



Commercial Nitrogen and Manure Fertilizer Applications on Minnesota Corn Acres Compared to the University of Minnesota Nitrogen Guidelines Crop Year 2010

A companion report to the 2010 Survey of Fertilizer and Manure Selection and
Management Practices on Corn and Wheat in Minnesota

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Introduction

The Minnesota Department of Agriculture (MDA) is responsible for the development and promotion of nitrogen Best Management Practices (BMPs) which optimize production and profitability while protecting the state's water resources. The MDA is also responsible for monitoring nitrogen use and the adoption of the nitrogen BMPs. The MDA conducts two types of surveys, which were designed and conducted in partnership with the National Agricultural Statistics Service (NASS). Additional information is available at:

<http://www.mda.state.mn.us/en/protecting/cleanwaterfund/gwdwprotection/nutrientmgmtsurvey.aspx>

On even crop years, the survey measures nitrogen use in regard to rate, source, and timing. A link to the most recent survey, [2010 Survey of Fertilizer and Manure Selection and Management Practices on Corn and Wheat in Minnesota](#), is available at the webpage listed above.

On odd crop years, surveys are conducted for BMP's regarding fall and spring nitrogen applications. A link to the most recent survey, [2011 Survey of Nitrogen Fertilizer BMPs on Corn in Minnesota](#), is also available on the MDA webpage listed above.

This is a companion report comparing the rates of nitrogen applications on fertilized corn acres to the University of Minnesota (U of M) guidelines for nitrogen fertilizer. They can be found at: <http://www.extension.umn.edu/agriculture/nutrient-management/fertilizer-management/fertilizing-corn-in-minnesota/index.html>

2010 Commercial Nitrogen and Manure Use Practices Summary and Highlights

The *Commercial Nitrogen and Manure Fertilizer Applications on Corn Acres Compared to the University of Minnesota Nitrogen Guidelines Crop Year 2010* and the *2010 Survey of Fertilizer and Manure Selection and Management Practices on Corn and Wheat in Minnesota*, are companion reports. This report summarized survey results for a number of important practices associated with nitrogen and manure applications on Minnesota's 2010 corn acres. Over 4,500 corn producers participated in the telephone survey and information was collected for 1,100,000 corn acres, representing 15 percent of Minnesota's 7,400,000 corn acres. Survey questions focused on the 96 percent of the respondents that fertilized corn with manure or nitrogen or wheat with nitrogen. This was the second fertilizer survey performed by the MDA and NASS to collect information on nitrogen use and management practices on Minnesota corn acres.

Survey Design and Implementation

Five nitrogen BMP regions (noted as “BMP regions” throughout the report) were previously developed by MDA staff. Counties were clustered based on similarities in geology, soils, and crops. More information about BMP regions can be found at: <http://www.mda.state.mn.us/protecting/bmps/nitrogenbmps.aspx>. Regional nitrogen use information is used to help design and implement specific water quality monitoring and nitrogen educational programs for each BMP region.

Minnesota Nitrogen Best Management Practices Regions

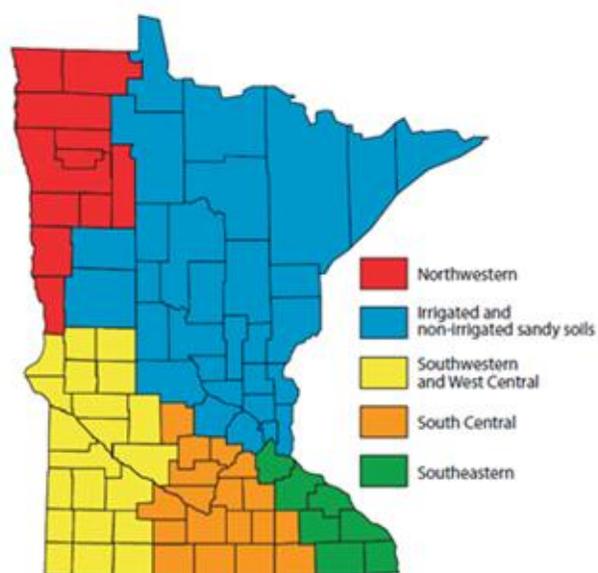


Figure 1. Minnesota nitrogen BMP regions.

For the purpose of this report the Minnesota nitrogen BMP regions will be defined as follows: Northwestern as NW, Irrigated and non-irrigated sandy soils as IRR, Southwestern and West Central As SW, South Central as SC, and Southeastern as SE.

NASS developed a sampling population of 7,000 farms by randomly drawing from its entire database of all corn growers in Minnesota. There were 5,500 farmers that raised corn or wheat and completed the survey in 2010. The definition of “corn” for purposes of this report includes both grain and silage and excludes sweet corn and popcorn.

Due to the low intensity of row crop agriculture in portions of northern Minnesota, survey results were not listed when there were less than five responses in any category for corn, manure or wheat.

Farmers in the survey were first asked “Did you grow corn on your operation in 2010?” Then, farmers were asked “How many corn acres were planted for field corn in 2010?” Table 1 details the farmers who responded. These farmers grew corn and the corresponding acres of corn grown.

Table 1. Statewide summary of respondents and corresponding corn acres by county and BMP region with and without manure.

County	BMP Region	Number of Respondents	Number of Corn Acres
Clay	NW	26	11,443
Kittson	NW	**	**
Mahnomen	NW	**	**
Marshall	NW	7	729
Norman	NW	23	8,523
Polk	NW	**	**
Red Lake	NW	5	729
Roseau	NW	6	2,575
Wilkin	NW	16	8,959
Totals/Averages	NW	94	36,832
Aitkin	IRR	5	380
Anoka	IRR	5	300
Becker	IRR	17	2,707
Benton	IRR	30	3,838
Cass	IRR	8	702
Chicago	IRR	18	4,272
Crow Wing	IRR	7	547
Hubbard	IRR	**	**
Isanti	IRR	21	5,142
Kanabec	IRR	9	982
Mille Lacs	IRR	24	3,014
Morrison	IRR	87	7,917
Otter Tail	IRR	86	19,680
Pine	IRR	22	1,405
Sherburne	IRR	16	5,239
Stearns	IRR	167	24,816
Todd	IRR	69	7,585
Wadena	IRR	13	1,564
Washington	IRR	16	3,361
Wright	IRR	40	5,112
Totals/Averages	IRR	664	98,809
Big Stone	SW	16	4,580
Chippewa	SW	32	18,516
Cottonwood	SW	46	17,606
Douglas	SW	28	4,107
Grant	SW	16	6,282
Jackson	SW	45	13,416
Kandiyohi	SW	42	15,809
Lac qui Parle	SW	43	18,158
Lincoln	SW	37	12,898
Lyon	SW	40	11,015
Murray	SW	38	9,957

County	BMP Region	Number of Respondents	Number of Corn Acres
Nobles	SW	60	14,646
Pipestone	SW	34	7,221
Pope	SW	35	12,429
Redwood	SW	61	17,177
Renville	SW	67	23,648
Rock	SW	28	5,618
Stevens	SW	28	11,249
Swift	SW	30	10,962
Traverse	SW	12	7,044
Yellow Medicine	SW	45	17426
Totals /Averages	SW	783	259,764
Blue Earth	SC	43	12,306
Brown	SC	48	12,406
Carver	SC	21	3,320
Dodge	SC	150	60,500
Faribault	SC	46	21,605
Freeborn	SC	47	20,711
Le Sueur	SC	35	6,211
Martin	SC	55	19,083
McLeod	SC	36	8,094
Meeker	SC	37	7,919
Mower	SC	251	74,177
Nicollet	SC	37	11,791
Rice	SC	32	9,597
Scott	SC	21	2,871
Sibley	SC	47	11,449
Steele	SC	31	10,771
Waseca	SC	50	17,692
Watonwan	SC	28	14,729
Totals /Averages	SC	1,015	325,232
Dakota	SE	159	36,340
Fillmore	SE	379	81,584
Goodhue	SE	391	86,340
Houston	SE	250	31,422
Olmsted	SE	279	60,287
Wabasha	SE	265	45,457
Winona	SE	297	44,083
Totals /Averages	SE	2,020	385,513
State	All	4,576	1,106,150

** Less than five responses

Farmers in the survey were then asked “Do you have a corn field without manure applied in the last five years? Table 2 details the farmers who answered yes to this question and the corresponding acres of corn grown.

Table 2. Statewide summary of respondents and corresponding corn acres by county and BMP region for all corn fields without manure.

County	BMP Region	Number of Respondents	Number of Corn Acres
Clay	NW	22	11,158
Kittson	NW	**	**
Mahnomen	NW	**	**
Marshall	NW	**	**
Norman	NW	19	8,052
Polk	NW	**	**
Red Lake	NW	**	**
Roseau	NW	**	**
Wilkin	NW	12	7,979
Totals/Averages	NW	67	34,198
Aitkin	IRR	**	**
Anoka	IRR	5	300
Becker	IRR	7	1,790
Benton	IRR	12	1,399
Cass	IRR	5	595
Chisago	IRR	12	1,727
Crow Wing	IRR	5	215
Hubbard	IRR	**	**
Isanti	IRR	18	3,729
Kanabec	IRR	7	945
Mille Lacs	IRR	14	2,525
Morrison	IRR	33	3,455
Otter Tail	IRR	56	15,271
Pine	IRR	9	778
Sherburne	IRR	10	4,965
Stearns	IRR	55	12,900
Todd	IRR	30	3,948
Wadena	IRR	8	1,163
Washington	IRR	11	3,174
Wright	IRR	27	3,982
Totals/Averages	IRR	330	63,245
Big Stone	SW	14	4,465
Chippewa	SW	28	17,596
Cottonwood	SW	33	14,147
Douglas	SW	12	2,982
Grant	SW	12	5,858
Jackson	SW	34	9,823
Kandiyohi	SW	22	7,696
Lac qui Parle	SW	39	15,358
Lincoln	SW	27	11,023
Lyon	SW	34	10,076
Murray	SW	30	8,752
Nobles	SW	42	11,572
Pipestone	SW	18	4,769
Pope	SW	24	9,863

County	BMP Region	Number of Respondents	Number of Corn Acres
Redwood	SW	42	11,942
Renville	SW	50	18,718
Rock	SW	21	4,748
Stevens	SW	24	9,819
Swift	SW	25	10,490
Traverse	SW	12	7,044
Yellow Medicine	SW	36	15,468
Totals /Averages	SW	579	212,209
Blue Earth	SC	34	10,348
Brown	SC	34	9,003
Carver	SC	12	2,125
Dodge	SC	107	44,647
Faribault	SC	36	19,957
Freeborn	SC	36	17,936
Le Sueur	SC	30	5,796
Martin	SC	37	14,422
McLeod	SC	23	6,334
Meeker	SC	22	4,599
Mower	SC	187	61,796
Nicollet	SC	22	6,850
Rice	SC	25	8,721
Scott	SC	18	2,576
Sibley	SC	28	8,498
Steele	SC	15	8,066
Waseca	SC	38	14,174
Watonwan	SC	25	11,444
Totals /Averages	SC	729	257,292
Dakota	SE	125	31,671
Fillmore	SE	253	66,247
Goodhue	SE	254	73,304
Houston	SE	133	20,748
Olmsted	SE	192	48,843
Wabasha	SE	146	32,293
Winona	SE	134	26,157
Totals /Averages	SE	1,237	299,263
State	Without Manure	2,942	866,207

** Less than five responses

Table 3 details the percent of farmers who had a corn field without manure applied by BMP region.

Table 3. Percent of respondents with a corn field without manure applied.

BMP Region	Did you have a Field Without Manure Applied?	Percentage of Respondents
Northwestern	Yes	71
Northwestern	No	29
Irrigated and non-irrigated sandy soils	Yes	50
Irrigated and non-irrigated sandy soils	No	50
South Western and West Central	Yes	74
South Western and West Central	No	26
South Central	Yes	72
South Central	No	28
Southeastern	Yes	61
Southeastern	No	39
Statewide	Yes	64
Statewide	No	36

Table 4 details the previous crop planted before the current corn crop by BMP region and the corresponding yield.

Table 4. Percent of acres by previous crop and the corresponding yields.

BMP Region	Previous Crop	Percent	Average Yield
Northwestern	Soybeans	60	136
Northwestern	Corn	**	**
Northwestern	Corn/Alfalfa	**	**
Northwestern	Alfalfa	**	**
Northwestern	Small Grains	18	130
Northwestern	Other	17	139
Irrigated and non-irrigated sandy soils	Soybeans	48	140
Irrigated and non-irrigated sandy soils	Corn	24	126
Irrigated and non-irrigated sandy soils	Corn/Alfalfa	5	134
Irrigated and non-irrigated sandy soils	Alfalfa	7	129
Irrigated and non-irrigated sandy soils	Small Grains	9	112
Irrigated and non-irrigated sandy soils	Other	7	132
South Western and West Central	Soybeans	78	165
South Western and West Central	Corn	13	168
South Western and West Central	Corn/Alfalfa	1	173
South Western and West Central	Alfalfa	2	142
South Western and West Central	Small Grains	3	148
South Western and West Central	Other	3	173
South Central	Soybeans	81	175
South Central	Corn	16	178
South Central	Corn/Alfalfa	1	175
South Central	Alfalfa	1	161
South Central	Small Grains	**	**
South Central	Other	1	171
Southeastern	Soybeans	58	172
Southeastern	Corn	24	173
Southeastern	Corn/Alfalfa	6	164
Southeastern	Alfalfa	9	164
Southeastern	Small Grains	1	141
Southeastern	Other	1	164
Statewide	Soybeans	66	168
Statewide	Corn	20	167
Statewide	Corn/Alfalfa	3	161
Statewide	Alfalfa	6	158
Statewide	Small Grains	2	130
Statewide	Other	3	154

** Less than five responses

Table 5 details the percentage of non-manured corn fields with nitrogen applied.

Table 5. Commercial fertilizer applications applied to non-manured corn fields.

BMP Region	Fertilizer Applied	Percentage of Respondents
Northwestern	Yes	97
Northwestern	No	3
Irrigated and non-irrigated sandy soils	Yes	92
Irrigated and non-irrigated sandy soils	No	8
Southwestern and West Central	Yes	96
Southwestern and West Central	No	4
South Central	Yes	96
South Central	No	4
Southeastern	Yes	96
Southeastern	No	4
Statewide	Yes	96
Statewide	No	4

Method of nitrogen application, either by variable rate or by one rate, expressed as a percentage for each BMP region is provided in Table 6.

Table 6. Variable rate nitrogen applications by BMP region.

BMP Region	Variable Rate Nitrogen Application	Percentage of Respondents
Northwestern	Variable rate	9
Northwestern	One rate	91
Irrigated and non-irrigated sandy soils	Variable rate	22
Irrigated and non-irrigated sandy soils	One rate	78
Southwestern and West Central	Variable rate	19
Southwestern and West Central	One rate	81
South Central	Variable rate	35
South Central	One rate	65
Southeastern	Variable rate	22
Southeastern	One rate	78
Statewide	Variable rate	24
Statewide	One rate	76

Yields and corresponding nitrogen rates by BMP region are provided in Table 7.

Table 7. Nitrogen rates and average yields by BMP region.

BMP Region	Nitrogen Rate Application	Percentage of Respondents
Northwestern	130	135
Irrigated and non-irrigated sandy soils	120	132
Southwestern and West Central	148	165
South Central	158	175
Southeastern	150	171
Statewide	148	166

Nitrogen fertilizer rates and yields by BMP region on corn following different crops in are detailed in Table 8.

Table 8. Average amount of nitrogen applied and corresponding yield by BMP region and previous crop.

BMP Region	Previous Crop	Nitrogen Rate Pounds per Acre	Previous Yield Bushels per Acre
Northwestern	Soybeans	131	136
Northwestern	Corn	**	**
Northwestern	Corn/Alfalfa	**	**
Northwestern	Alfalfa	**	**
Northwestern	Small Grains	120	130
Northwestern	Other	137	139
Irrigated and non-irrigated sandy soils	Soybeans	129	140
Irrigated and non-irrigated sandy soils	Corn	122	126
Irrigated and non-irrigated sandy soils	Corn/Alfalfa	102	134
Irrigated and non-irrigated sandy soils	Alfalfa	94	129
Irrigated and non-irrigated sandy soils	Small Grains	107	112
Irrigated and non-irrigated sandy soils	Other	114	132
Southwestern and West Central	Soybeans	146	165
Southwestern and West Central	Corn	162	168
Southwestern and West Central	Corn/Alfalfa	158	173
Southwestern and West Central	Alfalfa	112	142
Southwestern and West Central	Small Grains	136	148
Southwestern and West Central	Other	161	173
South Central	Soybeans	155	175
South Central	Corn	172	178
South Central	Corn/Alfalfa	157	175
South Central	Alfalfa	113	161
South Central	Small Grains	**	**
South Central	Other	145	171
Southeastern	Soybeans	150	172
Southeastern	Corn	166	173
Southeastern	Corn/Alfalfa	134	164
Southeastern	Alfalfa	120	164
Southeastern	Small Grains	137	141
Southeastern	Other	134	164
Statewide	Soybeans	148	168
Statewide	Corn	161	167
Statewide	Corn/Alfalfa	131	161
Statewide	Alfalfa	115	158
Statewide	Small Grains	122	130
Statewide	Other	136	154

** Less than five responses.

The U of M has developed Best Management Practices for Nitrogen Use in Minnesota. A core part of the BMPs are based on following the standard nitrogen guidelines for fertilizing corn in Minnesota. A consideration of soil productivity, price/value ratio and previous crop are used to arrive at the fertilizer nitrogen guidelines for corn. The following analysis is a comparison of the fertilizer applied by corn farmers in 2010 to those U of M guidelines for corn. For further descriptions, Please see those guidelines at:

<http://www.extension.umn.edu/agriculture/nutrient-management/fertilizer-management/fertilizing-corn-in-minnesota/index.html>

The figures in the report compare on-farm nitrogen fertilizer rates to those recommended by the University of Minnesota (Fertilizing Corn in Minnesota, 2006). The University of Minnesota guidelines are based on a ratio of the nitrogen price in \$/lb to corn price (crop value) in \$/bu. The publication provides four nitrogen price to crop value ratios and acceptable nitrogen fertilizer rates for each.

A single ratio of 0.05 nitrogen price to crop value ratio was used in this analysis for the following reasons:

- To allow the comparison of commercial nitrogen to manure applications since manure is less expensive than commercial fertilizer;
- For consistency because nitrogen and corn prices vary from year to year; and
- The survey did not ask how much a farmer paid for nitrogen or what future corn price was expected.

Corn charts are divided into 4 categories:

- Blue: below the U of M recommended range
- Green: within the U of M recommended range
- Yellow: 1 – 15 pounds above the U of M recommended range
- Red: greater than 15 pounds above the U of M recommended range

Figure 2 details the distribution of nitrogen fertilizer rate compared to the U of M guidelines for corn following a variety of crops in 2010 using a “nitrogen to corn price ratio” of 0.05. This format will be used for all chart analysis in this report.

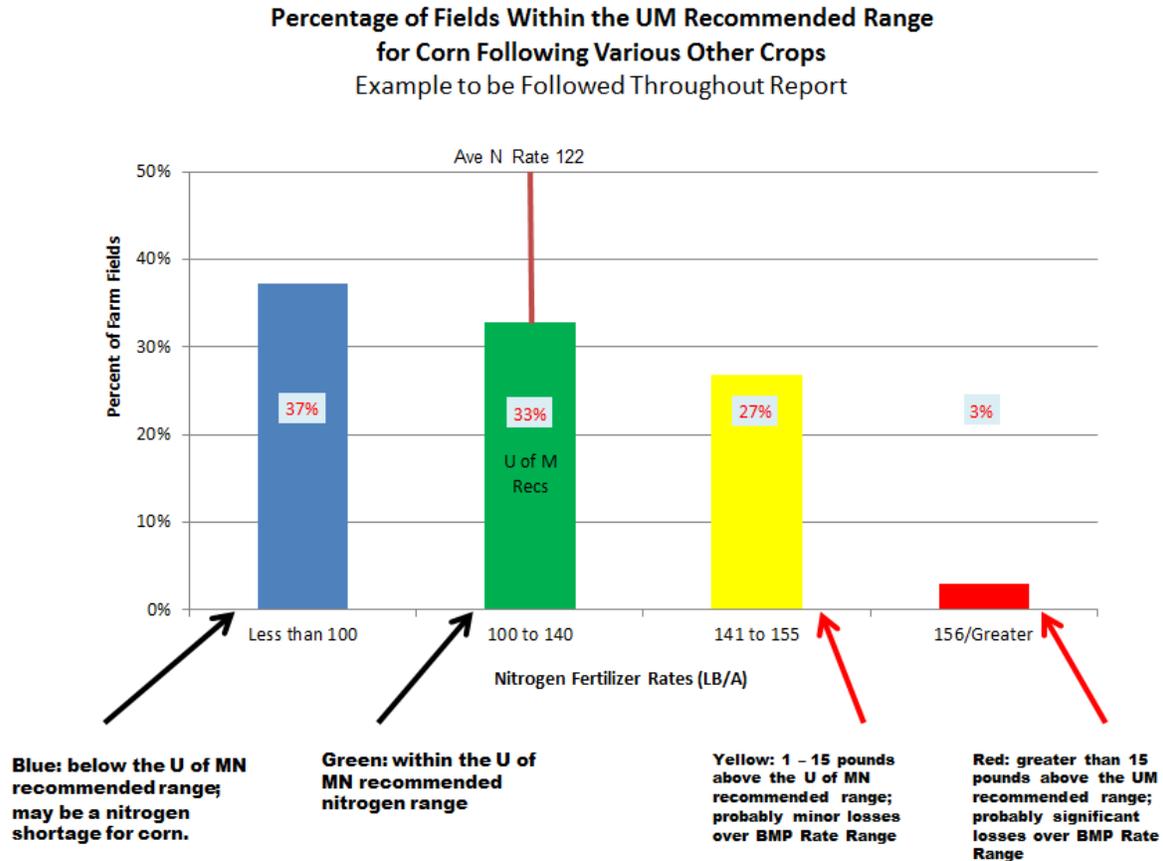


Figure 2. An example of analysis for the U of M recommended nitrogen application rate and ranges of nitrogen compared to farm field nitrogen rates.

Nitrogen rate comparison will be based on several scenarios for corn acres in Minnesota. Nitrogen guidelines can be found at:

<http://www.extension.umn.edu/agriculture/nutrient-management/fertilizer-management/fertilizing-corn-in-minnesota/index.html>

- The nitrogen rate per acre for corn will be compared to the U of M nitrogen rate guidelines for corn based on crop history. Below are the previous crops grown to the 2010 corn crop. Each previous crop requires a different recommended rate of nitrogen. All corn is assumed to be grown on highly productive soils. Highly productive soils are not detailed in the U of M nitrogen guidelines. The following crop rotations will be examined for comparison of nitrogen rates per acre to the U of M guidelines.

- Corn following soybeans is the most dominant crop rotation. An N price/crop value ratio of 0.05 will be used for the U of M guidelines. Typically, a ratio of 0.10 is often a ratio that represents the price of corn and the price of nitrogen in Minnesota. However, the U of M suggests using a 0.05 ratio when using manure as a nitrogen source that was produced on the farm.
 - Corn following corn is the second most dominant crop rotation. This rotation does not include alfalfa in the previous two years, 2009 or 2008.
 - Corn following alfalfa is a common rotation in Minnesota. Nitrogen credits are assumed to be 100 pounds per acre, for a medium stand of alfalfa rated at 2-3 plants per foot.
 - Corn following corn following alfalfa is also a common rotation in Minnesota. Nitrogen credits for the second year following alfalfa are assumed to be 50 pounds per acre, for a medium stand of alfalfa rated at 2-3 plants per foot.
 - Corn following small grains is the last rotation for comparison in Minnesota. It would have the same nitrogen application rates as corn following corn.
- The nitrogen rate per acre for corn will be compared to the U of M nitrogen rate guidelines for corn based on:
 - Variable rate versus non-variable rate nitrogen applications,
 - Yield categories of lower, medium, and higher yielding corn.
 - Nitrogen applied through various manure sources for corn following corn. In the 2010 crop year previous crop to corn acres was not collected. Therefore all analysis was based on the corn following corn scenario as that allows for the most nitrogen and we could not assume that fields applied would require less nitrogen because of a different previous crop.
 - The criteria for analysis on Minnesota county maps
 - Green represents five responses or more for that particular crop rotation within the BMP region
 - Yellow represents **less** than five responses for that particular crop rotation, but is within a certain BMP region

Analysis of Nitrogen Fertilizer Rate by Variable and Non-variable Rate Application

The following analysis compares corn crop rotation from five of the most common previous crops. This section demonstrate how farmers are applying nitrogen using variable and non-variable rates when applying commercial nitrogen fertilizer for the 2010 corn crop.

Statewide: Corn Following Soybeans

The majority of farmers reported corn following soybeans. Statewide sixty-six percent of the fields reported was corn following soybeans. Figure 3 details the counties where farmers reported on fields with corn following soybeans. There were 2,222 fields surveyed across Minnesota.

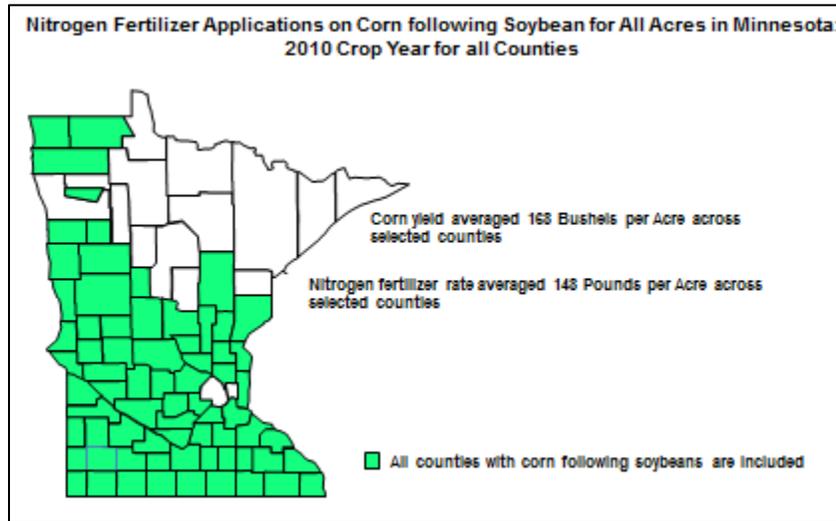


Figure 3. Counties with farmers reporting on corn following soybeans.

Figure 4 details the distribution of nitrogen fertilizer rates across Minnesota for corn following soybeans using a “nitrogen to corn price” ratio of 0.05. Table 9 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 4.

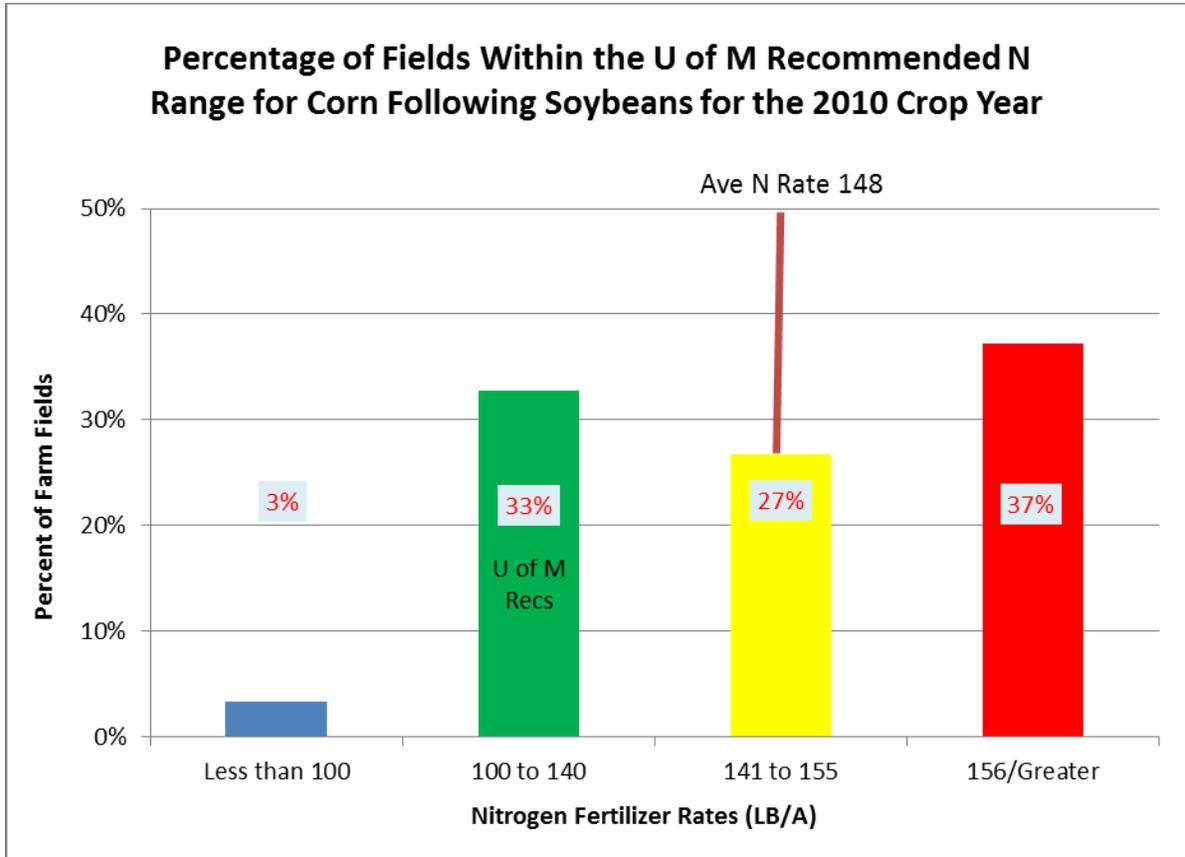


Figure 4. Percentage of fields within the U of M recommended range for corn following soybeans across Minnesota in 2010 with variable and non-variable rates applications of nitrogen: 2,222 fields.

Table 9. Nitrogen fertilizer rates and associated corn yields for corn following soybeans for the 2010 crop year.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	126	157	170	178
Avg N-Rate LB/A	79	127	149	172

Figure 5 details the distribution of nitrogen fertilizer rates across Minnesota for corn following soybeans without variable nitrogen rate application using a “nitrogen to corn price ratio” of 0.05. Table 10 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 5.

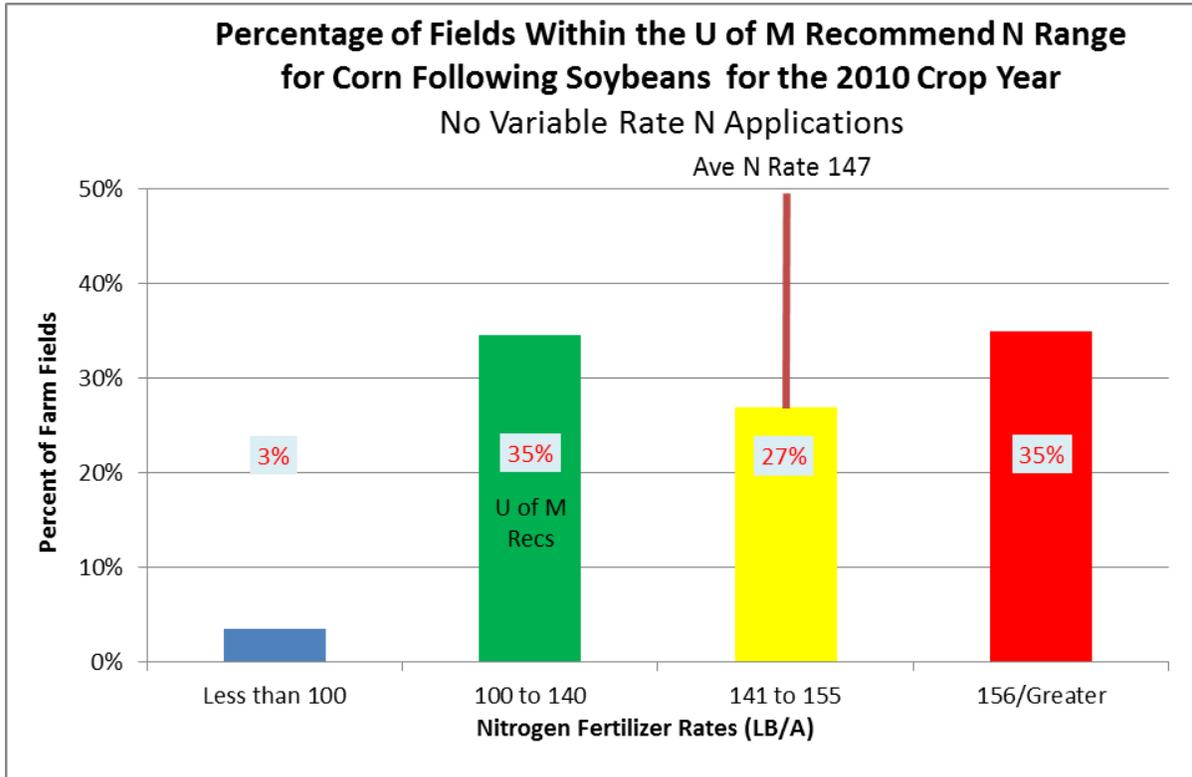


Figure 5. Percentage of fields within the U of M recommended range for corn following soybeans across Minnesota in 2010 with non-variable rate applications of nitrogen: 1,676 fields.

Table 10. Nitrogen fertilizer rates and associated corn yields for corn following soybeans without variable rate nitrogen applications for the 2010 crop year.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	125	155	167	176
Avg N-Rate LB/A	78	125	147	171

Figure 6 details the distribution of nitrogen fertilizer rates across Minnesota for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 11 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 6.

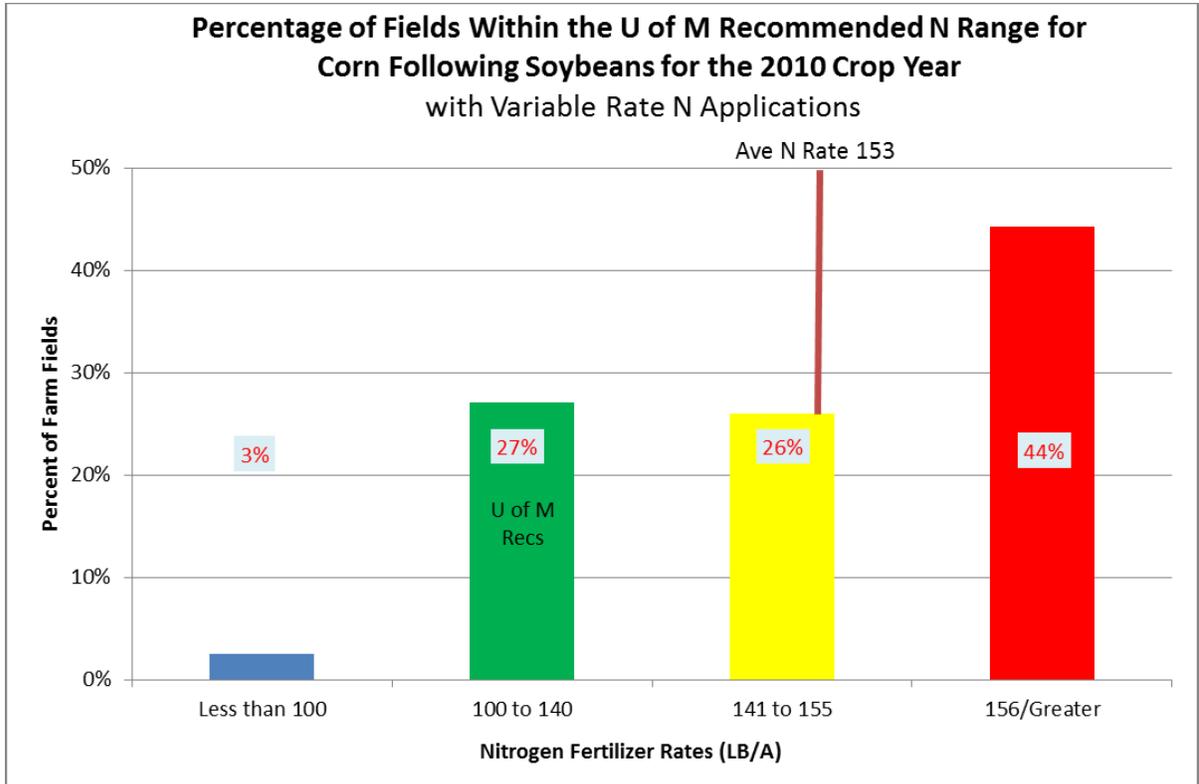


Figure 6. Percentage of fields within the U of M recommended range for corn following soybeans across Minnesota in 2010 with variable rate applications of nitrogen: 546 fields.

Table 11. Nitrogen fertilizer rates and associated corn yields for corn following soybeans with variable rate nitrogen applications for the 2010 crop year.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	121	158	175	183
Avg N-Rate LB/A	80	128	149	174

Southeastern Region: Corn Following Soybeans

There were 860 fields that were included in the SE BMP region corn following soybeans analysis. Figure 7 details the location, average rate of nitrogen fertilizer and average yield for corn following soybeans in the SE BMP region.

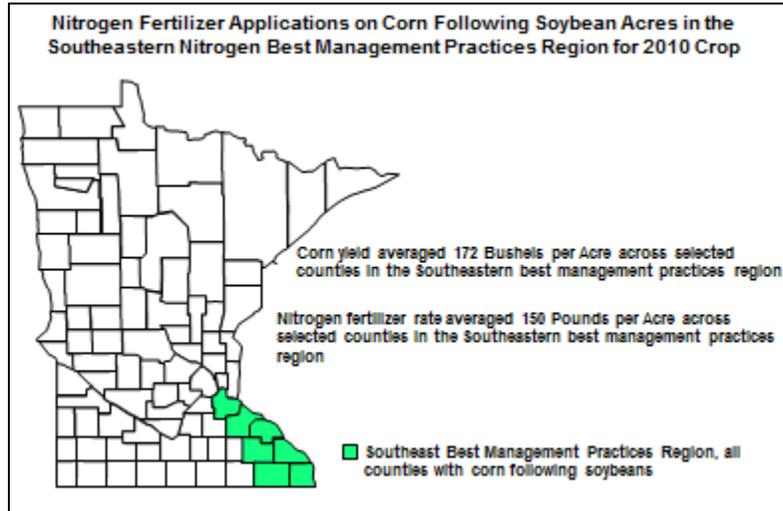


Figure 7. The corn yield averaged 172 bushels per acre and the nitrogen fertilizer rate averaged 150 pounds per acre across the SE BMP region.

Figure 8 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 12 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 8.

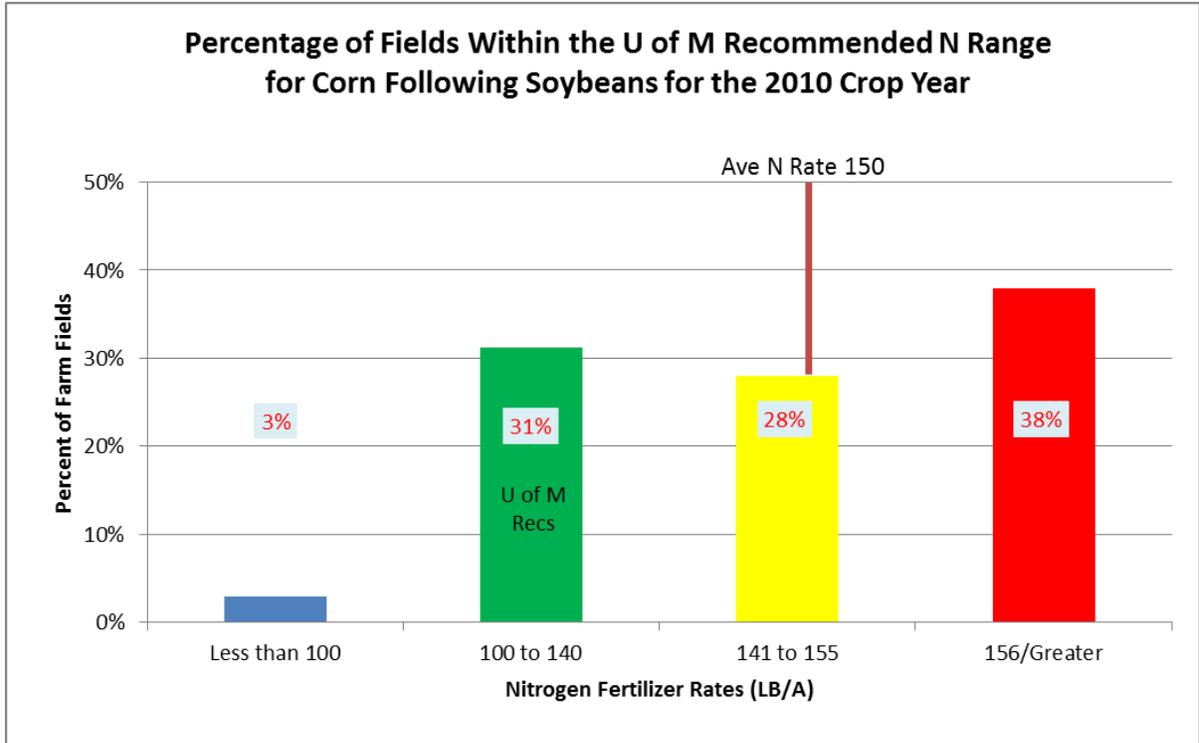


Figure 8. Percentage of fields within the U of M recommended range for corn following soybeans in the SE BMP region for 2010 with and without variable rate applications of nitrogen: 860 fields.

Table 12. Nitrogen fertilizer rates and associated corn yields for corn following soybeans for the 2010 crop year in the SE BMP region.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	140	162	173	181
Avg N-Rate LB/A	82	127	149	174

Figure 9 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 13 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 9.

