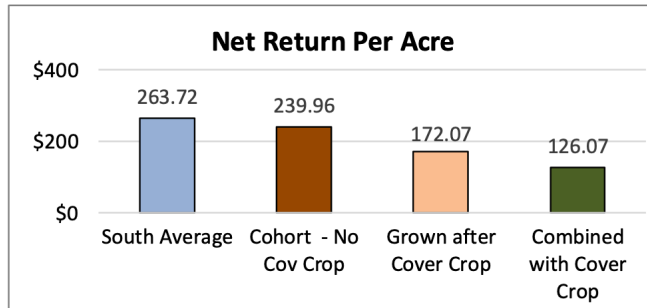
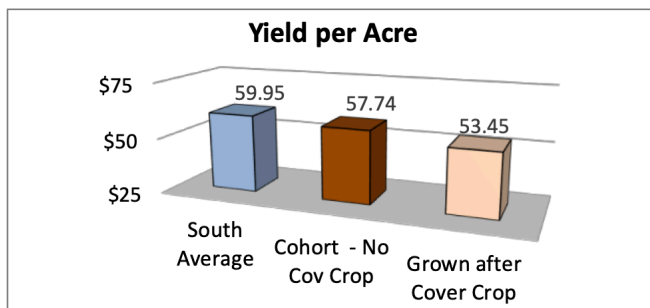
* For owned and rented acres combined, land cost is calculated as the the sum of: Land Rent, Interest, & RE taxes.

SOYBEANS - SOUTHERN DATA:

The Southern Average (Col 1) again shows a higher gross return and higher net return than other primary crop columns. Combined with Cover Crop (Col 5) shows less gross return, higher direct and overhead expense, and lower net return than the Southern Average. Grown after cover crop (Col 3) has an advantage in direct & overhead expense and machinery cost per acre versus the other primary crop columns. Direct expense for crops grown with no cover crop (Col 2) & grown after cover crops (Col 3) for the CC cohort were both more than the Southern Average (Col 1). Calculated land cost was higher for the Southern Average (Col 1). Total direct & overhead expense for the cover crop enterprise was \$78.58 for the CC cohort.

Soybean Enterprise Analysis (Owned and Rented Acres Combined) Southern Minnesota Farm Business Management Data

	State Avg.	Minnesota Cover Crop Group - Soybeans			
	No Cover Crop	No Cover Crop	Grown after Cover Crop	Cover Crop Enterprise	Combined with Cover Crop
Number of farms	967	49	36	36	36
Yield per acre	59.95	57.74	53.45	-	-
Value per bu.	14.21	14.12	13.95	-	-
Other crop income per acre	0.73	4.48	9.60	20.37	29.97
Gross return per acre	856.31	822.82	757.49	32.58	790.07
Direct Expenses					
Seeds & Plants	54.81	57.62	56.80	21.59	78.39
Fertilizer	35.34	48.15	61.13	0.94	62.07
Crop chemicals	69.87	76.20	73.36	2.66	76.02
Crop insurance	33.80	30.78	31.30	0.26	31.56
Fuel & oil	24.95	20.96	16.99	6.35	23.34
Repairs	41.30	41.44	37.61	13.45	51.05
Custom hire	14.71	24.14	16.95	8.38	25.33
Total direct expenses per acre	489.92	492.52	512.70	56.50	569.21
Return over direct exp per acre	366.39	330.30	244.78	-23.92	220.86
Total overhead expenses per acre	102.67	90.34	72.71	22.08	94.79
Total dir & ovhd expenses per acre	592.59	582.86	585.42	78.58	664.00
Net return per acre	263.72	239.96	172.07	-46.00	126.07
Net return over lbr & mgt	219.93	193.16	132.95	-60.35	72.60
Cost of Production with labor & mgmt	10.54	10.78	11.46	-	12.61
Machinery cost per acre	121.83	126.51	104.92	40.82	145.74
Land Cost *	223.21	197.86	216.19	-	217.59