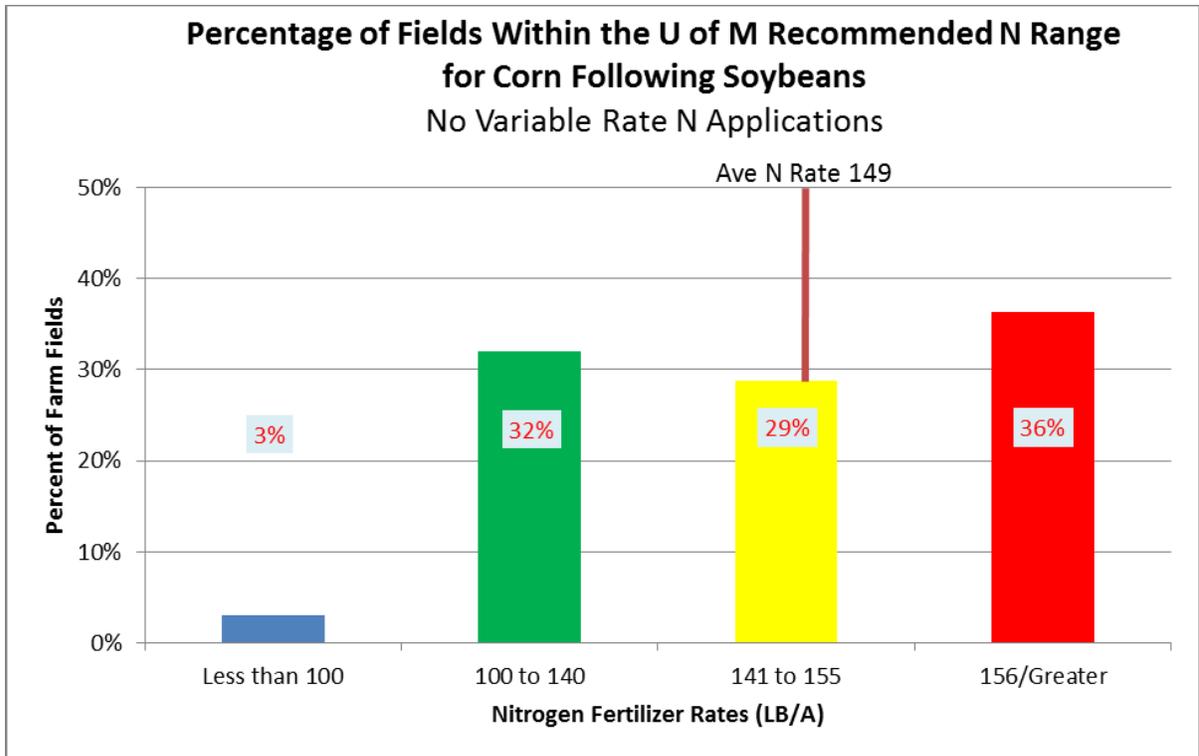


Figure 9. Percentage of fields within the U of M recommended range for corn following soybeans in the SE BMP region for 2010 with non-variable rate applications of nitrogen: 672 fields.

Table 13. Nitrogen fertilizer rates and associated corn yields for corn following soybeans without variable rate nitrogen applications for the 2010 crop year in the SE BMP region.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	142	162	172	180
Avg N-Rate LB/A	81	127	149	174

Figure 10 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 14 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 10.

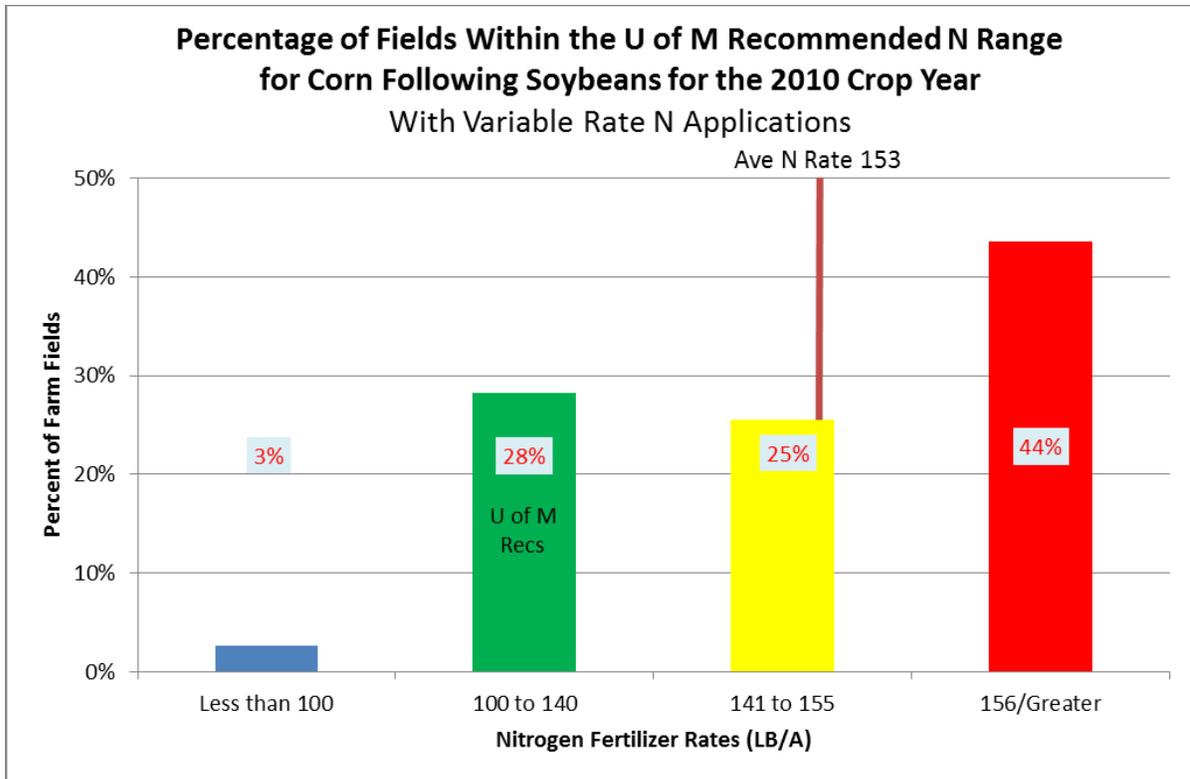


Figure 10. Percentage of fields within the U of M recommended range for corn following soybeans in the SE BMP region for 2010 with variable rate applications of nitrogen: 188 fields.

Table 14. Nitrogen fertilizer rates and associated corn yields for corn following soybeans with variable rate nitrogen applications for the 2010 crop year in the SE BMP region.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	131	162	175	184
Avg N-Rate LB/A	88	128	149	175

South Central Region: Corn Following Soybeans

There were 638 fields that were included in the SC BMP region corn following soybeans analysis. Figure 11 details the location, average rate of nitrogen fertilizer and average yield for corn following soybeans in the SC BMP region. All counties in the SC BMP region had more than five responses.

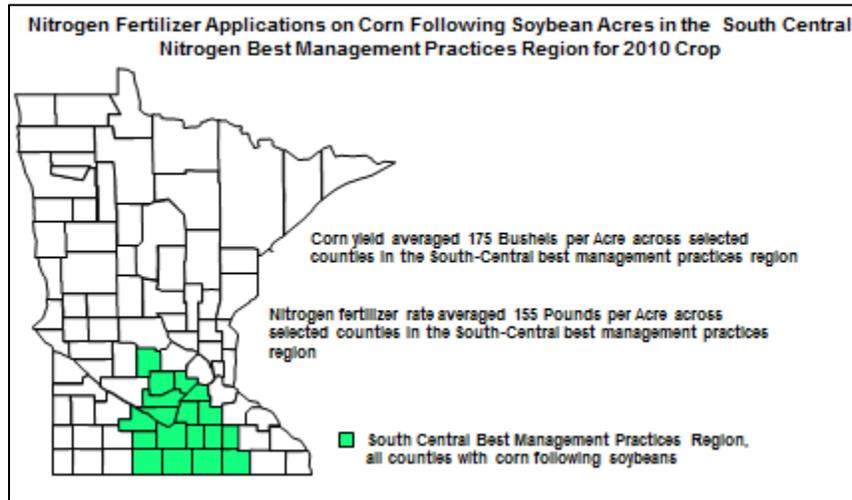


Figure 11. The corn yield averaged 175 bushels per acre and the nitrogen fertilizer rate averaged 155 pounds per acre across the SC BMP region.

Figure 12 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 15 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 12.

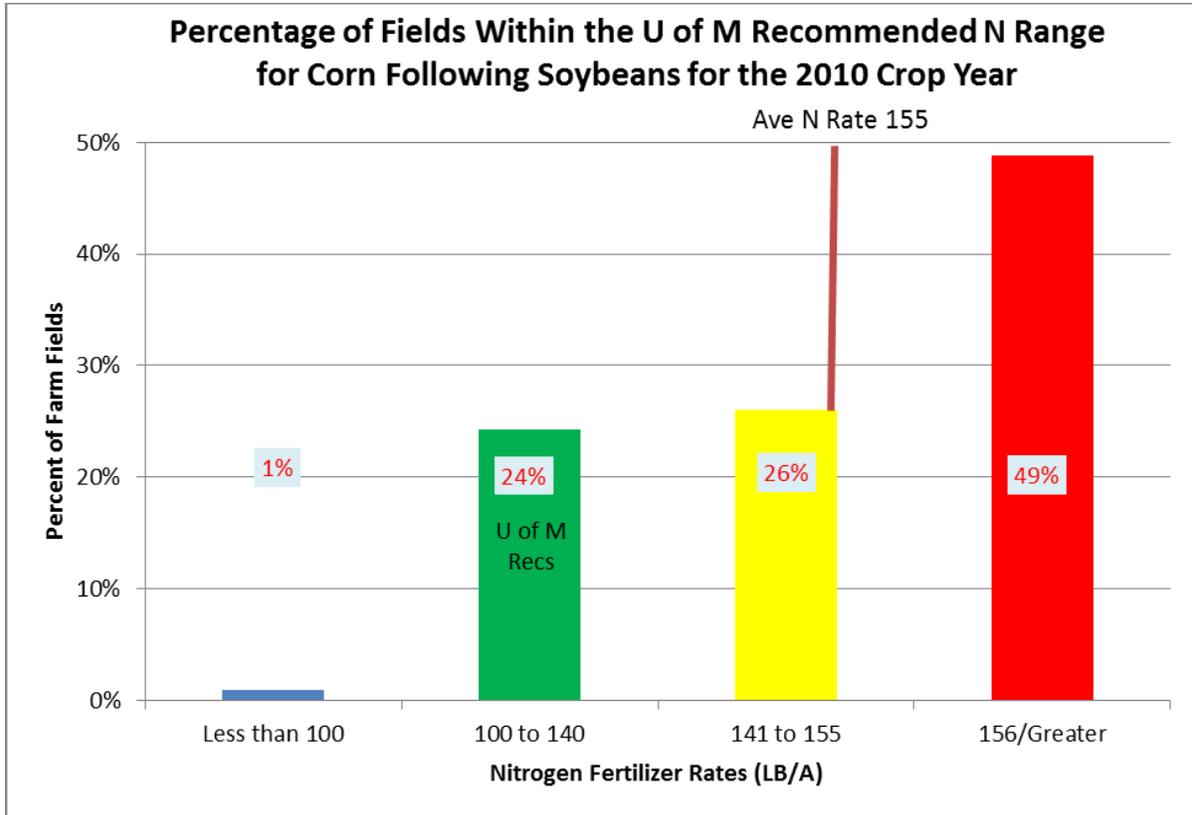


Figure 12. Percentage of fields within the U of M recommended range for corn following soybeans in the SC BMP region for 2010 with and without variable rate applications of nitrogen: 638 fields.

Table 15. Nitrogen fertilizer rates and associated corn yields for corn following soybeans with and without variable rate nitrogen applications for the 2010 crop year in the SC BMP region.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	132	166	175	180
Avg N-Rate LB/A	82	130	150	173

Figure 13 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 16 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 13.

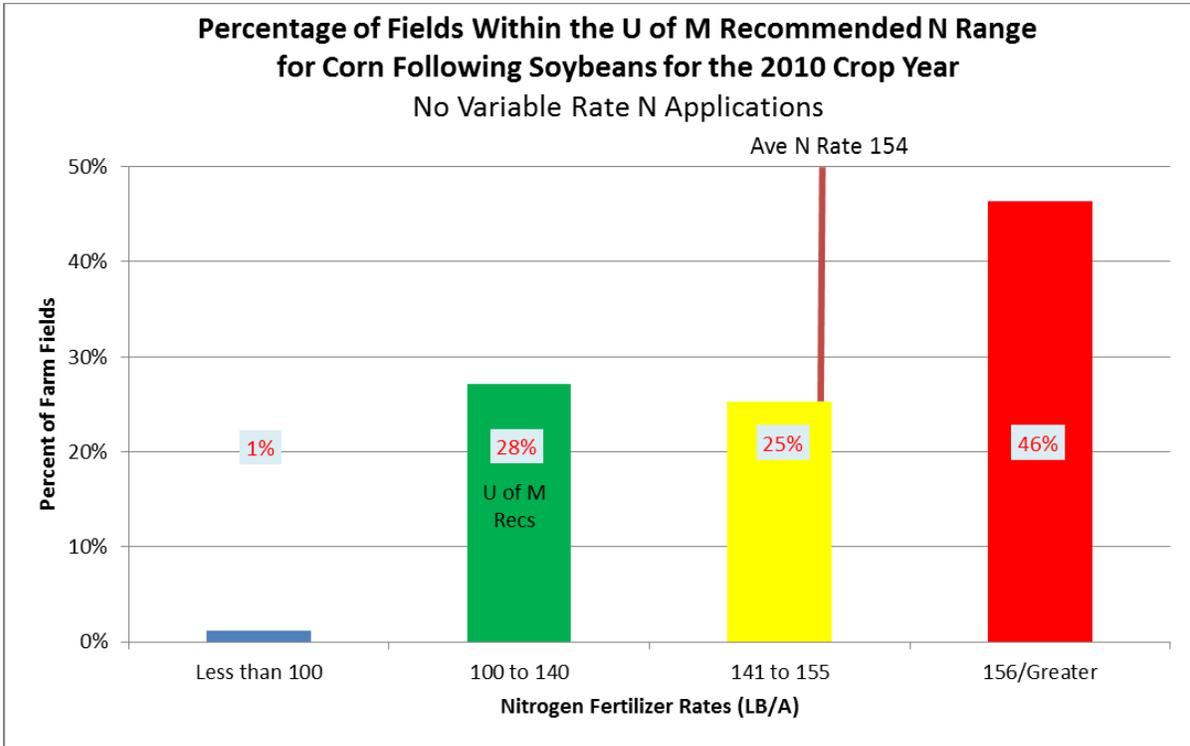


Figure 13. Percentage of fields within the U of M recommended range for corn following soybeans in the SC BMP region for 2010 without variable rate applications of nitrogen: 416 fields.

Table 16. Nitrogen fertilizer rates and associated corn yields for corn following soybeans without variable rate nitrogen applications for the 2010 crop year in the SC BMP region.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	124	166	173	178
Avg N-Rate LB/A	81	130	150	172

Figure 14 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 17 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 14.

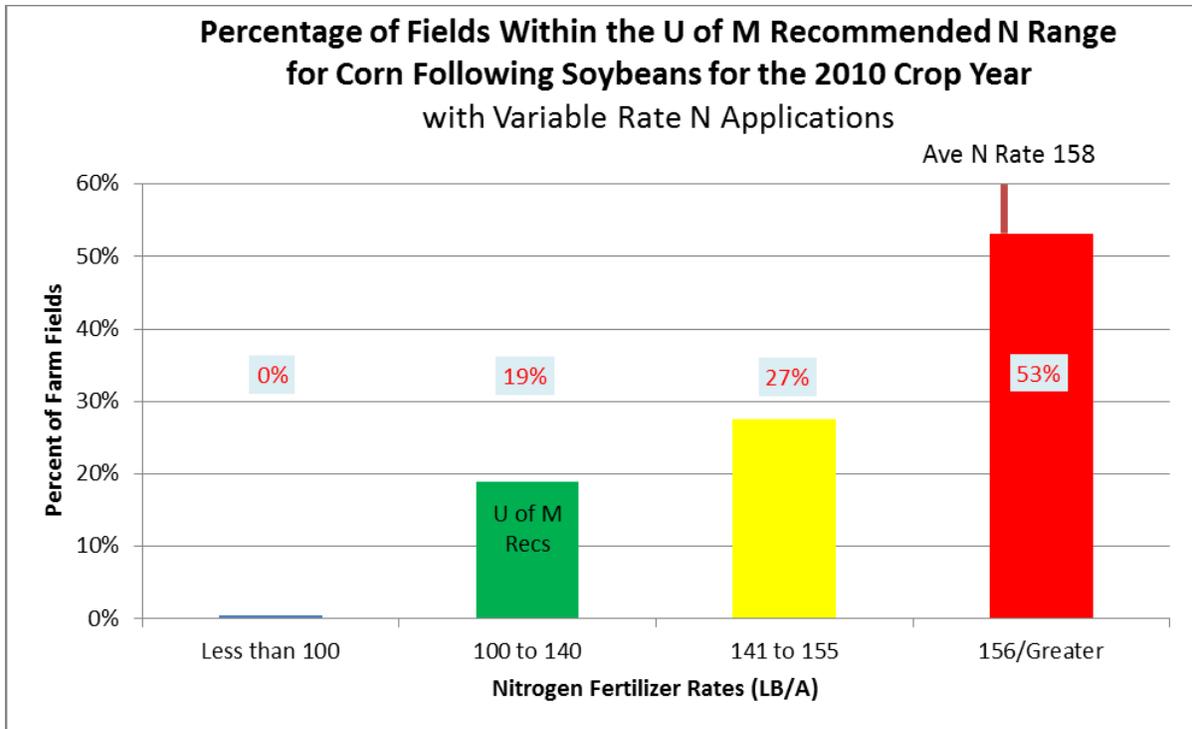


Figure 14. Percentage of fields within the U of M recommended range for corn following soybeans in the SC BMP region for 2010 with variable rate applications of nitrogen: 222 fields.

Table 17. Nitrogen fertilizer rates and associated corn yields for corn following soybeans with variable rate nitrogen applications for the 2010 crop year in the SC BMP region.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	132	166	175	180
Avg N-Rate LB/A	82	130	150	173

Southwestern and West Central Region: Corn Following Soybeans

There were 505 fields that were included in the SW BMP region corn following soybeans analysis. Figure 15 details the location, average rate of nitrogen fertilizer and average yield for corn following soybeans in the SW BMP region.

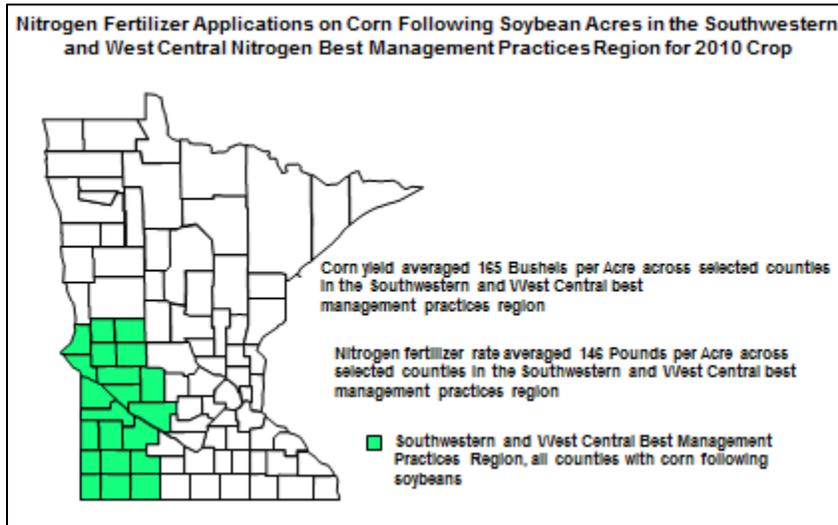


Figure 15. The corn yield averaged 165 bushels per acre and the nitrogen fertilizer rate averaged 146 pounds per acre across the SW BMP region.

Figure 16 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 18 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 16.

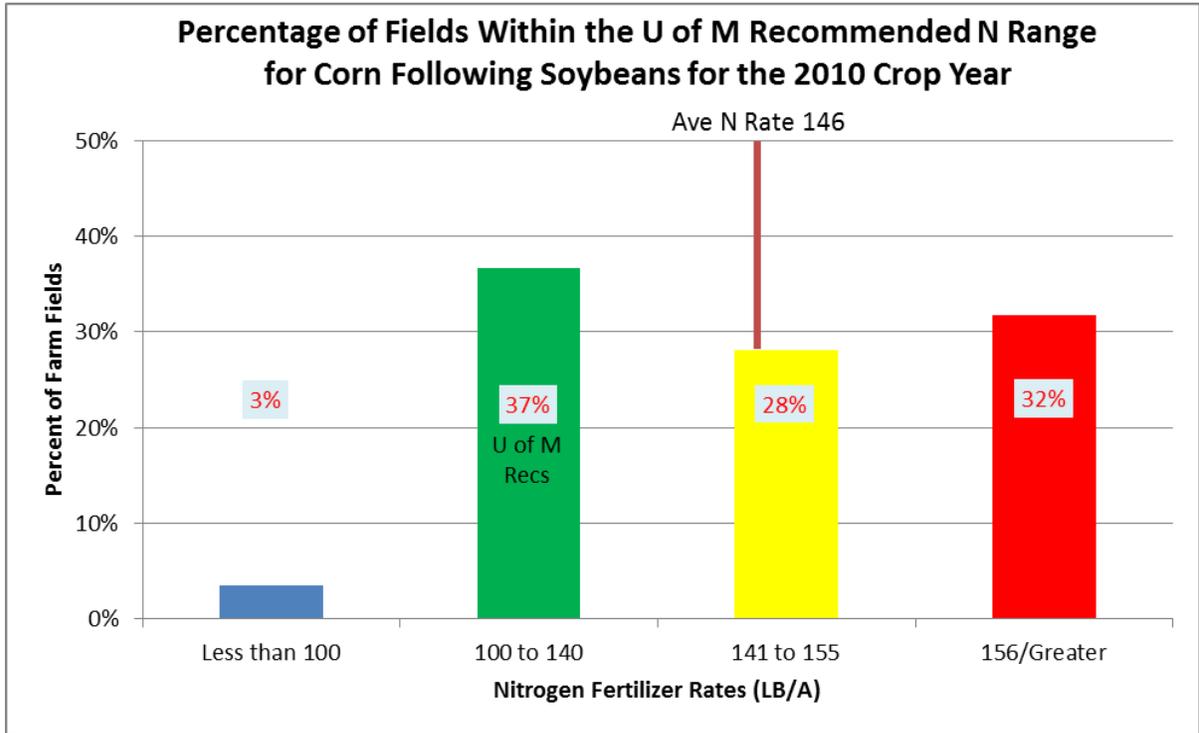


Figure 16. Percentage of fields within the U of M recommended range for corn following soybeans in the SW BMP region for 2010 with and without variable rate applications of nitrogen: 505 fields.

Table 18. Nitrogen fertilizer rates and associated corn yields for corn following soybeans with and without variable rate nitrogen applications for the 2010 crop year in the SW BMP region.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	137	159	169	173
Avg N-Rate LB/A	79	128	149	171

Figure 17 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 19 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 17.

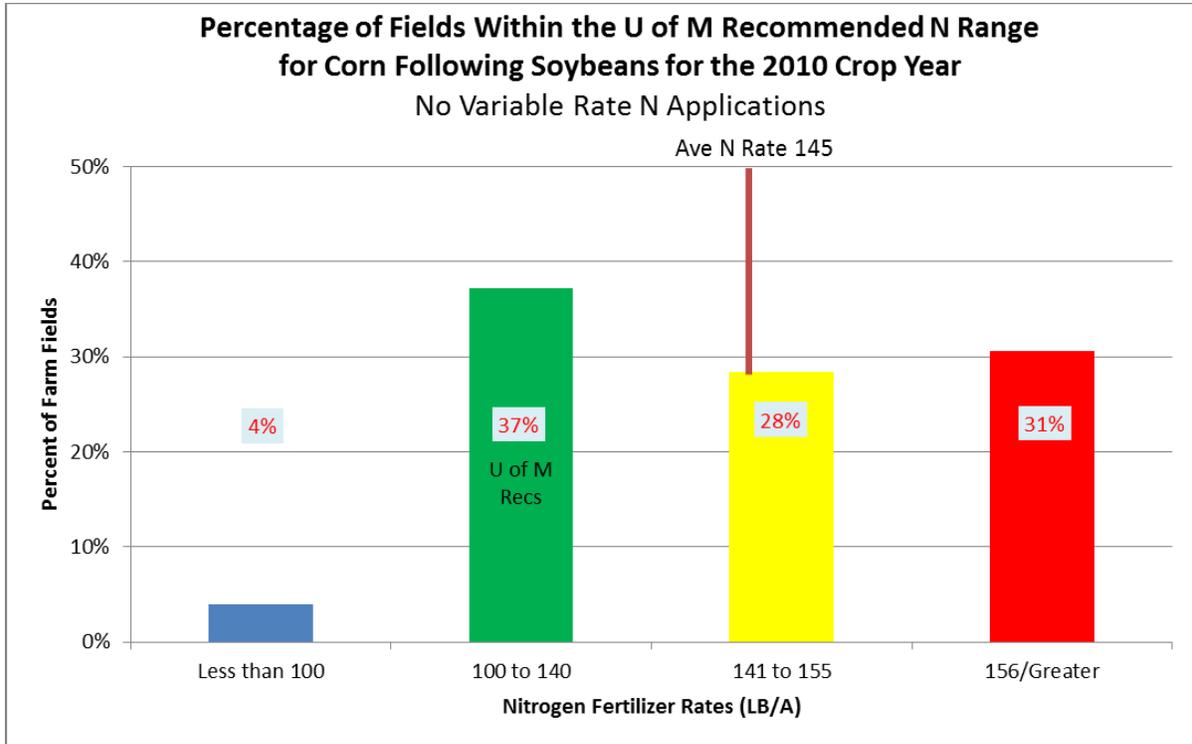


Figure 17. Percentage of fields within the U of M recommended range for corn following soybeans in the SW BMP region for 2010 without variable rate applications of nitrogen: 409 fields.

Table 19. Nitrogen fertilizer rates and associated corn yields for corn following soybeans without variable rate nitrogen applications for the 2010 crop year in the SW BMP region.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	136	159	169	171
Avg N-Rate LB/A	78	128	150	170

Figure 18 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 20 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 18.

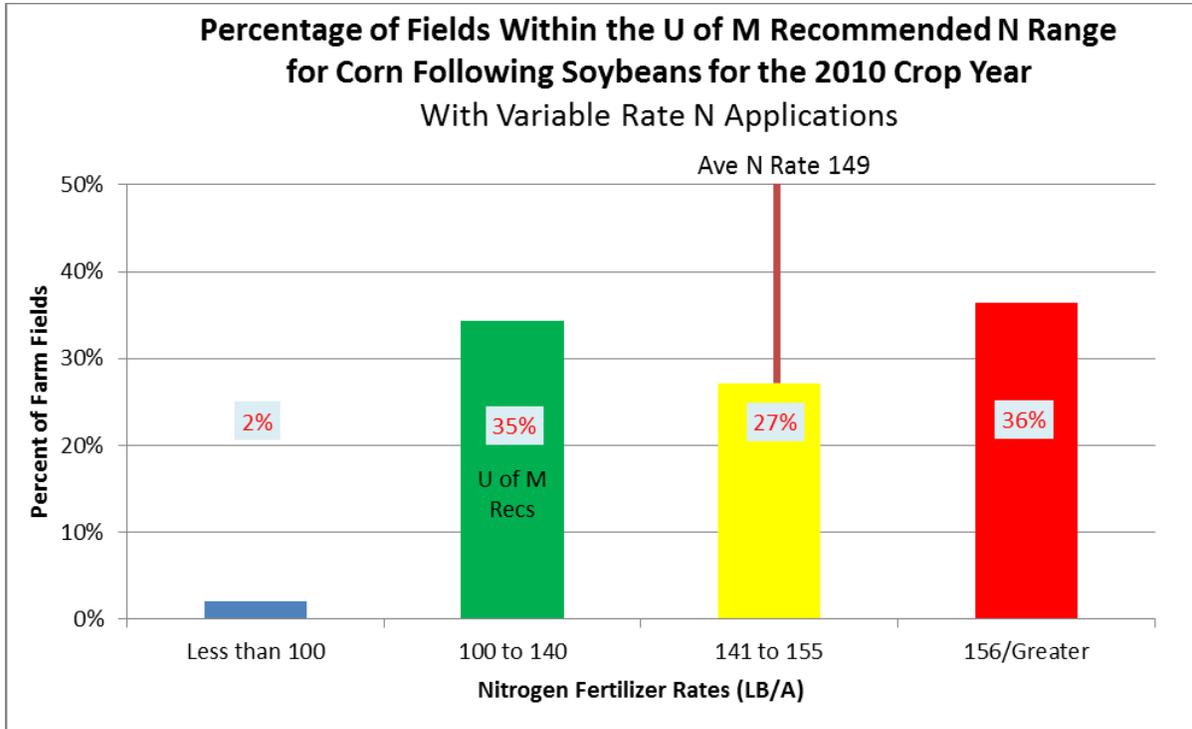


Figure 18. Percentage of fields within the U of M recommended range for corn following soybeans in the SW BMP region for 2010 with variable rate applications of nitrogen: 96 fields.

Table 20. Nitrogen fertilizer rates and associated corn yields for corn following soybeans with variable rate nitrogen applications for the 2010 crop year in the SW BMP region.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	144	156	169	178
Avg N-Rate LB/A	80	128	149	173

Northwestern Region: Corn Following Soybeans

There were 46 fields that were included in the NW BMP region corn following soybeans analysis. Figure 19 details the location, average rate of nitrogen fertilizer and average yield for corn following soybeans in the NW BMP region.

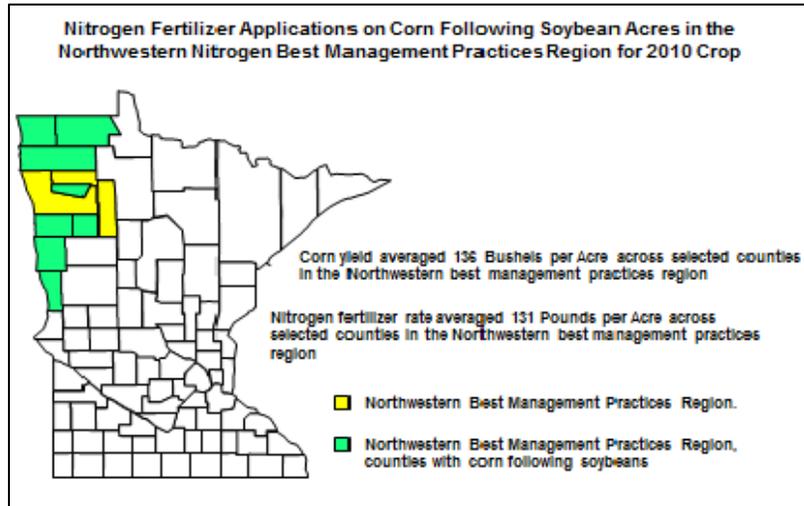


Figure 19. The corn yield averaged 136 bushels per acre and the nitrogen fertilizer rate averaged 131 pounds per acre across the NW BMP region.

Figure 20 details the distribution of nitrogen fertilizer rates in the NW BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 21 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 20.

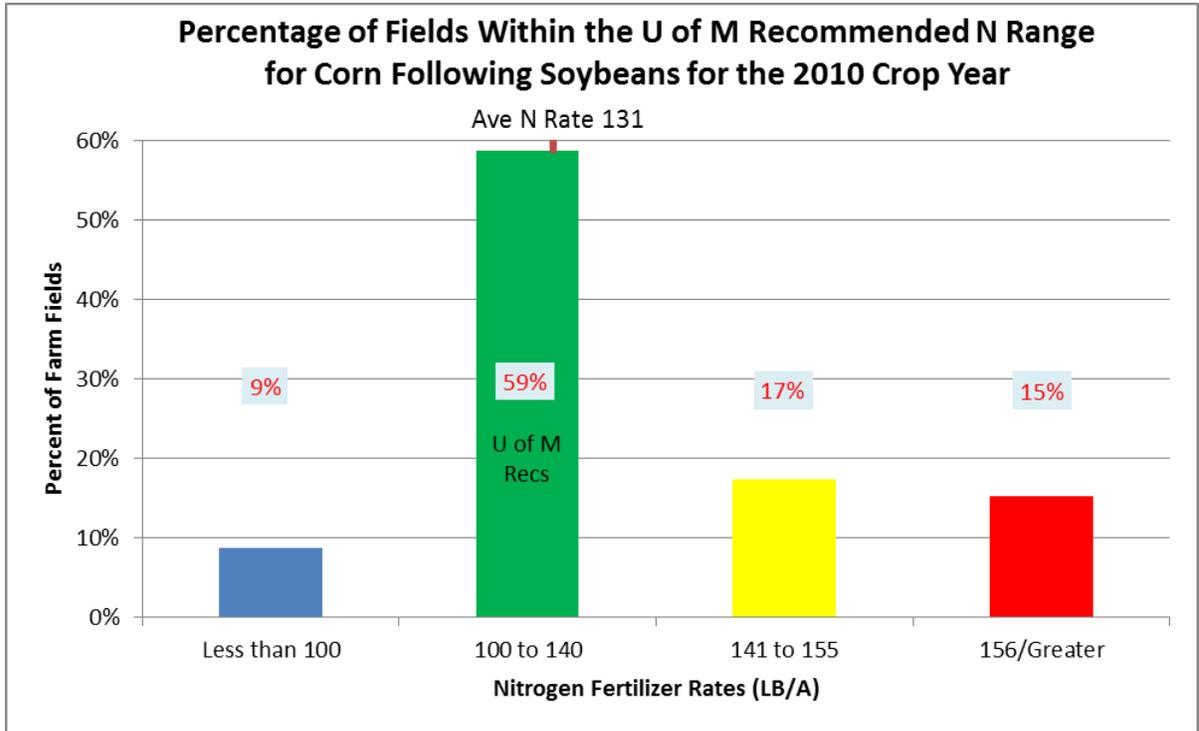


Figure 20. Percentage of fields within the U of M recommended range for corn following soybeans in the NW BMP region for 2010 with and without variable rate applications of nitrogen: 46 fields.

Table 21. Nitrogen fertilizer rates and associated corn yields for corn following soybeans with and without variable rate nitrogen applications for the 2010 crop year in the NW BMP region.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	114	135	135	151
Avg N-Rate LB/A	77	126	150	161

Figure 21 details the distribution of nitrogen fertilizer rates in the NW BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 22 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 21.

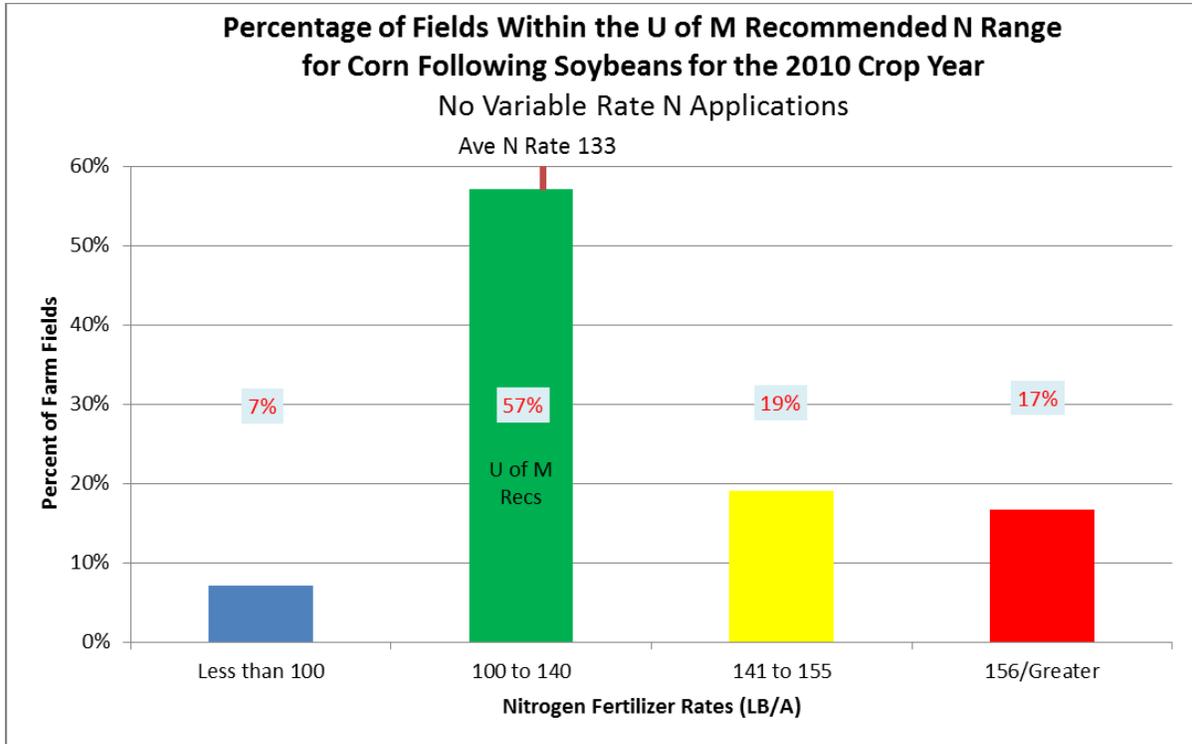


Figure 21. Percentage of fields within the U of M recommended range for corn following soybeans in the NW BMP region for 2010 without variable rate applications of nitrogen: 42 fields.

Table 22. Nitrogen fertilizer rates and associated corn yields for corn following soybeans without variable rate nitrogen applications for the 2010 crop year in the NW BMP region.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	118	136	135	151
Avg N-Rate LB/A	80	126	150	161

Less than five farmers reported planting corn following soybeans in the NW BMP region for fields with variable rate nitrogen application.

Irrigated and Non-irrigated Sandy Soils Region: Corn Following Soybeans

There were 173 fields that were included in the IRR BMP region corn following soybeans analysis. Figure 22 details the distribution of nitrogen fertilizer rates across the IRR BMP region for corn following soybeans.

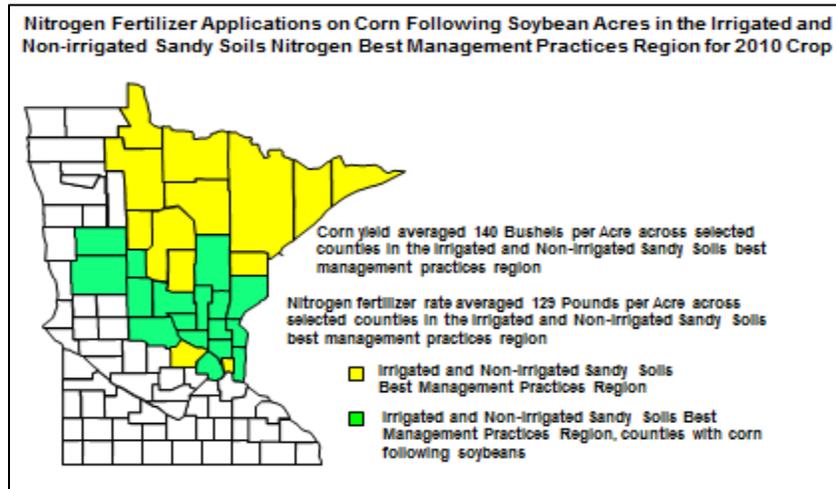


Figure 22. The corn yield averaged 140 bushels per acre and the nitrogen fertilizer rate averaged 129 pounds per acre across the IRR BMP region.

Figure 23 details the distribution of nitrogen fertilizer rates in the IRR BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 23 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 23.

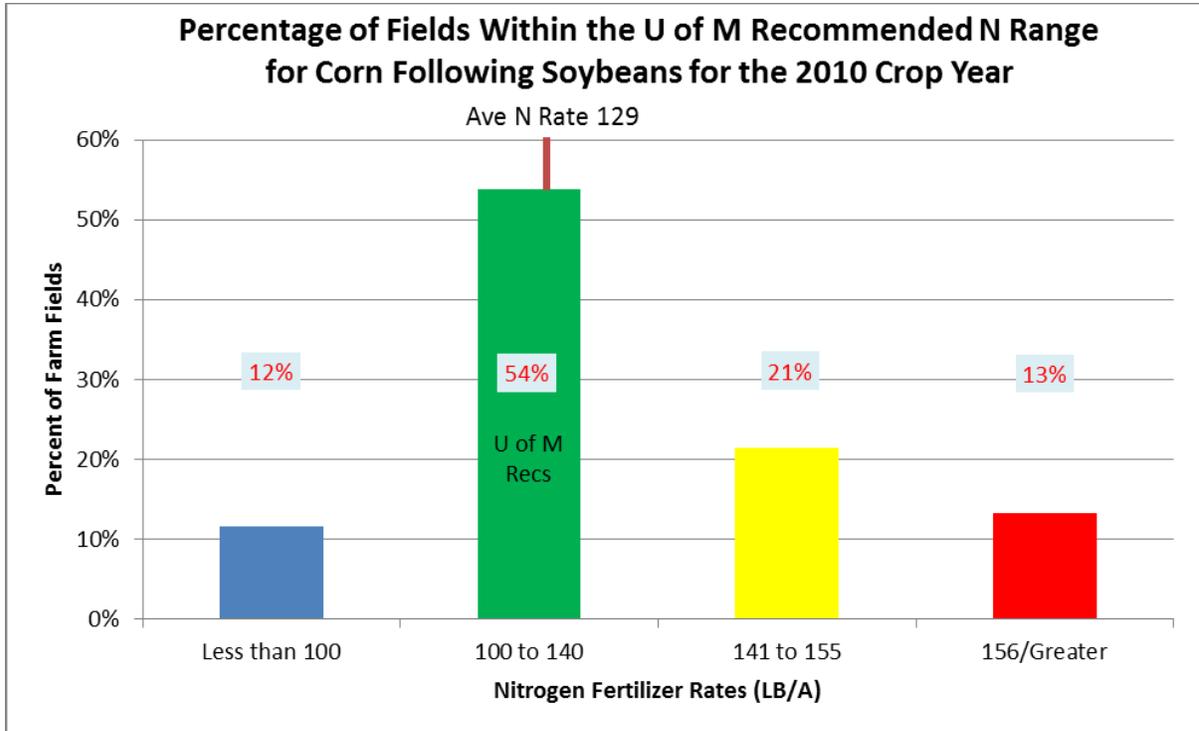


Figure 23. Percentage of fields within the U of M recommended range for corn following soybeans in the IRR BMP region for 2010 with and without variable rate applications of nitrogen: 173 fields.

Table 23. Nitrogen fertilizer rates and associated corn yields for corn following soybeans with and without variable rate nitrogen applications for the 2010 crop year in the IRR BMP region.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	101	134	151	175
Avg N-Rate LB/A	75	121	149	173

Figure 24 details the distribution of nitrogen fertilizer rates in the IRR BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 24 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 24.

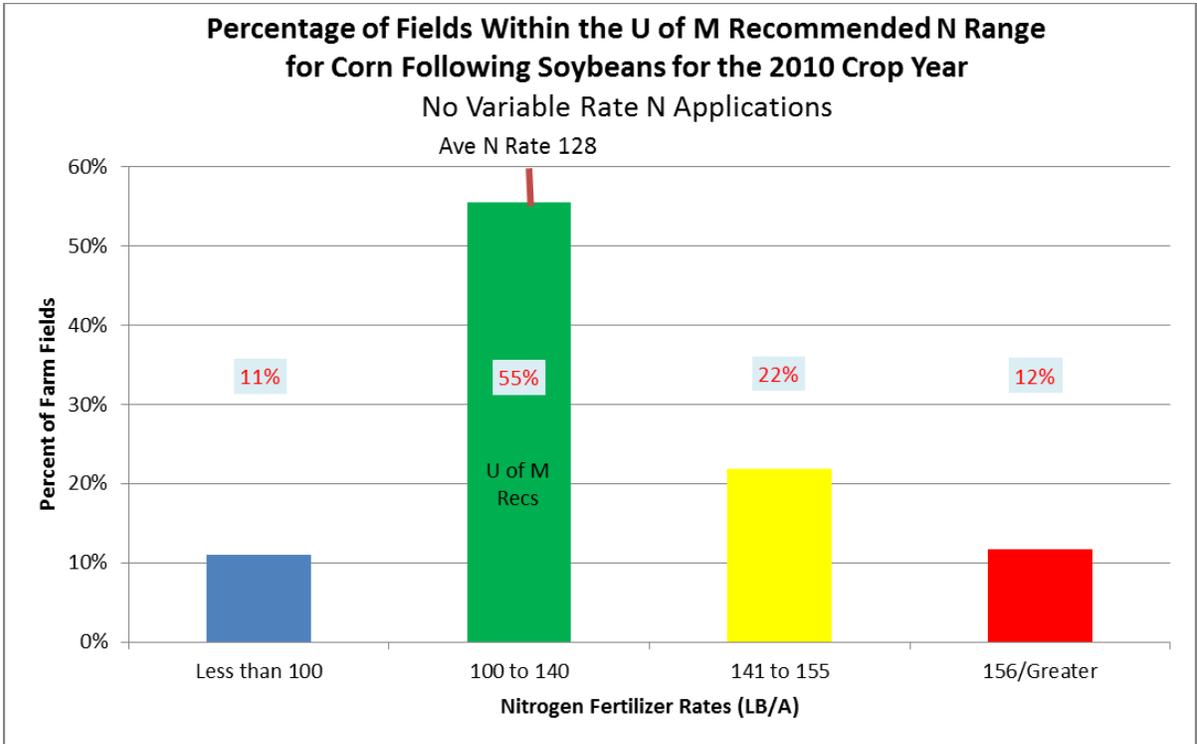


Figure 24. Percentage of fields within the U of M recommended range for corn following soybeans in the IRR BMP region for 2010 without variable rate applications of nitrogen: 137 fields.

Table 24. Nitrogen fertilizer rates and associated corn yields for corn following soybeans without variable rate nitrogen applications for the 2010 crop year in the IRR BMP region.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	103	135	151	173
Avg N-Rate LB/A	76	121	149	171

Figure 25 details the distribution of nitrogen fertilizer rates in the IRR BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 25 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 25.

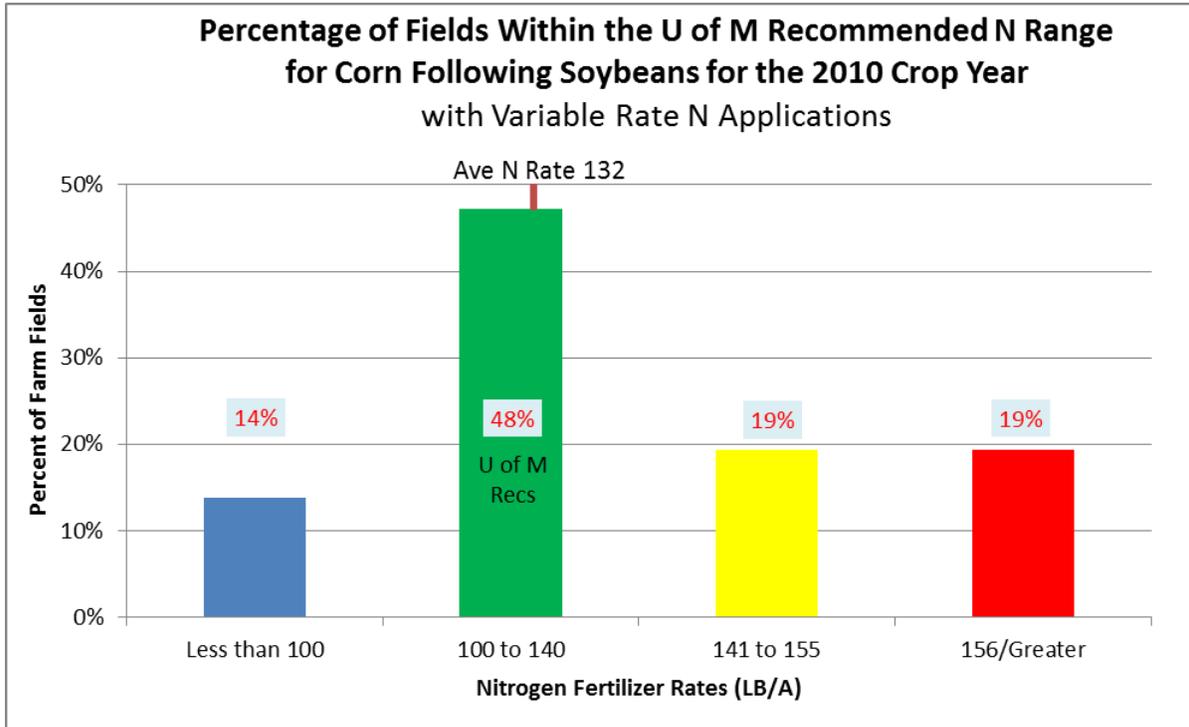


Figure 25. Percentage of fields within the U of M recommended range for corn following soybeans in the IRR BMP region for 2010 with variable rate applications of nitrogen: 36 fields.

Table 25. Nitrogen fertilizer rates and associated corn yields for corn following soybeans with variable rate nitrogen applications for the 2010 crop year in the IRR BMP region.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	97	134	153	179
Avg N-Rate LB/A	72	124	150	176

Statewide: Corn Following Corn

Statewide twenty percent of the fields reported were corn following corn fields. Figure 26 details the counties where farmers reported on fields with corn following corn. There were 665 corn following corn fields surveyed across Minnesota.

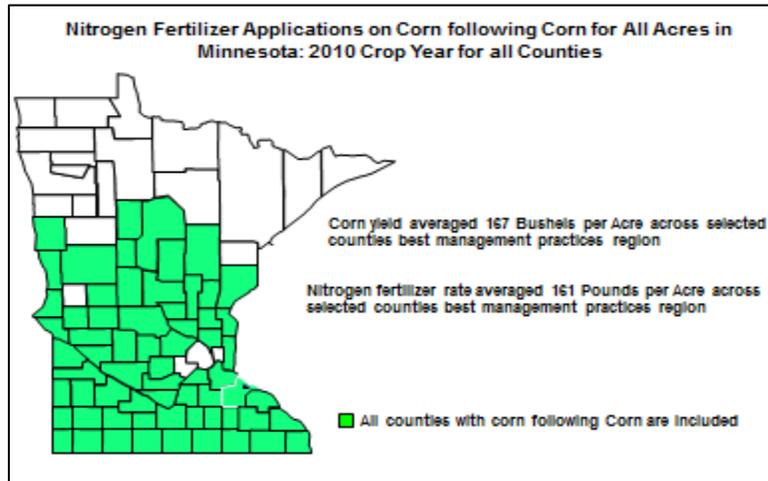


Figure 26. Counties with famers reporting on corn following corn fields.

Figure 27 details the distribution of nitrogen fertilizer rates across Minnesota for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 26 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 27.

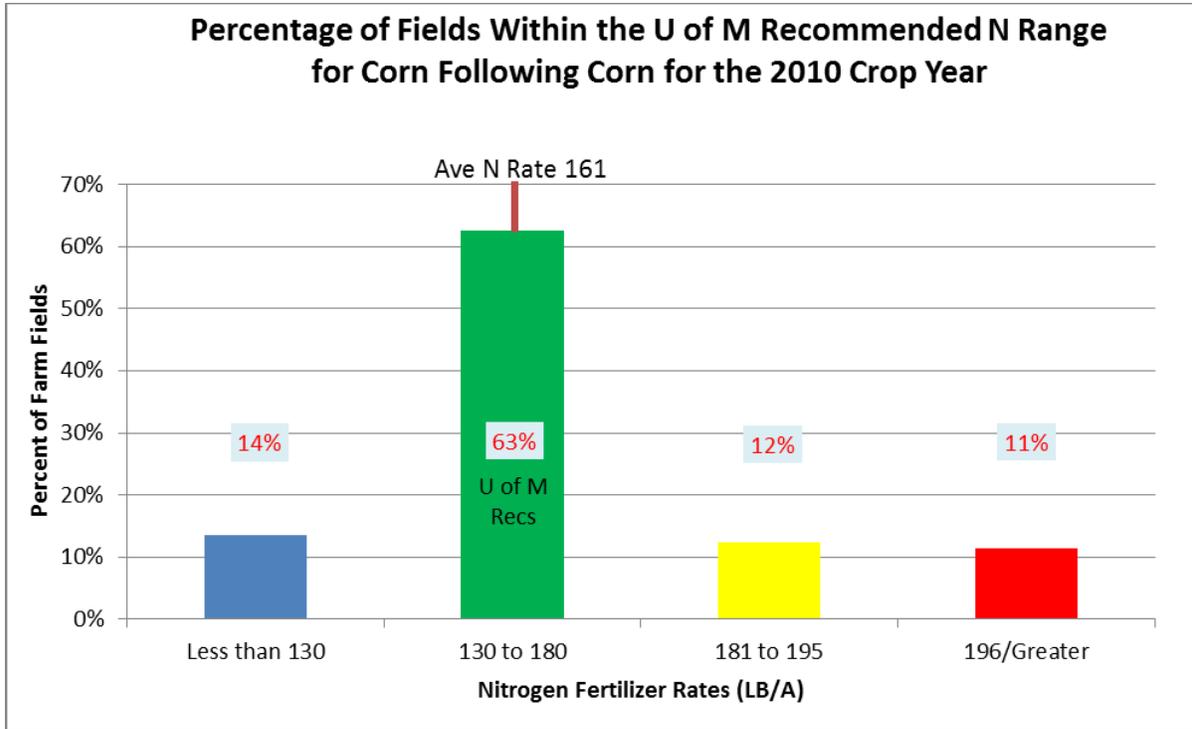


Figure 27. Percentage of fields within the U of M recommended range for corn following corn with and without variable rates nitrogen applications across Minnesota in 2010: 665 fields.

Table 26. Nitrogen fertilizer rates and associated corn yields for corn following corn with and without variable rate nitrogen applications for the 2010 crop year across Minnesota.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	126	169	184	186
Avg N-Rate LB/A	104	159	188	207

Figure 28 details the distribution of nitrogen fertilizer rates across Minnesota for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 27 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 28.

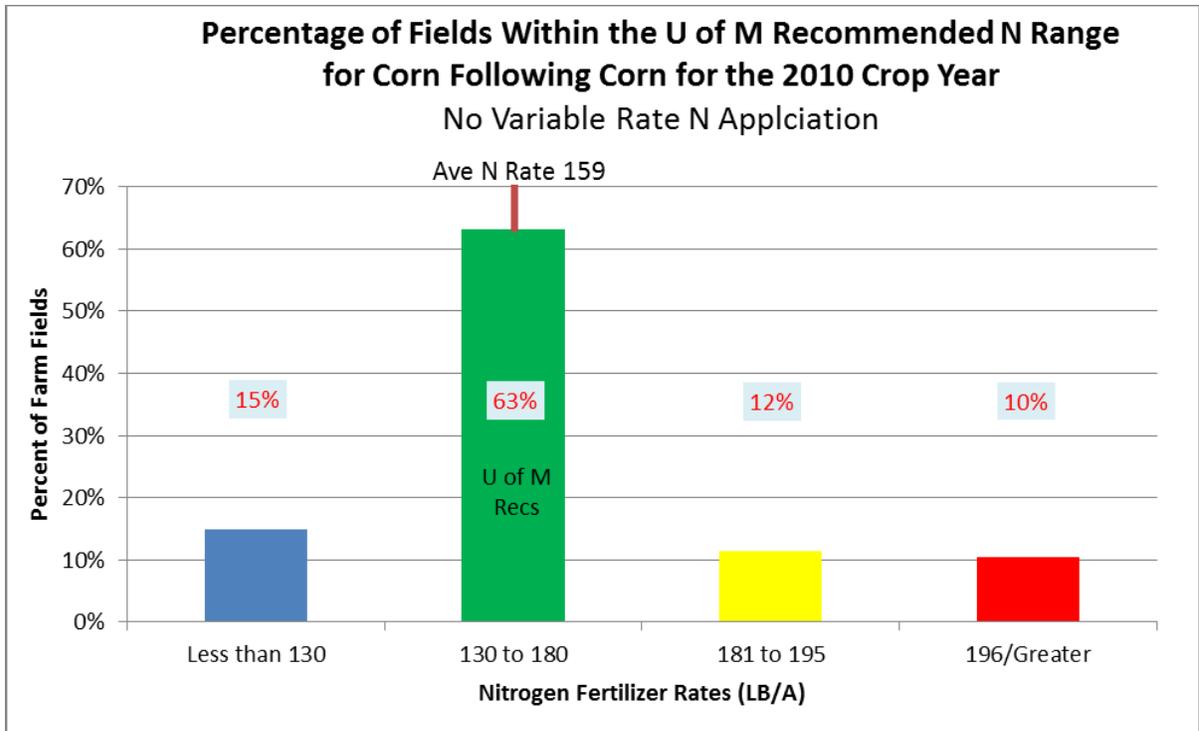


Figure 28. Percentage of fields within the U of M recommended range for corn following corn without variable rate nitrogen applications across Minnesota in 2010: 508 fields.

Table 27. Nitrogen fertilizer rates and associated corn yields for corn following corn without variable rate nitrogen applications for the 2010 crop year across Minnesota.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	127	168	182	186
Avg N-Rate LB/A	105	159	188	207

Figure 29 details the distribution of nitrogen fertilizer rates across Minnesota for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 28 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 29.

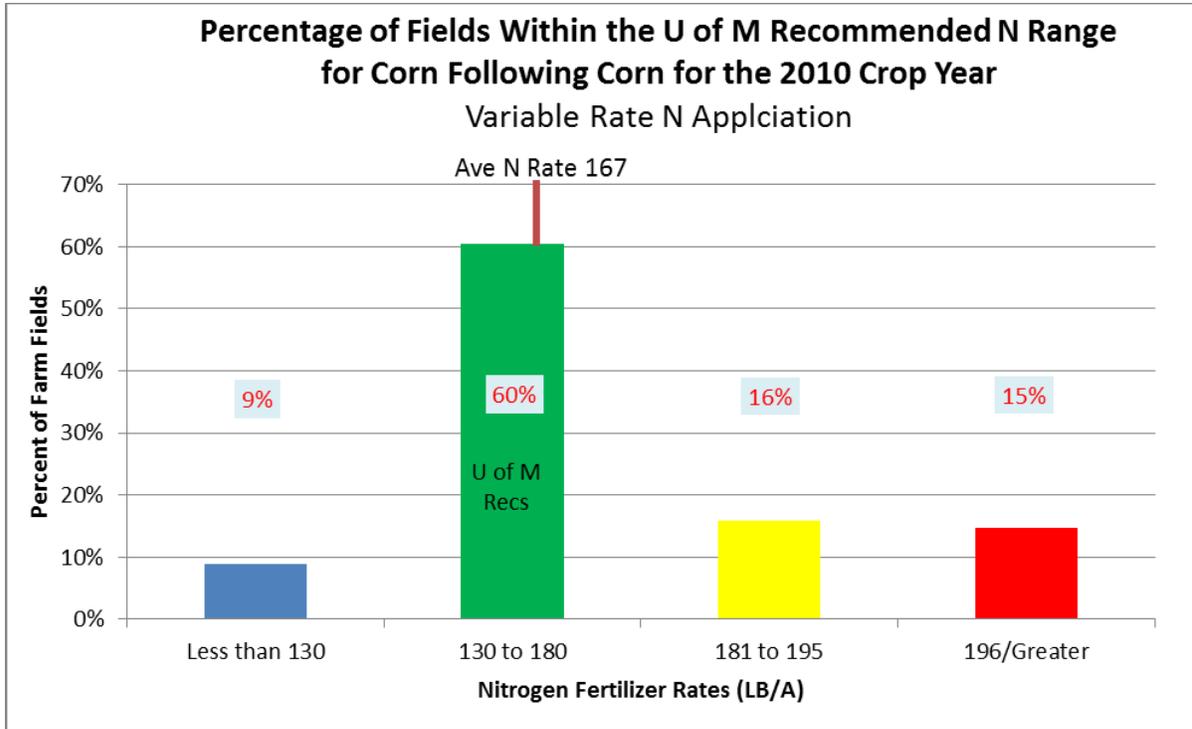


Figure 29. Percentage of fields within the U of M recommended range for corn following corn with variable rate applications across Minnesota in 2010: 157 fields.

Table 28. Nitrogen fertilizer rates and associated corn yields for corn following corn with variable rate nitrogen applications for the 2010 crop year across Minnesota.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	121	171	190	185
Avg N-Rate LB/A	100	161	187	206

Southeastern Region: Corn Following Corn

There were 361 fields that were included in the SE BMP region corn following corn analysis. Figure 30 details the location, average rate of nitrogen fertilizer and average yield for corn following corn in the SE BMP region.

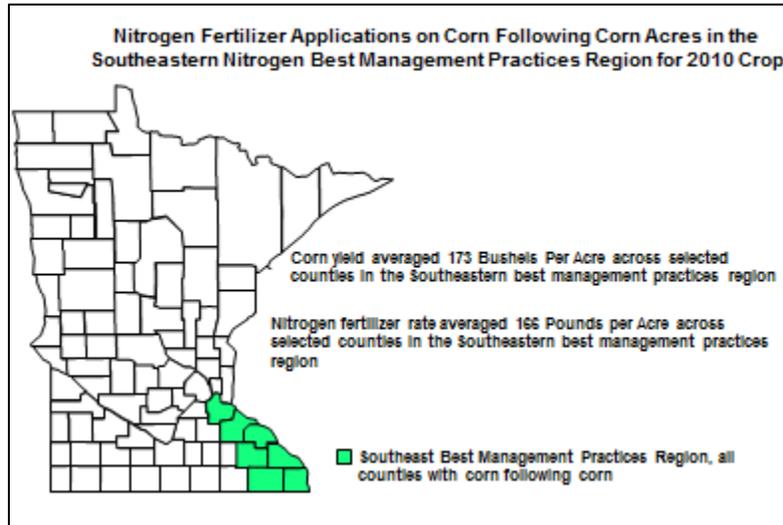


Figure 30. The corn yield averaged 173 bushels per acre and the nitrogen fertilizer rate averaged 166 pounds per acre across the SE BMP region.

Figure 31 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 29 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 31.

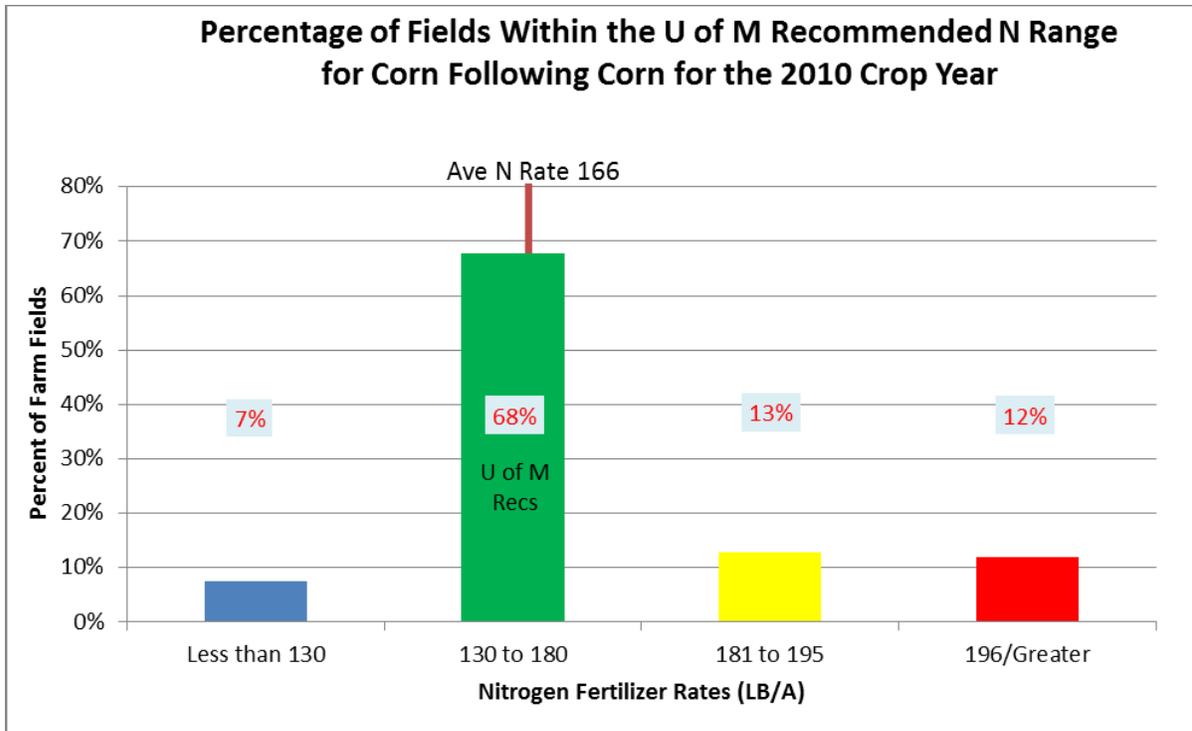


Figure 31. Percentage of fields within the U of M recommended range for corn following corn with and without variable rate applications in the SE BMP region in 2010: 361 fields.

Table 29. Nitrogen fertilizer rates and associated corn yields for corn following corn with and without variable rate nitrogen applications for the 2010 crop year in the SE BMP region.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	143	171	185	185
Avg N-Rate LB/A	113	161	188	208

Figure 32 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 30 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 32.

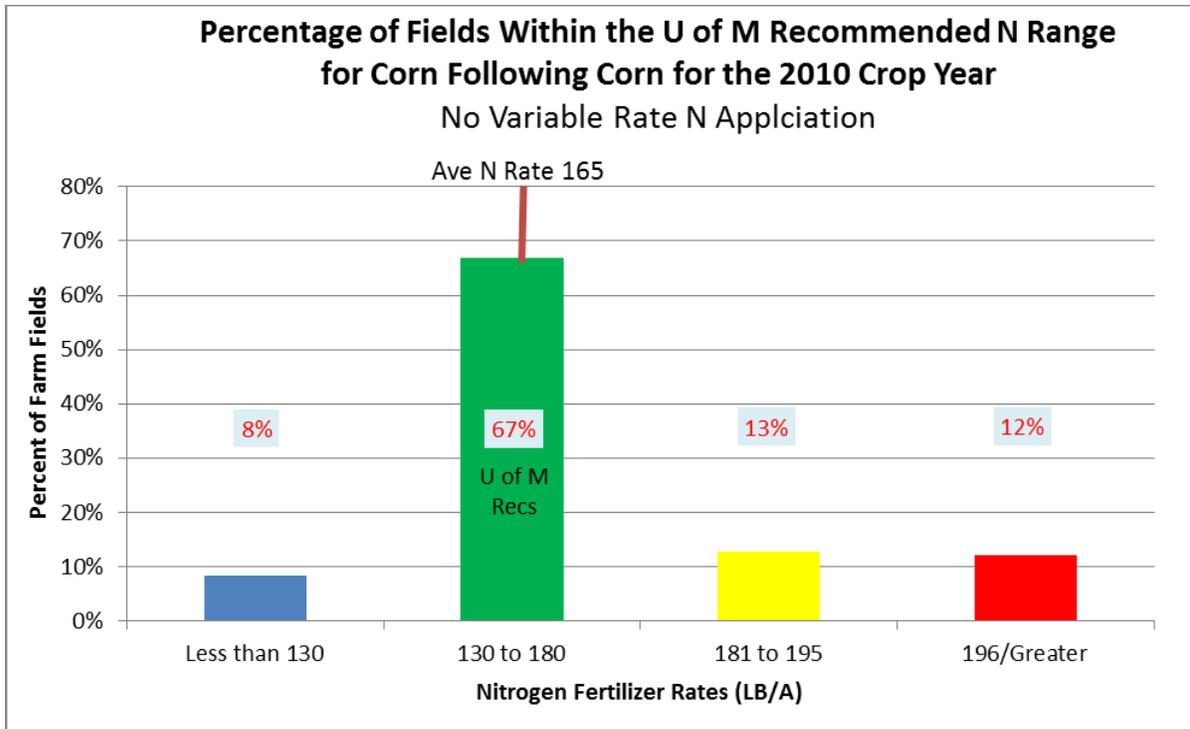


Figure 32. Percentage of fields within the U of M recommended range for corn following corn without variable rate applications in the SE BMP region in 2010: 289 fields

Table 30. Nitrogen fertilizer rates and associated corn yields for corn following corn without variable rate nitrogen applications for the 2010 crop year in the SE BMP region.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	140	172	183	185
Avg N-Rate LB/A	112	160	188	208

Figure 33 details the distribution of nitrogen fertilizer rates in the SE BMP for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 31 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 33.

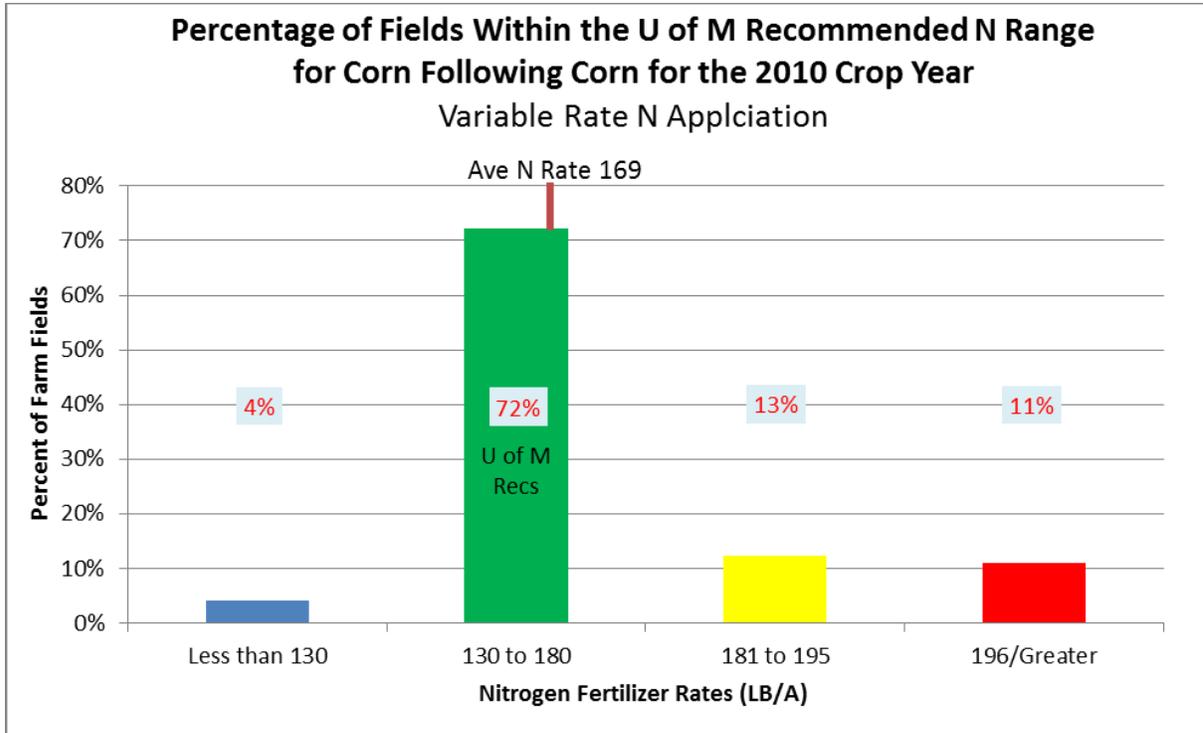


Figure 33. Percentage of fields within the U of M recommended range for corn following corn with variable rate applications in the SE BMP region in 2010: 72 fields.

Table 31. Nitrogen fertilizer rates and associated corn yields for corn following corn with variable rate nitrogen applications for the 2010 crop year in the SE BMP region.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	168	170	190	183
Avg N-Rate LB/A	120	163	187	207

South Central Region: Corn Following Corn

There were 128 fields that were included in the SC BMP region corn following corn analysis. Figure 34 details the location, average rate of nitrogen fertilizer and average yield for corn following corn in the SC BMP region.

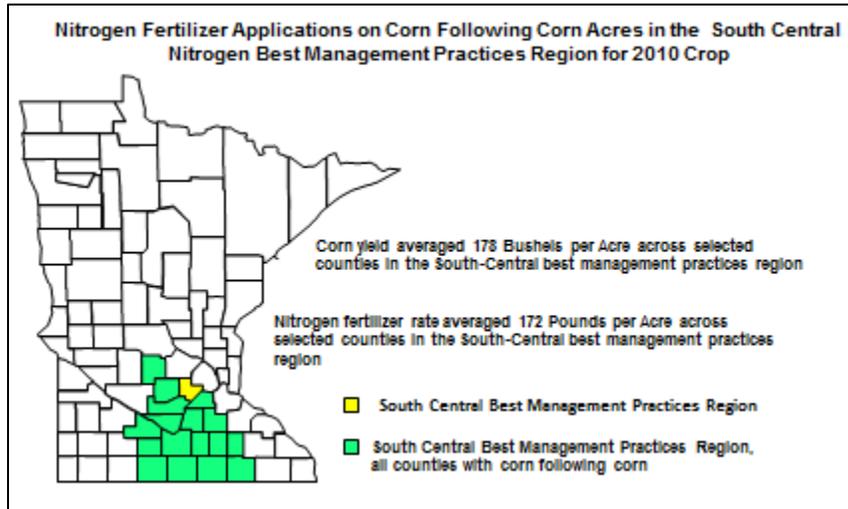


Figure 34. The corn yield averaged 178 bushels per acre and the nitrogen fertilizer rate averaged 172 pounds per acre across the SC BMP region.

Figure 35 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 32 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 35.

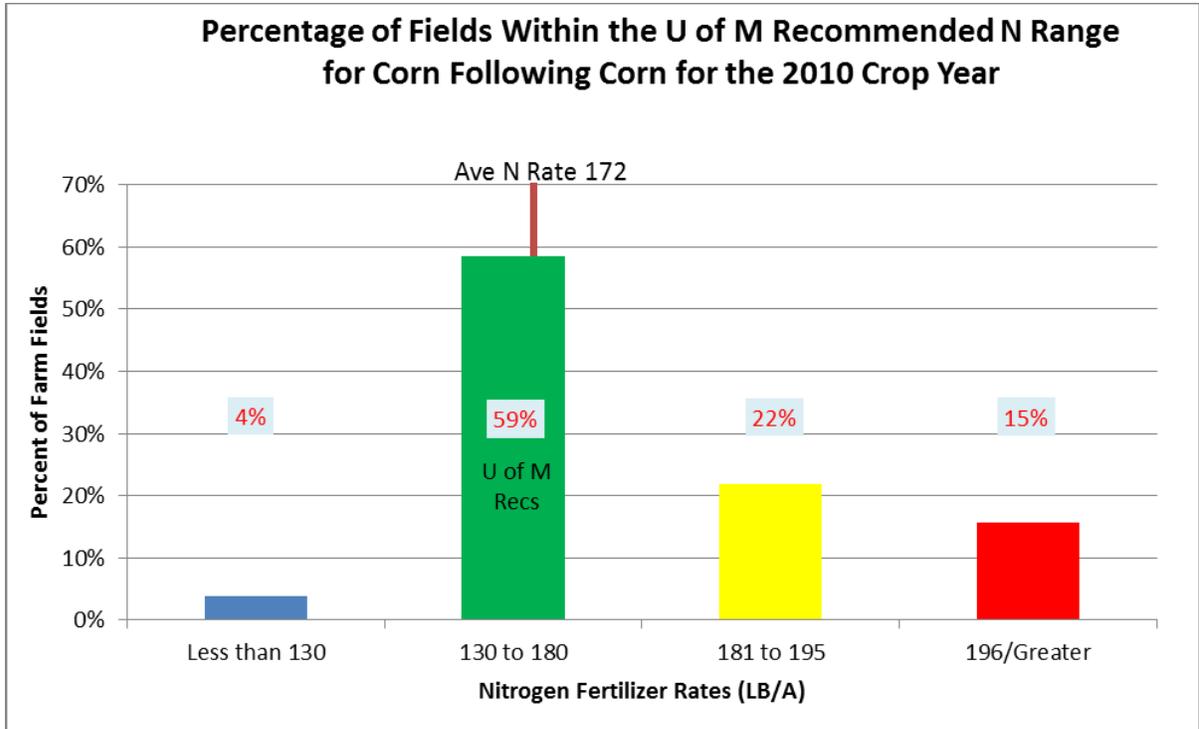


Figure 35. Percentage of fields within the U of M recommended range for corn following corn with and without variable rate applications in the SC BMP region in 2010: 128 fields.

Table 32. Nitrogen fertilizer rates and associated corn yields for corn following corn with and without variable rate nitrogen applications for the 2010 crop year in the SC BMP region.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	161	174	186	188
Avg N-Rate LB/A	124	160	188	207

Figure 36 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 33 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 36.

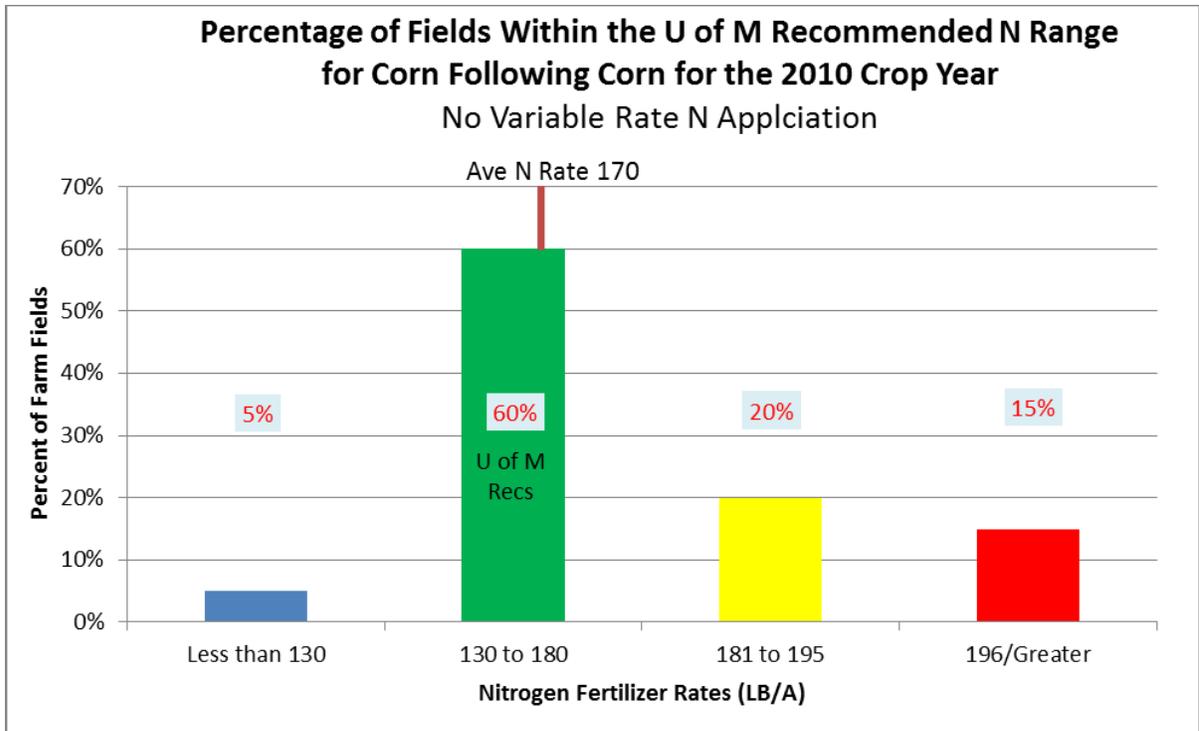


Figure 36. Percentage of fields within the U of M recommended range for corn following corn without variable rate applications in the SC BMP region in 2010: 80 fields.

Table 33. Nitrogen fertilizer rates and associated corn yields for corn following corn without variable rate nitrogen applications for the 2010 crop year in the SC BMP region.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	158	171	182	189
Avg N-Rate LB/A	124	158	188	207

Figure 37 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 34 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 37.

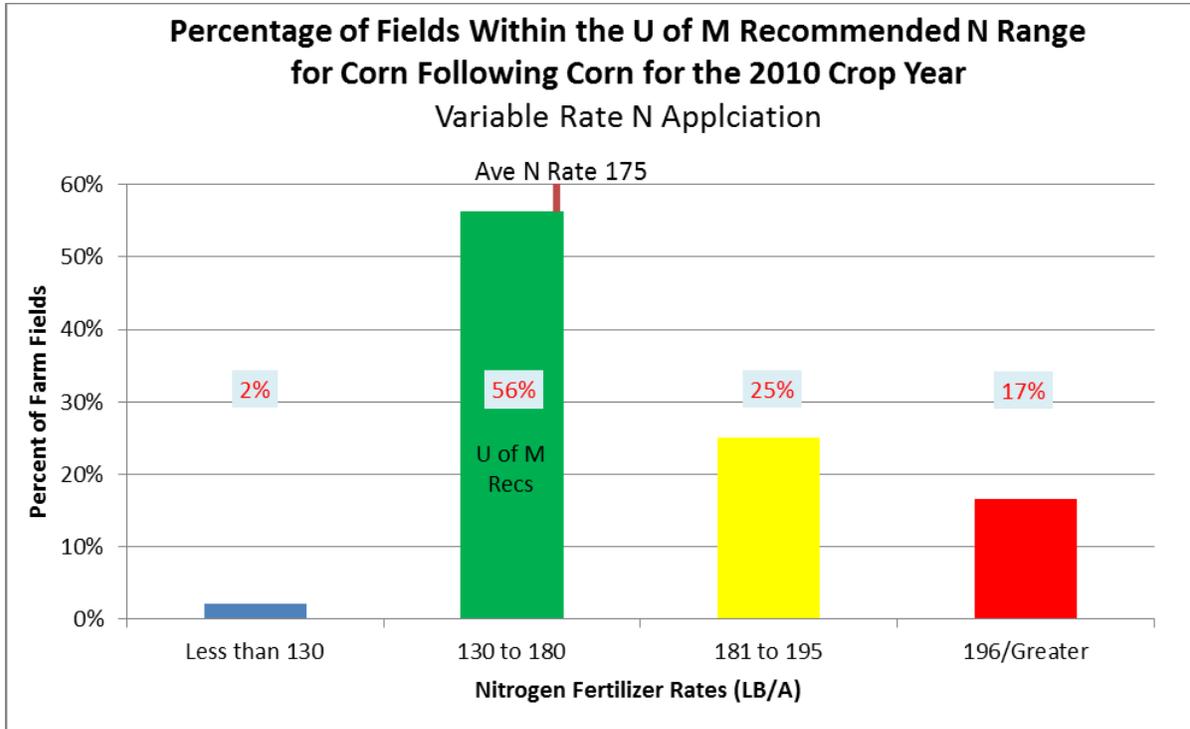


Figure 37. Percentage of fields within the U of M recommended range for corn following corn with variable rate applications in the SC BMP region in 2010: 48 fields.

Table 34. Nitrogen fertilizer rates and associated corn yields for corn following corn with variable rate nitrogen applications for the 2010 crop year in the SC BMP region.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	175	180	190	187
Avg N-Rate LB/A	125	163	187	207

Southwestern and West Central Region: Corn Following Corn

There were 85 fields that were included in the SW BMP region corn following corn analysis. Figure 38 details the location, average rate of nitrogen fertilizer and average yield for corn following corn in the SW BMP region.

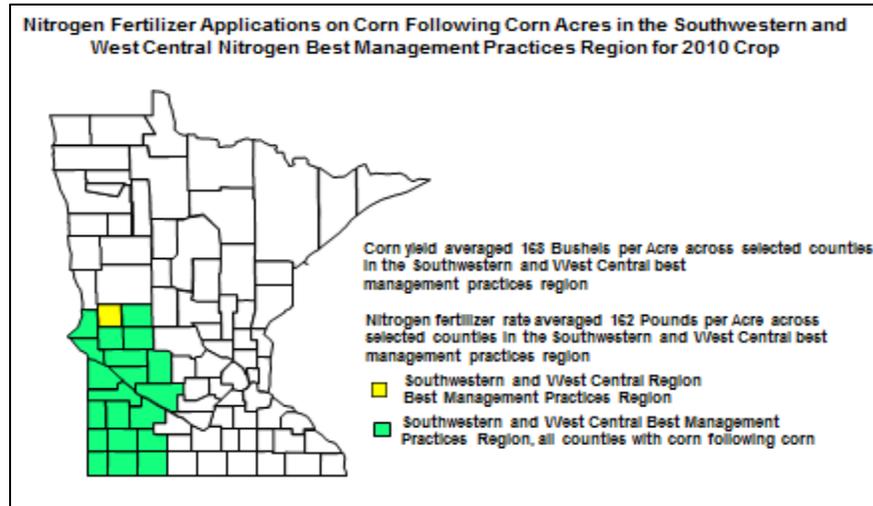


Figure 38. The corn yield averaged 168 bushels per acre and the nitrogen fertilizer rate averaged 162 pounds per acre across the SW BMP region.

Figure 39 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 35 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 39.