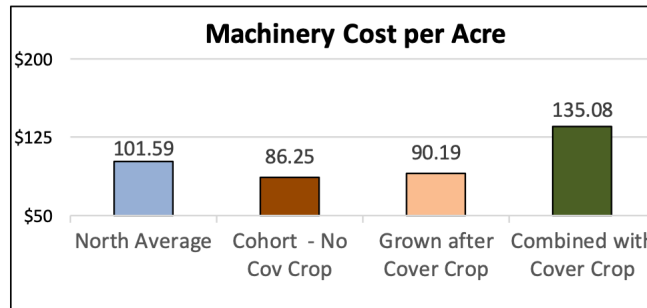
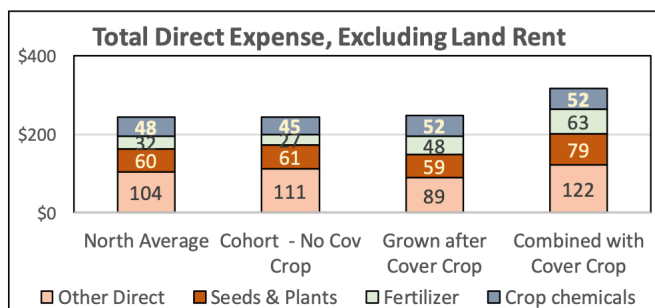
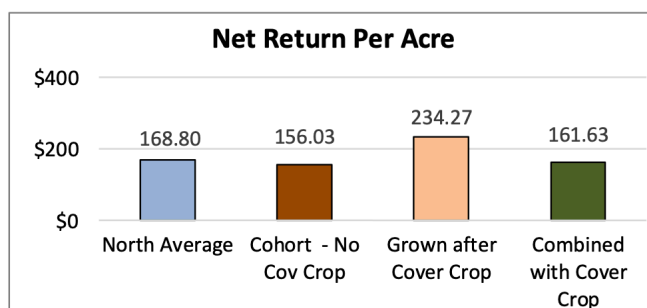
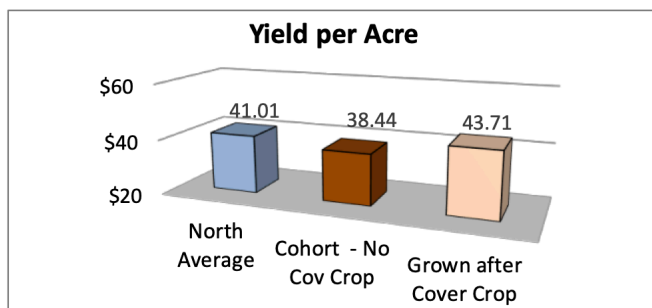
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SOYBEANS - NORTHERN DATA:

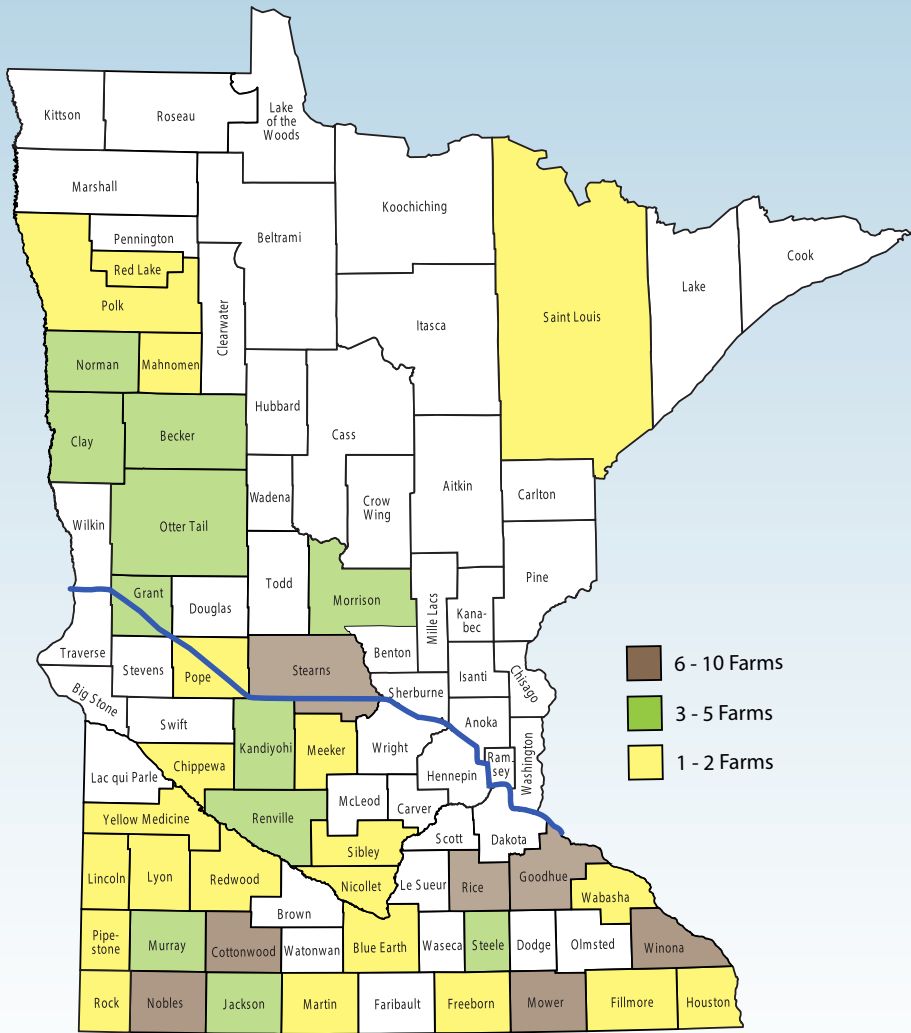
The Northern Average (Col 1) does not appear to have a specific advantage or disadvantage to the other primary crop columns. Combined with Cover Crop (Col 5) has a higher gross return and higher direct & overhead expense per acre than the Northern Average, while the net return is just slightly less. Grown after cover crop (Col 3) again has the advantage in net return per acre and cost of production over the other primary crop columns. Direct expenses for crops grown with no cover crop (Col 2) for the CC cohort were less than the Northern Average (Col 1). Calculated land cost was again higher for the Northern Average (Col 1). Total direct & overhead expense for the cover crop enterprise was \$96.27 for the CC cohort.

Soybean Enterprise Analysis (Owned and Rented Acres Combined) Northern Minnesota Farm Business Management Data

	Northern Avg. No Cover Crop	Northern Minnesota Cover Crop Group - Soybeans			
		No Cover Crop	Grown after Cover Crop	Cover Crop Enterprise	Combined with Cover Crop
Number of farms	375	21	10	10	10
Yield per acre	41.01	38.44	43.71	-	-
Value per bu.	13.91	13.97	14.29	-	-
Other crop income per acre	3.01	3.45	11.51	2.71	14.21
Gross return per acre	585.49	561.40	649.88	23.63	673.51
Direct Expenses					
Seeds & Plants	59.71	61.27	58.99	19.79	78.78
Fertilizer	31.87	26.66	48.13	14.50	62.63
Crop chemicals	48.04	45.01	52.27	-	52.27
Crop insurance	23.23	25.40	-	2.26	2.26
Fuel & oil	23.42	22.32	25.11	10.89	36.00
Repairs	36.20	36.08	26.94	10.53	37.47
Custom hire	7.32	3.21	1.34	6.91	8.25
Total direct expenses per acre	339.30	332.90	340.60	68.64	409.24
Return over direct exp per acre	246.19	228.50	309.27	-45.01	264.27
Total overhead expenses per acre	77.39	72.47	75.01	27.63	102.64
Total dir & ovhd expenses per acre	416.69	405.36	415.61	96.27	511.88
Net return per acre	168.80	156.03	234.27	-72.64	161.63
Net return over lbr & mgt	132.35	123.34	199.75	-89.19	110.56
Cost of Production with labor & mgmt	10.68	10.76	9.72	-	12.08
Machinery cost per acre	101.59	86.25	90.19	44.90	135.08
Land Cost *	114.10	104.15	110.03	-	112.72

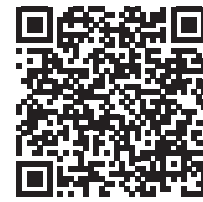


* For owned and rented acres combined, land cost is calculated as the the sum of: Land Rent, Interest, & RE taxes.



SOURCES OF DATA

The 121 producers in this report were a part of the State FBM Database. Those producers are located in 39 of Minnesota's 87 counties. Those counties are highlighted on the map. The blue line shows the separation of northern and southern data in this report.



Project Partners



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