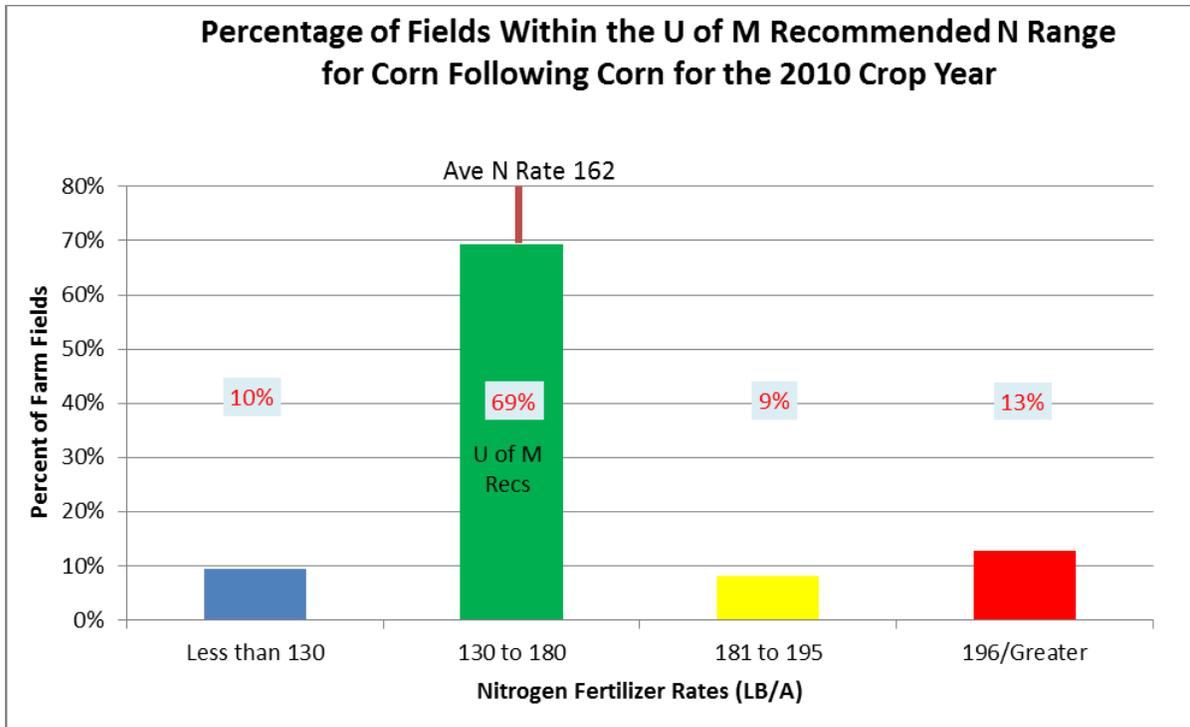


Figure 39. Percentage of fields within the U of M recommended range for corn following corn with and without variable rate applications in the SW BMP region in 2010: 85 fields.

Table 35. Nitrogen fertilizer rates and associated corn yields for corn following corn with and without variable rate nitrogen applications for the 2010 crop year in the SW BMP region.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	136	168	179	184
Avg N-Rate LB/A	112	159	188	204

Figure 40 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 36 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 40.

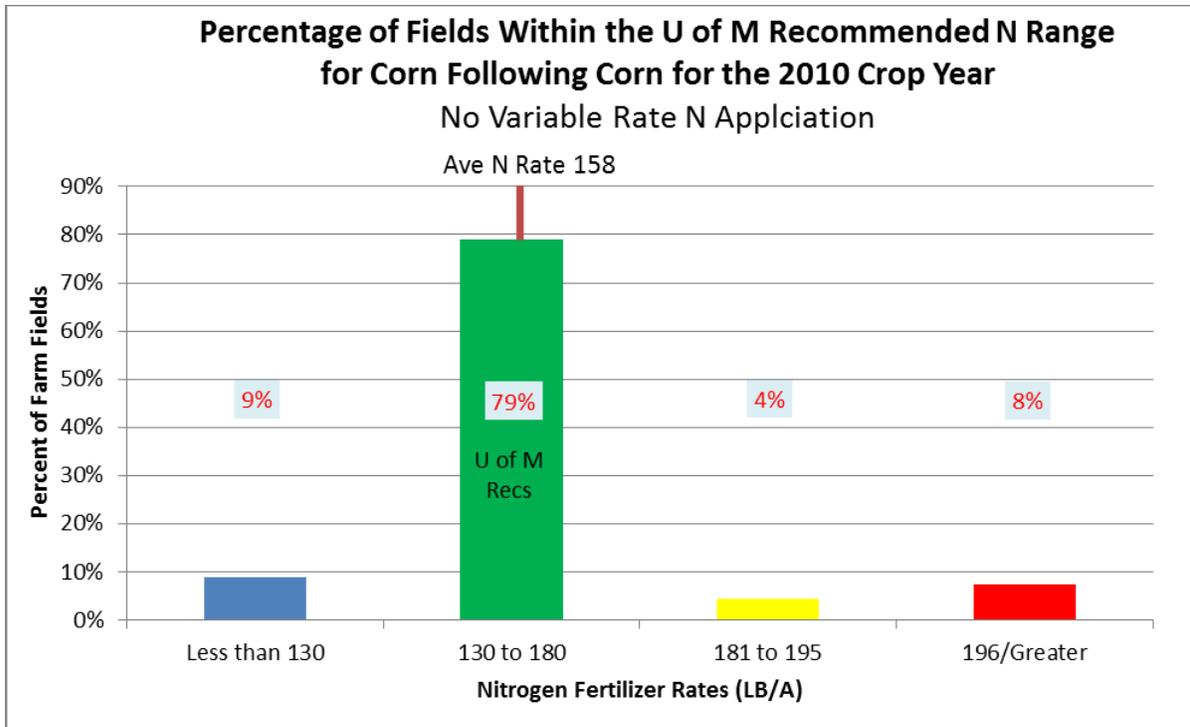


Figure 40. Percentage of fields within the U of M recommended range for corn following corn without variable rate applications in the SW BMP region in 2010: 67 fields.

Table 36. Nitrogen fertilizer rates and associated corn yields for corn following corn without variable rate nitrogen applications for the 2010 crop year in the SW BMP region.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	140	168	170	183
Avg N-Rate LB/A	109	158	189	204

Figure 41 details the distribution of average nitrogen fertilizer rates in the SW BMP region for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 37 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 41.

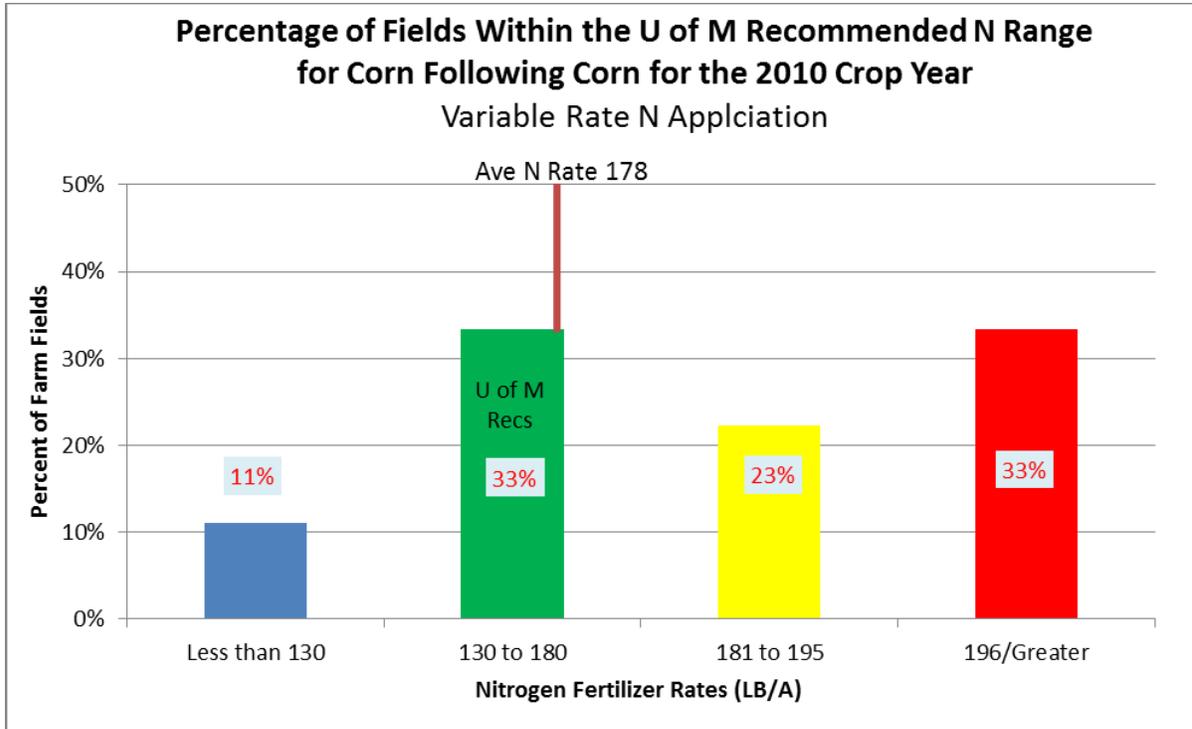


Figure 41. Percentage of fields within the U of M recommended range for corn following corn with variable rate applications in the SW BMP region in 2010: 18 fields.

Table 37. Nitrogen fertilizer rates and associated corn yields for corn following corn with variable rate nitrogen applications for the 2010 crop year in the SW BMP region.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	123	170	186	186
Avg N-Rate LB/A	121	164	187	204

Northwestern Region: Corn Following Corn

Less than five farmers reported planting corn following corn in the NW BMP region for fields with variable and non-variable rate nitrogen application.

Less than five farmers reported planting corn following corn in the NW BMP region for fields with non-variable rate nitrogen application.

Less than five farmers reported planting corn following corn in the NW BMP region for fields with variable rate nitrogen application.

Irrigated and Non-irrigated Sandy Soils Region: Corn Following Corn

There were 88 fields that were included in the IRR BMP region corn following corn analysis. Figure 42 details the location, average rate of nitrogen fertilizer and average yield for corn following corn in the IRR BMP region.

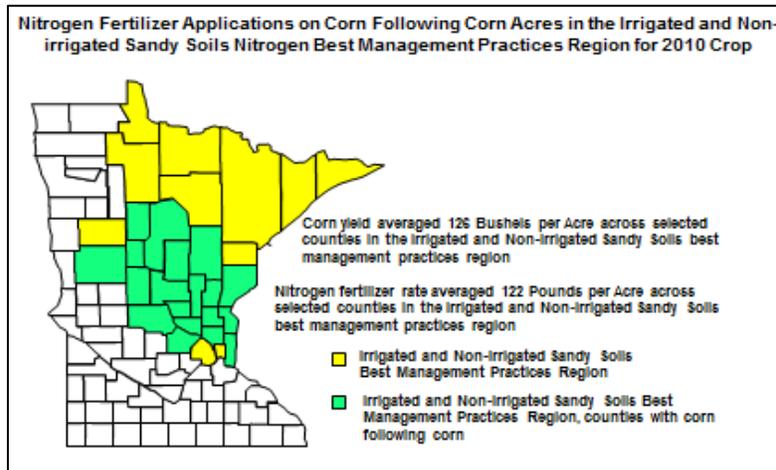


Figure 42. The corn yield averaged 126 bushels per acre and the nitrogen fertilizer rate averaged 122 pounds per acre across the IRR BMP region.

Figure 43 details the distribution of average nitrogen fertilizer rates in the IRR BMP region for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 38 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 43.

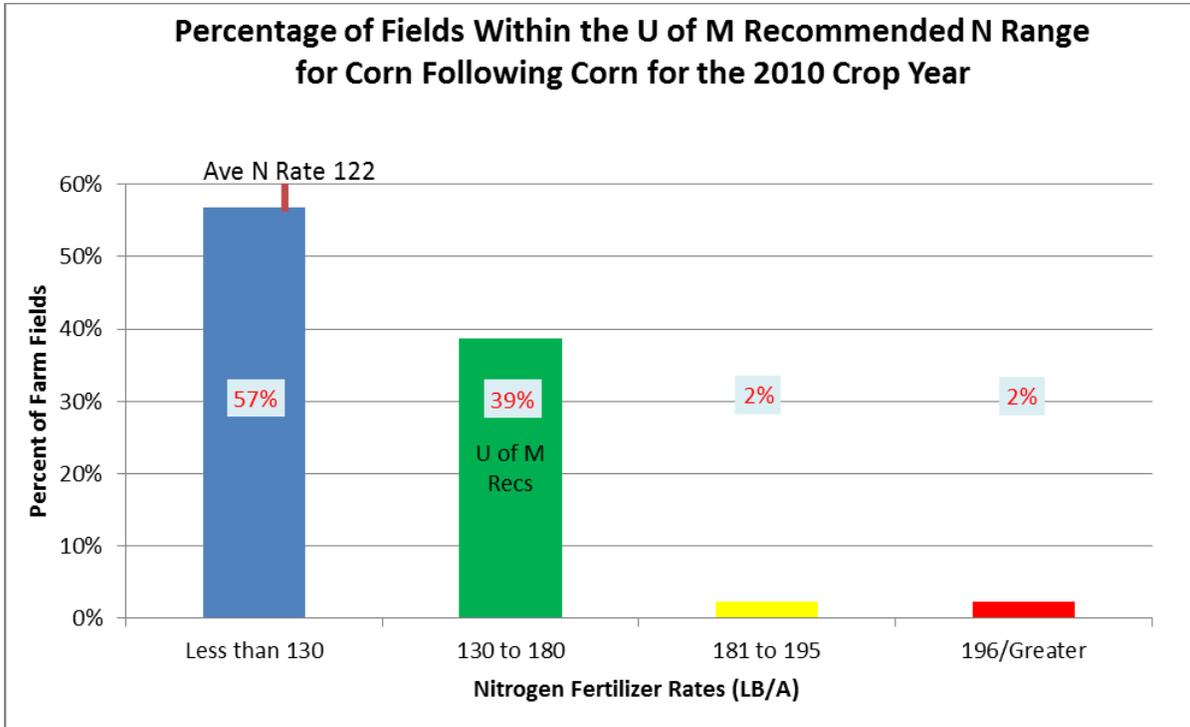


Figure 43. Percentage of fields within the U of M recommended range for corn following corn with and without variable rate applications in the IRR BMP region in 2010: 88 fields.

Table 38. Nitrogen fertilizer rates and associated corn yields for corn following corn with and without variable rate nitrogen applications for the 2010 crop year in the IRR BMP region.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./acre	111	143	160	178
Avg N-Rate LB/A	96	150	190	210

Figure 44 details the distribution of average nitrogen fertilizer rates in the IRR BMP region for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 39 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 44.

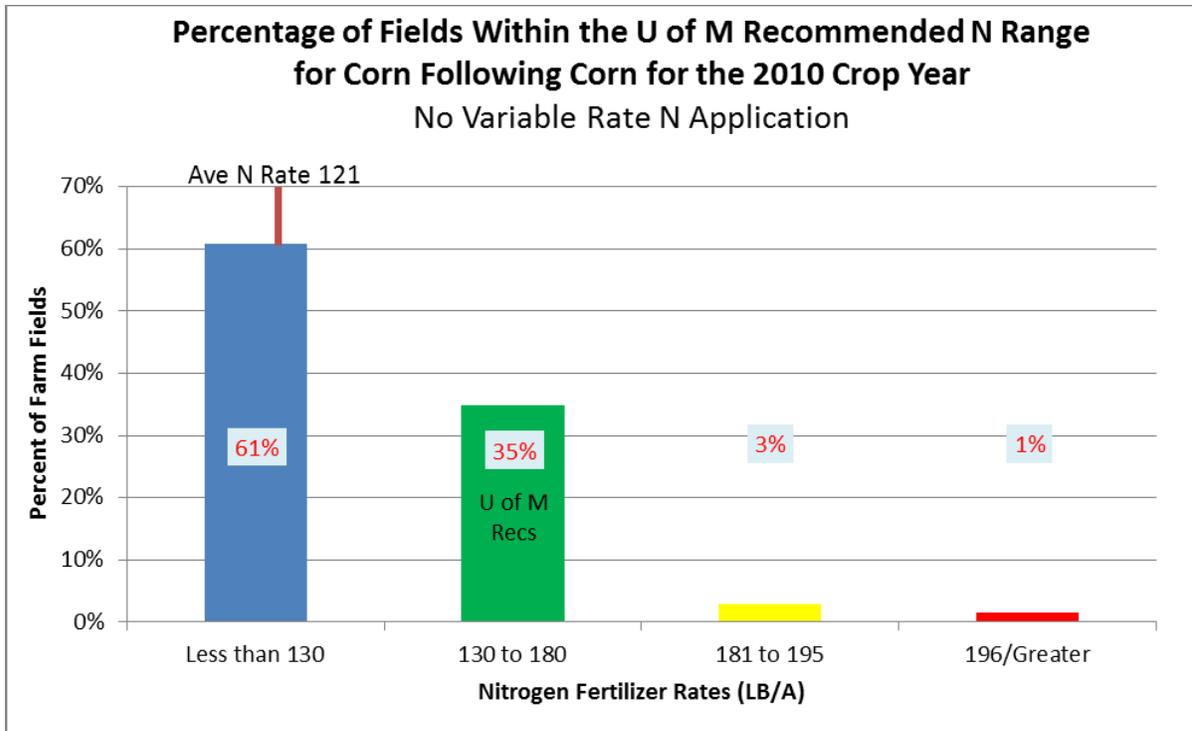


Figure 44. Percentage of fields within the U of M recommended range for corn following corn without variable rate applications in the IIR BMP region in 2010: 69 fields.

Table 39. Nitrogen fertilizer rates and associated corn yields for corn following corn without variable rate nitrogen applications for the 2010 crop year in the IRR BMP region.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	114	140	160	175
Avg N-Rate LB/A	99	151	190	210

Figure 45 details the distribution of average nitrogen fertilizer rates in the IRR BMP region for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 40 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 45.

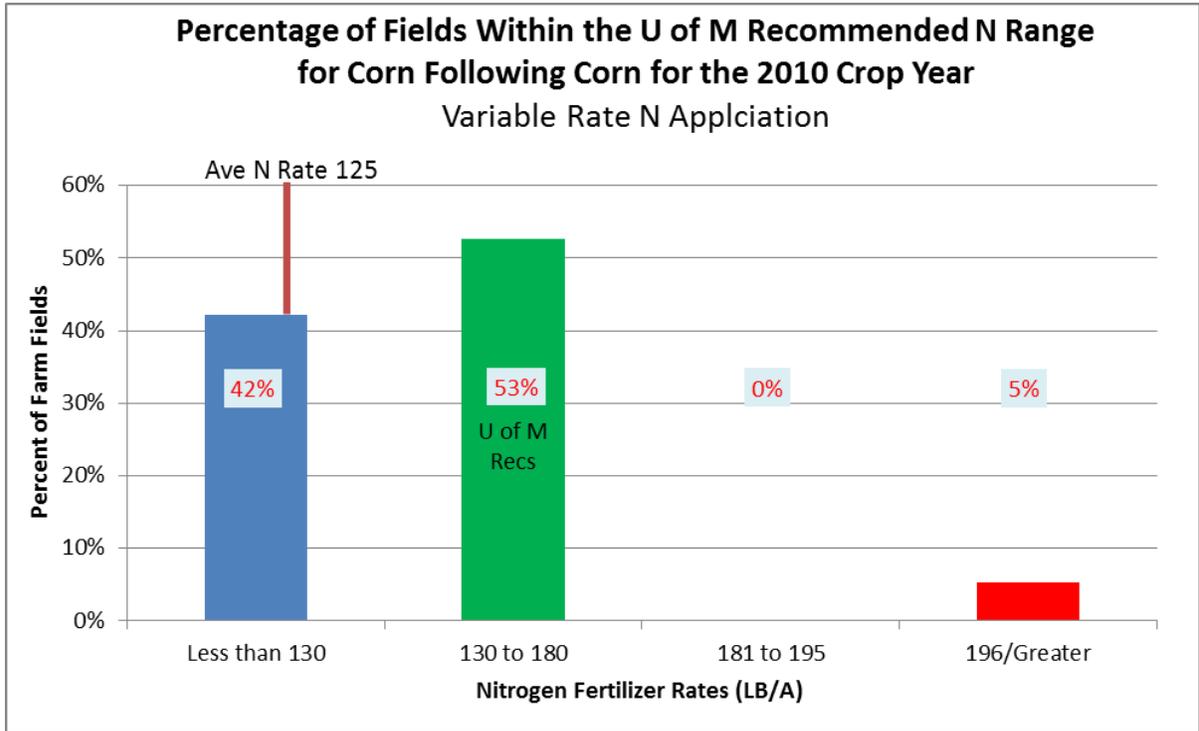


Figure 45. Percentage of fields within the U of M recommended range for corn following corn with variable rate applications in the Irrigated Non-irrigated Sandy Soils BMP region in 2010: 19 fields.

Table 40. Nitrogen fertilizer rates and associated corn yields for corn following corn with variable rate nitrogen applications for the 2010 crop year in the IRR BMP region.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	96	152	No Data	180
Avg N-Rate LB/A	84	149	No Data	210

Statewide: Corn Following Corn Following Alfalfa

Statewide there were 113 fields that were included in the corn following corn following alfalfa in the statewide region analysis. Figure 46 details the location, average rate of nitrogen fertilizer and average yield for corn following corn following alfalfa throughout the state.

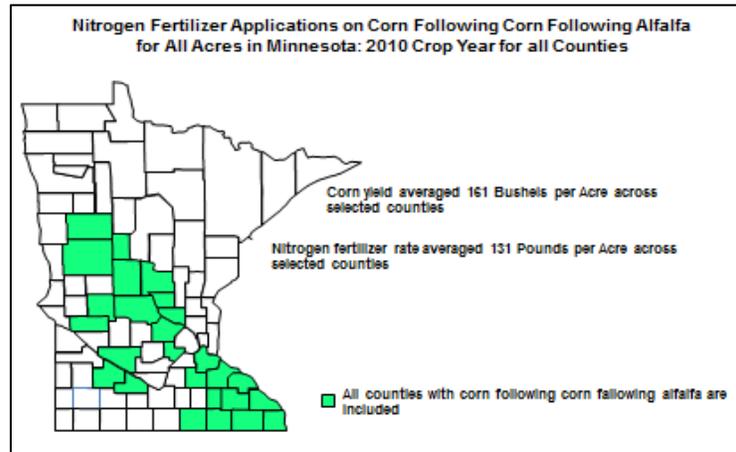


Figure 46. Counties with fields reporting on corn following corn following alfalfa fields.

Figure 47 details the distribution of nitrogen fertilizer rates across Minnesota for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 41 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 47.

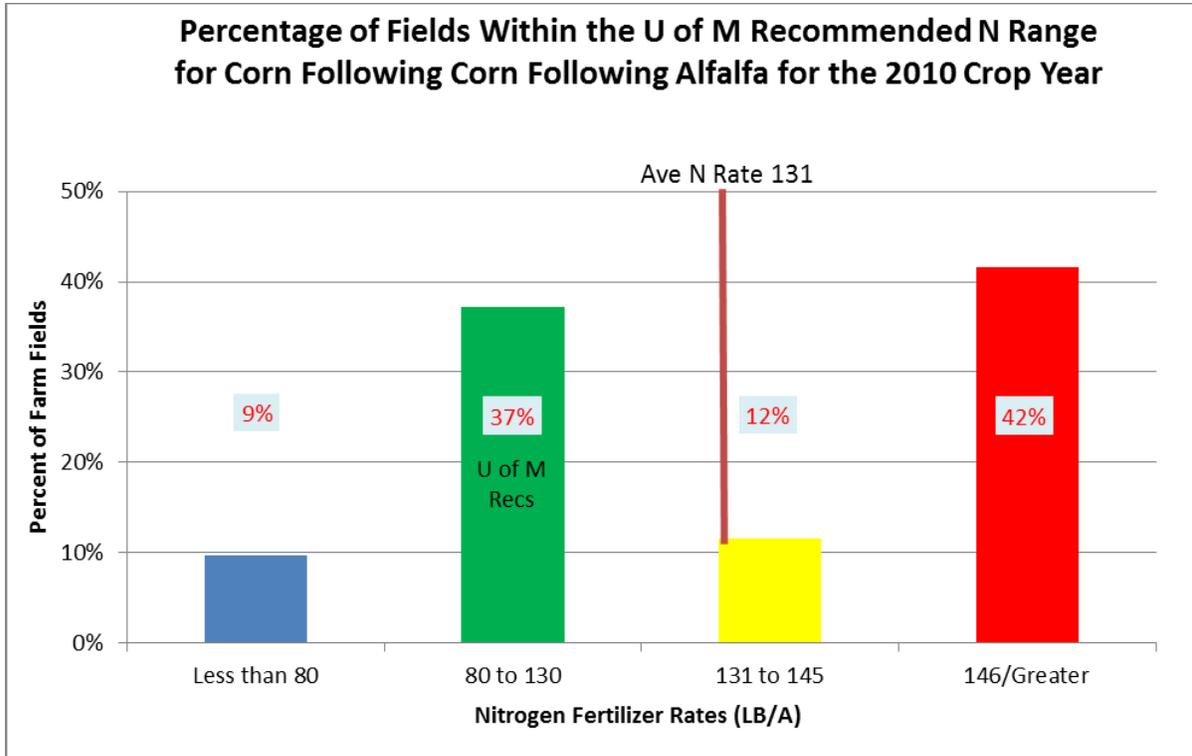


Figure 47. Percentage of fields within the U of M recommended range for corn following corn following alfalfa with and without variable rate applications across Minnesota in 2010: 113 fields.

Table 41. Nitrogen fertilizer rates and associated corn yields for corn following corn following alfalfa with and without variable rate nitrogen applications for the 2010 crop year across Minnesota.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	117	157	170	172
Avg N-Rate LB/A	46	111	138	168

Figure 48 details the distribution of nitrogen fertilizer rates across Minnesota for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 42 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 48.

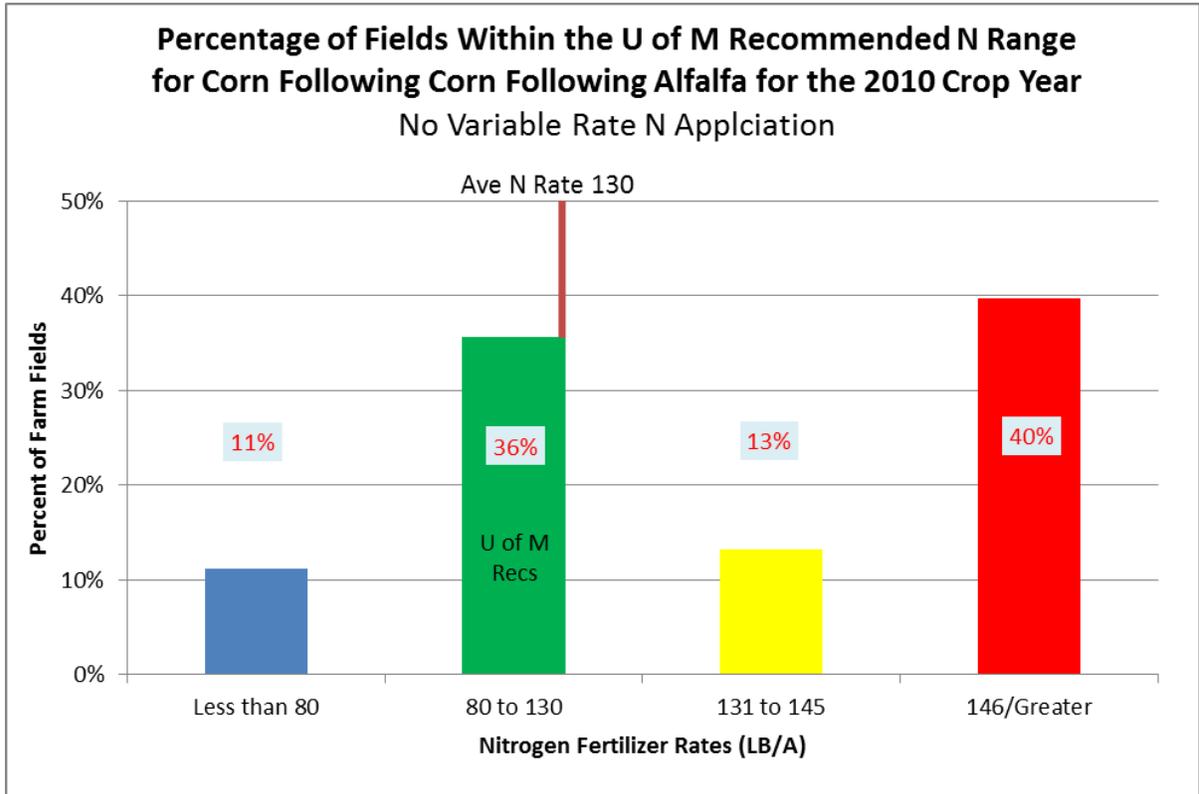


Figure 48. Percentage of fields within the U of M recommended range for corn following corn following alfalfa without variable rate applications across Minnesota in 2010: 98 fields.

Table 42. Nitrogen fertilizer rates and associated corn yields for corn following corn following alfalfa without variable rate nitrogen applications for the 2010 crop year across Minnesota.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	117	158	170	171
Avg N-Rate LB/A	46	113	138	167

Figure 49 details the distribution of nitrogen fertilizer rates across Minnesota for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 43 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 49.

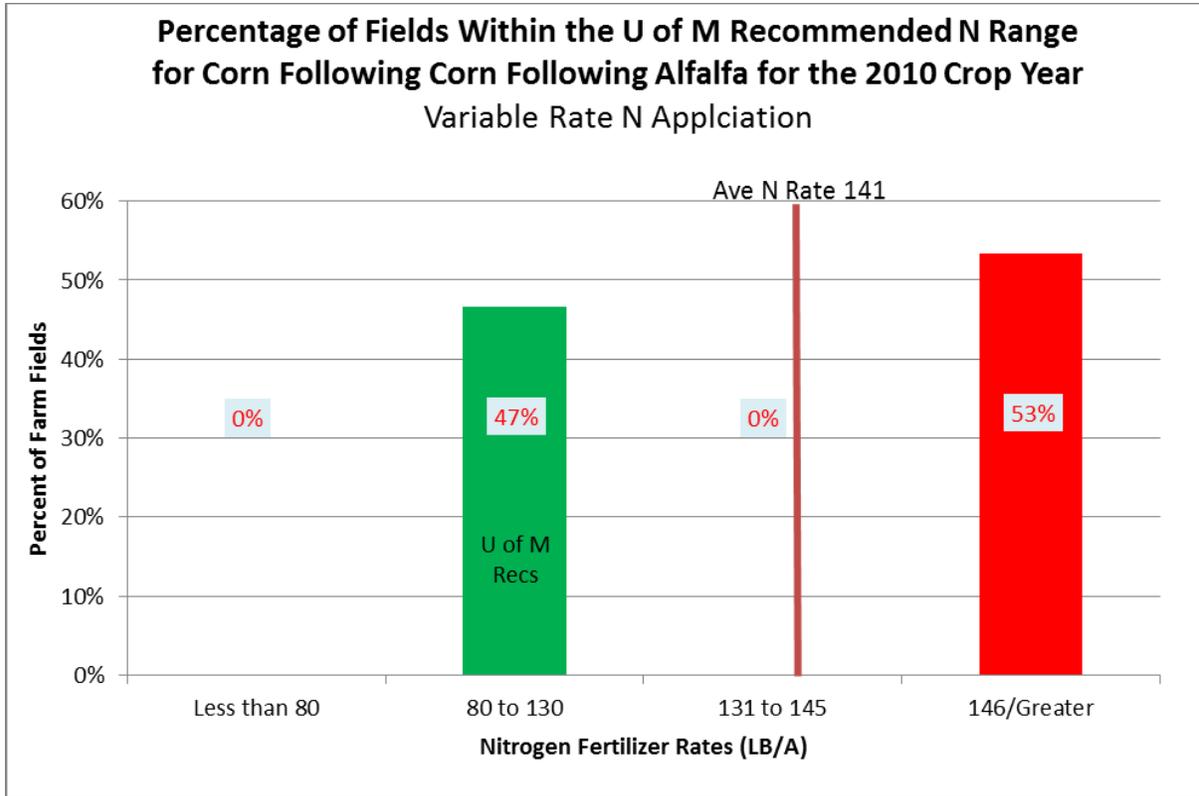


Figure 49. Percentage of fields within the U of M recommended range for corn following corn following alfalfa with variable rate applications across Minnesota in 2010: 15 fields.

Table 43. Nitrogen fertilizer rates and associated corn yields for corn following corn following alfalfa with and without variable rate nitrogen applications for the 2010 crop year across Minnesota.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	No Data	153	No Data	174
Avg N-Rate LB/A	No Data	104	No Data	173

Southeastern Region: Corn Following Corn Following Alfalfa

There were 84 fields that were included in the SE BMP region corn following corn following alfalfa analysis. Figure 50 details the location, average rate of nitrogen fertilizer and average yield for corn following corn following alfalfa in the SE BMP region.

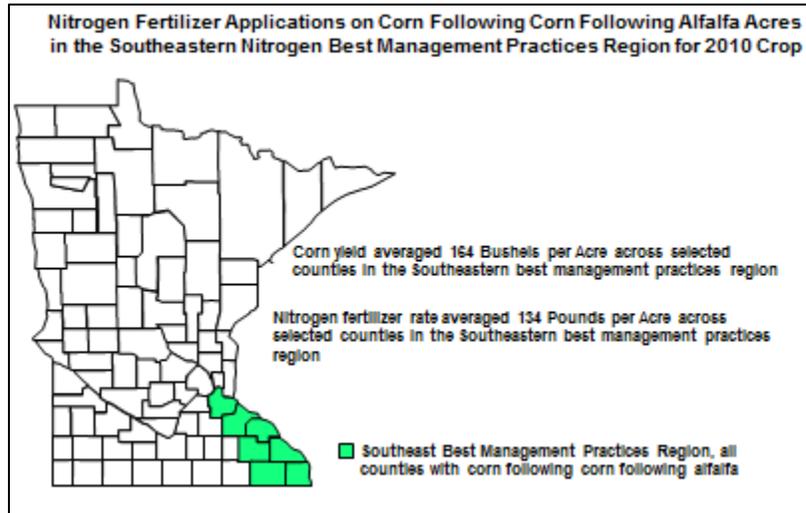


Figure 50. The corn yield averaged 164 bushels per acre and the nitrogen fertilizer rate averaged 134 pounds per acre across the SE BMP region.

Figure 51 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 44 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 51.

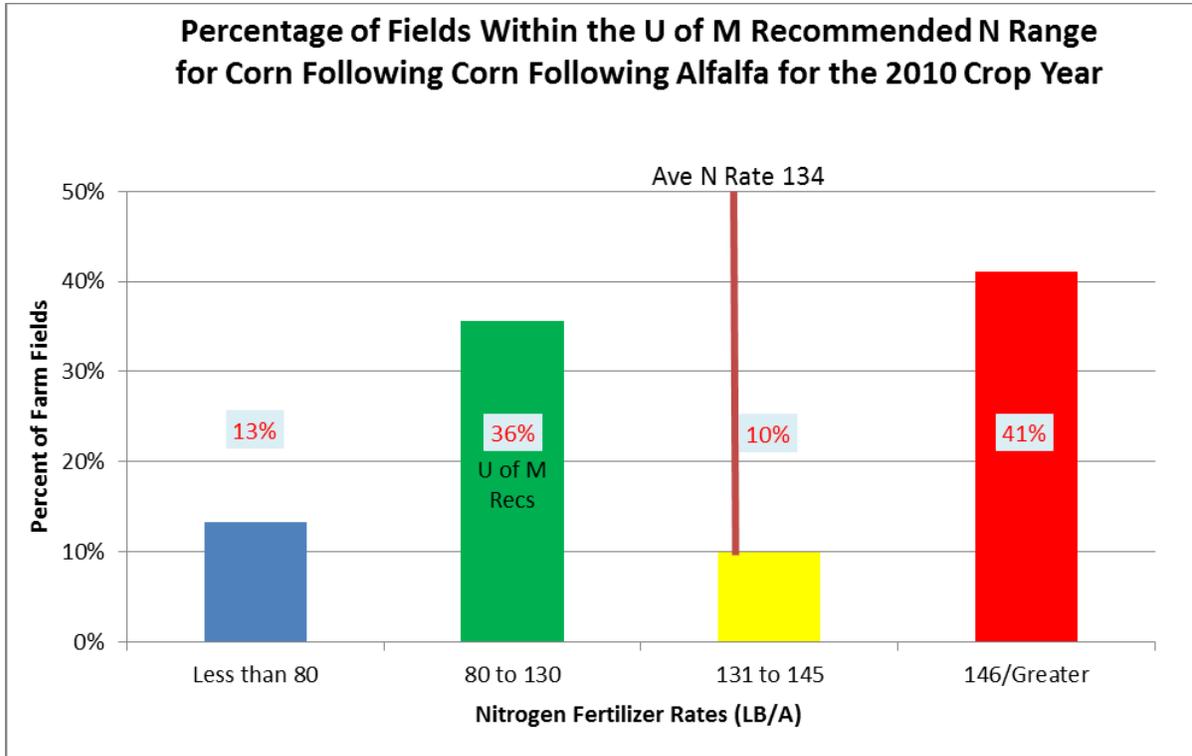


Figure 51. Percentage of fields within the U of M recommended range for corn following corn following alfalfa with and without variable rate applications in the SE BMP region in 2010: 90 fields.

Table 44. Nitrogen fertilizer rates and associated corn yields for corn following corn following alfalfa with and without variable rate nitrogen applications for the 2010 crop year in the SE BMP region.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	143	161	171	171
Avg N-Rate LB/A	40	113	137	166

Figure 52 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 45 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 52.

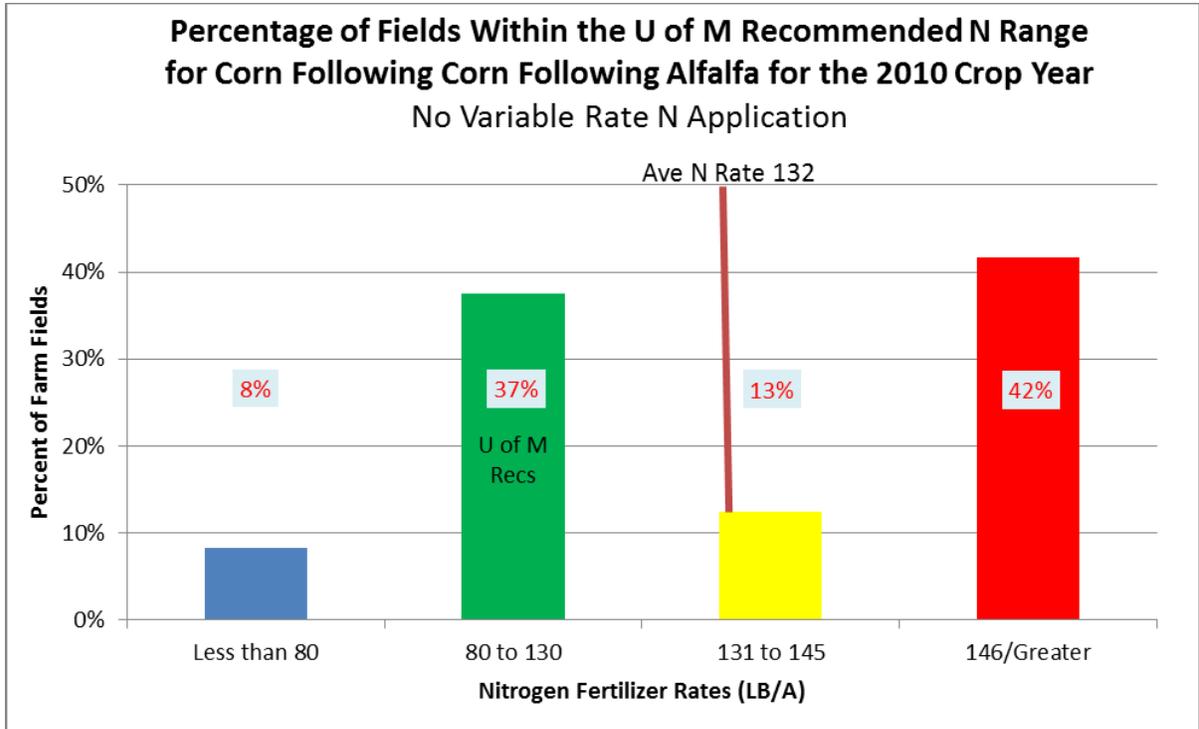


Figure 52. Percentage of fields within the U of M recommended range for corn following corn following alfalfa without variable rate applications in the SE BMP region in 2010: 72 Fields

Table 45. Nitrogen fertilizer rates and associated corn yields for corn following corn following alfalfa without variable rate nitrogen applications for the 2010 crop year in the SE BMP region.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	132	162	171	171
Avg N-Rate LB/A	40	114	137	166

Figure 53 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 46 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 53.

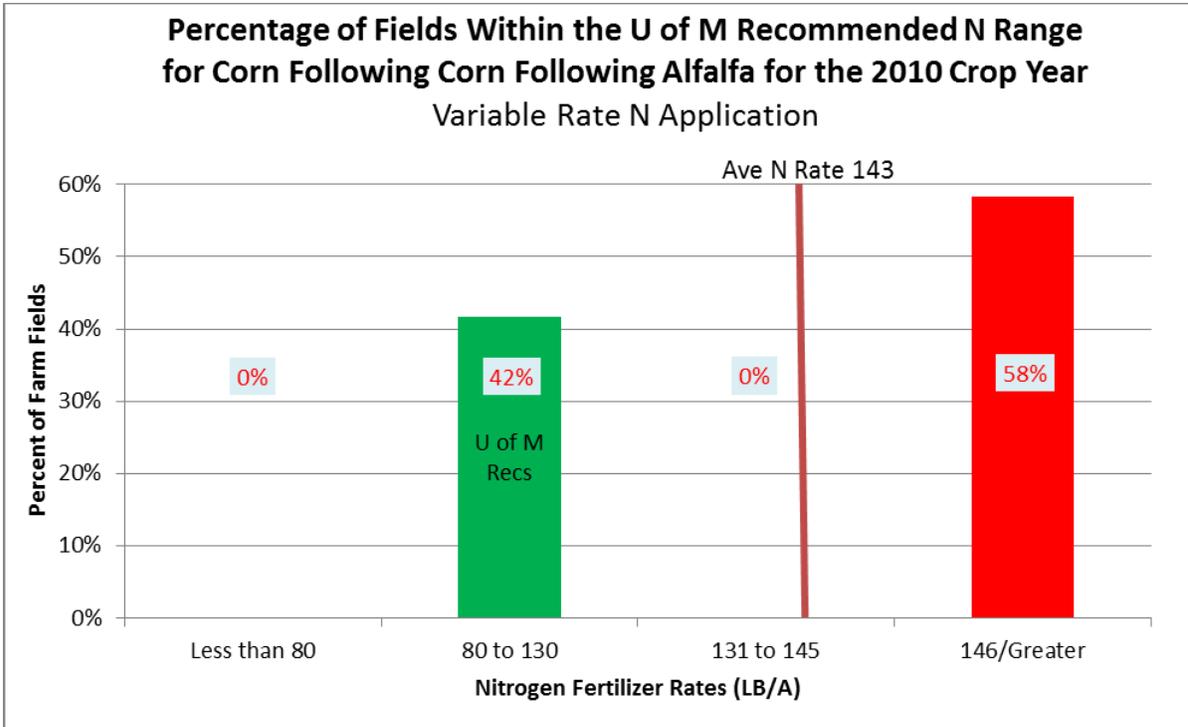


Figure 53. Percentage of fields within the U of M recommended range for corn following corn following alfalfa with variable rate applications in the SE BMP region in 2010: 12 Fields

Table 46. Nitrogen fertilizer rates and associated corn yields for corn following corn following alfalfa with variable rate nitrogen applications for the 2010 crop year in the SE BMP region.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	No Data	154	No Data	170
Avg N-Rate LB/A	No Data	106	No Data	169

South Central Region: Corn Following Corn Following Alfalfa

There were 7 fields that were included in the SC BMP region corn following corn following alfalfa analysis. Figure 54 details the location, average rate of nitrogen fertilizer and average yield for corn following corn following alfalfa in the SC BMP region.

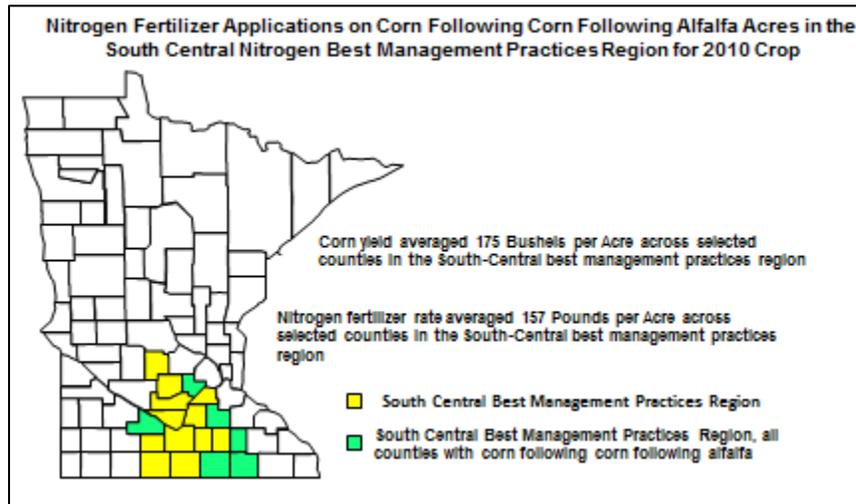


Figure 54. The corn yield averaged 175 bushels per acre and the nitrogen fertilizer rate averaged 157 pounds per acre across the SC BMP region.

Figure 55 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 47 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 55.

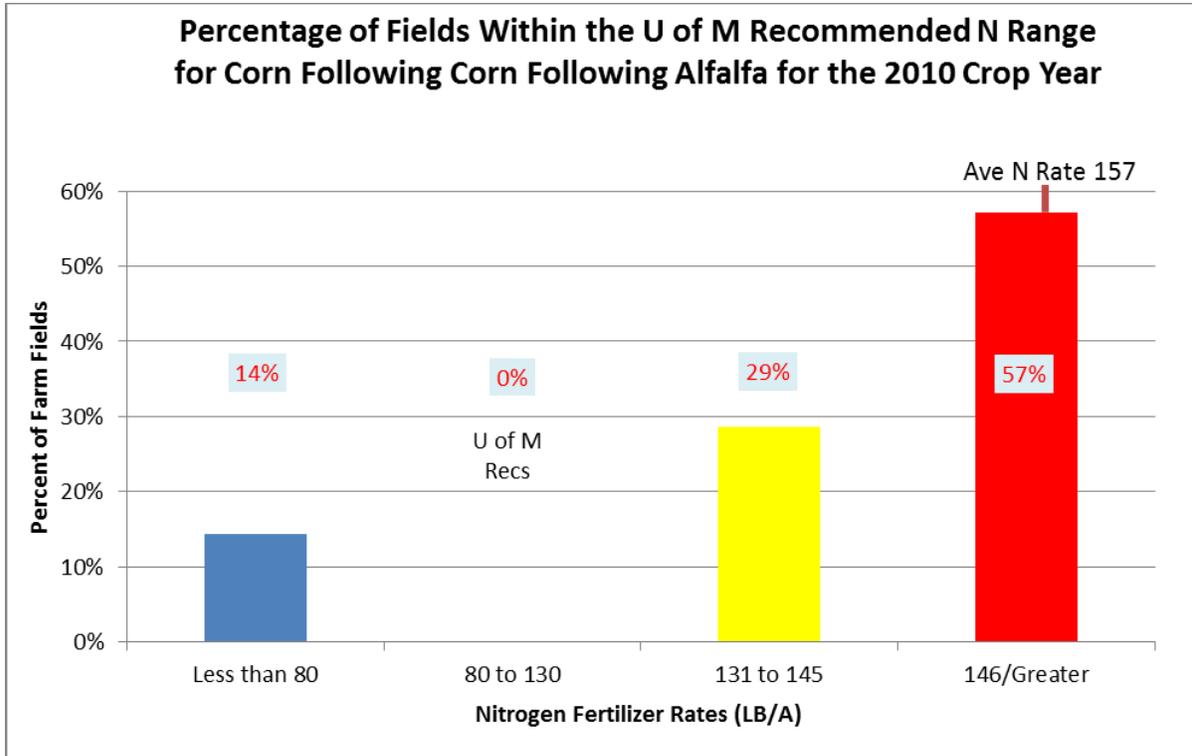


Figure 55. Percentage of fields within the U of M recommended range for corn following corn following alfalfa with and without variable rate applications in the SC BMP region in 2010: 7 fields.

Table 47. Nitrogen fertilizer rates and associated corn yields for corn following corn following alfalfa with and with without variable rate nitrogen applications for the 2010 crop year in the SC BMP region.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	140	No Data	180	181
Avg N-Rate LB/A	75	No Data	138	187

Figure 56 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 48 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 56.

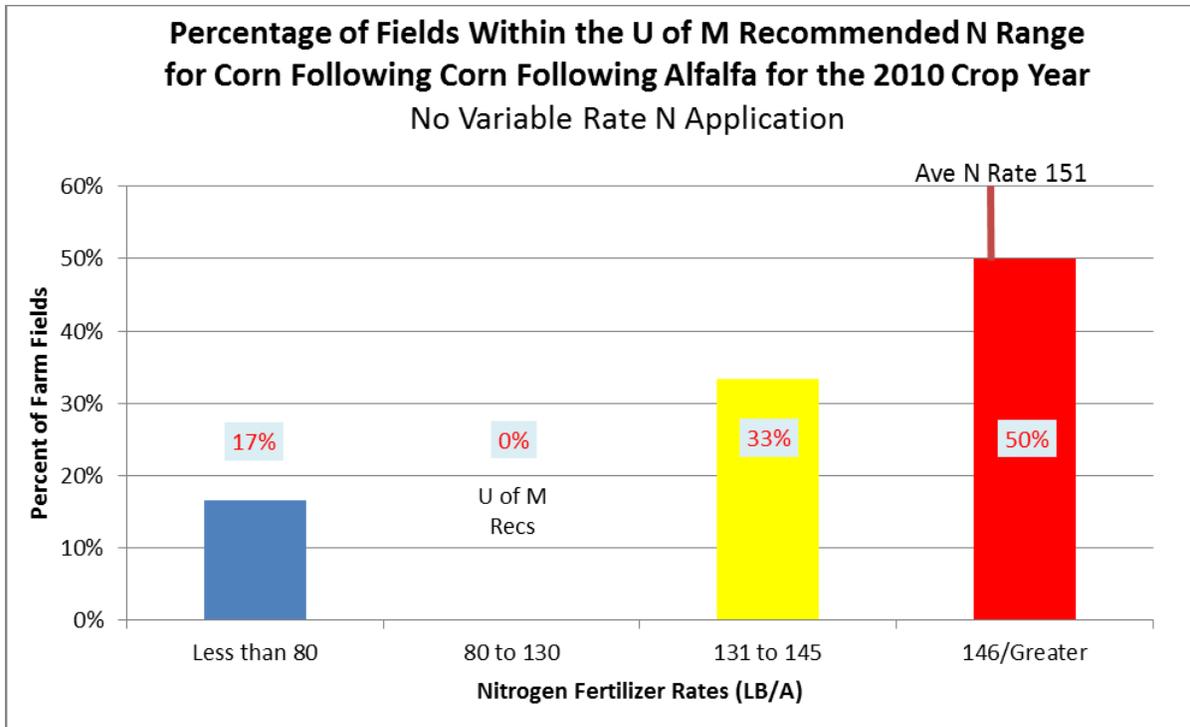


Figure 56. Percentage of fields within the U of M recommended range for corn following corn following alfalfa without variable rate applications in the SC BMP region in 2010: 6 fields.

Table 48. Nitrogen fertilizer rates and associated corn yields for corn following corn following alfalfa without variable rate nitrogen applications for the 2010 crop year in the SC BMP region.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	140	No Data	180	175
Avg N-Rate LB/A	75	No Data	138	184

Less than five fields reported variable rate nitrogen applications for corn following corn following alfalfa in the SC BMP region.

Southwestern and West Central Region: Corn Following Corn Following Alfalfa

There were five fields that were included in the SW BMP region corn following corn following alfalfa analysis. Figure 57 details the location, average rate of nitrogen fertilizer and average yield for corn following corn following alfalfa in the SW BMP region.

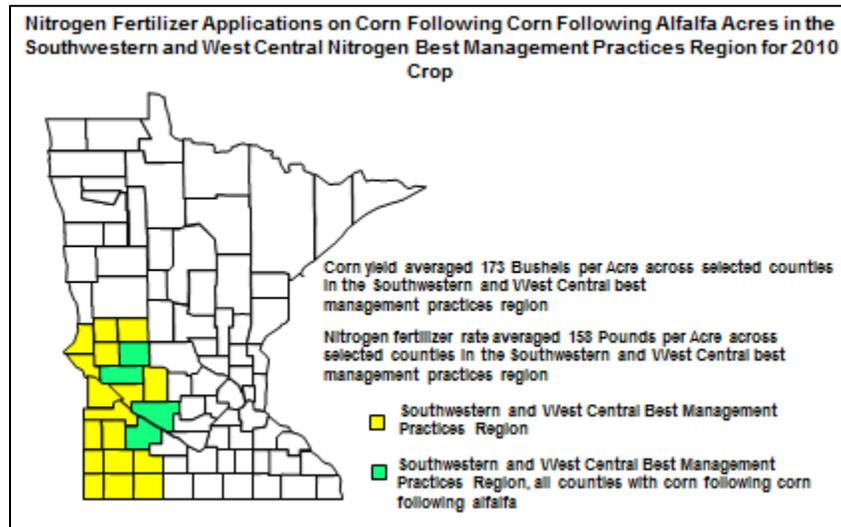


Figure 57. The corn yield averaged 173 bushels per acre and the nitrogen fertilizer rate averaged 158 pounds per acre across the SW BMP region.

Figure 58 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 49 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 58.

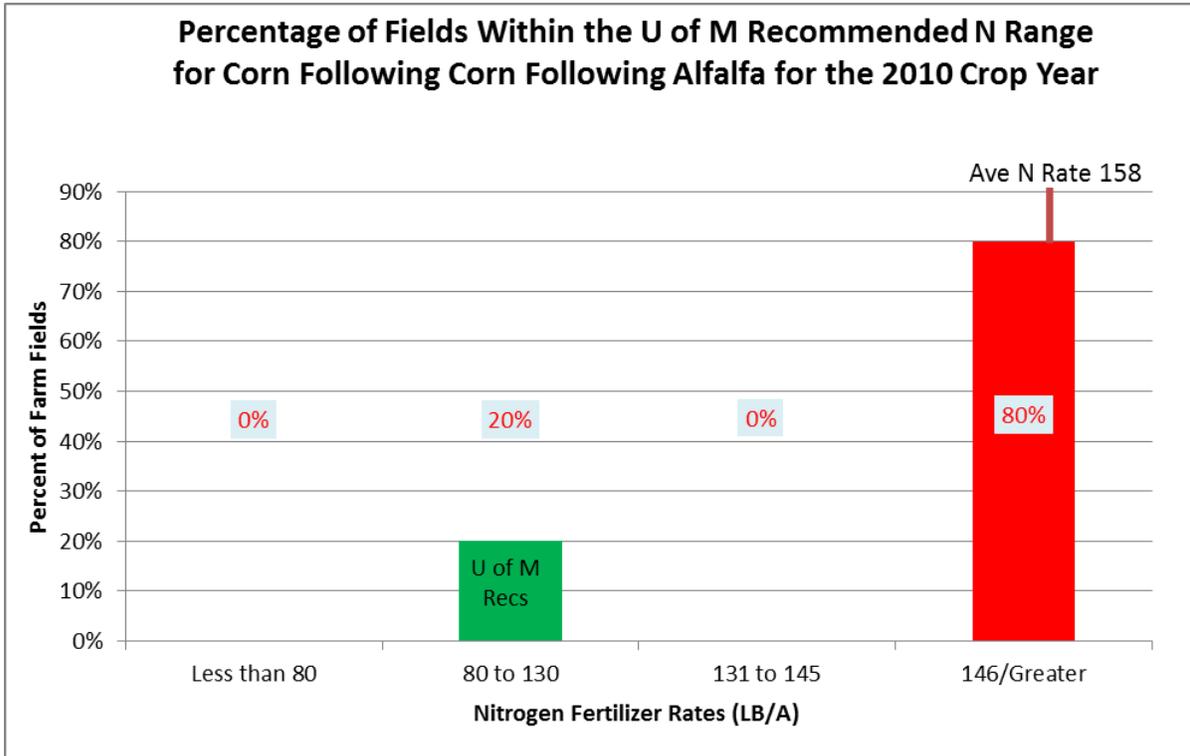


Figure 58. Percentage of fields within the U of M recommended range for corn following corn following alfalfa with and without variable rate applications in the SW BMP region in 2010: 5 fields.

Table 49. Nitrogen fertilizer rates and associated corn yields for corn following corn following alfalfa with and without variable rate nitrogen applications for the 2010 crop year in the SW BMP region.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	No Data	147	No Data	180
Avg N-Rate LB/A	No Data	120	No Data	168

Figure 59 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 50 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 59.

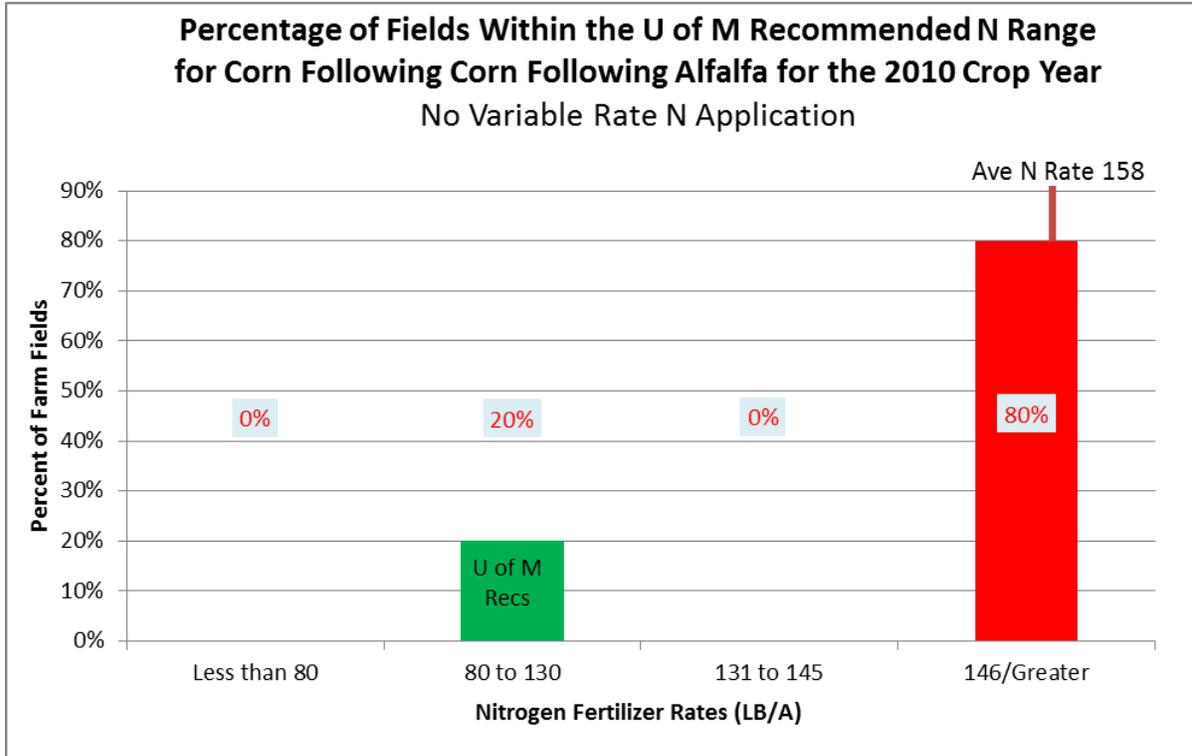


Figure 59. Percentage of fields within the U of M recommended range for corn following corn following alfalfa without variable rate applications in the SW BMP region in 2010: 5 fields.

Table 50. Nitrogen fertilizer rates and associated corn yields for corn following corn following alfalfa without variable rate nitrogen applications for the 2010 crop year in the SW BMP region.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	No Data	147	No Data	180
Avg N-Rate LB/A	No Data	120	No Data	168

Less than five farmers reported planting corn following corn following alfalfa in the SW BMP region for fields with variable rate nitrogen application.

Northwestern Region: Corn Following Corn Following Alfalfa

Less than five farmers reported planting corn following corn following alfalfa in the NW BMP region for fields with non-variable and variable rate nitrogen application.

Less than five farmers reported planting corn following corn following alfalfa in the NW BMP region for fields with non-variable rate nitrogen application.

Less than five farmers reported planting corn following corn following alfalfa in the NW BMP region for fields with variable rate nitrogen application.

Irrigated and Non-irrigated Sandy Soils Region: Corn Following Corn Following Alfalfa

There were 17 fields that were included in the IRR BMP region corn following corn following alfalfa analysis. Figure 60 details the distribution of nitrogen fertilizer rates across the IRR BMP region for corn following corn following alfalfa

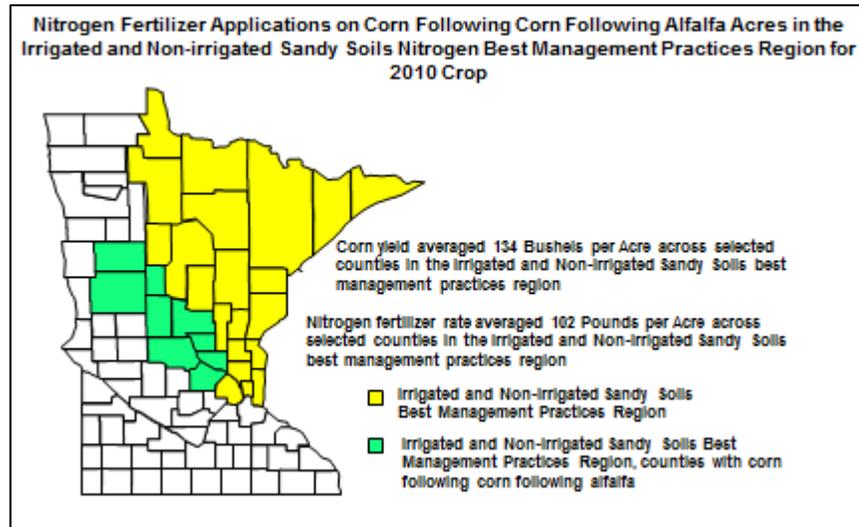


Figure 60. The corn yield averaged 134 bushels per acre and the nitrogen fertilizer rate averaged 102 pounds per acre across the IRR BMP region.

Figure 61 details the distribution of nitrogen fertilizer rates in the IRR BMP region for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 51 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 61.

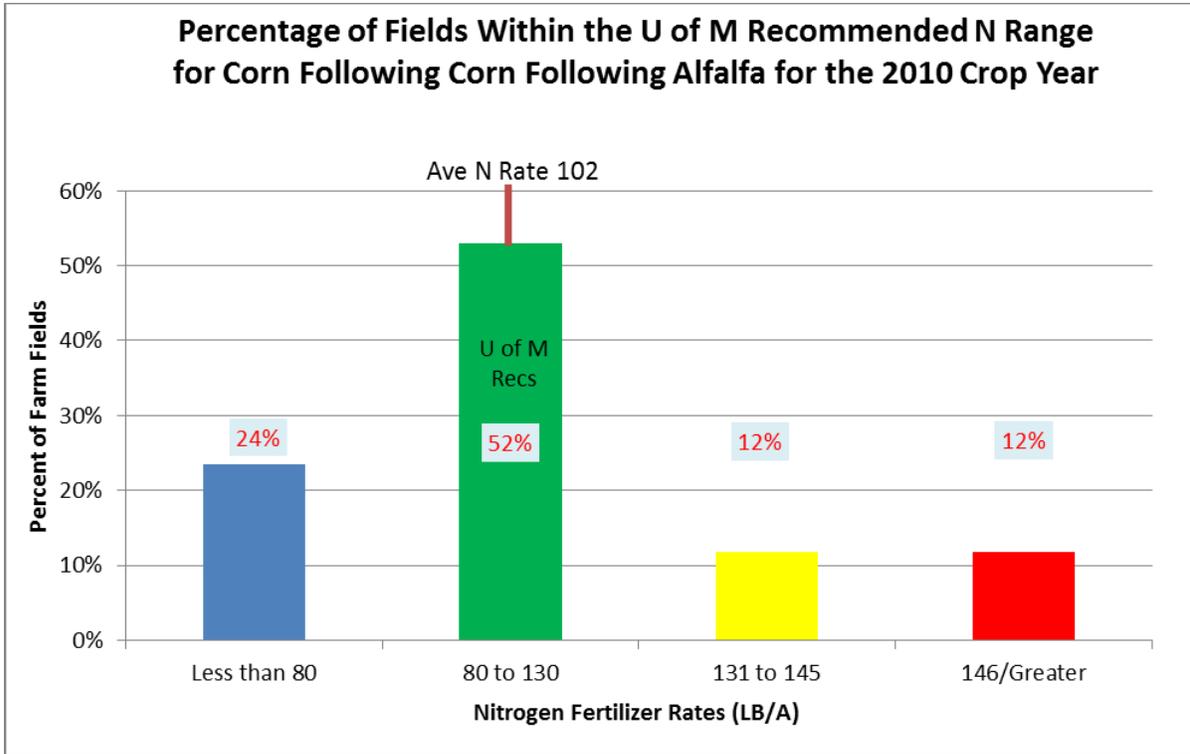


Figure 61. Percentage of fields within the U of M recommended range for corn following corn following alfalfa with and without variable rate applications in the IRR BMP region in 2010: 17 fields.

Table 51. Nitrogen fertilizer rates and associated corn yields for corn following corn following alfalfa with and without variable rate nitrogen applications for the 2010 crop year in the IRR BMP region.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	88	146	153	150
Avg N-Rate LB/A	48	105	140	160

Figure 62 details the distribution of nitrogen fertilizer rates in the IRR BMP region for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 52 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 62.

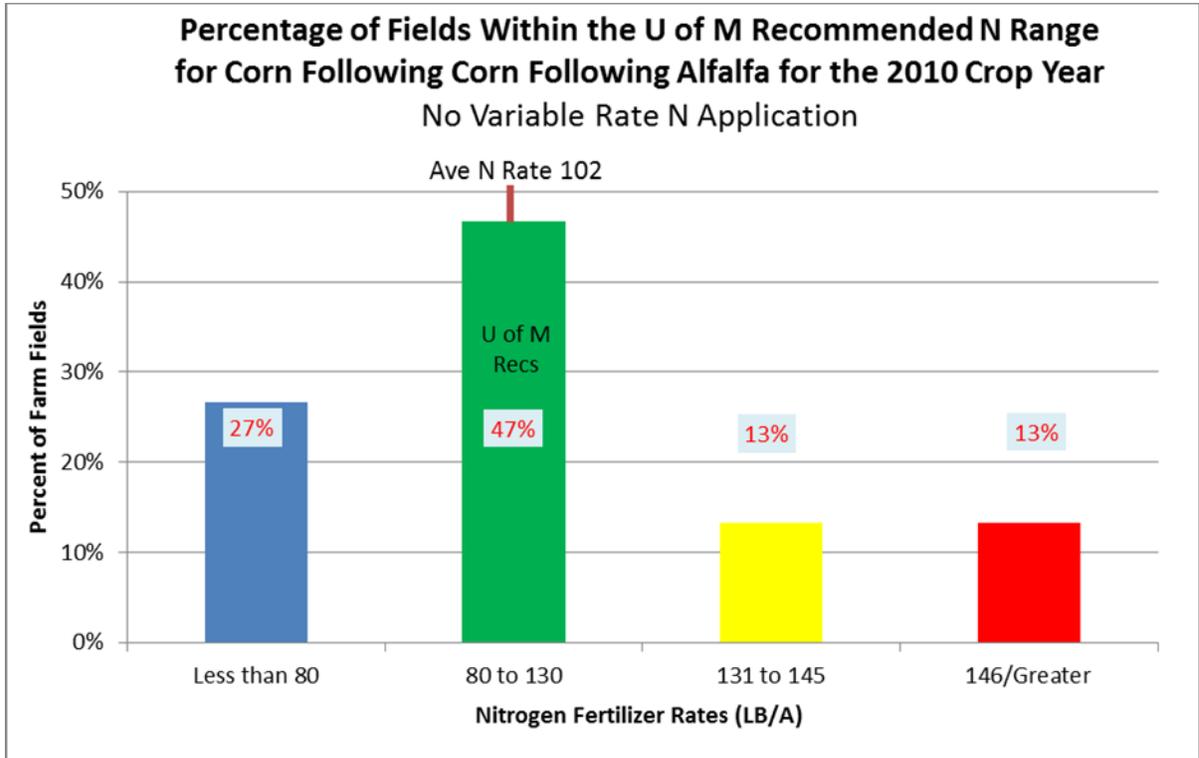


Figure 62. Percentage of fields within the U of M recommended range for corn following corn following alfalfa without variable rate applications in the IRR BMP region in 2010: 15 fields.

Table 52. Nitrogen fertilizer rates and associated corn yields for corn following corn following alfalfa without variable rate nitrogen applications for the 2010 crop year in the IRR BMP region.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	88	145	153	150
Avg N-Rate LB/A	48	106	140	160

Less than five farmers reported planting corn following corn following alfalfa in the IRR BMP region for fields with variable rate nitrogen application.

Statewide: Corn Following Alfalfa

Statewide six percent of the fields reported were corn following alfalfa. Figure 63 details the counties where farmers reported on fields with corn following alfalfa. There were 186 corn following alfalfa fields surveyed across Minnesota.

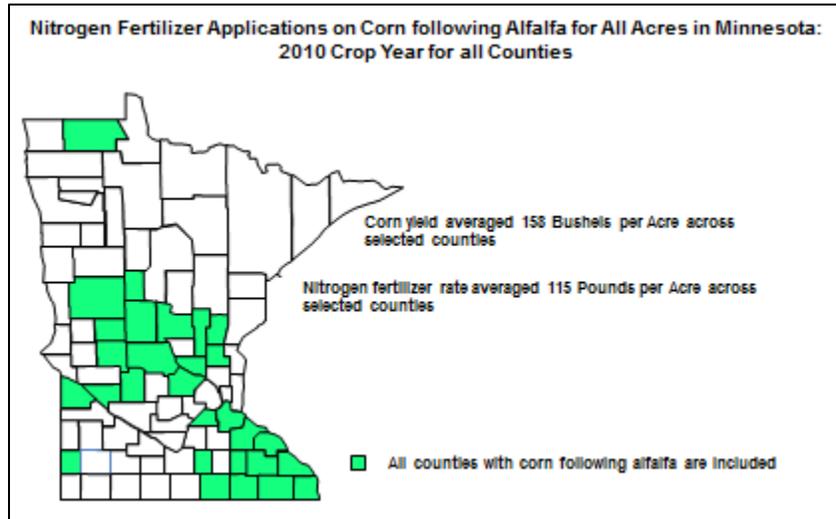


Figure 63. Counties with farmers reporting on corn following alfalfa fields.

Figure 64 details the distribution of nitrogen fertilizer rates across Minnesota for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 53 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 64.

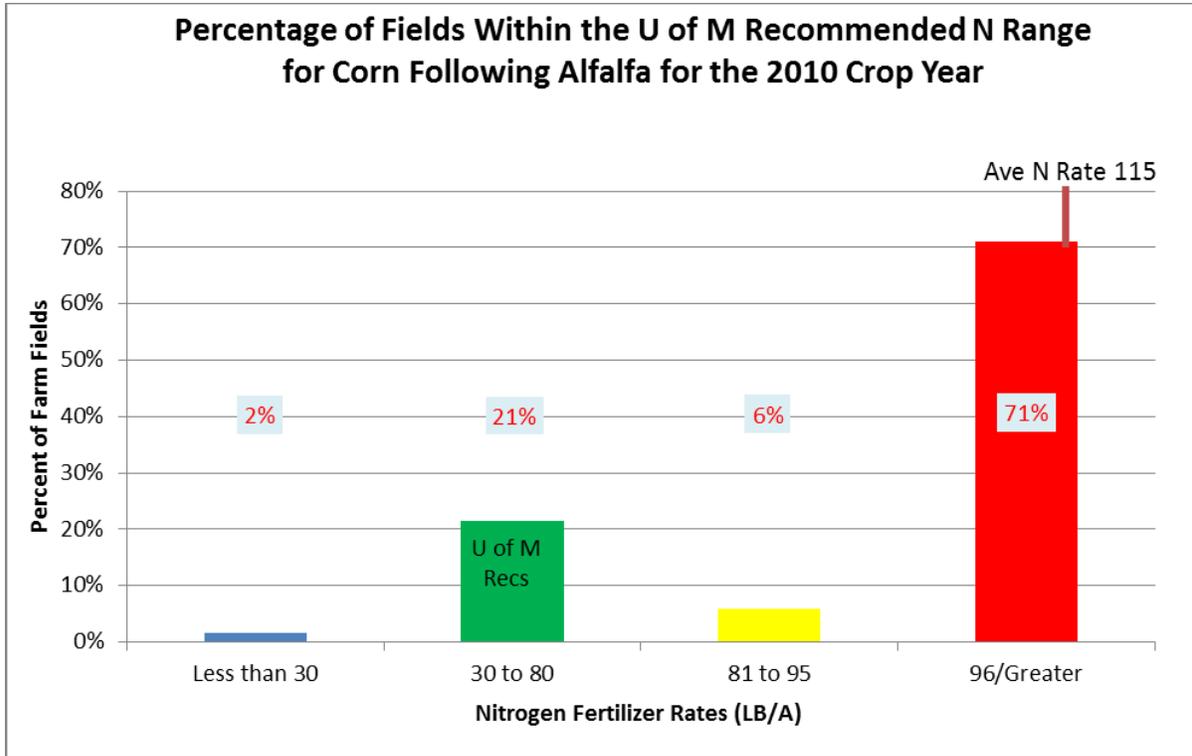


Figure 64. Percentage of fields within the U of M recommended range for corn following alfalfa with and without variable rate nitrogen applications across Minnesota in 2010: 186 fields.

Table 53. Nitrogen fertilizer rates and associated corn yields for corn following alfalfa with and without variable rate nitrogen applications for the 2010 crop year across Minnesota.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	135	147	145	162
Avg N-Rate LB/A	16	62	89	136

Figure 65 details the distribution of nitrogen fertilizer rates across Minnesota for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 54 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 65.

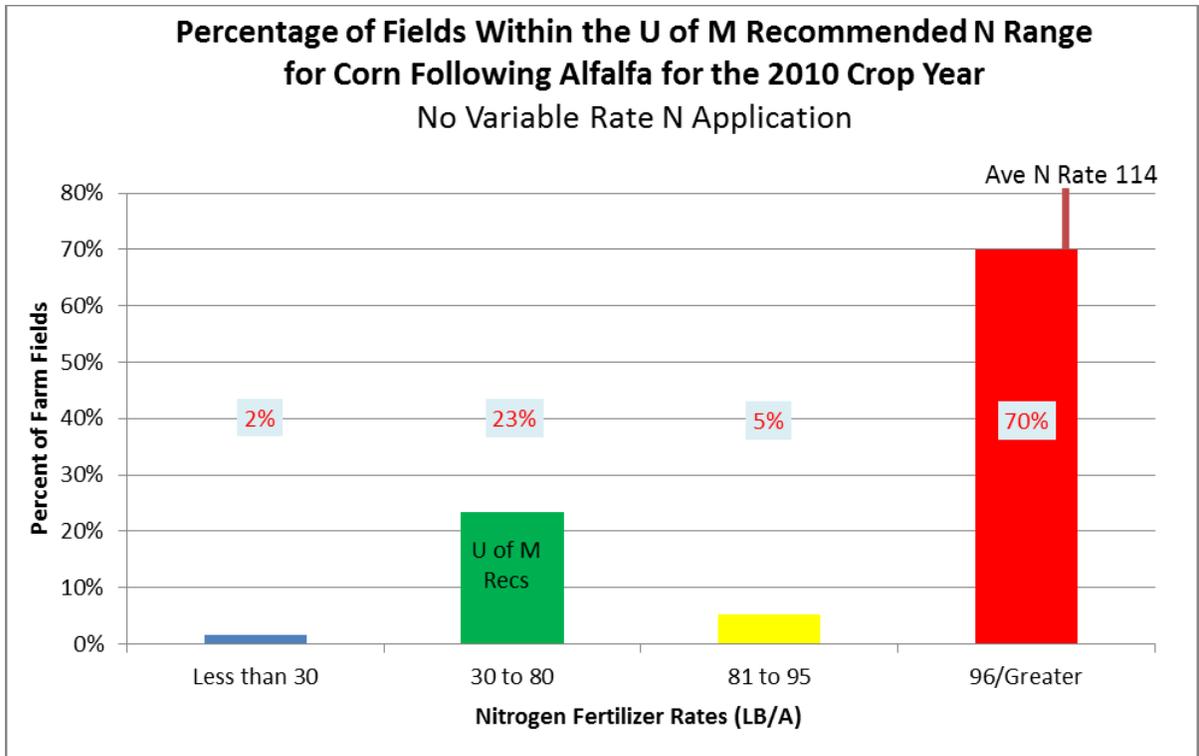


Figure 65. Percentage of fields within U of M recommended range for corn following alfalfa without variable rate nitrogen applications across Minnesota in 2010: 133 fields.

Table 54. Nitrogen fertilizer rates and associated corn yields for corn following alfalfa without variable rate nitrogen applications for the 2010 crop year across Minnesota.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	128	128	149	164
Avg N-Rate LB/A	20	59	88	137

Figure 66 details the distribution of nitrogen fertilizer rates across Minnesota for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 55 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 66.

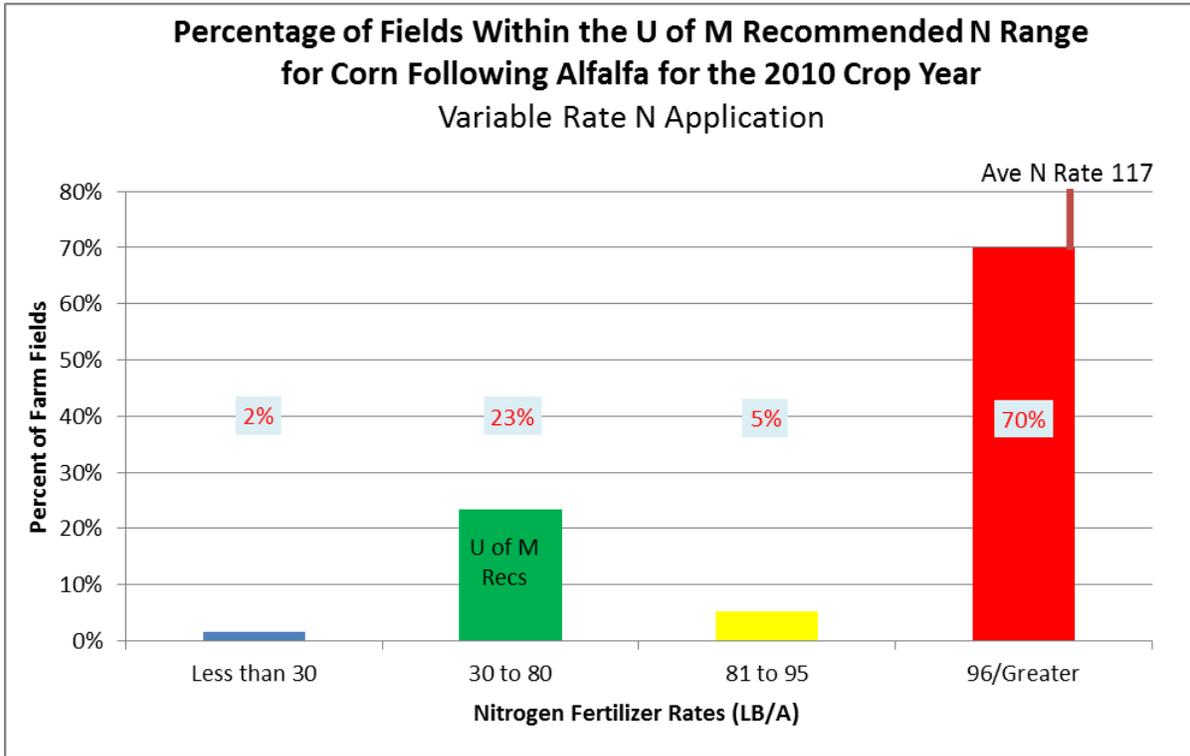


Figure 66. Percentage of fields within the U of M recommended range for corn following alfalfa with variable rate nitrogen applications across Minnesota in 2010: 53 fields.

Table 55. Nitrogen fertilizer rates and associated corn yields for corn following alfalfa with variable rate nitrogen applications for the 2010 crop year across Minnesota.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	150	139	133	158
Avg N-Rate LB/A	9	70	91	133

Southeastern Region: Corn Following Alfalfa

There were 139 fields that were included in the SE BMP region corn following alfalfa analysis. Figure 67 details the location, average rate of nitrogen fertilizer and average yield for corn following alfalfa in the SE BMP region.

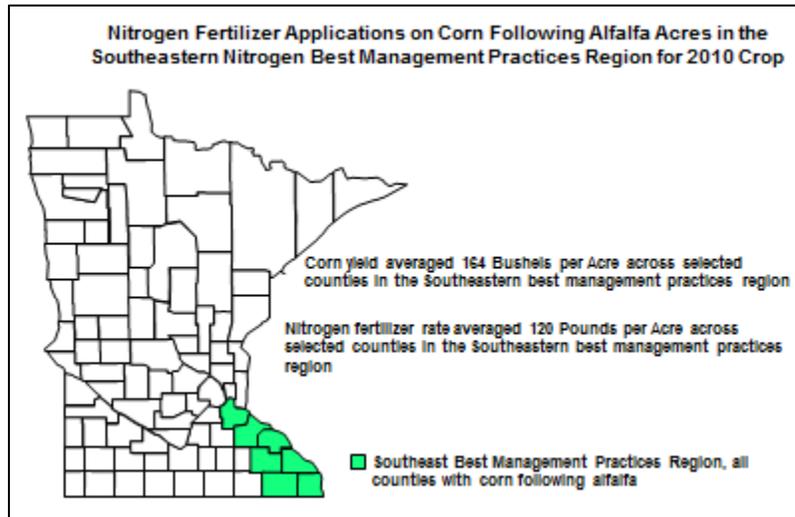


Figure 67. The corn yield averaged 164 bushels per acre and the nitrogen fertilizer rate averaged 120 pounds per acre across the SE BMP region.

Figure 68 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 56 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 68.

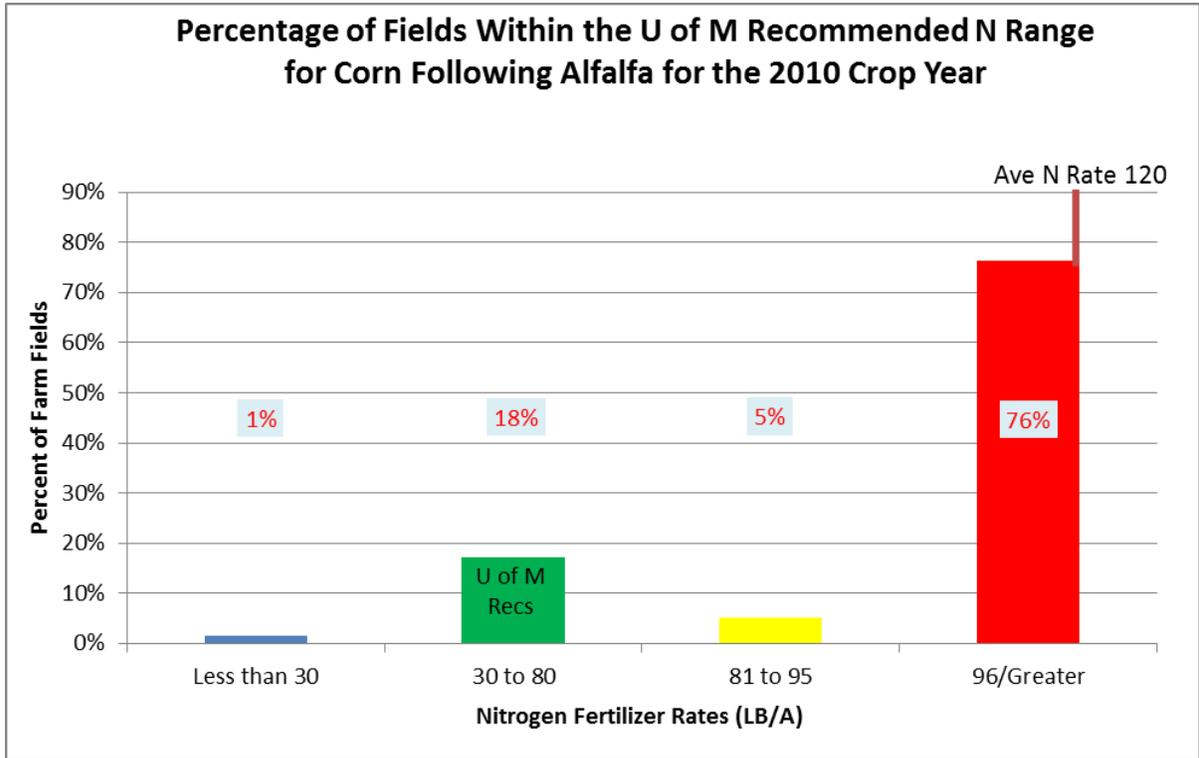


Figure 68. Percentage of fields within the U of M recommended range for corn following alfalfa with and without variable rates nitrogen applications in the SE BMP region for 2010: 139 fields.

Table 56. Nitrogen fertilizer rates and associated corn yields for corn following alfalfa with and without variable rate nitrogen applications for the 2010 crop year in the SE BMP region.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	168	158	159	166
Avg N-Rate LB/A	12	61	89	137

Figure 69 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 57 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 69.

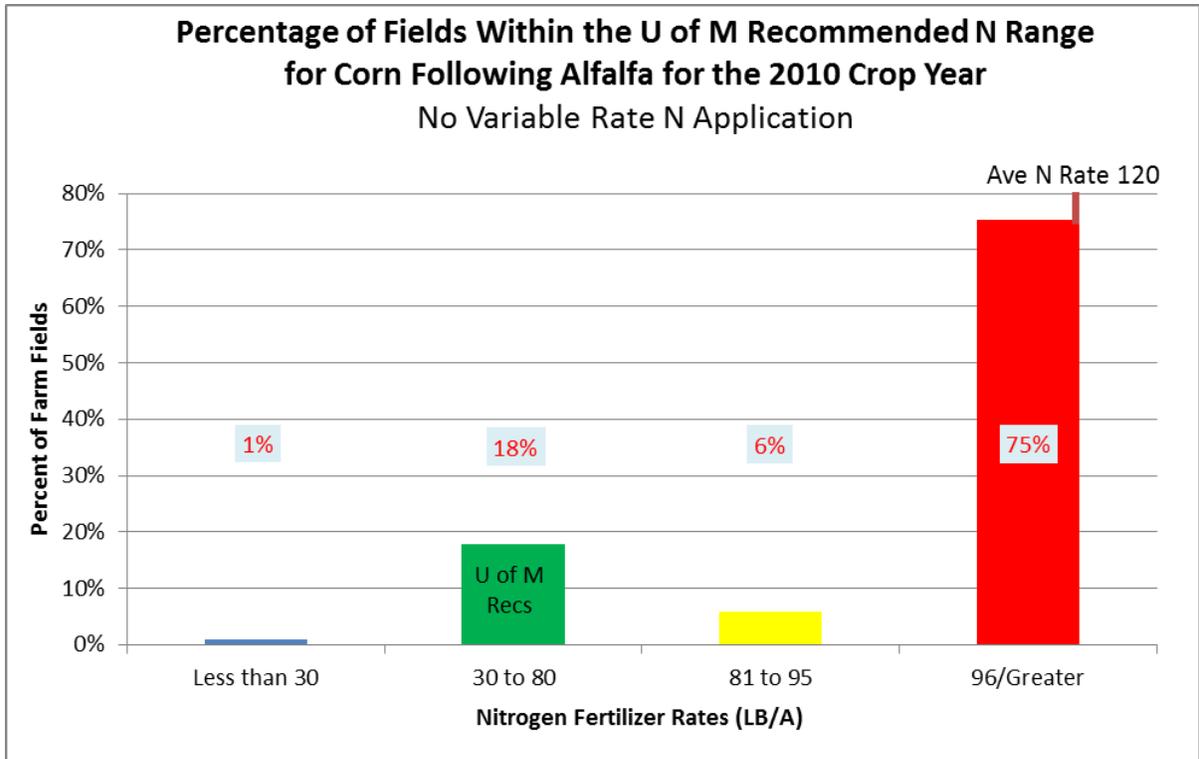


Figure 69. Percentage of fields within the U of M recommended range for corn following alfalfa without variable rate nitrogen applications in the SE BMP region for 2010: 101 fields

Table 57. Nitrogen fertilizer rates and associated corn yields for corn following alfalfa without variable rate nitrogen applications for the 2010 crop year in the SE BMP region.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	185	168	158	167
Avg N-Rate LB/A	15	69	89	138

Figure 70 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 58 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 70.

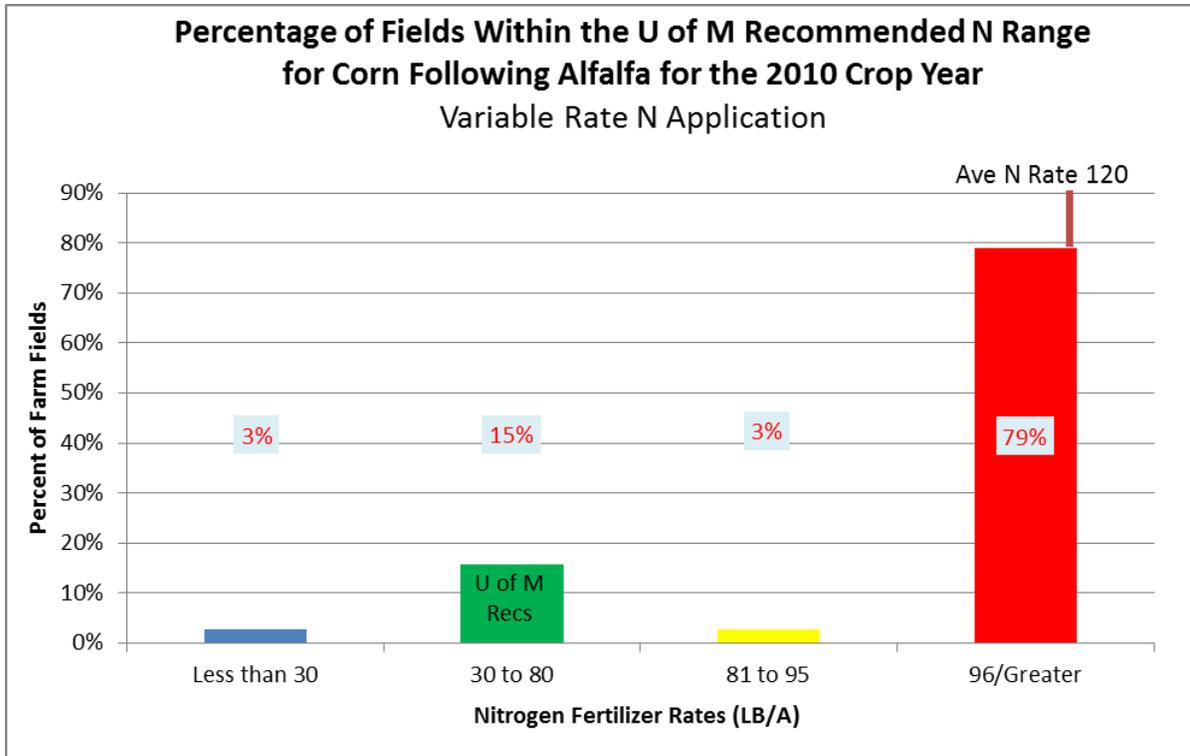


Figure 70. Percentage of fields within the U of M recommended range for corn following alfalfa with variable rate nitrogen applications in the SE BMP region for 2010: 38 fields

Table 58. Nitrogen fertilizer rates and associated corn yields for corn following alfalfa with variable rate nitrogen applications for the 2010 crop year in the SE BMP region.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	150	130	160	164
Avg N-Rate LB/A	9	68	90	136

South Central Region: Corn Following Alfalfa

There were 8 fields that were included in the SC BMP region corn following alfalfa analysis. Figure 71 details the location, average rate of nitrogen fertilizer and average yield for corn following alfalfa in the SC BMP region.

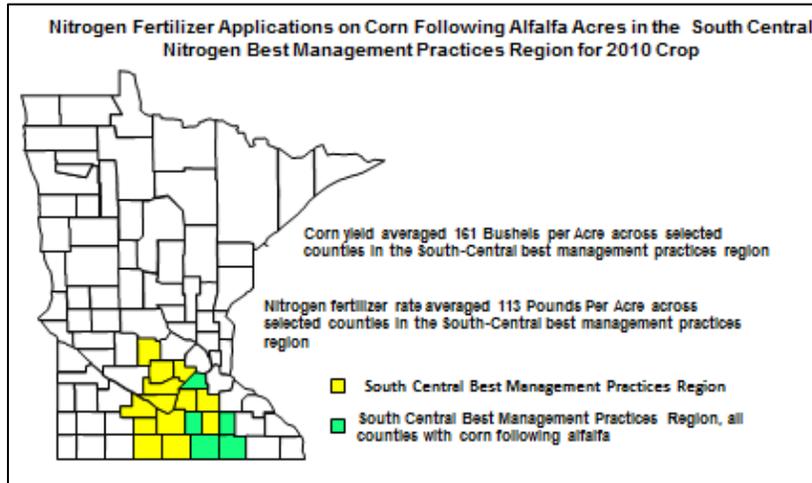


Figure 71. The corn yield averaged 161 bushels per acre and the nitrogen fertilizer rate averaged 113 pounds per acre across the SW BMP region.

Figure 72 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 59 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 72.

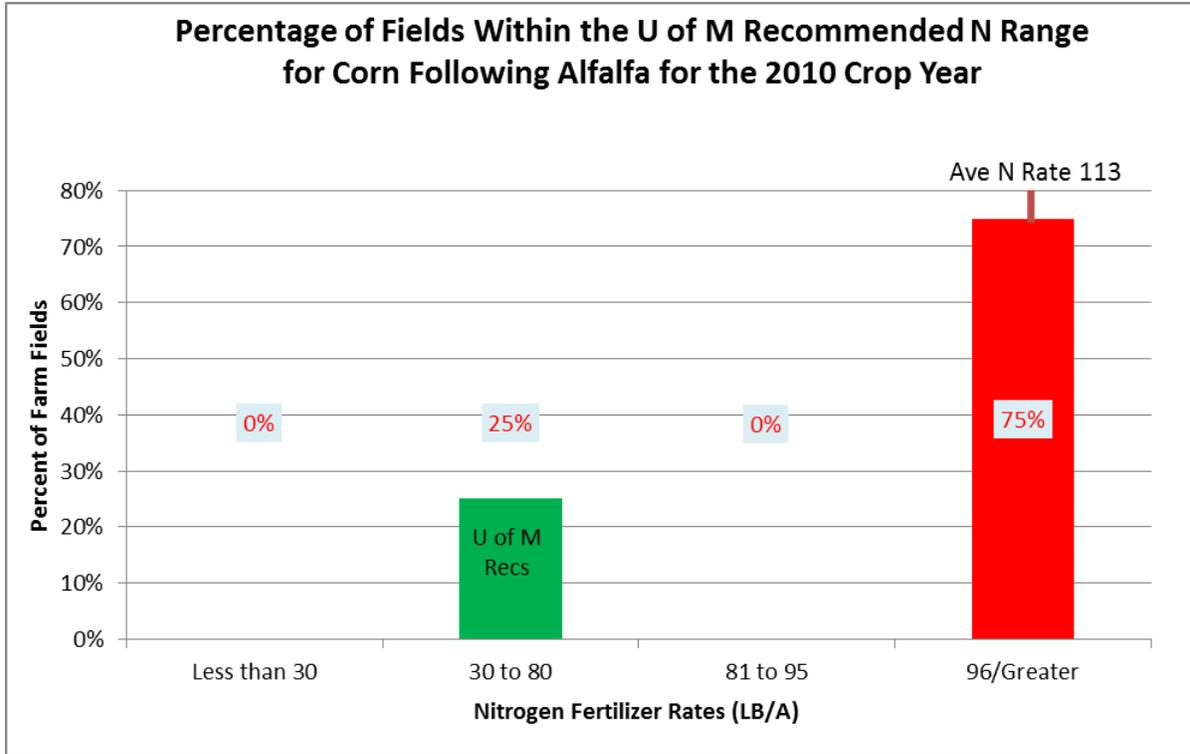


Figure 72. Percentage of fields within the U of M recommended range for corn following alfalfa with variable rate nitrogen applications in the SC BMP region for 2010: 8 fields

Table 59. Nitrogen fertilizer rates and associated corn yields for corn following alfalfa with variable rate nitrogen applications for the 2010 crop year in the SC BMP region.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	No Data	179	No Data	155
Avg N-Rate LB/A	No Data	57	No Data	132

Figure 73 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 60 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 73.

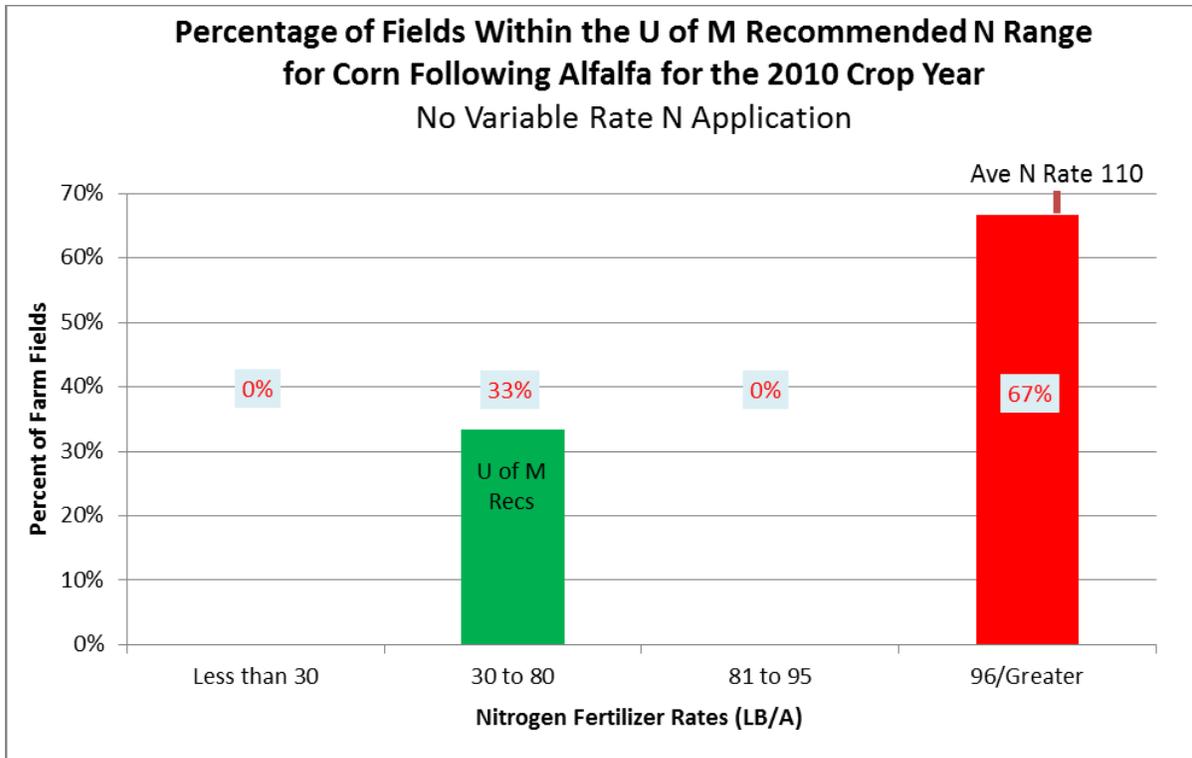


Figure 73. Percentage of fields within the U of M recommended range for corn following alfalfa with variable rate nitrogen applications in the SC BMP region for 2010: 6 fields.

Table 60. Nitrogen fertilizer rates and associated corn yields for corn following alfalfa with variable rate nitrogen applications for the 2010 crop year in the SC BMP region.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	No Data	179	No Data	171
Avg N-Rate LB/A	No Data	57	No Data	137

Less than five farmers reported planting corn following alfalfa in the SC BMP region for fields with variable rate nitrogen application.

Southwestern and West Central Region: Corn Following Alfalfa

There were 11 fields that were included in the SW BMP region corn following alfalfa analysis. Figure 74 details the location, average rate of nitrogen fertilizer and average yield for corn following alfalfa in the SW BMP region.

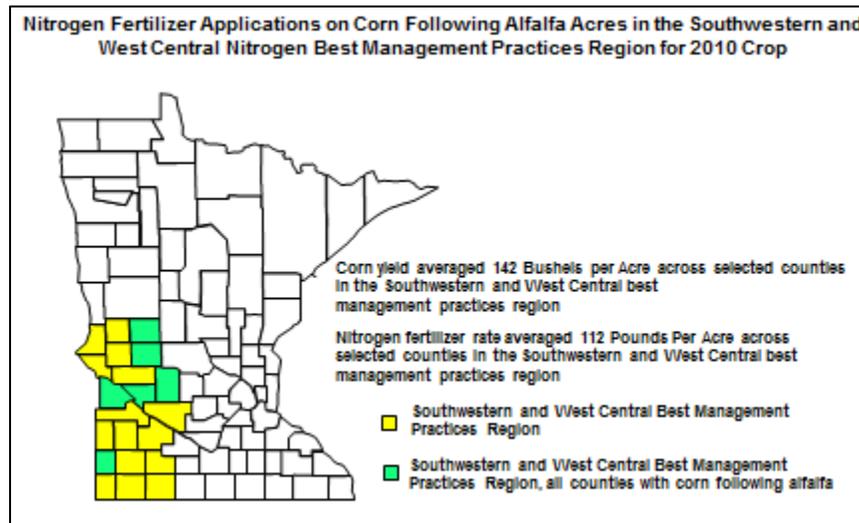


Figure 74. The corn yield averaged 142 bushels per acre and the nitrogen fertilizer rate averaged 112 pounds per acre across the SW BMP region.

Figure 75 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 61 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 75.

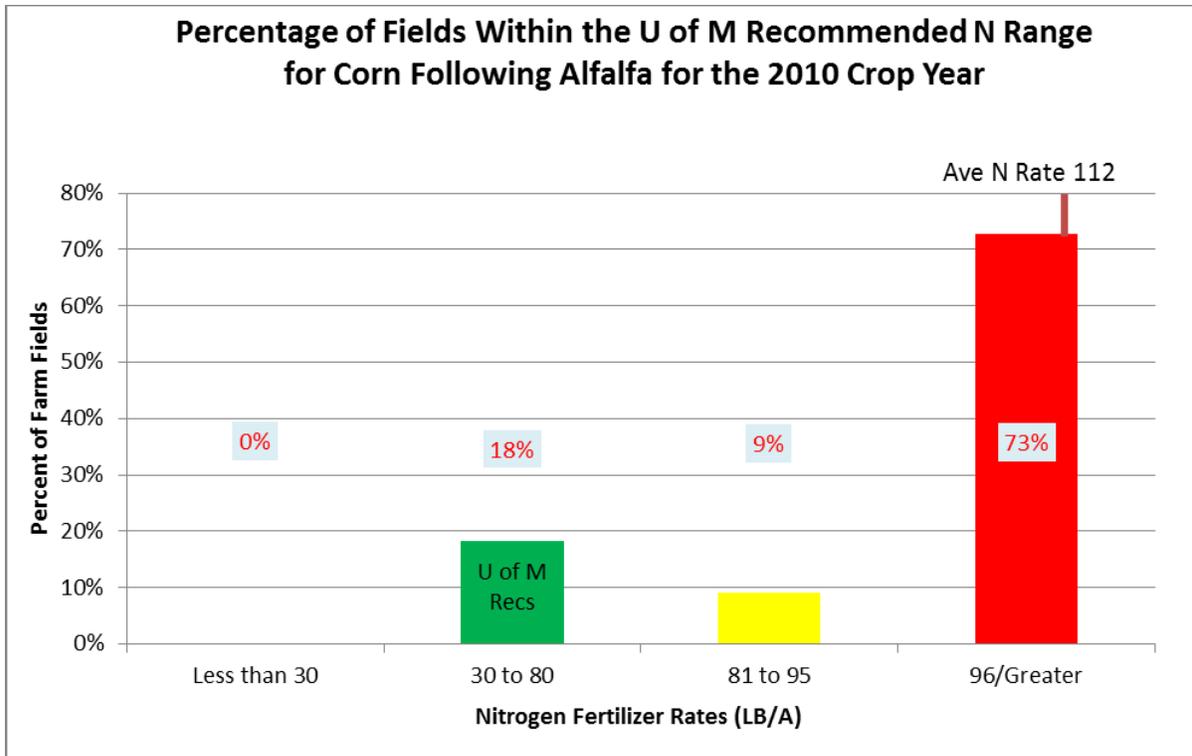


Figure 75. Percentage of fields within the U of M recommended range for corn following alfalfa with and without variable rate nitrogen applications in the SW BMP region for 2010: 11 fields.

Table 61. Nitrogen fertilizer rates and associated corn yields for corn following alfalfa with and without variable rate nitrogen applications for the 2010 crop year in the SW BMP region.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	No Data	130	120	148
Avg N-Rate LB/A	No Data	59	85	129

Figure 76 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 62 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 76.

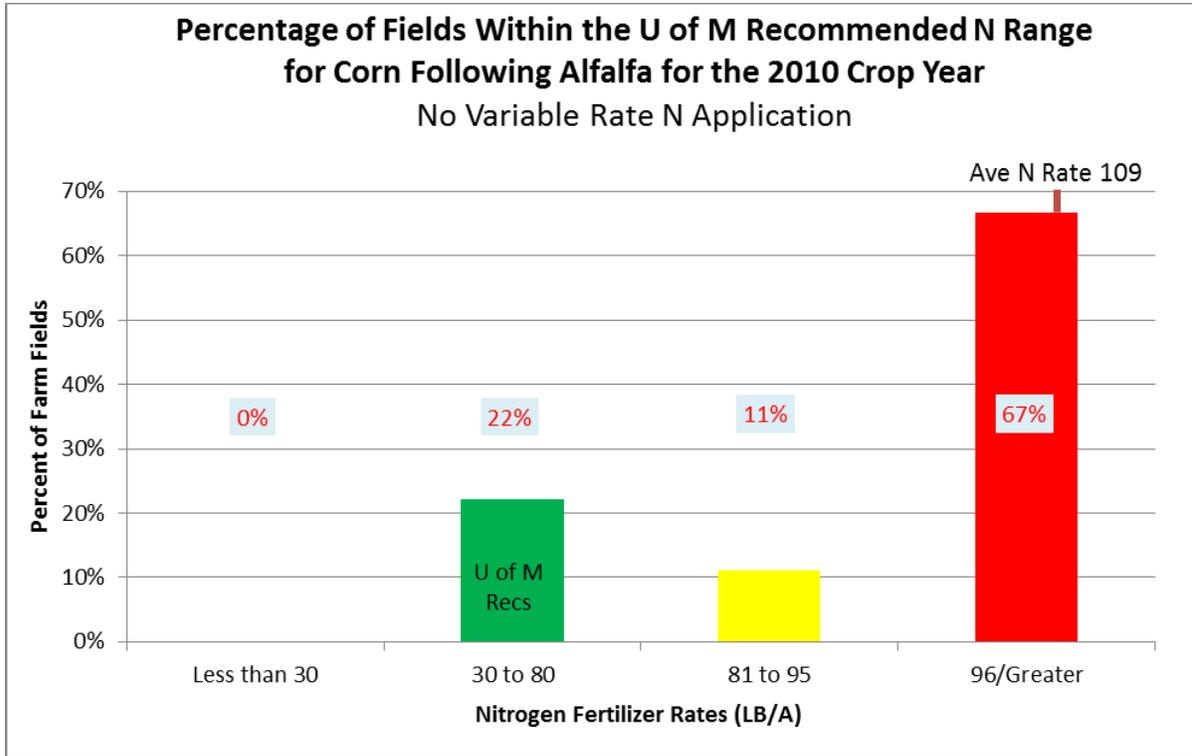


Figure 76. Percentage of fields within the U of M recommended range for corn following alfalfa with and without variable rate nitrogen applications in the SW BMP region for 2010: 9 fields.

Table 62. Nitrogen fertilizer rates and associated corn yields for corn following alfalfa without variable rate nitrogen applications for the 2010 crop year in the SW BMP region.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	No Data	130	120	148
Avg N-Rate LB/A	No Data	59	85	130

Less than five farmers reported planting corn following alfalfa in the SW BMP region for fields with variable rate nitrogen application.

Northwestern Region: Corn Following Alfalfa

Less than five farmers reported planting corn following alfalfa in the NW BMP region for fields with non-variable and variable rate nitrogen application.

Less than five farmers reported planting corn following alfalfa in the NW BMP region for fields with non-variable rate nitrogen application.

Less than five farmers reported planting corn following alfalfa in the NW BMP region for fields with variable rate nitrogen application.

Irrigated and Non-irrigated Sandy Soils Region: Corn Following Alfalfa

There were 77 fields that were included in the IRR BMP region corn following alfalfa analysis. Figure 42 details the distribution of nitrogen fertilizer rates across the IRR BMP region for corn following alfalfa.

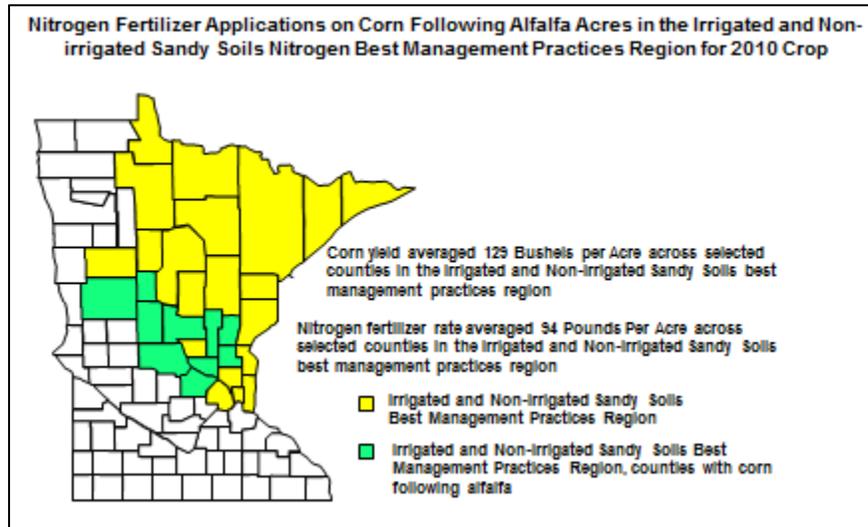


Figure 77. The corn yield averaged 129 bushels per acre and the nitrogen fertilizer rate averaged 94 pounds per acre across the IRR BMP region.

Figure 78 details the distribution of nitrogen fertilizer rates in the IRR BMP region for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 63 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 78.

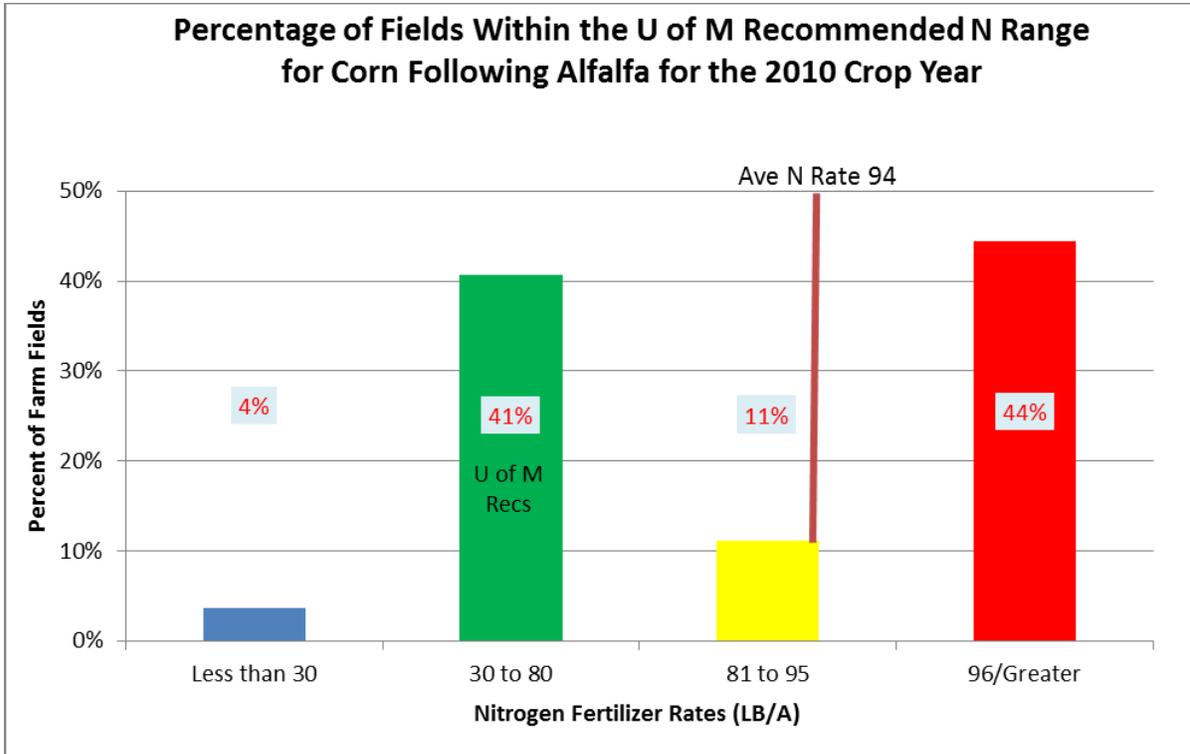


Figure 78. Percentage of fields within the U of M recommended range for corn following alfalfa with and without variable rate nitrogen applications in the IRR BMP region for 2010: 27 fields.

Table 63. Nitrogen fertilizer rates and associated corn yields for corn following alfalfa with and without variable rate nitrogen applications for the 2010 crop year in the IRR BMP region.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	70	123	123	142
Avg N-Rate LB/A	25	65	92	127

Figure 79 details the distribution of nitrogen fertilizer rates in the IRR BMP region for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 64 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 79.

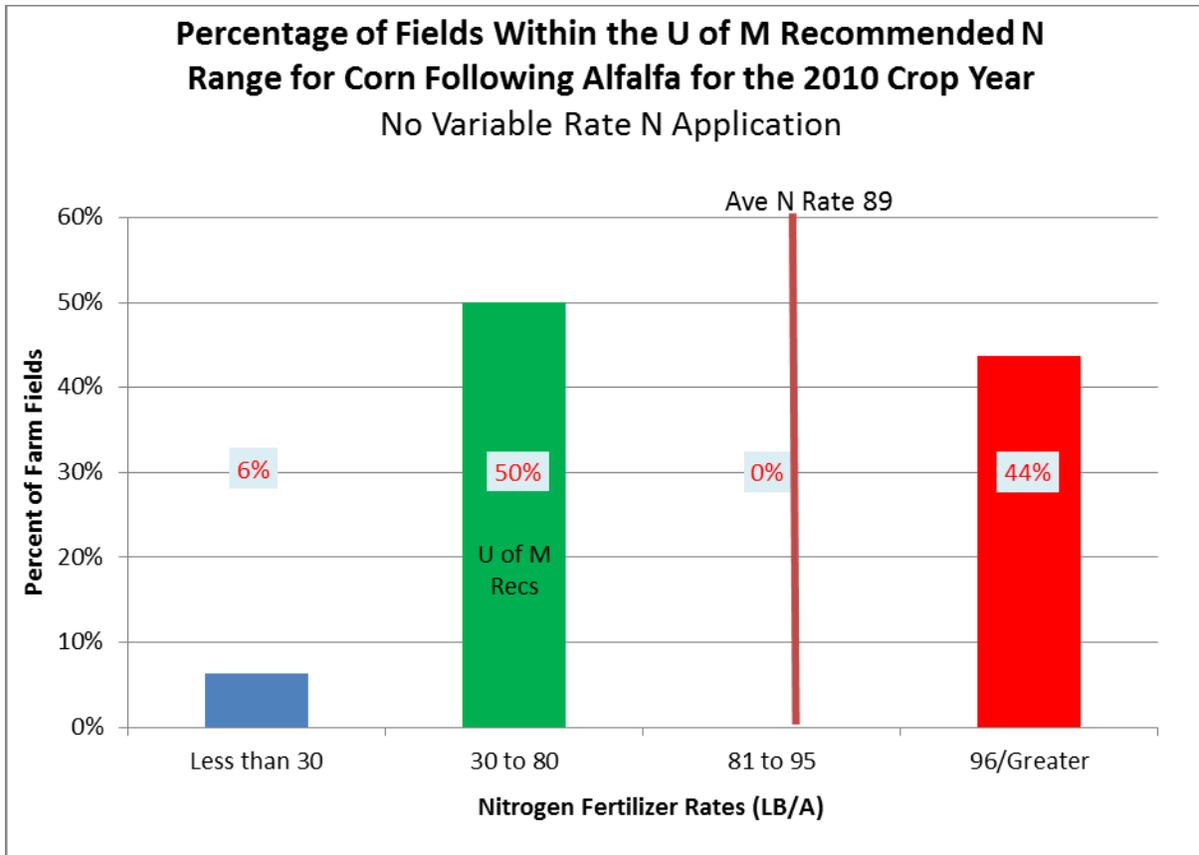


Figure 79. Percentage of fields within the U of M recommended range for corn following alfalfa without variable rate nitrogen applications in the IRR BMP region for 2010: 16 fields.

Table 64. Nitrogen fertilizer rates and associated corn yields for corn following alfalfa without variable rate nitrogen applications for the 2010 crop year in the IRR BMP region.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	70	110	No Data	146
Avg N-Rate LB/A	25	61	No Data	130

Figure 80 details the distribution of nitrogen fertilizer rates in the IRR BMP region for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 65 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 80.

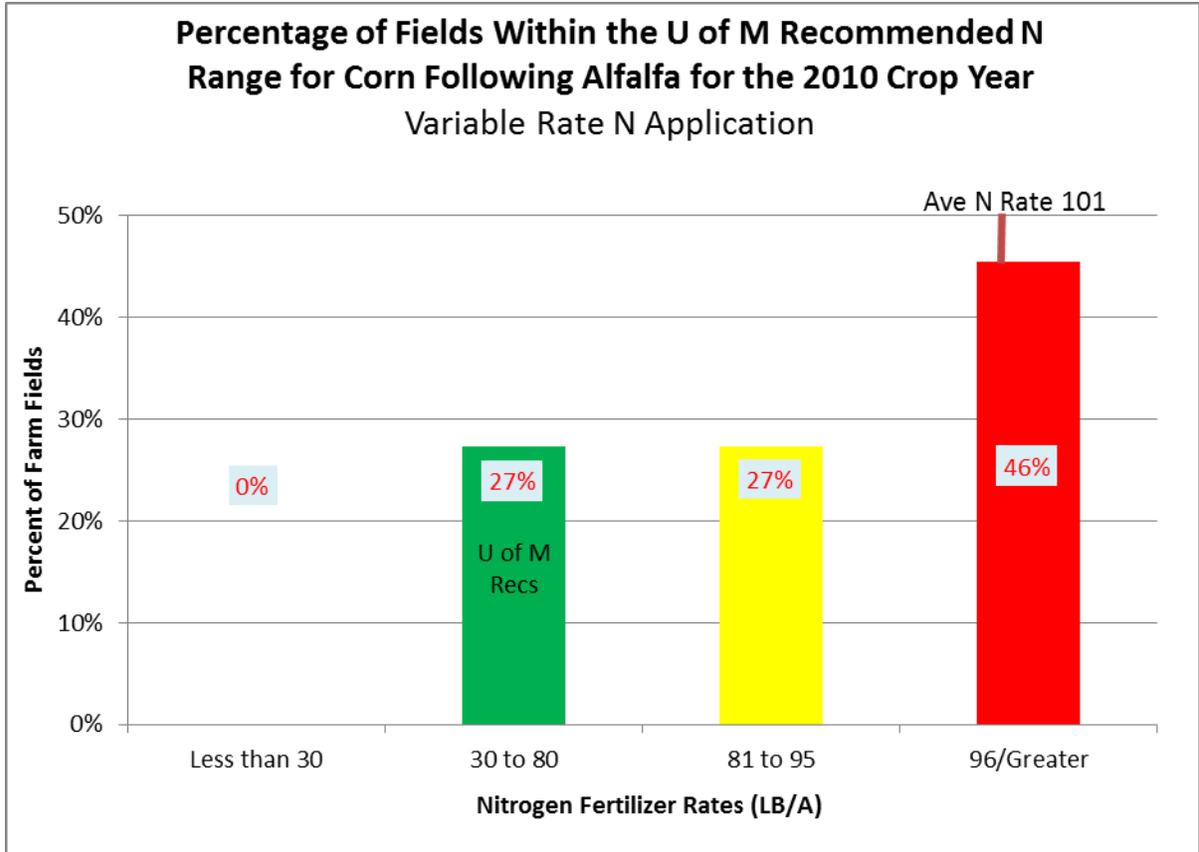


Figure 80. Percentage of fields within the U of M recommended range for corn following alfalfa with variable rate nitrogen applications in the IRR BMP region for 2010: 11 fields.

Table 65. Nitrogen fertilizer rates and associated corn yields for corn following alfalfa with variable rate nitrogen applications for the 2010 crop year in the IRR BMP region.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	No Data	158	123	137
Avg N-Rate LB/A	No Data	73	92	124

Statewide: Corn Following Small Grains

Statewide there were 79 fields that were included in the corn following small grains in the statewide region analysis. Figure 81 details the location, average rate of nitrogen fertilizer and average yield for corn following corn following alfalfa throughout the state.

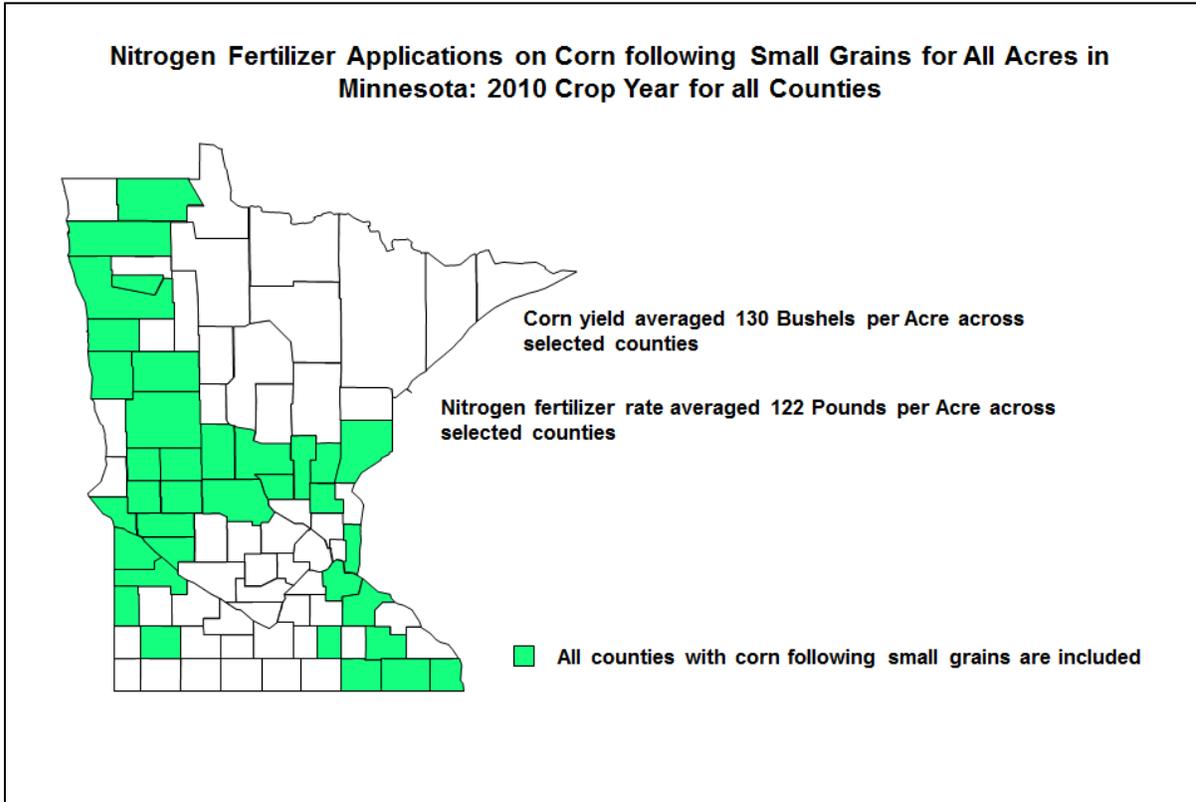


Figure 81. Counties with farmers reporting on corn following small grains fields.

Figure 82 details the distribution of nitrogen fertilizer rates across Minnesota for corn following small grains using a “nitrogen to corn price ratio” of 0.05. Table 66 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 82.

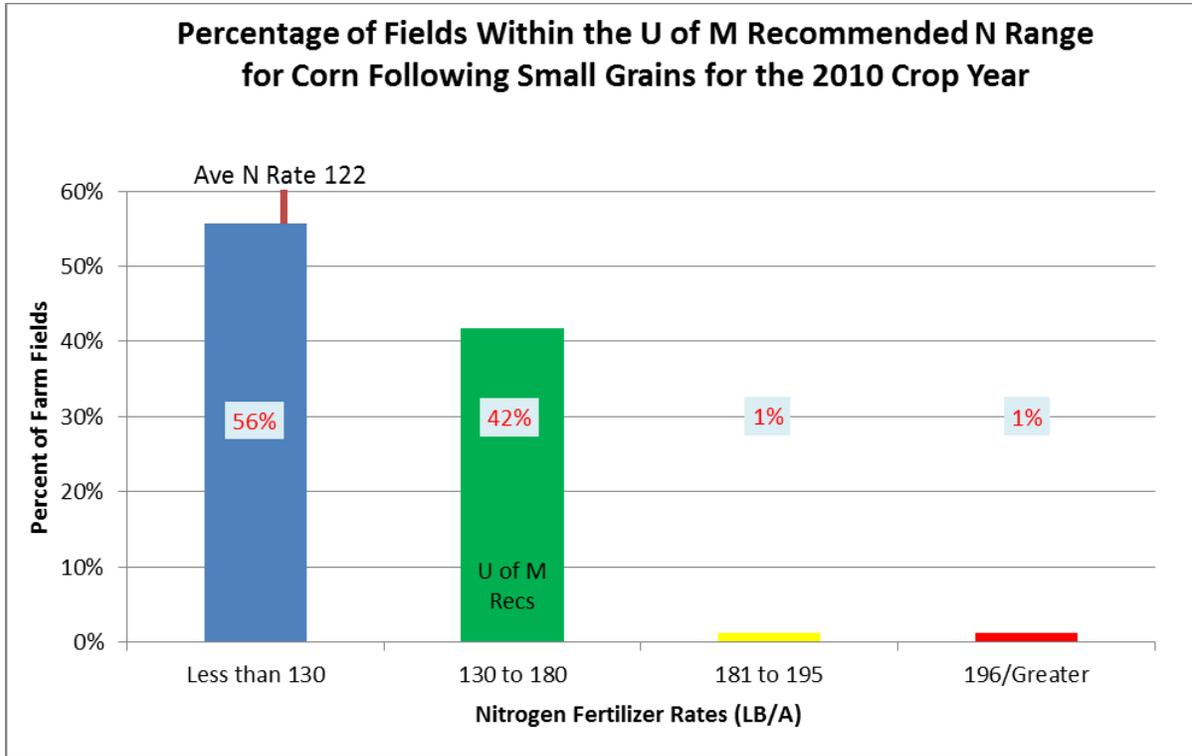


Figure 82. Percentage of fields within the U of M recommended range for corn following small grains with and without variable rate nitrogen applications across Minnesota for 2010: 79 fields.

Table 66. Nitrogen fertilizer rates and associated corn yields for corn following small grains with and without variable rate nitrogen applications for the 2010 crop year across Minnesota.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	116	147	185	178
Avg N-Rate LB/A	99	148	190	220

Figure 83 details the distribution of nitrogen fertilizer rates across Minnesota for corn following small grains using a “nitrogen to corn price ratio” of 0.05. Table 67 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 83.

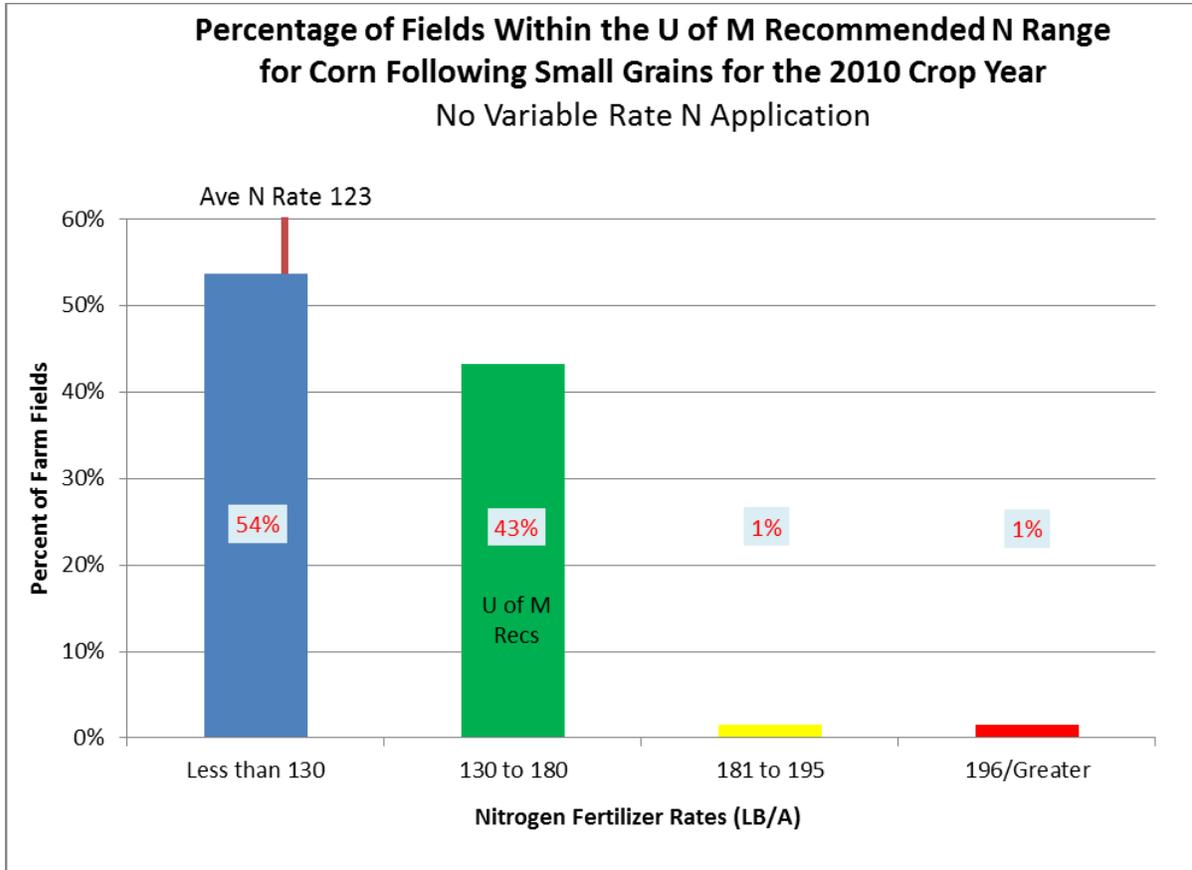


Figure 83. Percentage of fields within the U of M recommended range for corn following small grains without variable rate nitrogen applications across Minnesota for 2010: 67 fields.

Table 67. Nitrogen fertilizer rates and associated corn yields for corn following small grains without variable rate nitrogen applications for the 2010 crop year across Minnesota.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	116	144	185	178
Avg N-Rate LB/A	99	148	190	220

Figure 84 details the distribution of nitrogen fertilizer rates across Minnesota for corn following small grains using a “nitrogen to corn price ratio” of 0.05. Table 68 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 84.

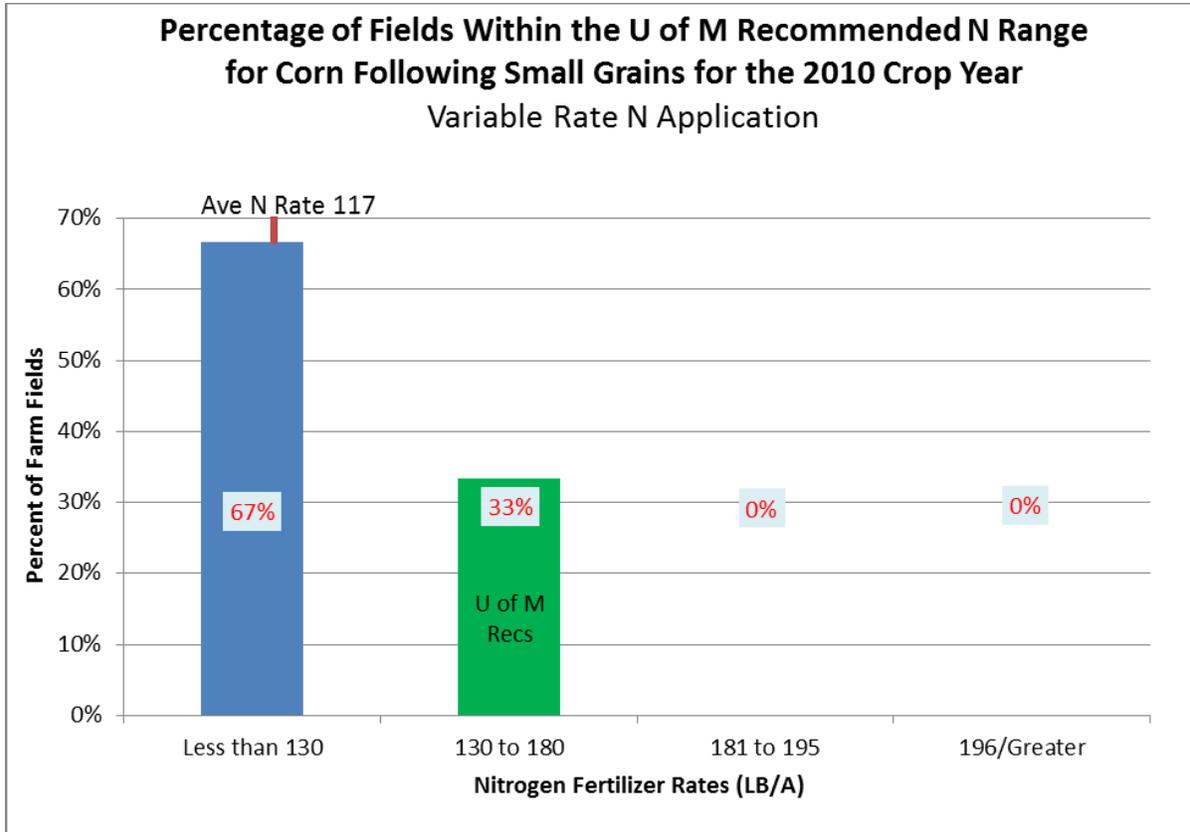


Figure 84. Percentage of fields within the U of M recommended range for corn following small grains with variable rate nitrogen applications across Minnesota for 2010: 12 fields.

Table 68. Nitrogen fertilizer rates and associated corn yields for corn following small grains with variable rate nitrogen applications for the 2010 crop year across Minnesota.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	114	165	No Data	No Data
Avg N-Rate LB/A	100	150	No Data	No Data

Southeastern Region: Corn Following Small Grains

There were 10 fields that were included in the SE BMP region corn following small grains analysis. Figure 85 details the location, average rate of nitrogen fertilizer and average yield for corn following small grains in the SE BMP region.

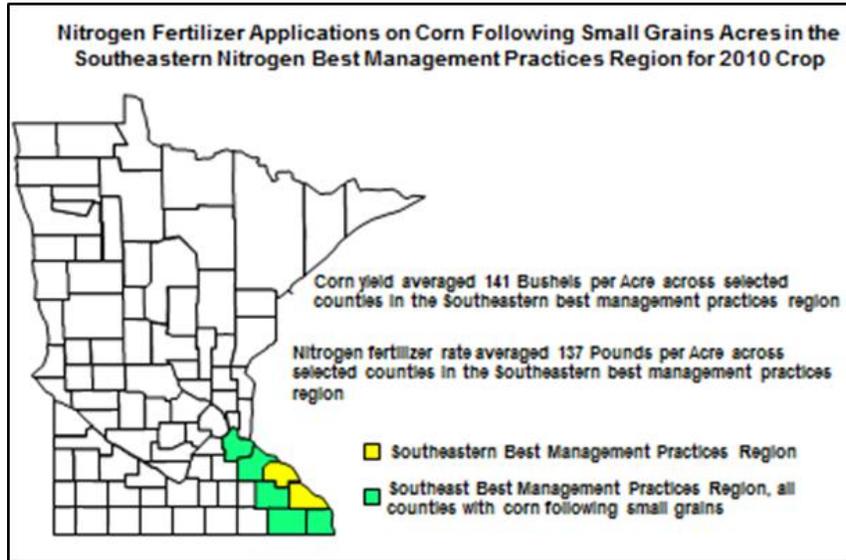


Figure 85. The corn yield averaged 141 bushels per acre and the nitrogen fertilizer rate averaged 137 pounds per acre across the SE BMP region.

Figure 86 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following small grains using a “nitrogen to corn price ratio” of 0.05. Table 69 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 86.

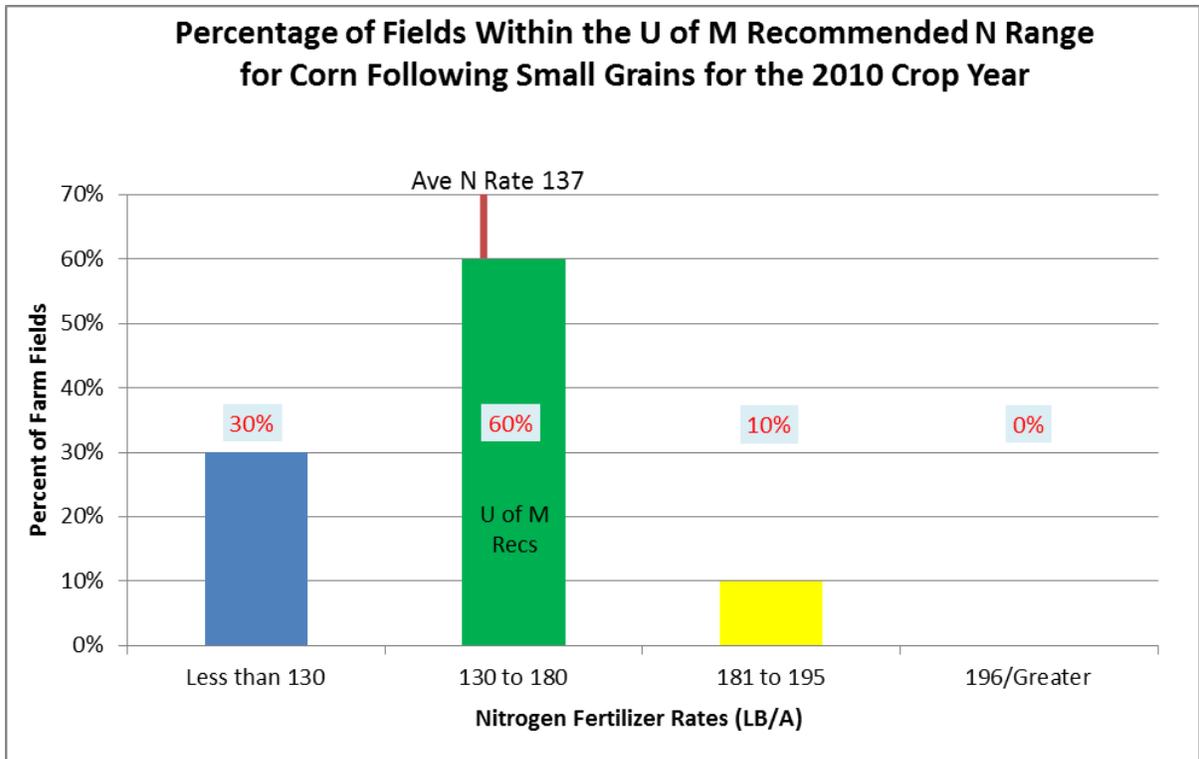


Figure 86. Percentage of fields within the U of M recommended range for corn following small grains with and without variable rate nitrogen applications in the SE BMP region for 2010: 10 fields.

Table 69. Nitrogen fertilizer rates and associated corn yields for corn following small grains with and without variable rate nitrogen applications for the 2010 crop year in the SE BMP region.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	110	149	185	No Data
Avg N-Rate LB/A	91	150	190	No Data

Figure 87 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following small grains using a “nitrogen to corn price ratio” of 0.05. Table 70 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 87.

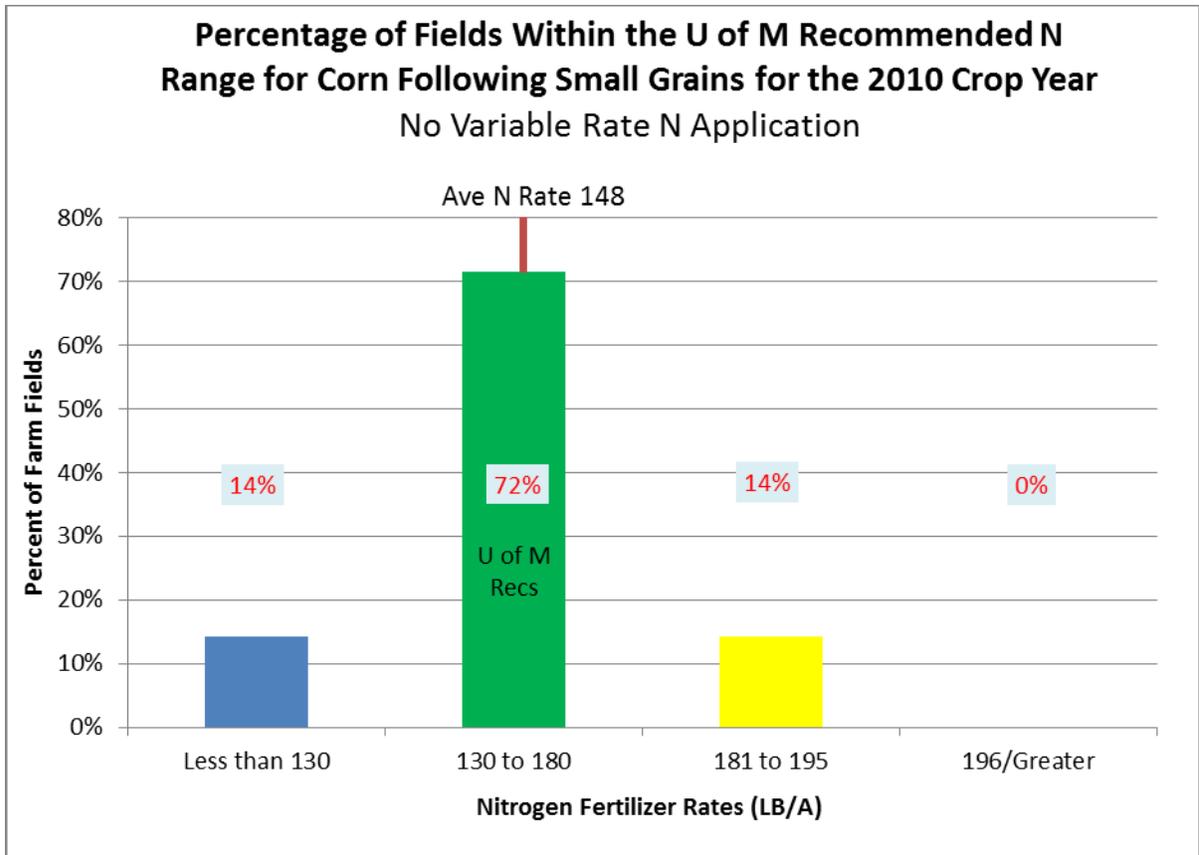


Figure 87. Percentage of fields within the U of M recommended range for corn following small grains without variable rate nitrogen applications in the SE BMP region for 2010: 7 fields.

Table 70. Nitrogen fertilizer rates and associated corn yields for corn following small grains without variable rate nitrogen applications for the 2010 crop year in the SE BMP region.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	100	155	185	No Data
Avg N-Rate LB/A	91	150	190	No Data

Less than five farmers reported planting corn following small grains in the SE BMP region for fields with variable rate nitrogen application.

South Central Region: Corn Following Small Grains

Less than five farmers reported planting corn following small grains in the SC BMP region for fields with non-variable rate nitrogen application.

Less than five farmers reported planting corn following small grains in the SC BMP region for fields with variable rate nitrogen application.

Southwestern Region: Corn Following Small Grains

There were 22 fields that were included in the SW BMP region corn following small grains analysis. Figure 88 details the location, average rate of nitrogen fertilizer and average yield for corn following small grains in the SW BMP region.

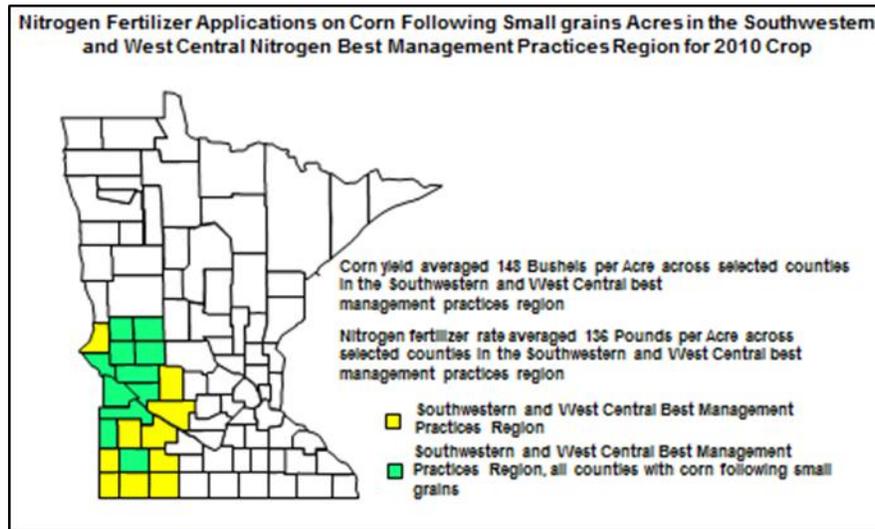


Figure 88. The corn yield averaged 148 bushels per acre and the nitrogen fertilizer rate averaged 136 pounds per acre across the NW BMP region.

Figure 89 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following small grains using a “nitrogen to corn price ratio” of 0.05. Table 71 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 89.

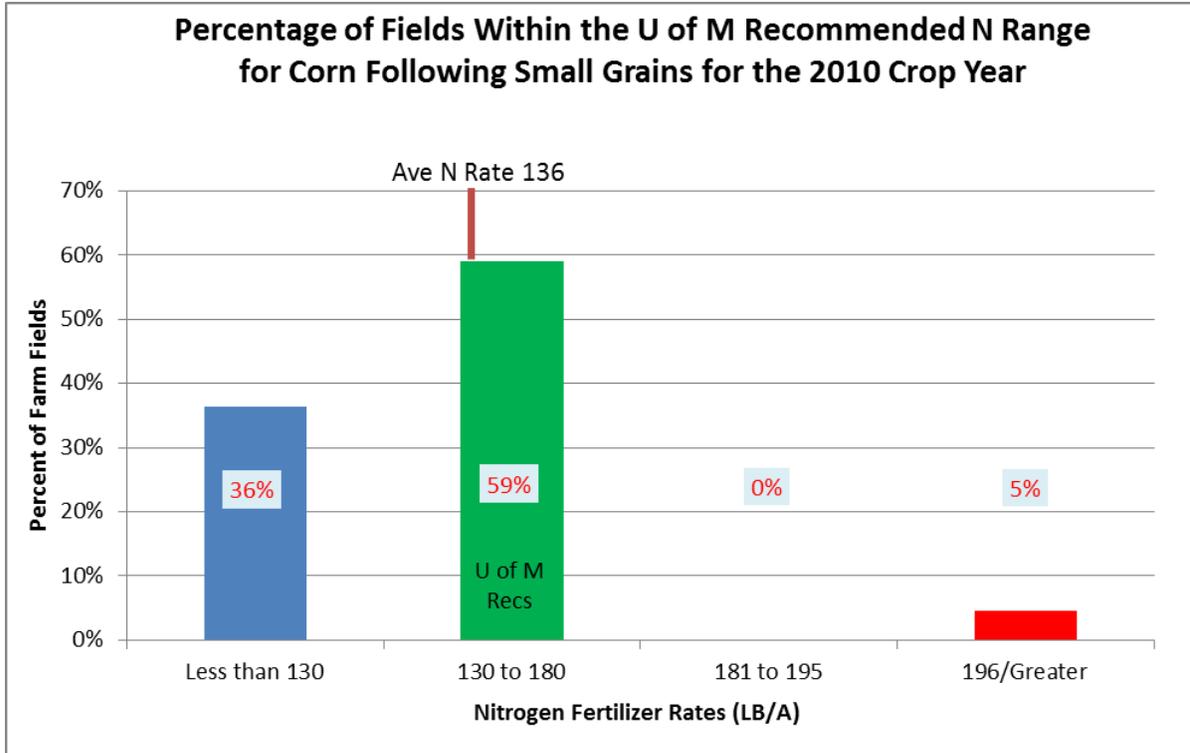


Figure 89. Percentage of fields within the U of M recommended range for corn following small grains with and without variable rate nitrogen applications in the SW BMP region for 2010: 22 fields.

Table 71. Nitrogen fertilizer rates and associated corn yields for corn following small grains with and without variable rate nitrogen applications for the 2010 crop year in the SW BMP region.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	139	151	No Data	178
Avg N-Rate LB/A	106	148	No Data	220

Figure 90 details the distribution of average nitrogen fertilizer rates in the SW BMP region for corn following small grains using a “nitrogen to corn price ratio” of 0.05. Table 72 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 90.

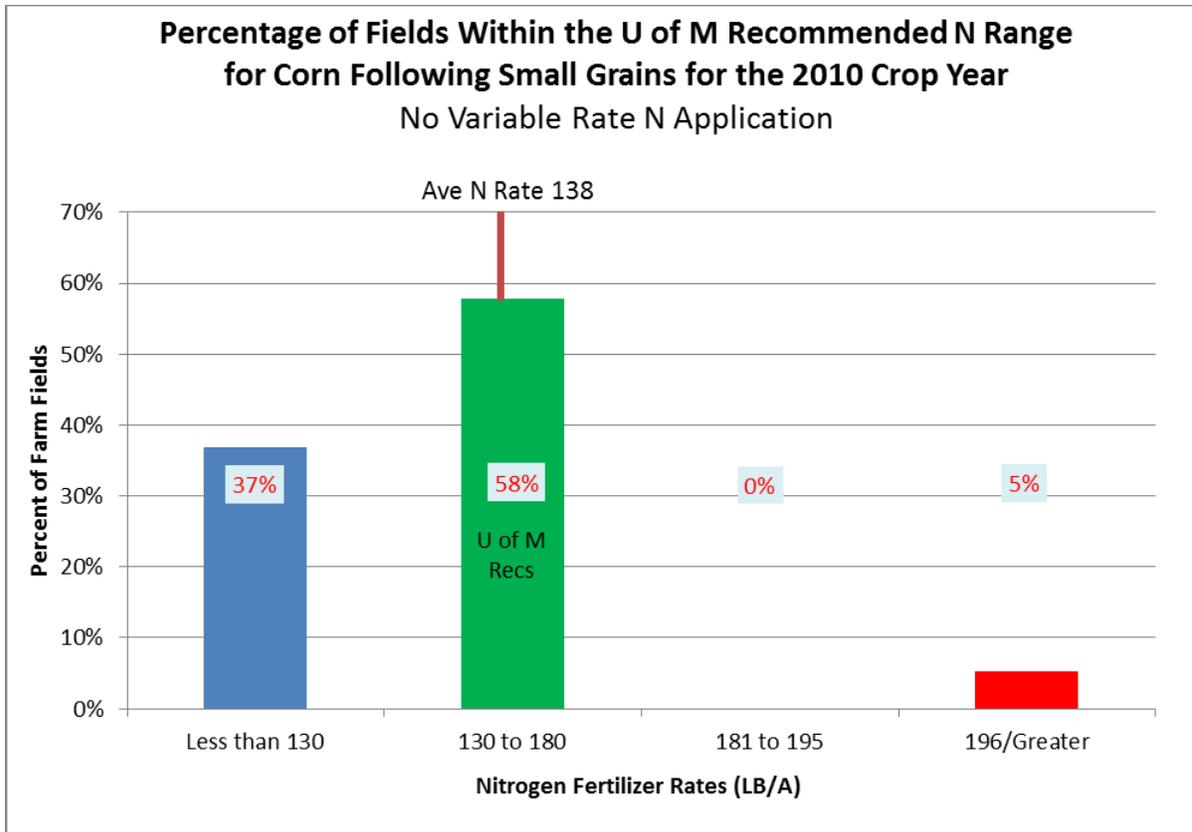


Figure 90. Percentage of fields within the U of M recommended range for corn following small grains without variable rate nitrogen applications in the SW BMP region for 2010: 19 fields.

Table 72. Nitrogen fertilizer rates and associated corn yields for corn following small grains without variable rate nitrogen applications for the 2010 crop year in the SW BMP region.

N Fertilizer Ranges	<100 LB/A	100-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	143	146	No Data	178
Avg N-Rate LB/A	113	147	No Data	220

Less than five farmers reported planting corn following small grains in the SW BMP region for fields with variable rate nitrogen application.

Northwestern Region: Corn Following Small Grains

There were 14 fields that were included in the NW BMP region corn following small grains analysis. Figure 91 details the location, average rate of nitrogen fertilizer and average yield for corn following small grains in the NW BMP region.

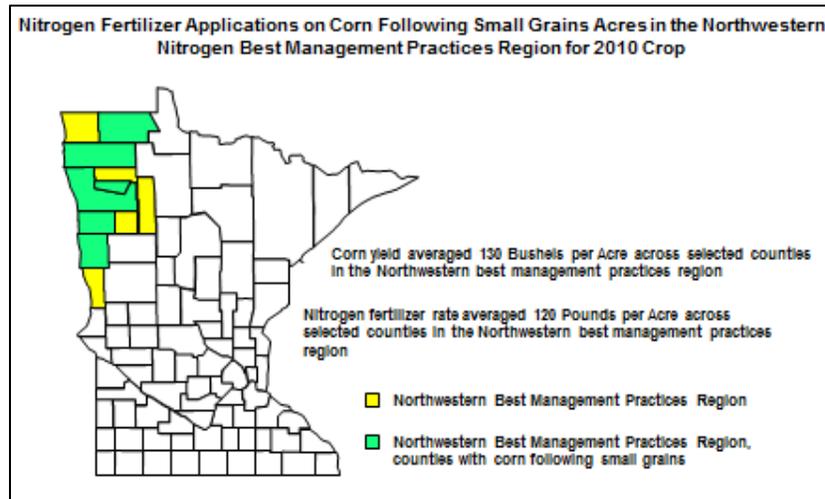


Figure 91. The corn yield averaged 130 bushels per acre and the nitrogen fertilizer rate averaged 120 pounds per acre across the NW BMP region.

Figure 92 details the distribution of nitrogen fertilizer rates in the NW BMP region for corn following small grains using a “nitrogen to corn price ratio” of 0.05. Table 73 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 92.

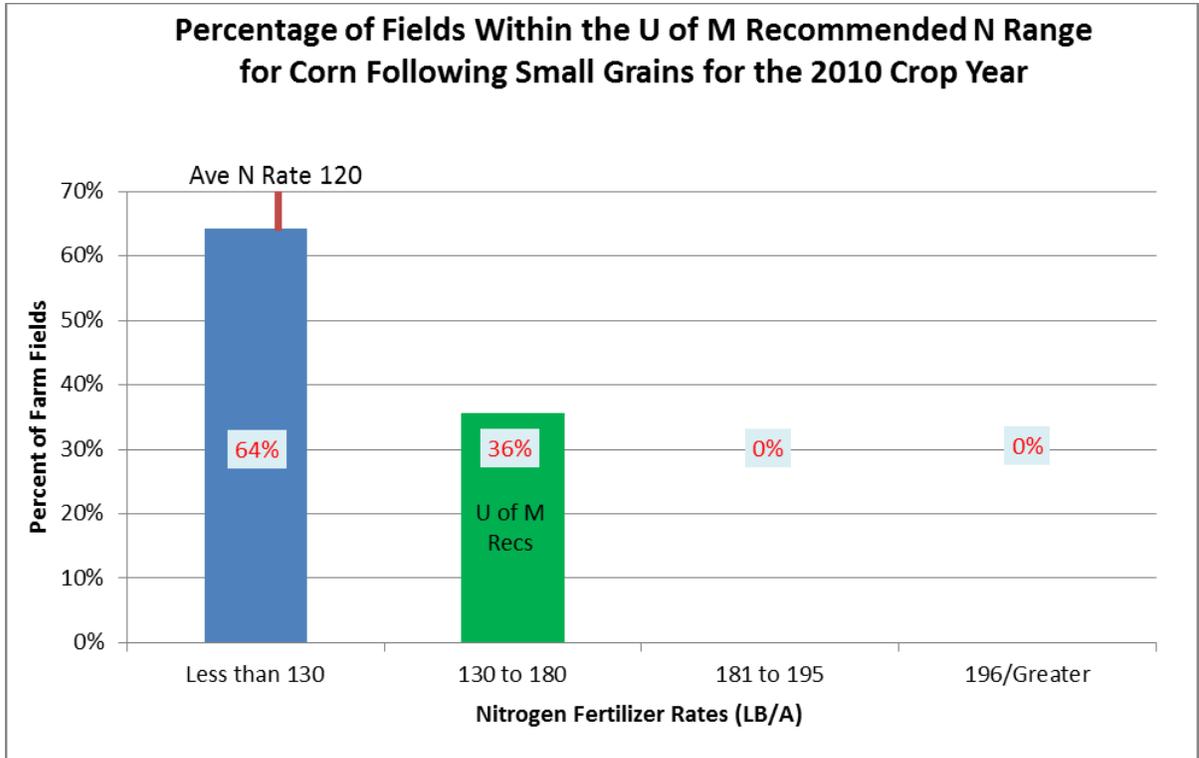


Figure 92. Percentage of fields within the U of M recommended range for corn following small grains with and without variable rates nitrogen application in the NW BMP region for 2010: 14 fields.

Table 73. Nitrogen fertilizer rates and associated corn yields for corn following small grains with and without variable rate nitrogen applications for the 2010 crop year in the NW BMP region.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	122	143	No Data	No Data
Avg N-Rate LB/A	107	144	No Data	No Data

Figure 93 details the distribution of nitrogen fertilizer rates in the NW BMP region for corn following small grains using a “nitrogen to corn price ratio” of 0.05. Table 74 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 93.

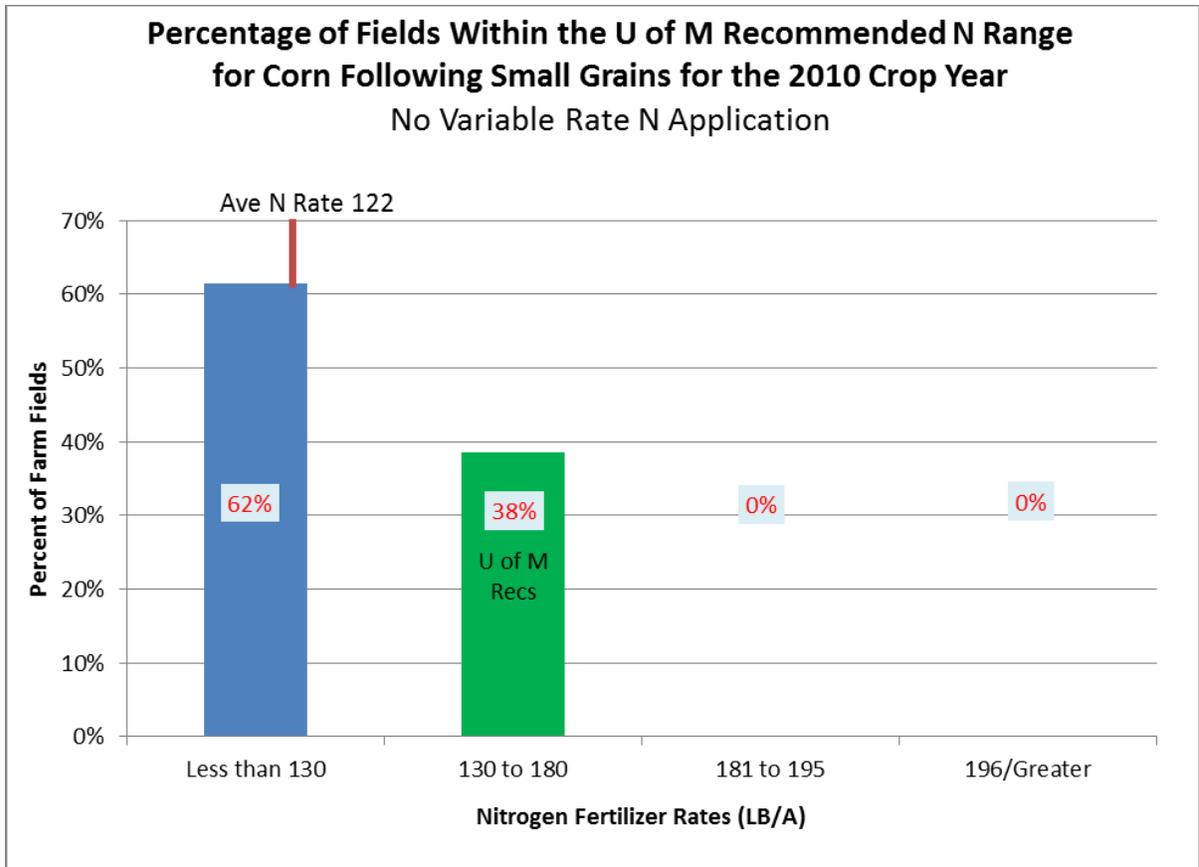


Figure 93. Percentage of fields within the U of M recommended range for corn following small grains without variable rate nitrogen applications in the NW BMP region for 2010: 13 fields.

Table 74. Nitrogen fertilizer rates and associated corn yields for corn following small grains without variable rate nitrogen applications for the 2010 crop year in the NW BMP region.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	123	143	No Data	No Data
Avg N-Rate LB/A	109	144	No Data	No Data

Less than five farmers reported planting corn following small grains in the NW BMP region for fields with variable rate nitrogen application.

Irrigated and Non-irrigated Sandy Soils Region: Corn Following Small Grains

There were 31 fields that were included in the IRR BMP region corn following small grains analysis. Figure 94 details the location, average rate of nitrogen fertilizer and average yield for corn following small grains in the IRR BMP region.

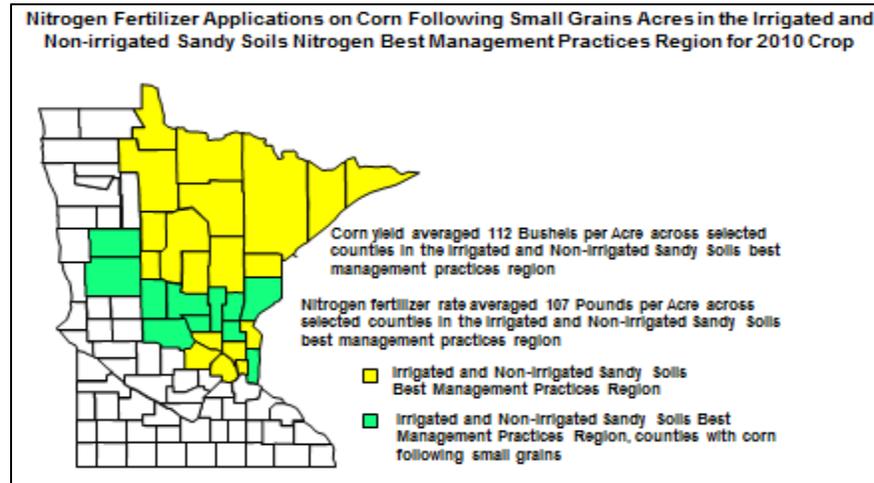


Figure 94. The corn yield averaged 112 bushels per acre and the nitrogen fertilizer rate averaged 107 pounds per acre across the IRR BMP region.

Figure 95 details the distribution of nitrogen fertilizer rates in the IRR BMP region for corn following small grains using a “nitrogen to corn price ratio” of 0.05. Table 75 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 95.

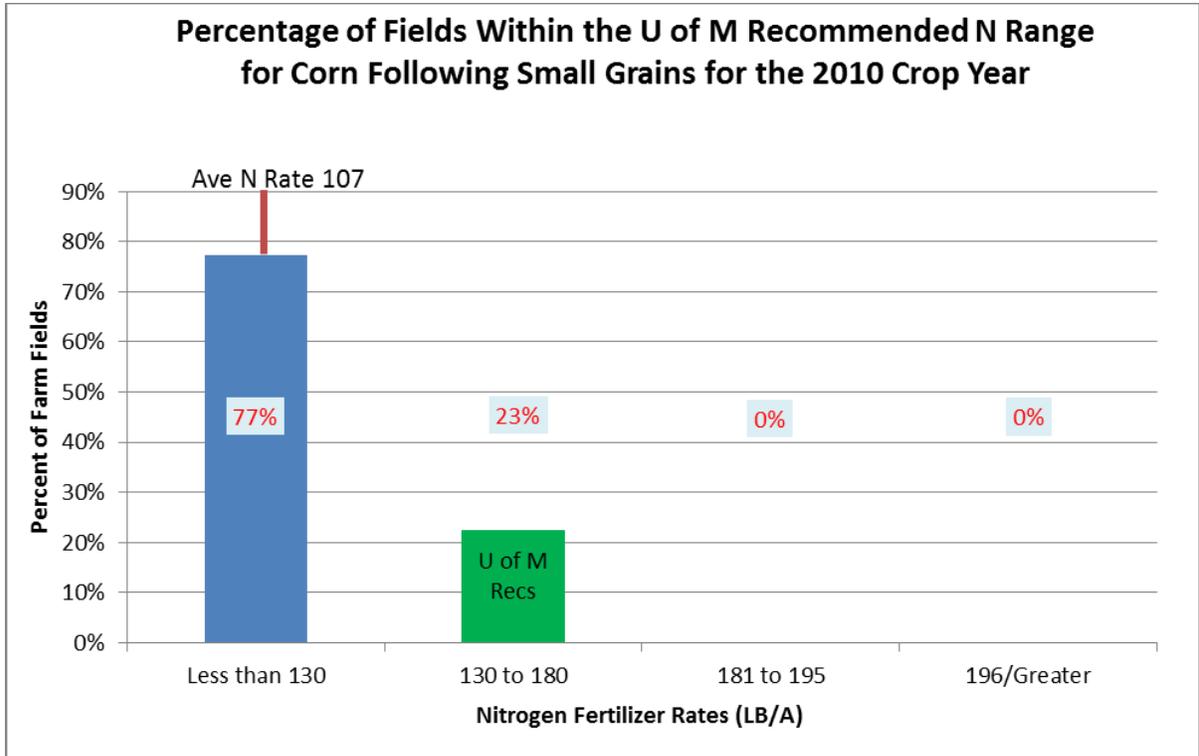


Figure 95. Percentage of fields within the U of M recommended range for corn following small grains with and without variable rates nitrogen application in the IRR BMP region for 2010: 31 fields.

Table 75. Nitrogen fertilizer rates and associated corn yields for corn following small grains with and without variable rate nitrogen applications for the 2010 crop year in the IRR BMP region.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	107	131	No Data	No Data
Avg N-Rate LB/A	94	150	No Data	No Data

Figure 96 details the distribution of nitrogen fertilizer rates in the IRR BMP region for corn following small grains using a “nitrogen to corn price ratio” of 0.05. Table 76 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 96.

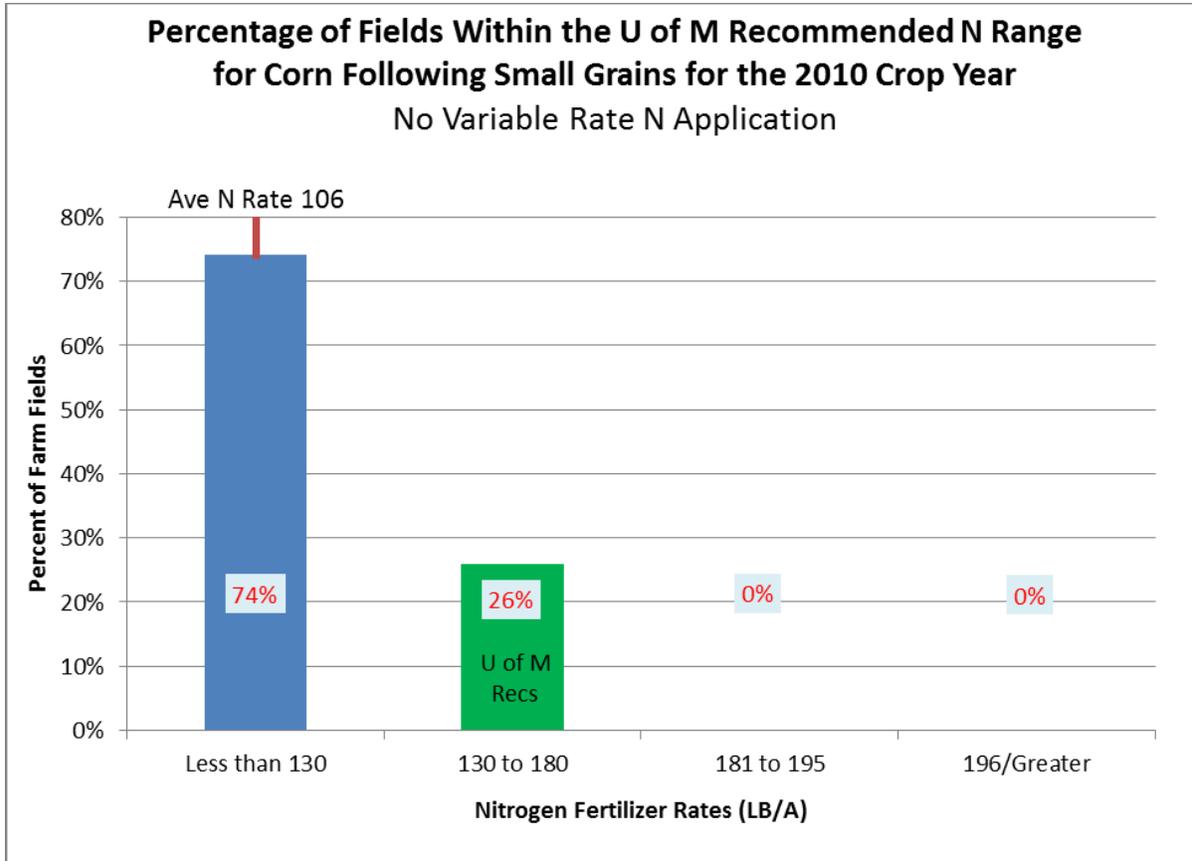


Figure 96. Percentage of fields within the U of M recommended range for corn following small grains without variable rates nitrogen application in the IRR BMP region for 2010: 27 fields.

Table 76. Nitrogen fertilizer rates and associated corn yields for corn following small grains without variable rate nitrogen applications for the 2010 crop year in the IRR BMP region.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	106	131	No Data	No Data
Avg N-Rate LB/A	90	150	No Data	No Data

Less than five farmers reported planting corn following small grains in the IRR BMP region for fields with variable rate nitrogen application.

Analysis of Nitrogen Fertilizer Rate by Yields

The following section compares corn crops followed by soybeans, corn, corn following alfalfa, alfalfa, or small grains. The analysis demonstrates the quantity of nitrogen applied to corn when applying commercial nitrogen fertilizer compared to the corresponding yields for the 2010 corn crop. The categories of the analysis are grouped into corn yields, as reported by the farmer, into less than 155 bushels per acre, between 155 and 175 bushels per acre, and greater than 175 bushels per acre.

Statewide: Corn Following Soybeans

Statewide: Corn Following Soybeans Figure 97 details the distribution of nitrogen fertilizer rates across Minnesota for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 77 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 97.

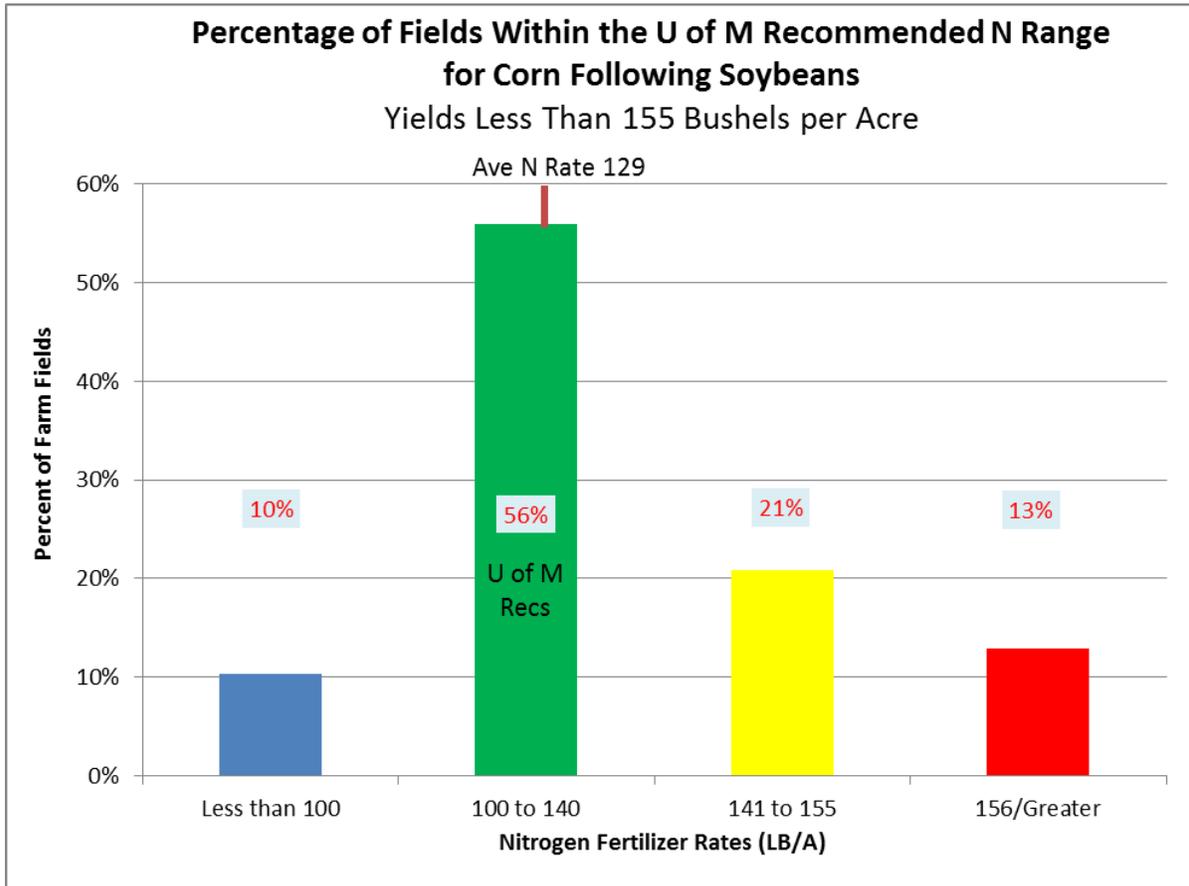


Figure 97. Percentage of fields within the U of M recommended range for corn following soybeans across Minnesota in 2010 on all fields with less than 155 bushels per acre: 542 fields.

Table 77. Pounds of nitrogen applied per acre to fields and yield of corn following soybeans in Minnesota for 2010 on fields with less than 155 bushels per acre.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	114	135	142	145
Avg N-Rate LB/A	78	123	140	166

Figure 98 details the distribution of nitrogen fertilizer rates across Minnesota for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 78 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 98.

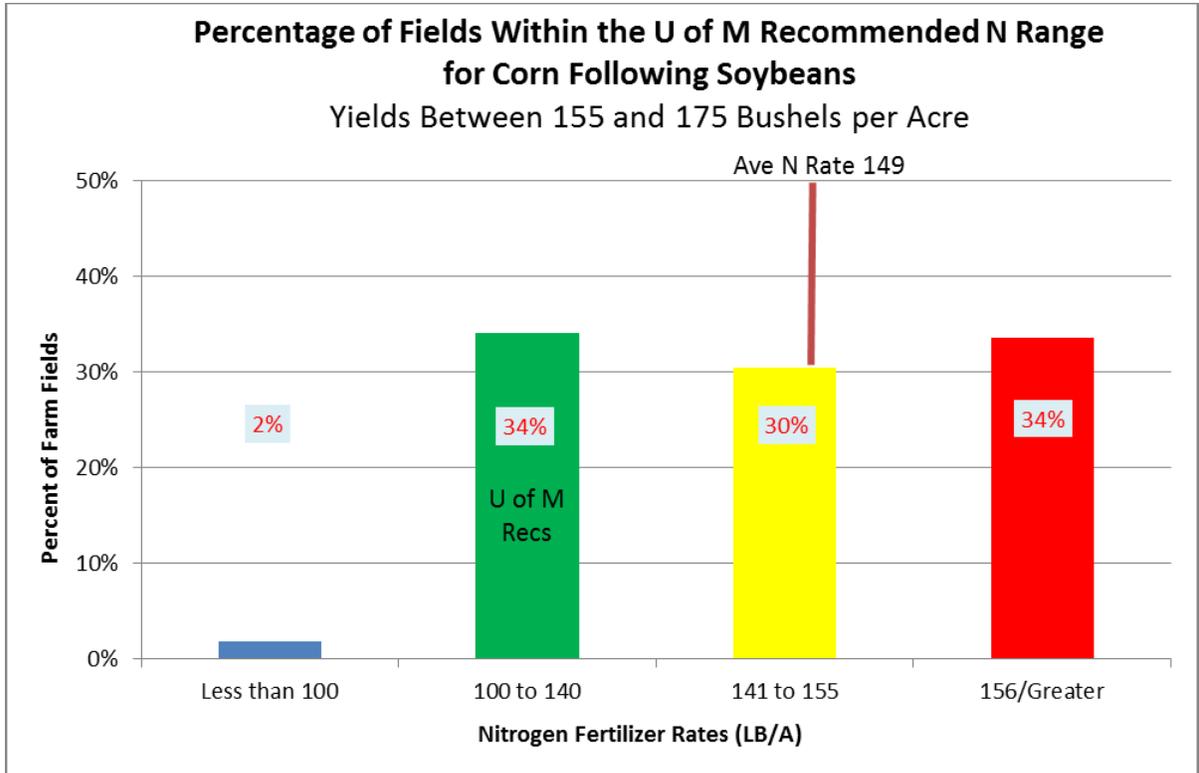


Figure 98. Percentage of fields within the U of M recommended range for corn following soybeans in 2010 on all fields across Minnesota between 155 and 175 bushels per acre: 796 fields.

Table 78. Pounds of nitrogen applied per acre to fields and yield of corn following soybeans in Minnesota for 2010 on fields between 155 and 175 bushels per acre.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	164	166	168	169
Avg N-Rate LB/A	81	129	149	171

Figure 99 details the distribution of nitrogen fertilizer rates across Minnesota for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 79 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 99.

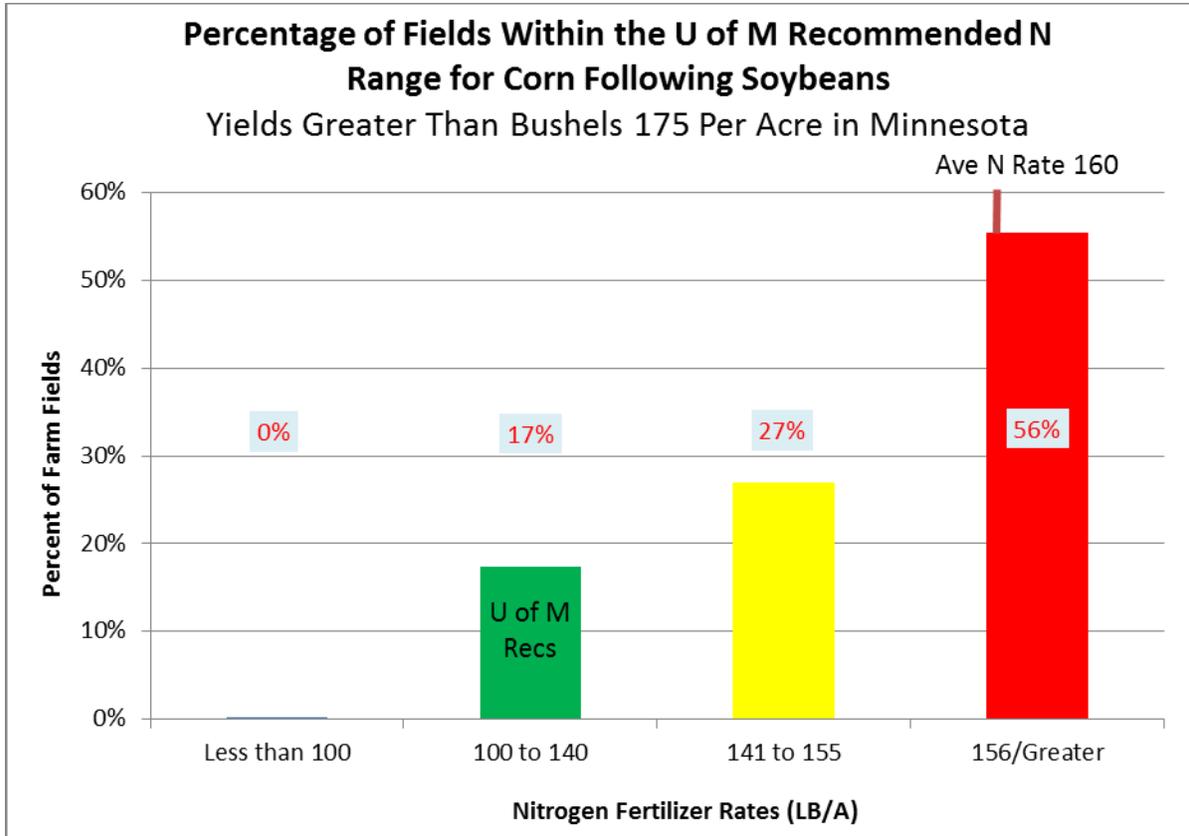


Figure 99. Percentage of fields within the U of M recommended range for corn following soybeans across Minnesota in 2010 on all fields yielding greater than 175 bushels per acre: 884 fields.

Table 79. Pounds of nitrogen applied per acre to fields and yield of corn following soybeans in Minnesota for 2010 on fields greater than 175 bushels per acre.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	183	186	187	189
Avg N-Rate LB/A	83	131	149	174

Southeastern Region: Corn Following Soybeans

Figure 100 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 80 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 100.

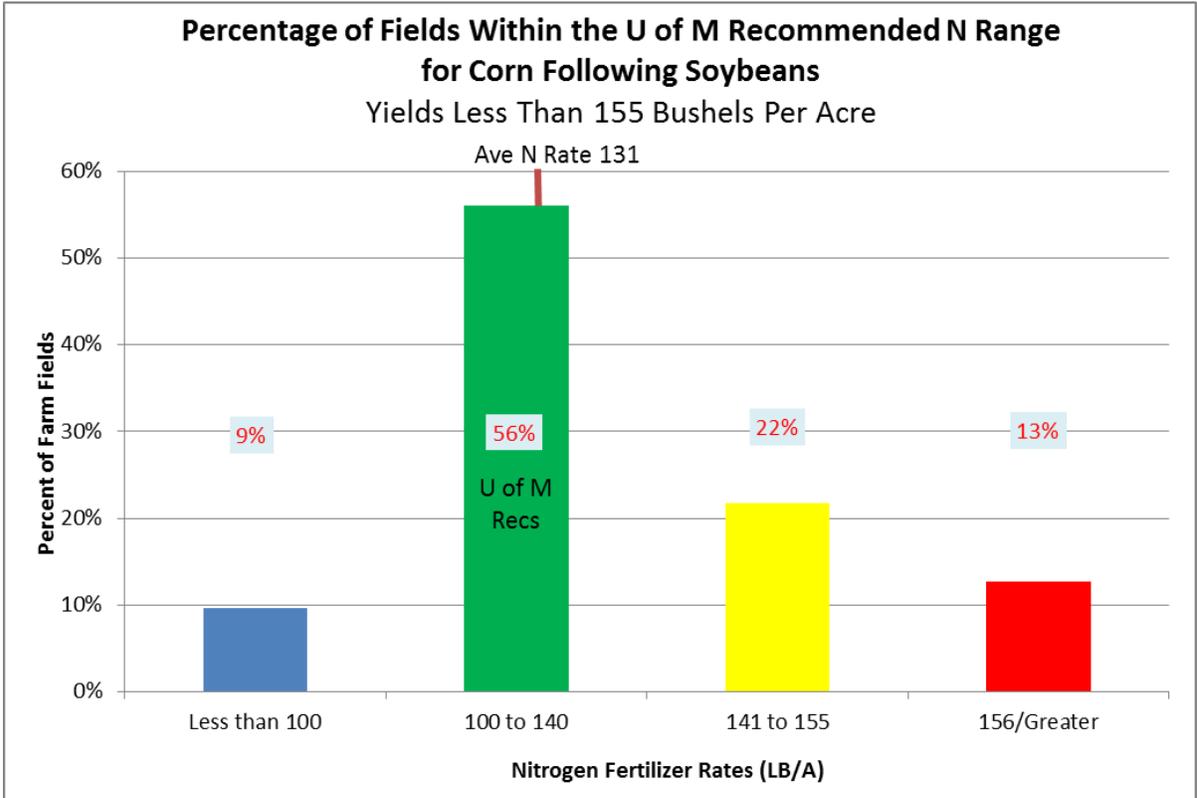


Figure 100. Percentage of fields within the U of M recommended range for corn following soybeans in the SE BMP region in 2010 on all fields yielding less than 155 bushels per acre: 166 fields.

Table 80. Pounds of nitrogen applied per acre to fields and yield of corn following soybeans in SE BMP region for 2010 on fields with less than 155 bushels per acre.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	124	139	142	146
Avg N-Rate LB/A	84	124	149	167

Figure 101 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 81 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 101.

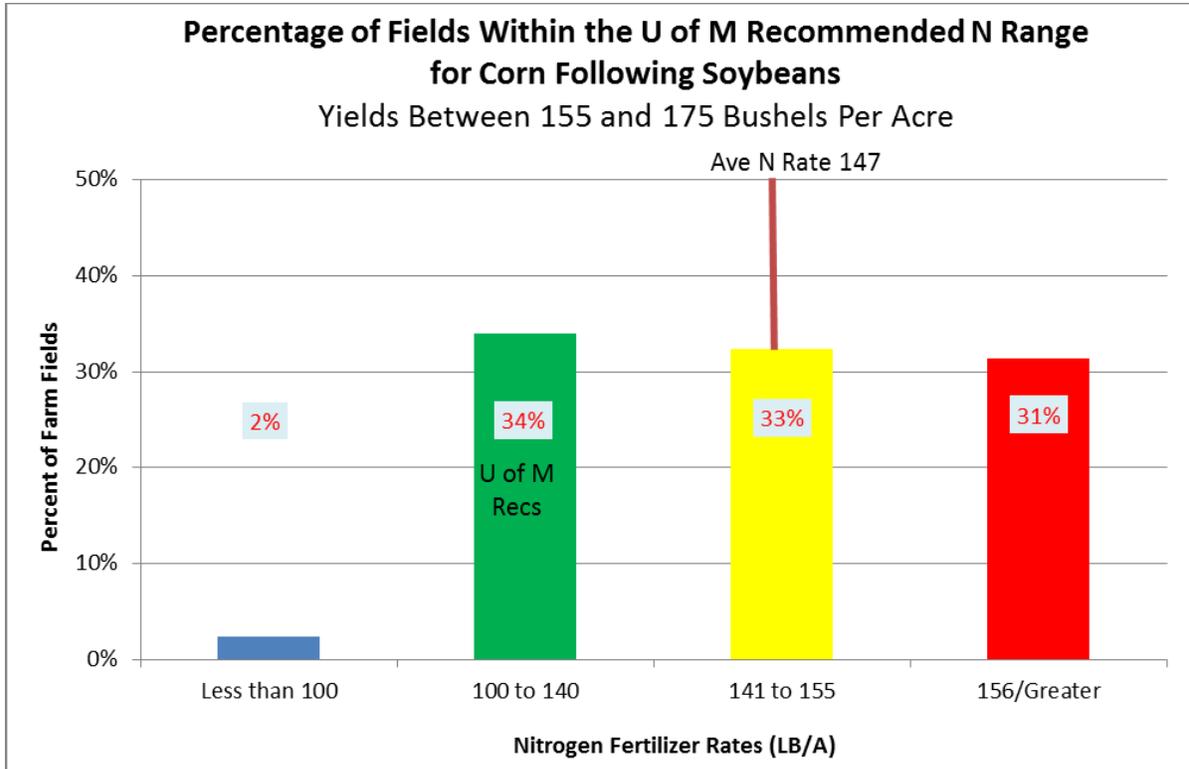


Figure 101. Percentage of fields within the U of M recommended range for corn following soybeans in the SE BMP region in 2010 on all fields yielding between 155 and 175 bushels per acre: 300 fields.

Table 81. Pounds of nitrogen applied per acre to fields and yield of corn following soybeans in SE BMP region for 2010 on fields between 155 to 175 bushels per acre.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	165	166	168	169
Avg N-Rate LB/A	80	128	150	171

Figure 102 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 82 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 102.

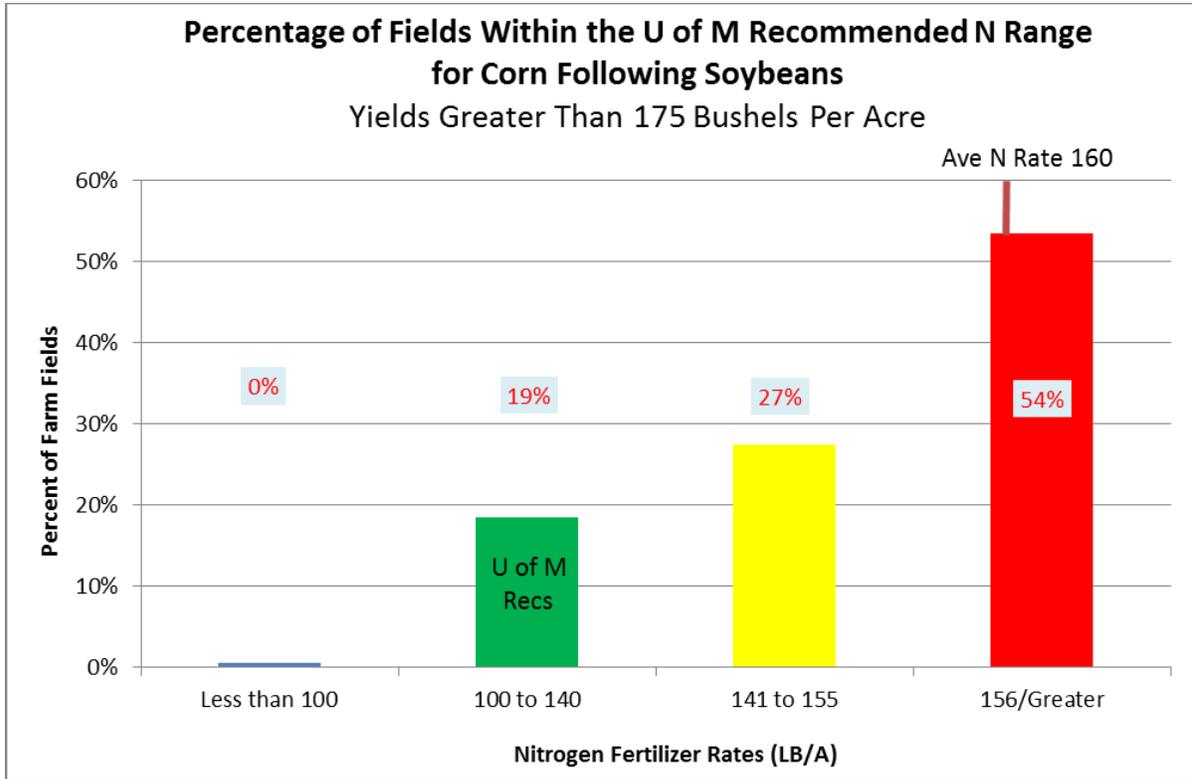


Figure 102. Percentage of fields within the U of M recommended range for corn following soybeans in the SE BMP region in 2010 on all fields yielding greater than 175 bushels per acre: 394 fields.

Table 82. Pounds of nitrogen applied per acre to fields and yield of corn following soybeans in SE BMP region for 2010 on fields greater than 175 bushels per acre.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	183	186	187	190
Avg N-Rate LB/A	83	130	149	176

South Central Region: Corn Following Soybeans

Figure 103 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 83 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 103.

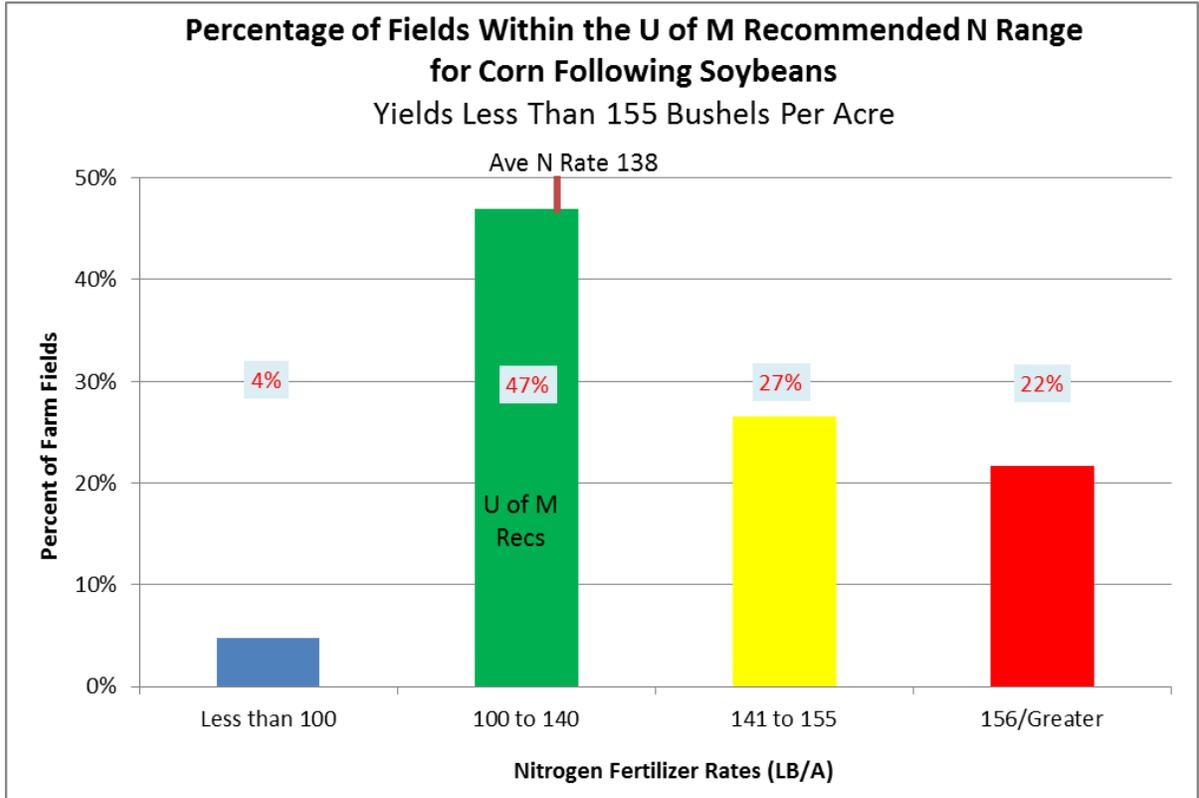


Figure 103. Percentage of fields within the U of M recommended range for corn following soybeans in the SC BMP region in 2010 on all fields yielding less than 155 bushels per acre: 83 fields.

Table 83. Pounds of nitrogen applied per acre to fields and yield of corn following soybeans in SC BMP region for 2010 on fields less than 155 bushels per acre.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	112	139	146	144
Avg N-Rate LB/A	79	125	148	168

Figure 104 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 84 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 104.

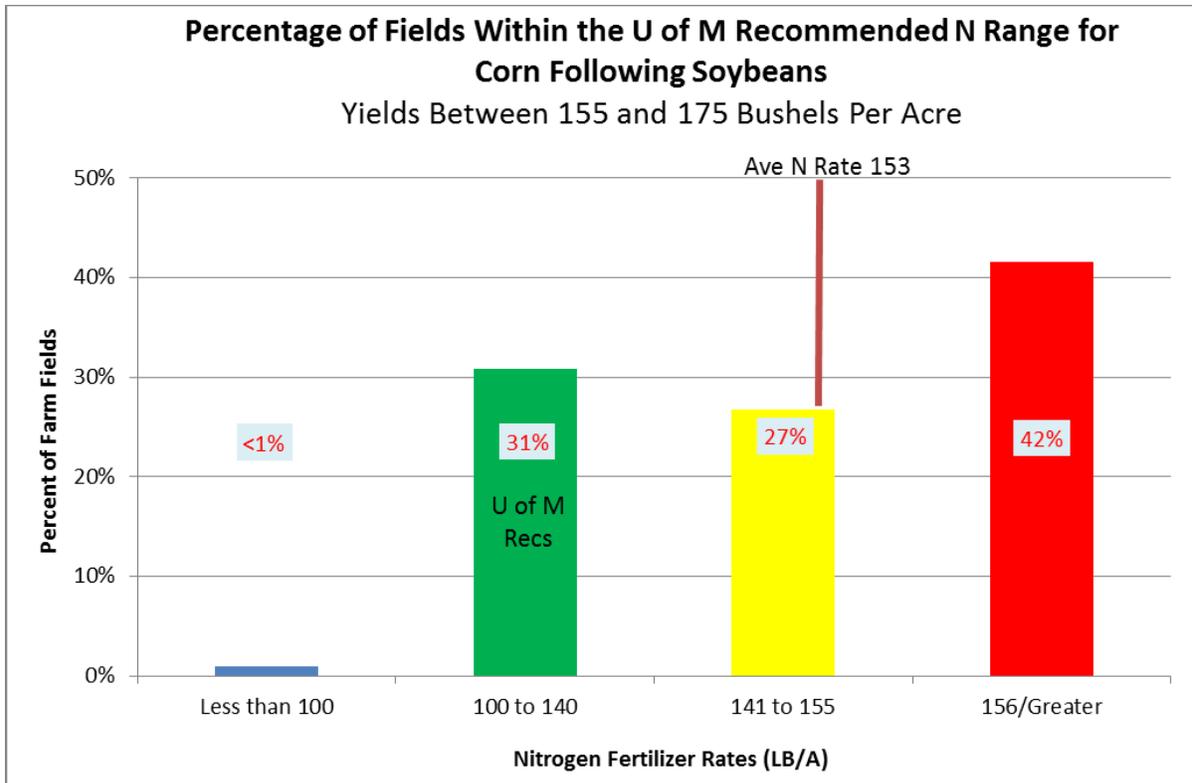


Figure 104. Percentage of fields within the U of M recommended range for corn following soybeans in the SC BMP region in 2010 on all fields yielding between 155 and 175 bushels per acre: 224 fields.

Table 84. Pounds of nitrogen applied per acre to fields and yield of corn following soybeans in SC BMP region for 2010 on fields between 155 and 175 bushels per acre.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	170	167	168	169
Avg N-Rate LB/A	90	131	150	169

Figure 105 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 85 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 105.

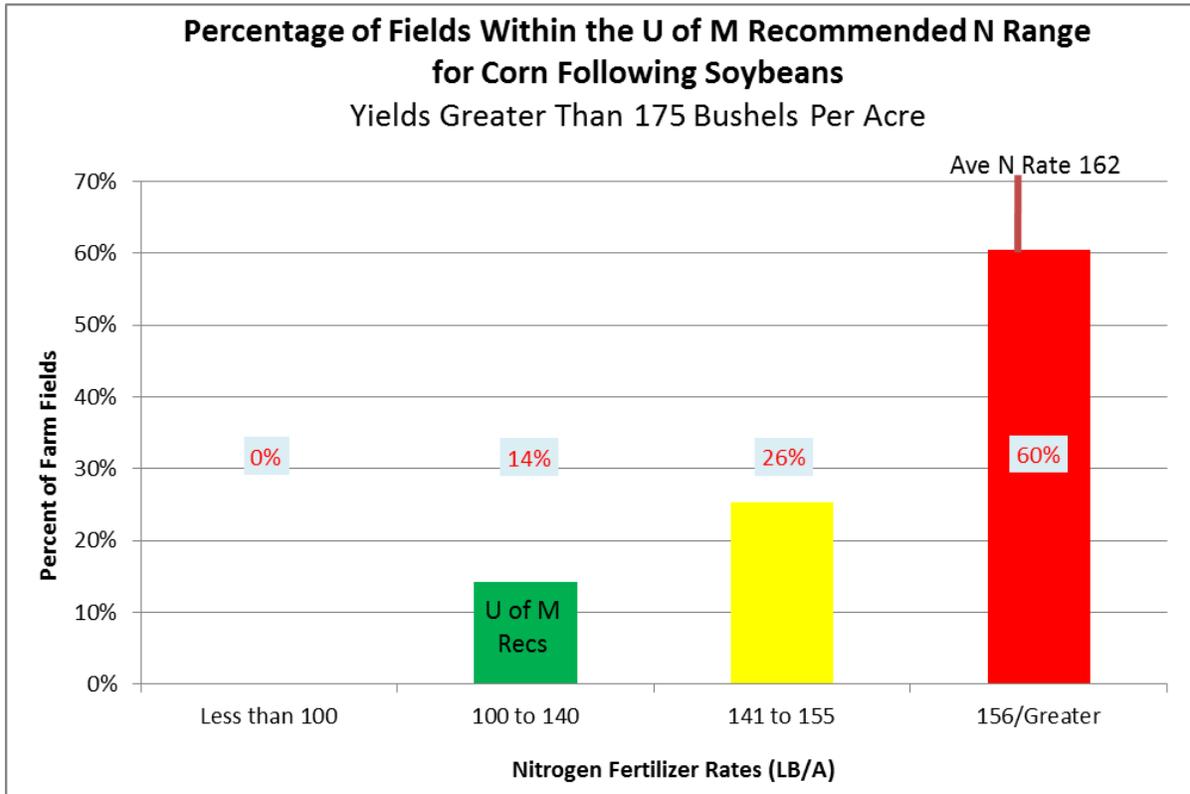


Figure 105. Percentage of fields within the U of M recommended range for corn following soybeans in the SC BMP region in 2010 on all fields yielding greater than 175 bushels per acre: 331 fields.

Table 85. Pounds of nitrogen applied per acre to fields and yield of corn following soybeans in SC BMP region for 2010 on fields greater than 175 bushels per acre.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	No Data	188	188	189
Avg N-Rate LB/A	No Data	132	150	174

Southwestern Region: Corn Following Soybeans

Figure 106 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 86 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 106.

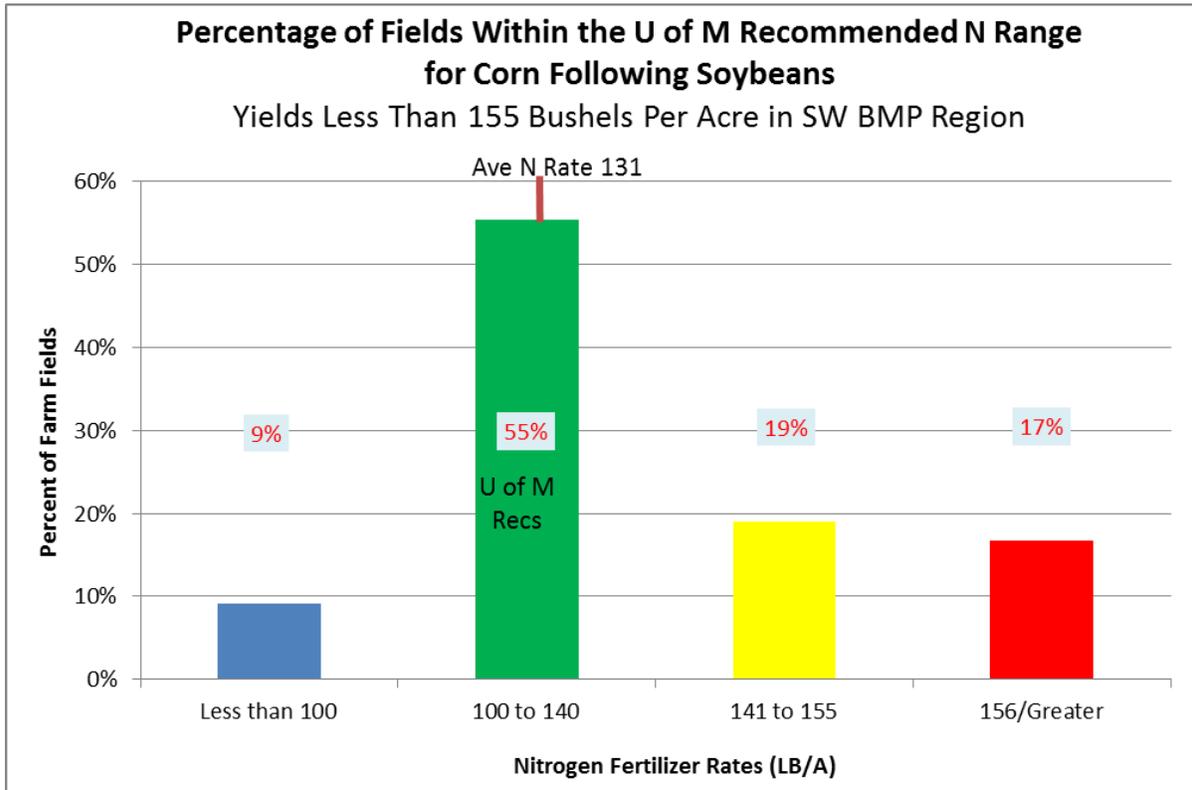


Figure 106. Percentage of fields within the U of M recommended range for corn following soybeans in the SW BMP region in 2010 on all fields yielding less than 155 bushels per acre: 132 fields.

Table 86. Pounds of nitrogen applied per acre to fields and yield of corn following soybeans in SW BMP region for 2010 on fields less than 155 bushels per acre.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	125	139	144	145
Avg N-Rate LB/A	78	123	149	166

Figure 107 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 87 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 107.

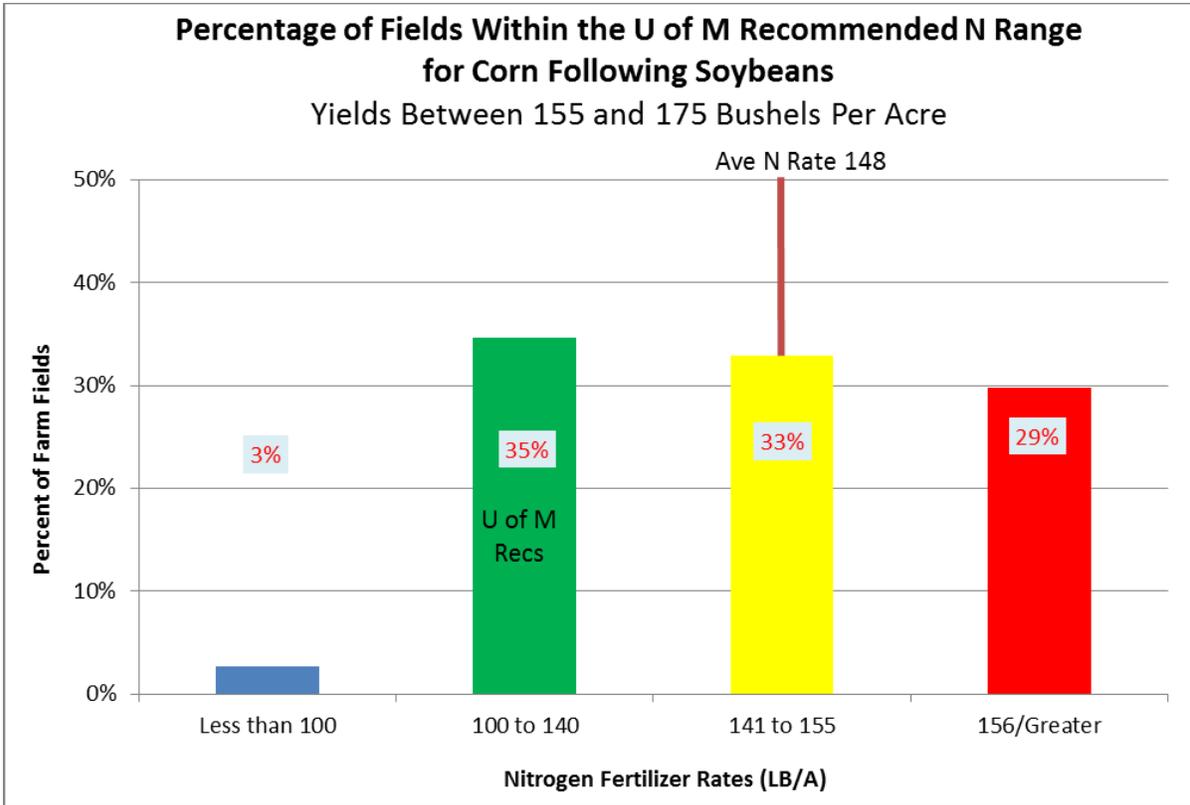


Figure 107. Percentage of fields within the U of M recommended range for corn following soybeans in the SW BMP region in 2010 on all fields yielding between 155 and 175 bushels per acre: 228 fields.

Table 87. Pounds of nitrogen applied per acre to fields and yield of corn following soybeans in SW BMP region for 2010 on fields between 155 and 175 bushels per acre.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	162	166	167	167
Avg N-Rate LB/A	80	131	149	171

Figure 108 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 88 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 108.

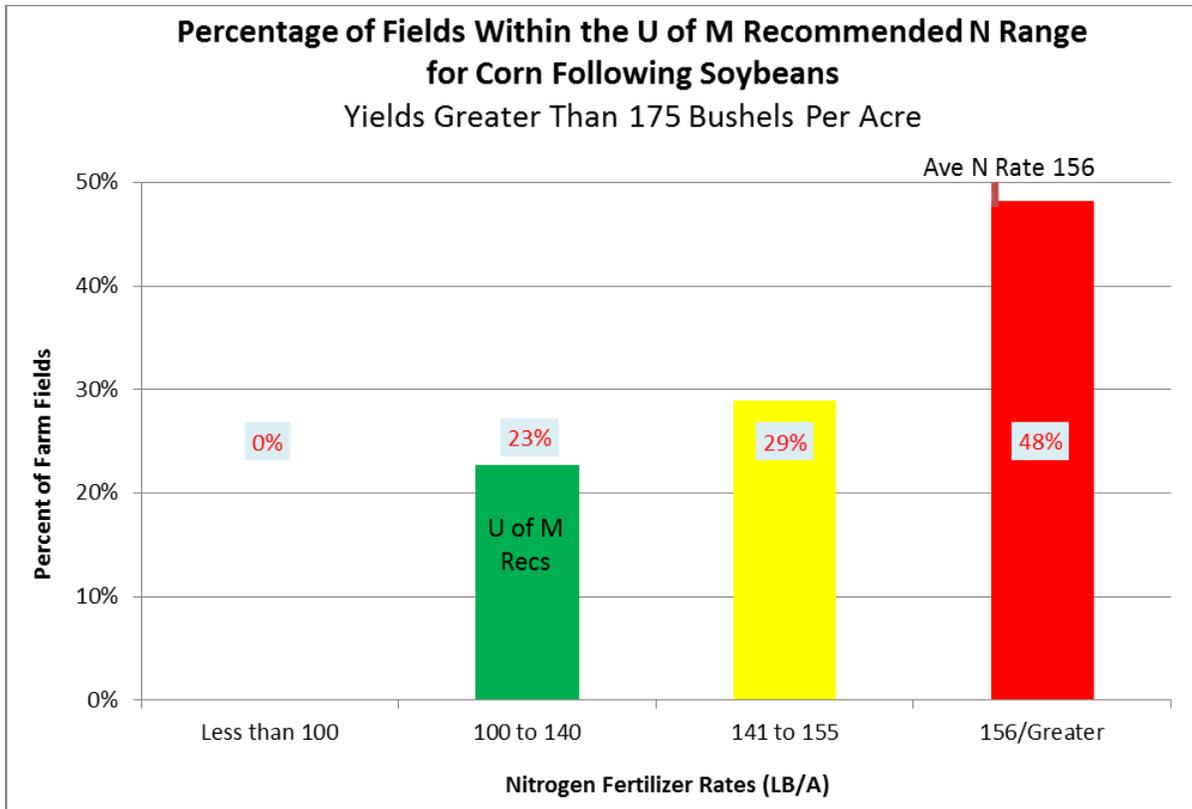


Figure 108. Percentage of fields within the U of M recommended range for corn following soybeans in the SW BMP region in 2010 on all fields yielding greater than 175 bushels per acre: 145 fields.

Table 88. Pounds of nitrogen applied per acre to fields and yield of corn following soybeans in the SW BMP region for 2010 on all fields with greater than 175 bushels per acre.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	No Data	159	169	173
Avg N-Rate LB/A	No Data	128	149	171

Northwestern Region: Corn Following Soybeans

Figure 109 details the distribution of nitrogen fertilizer rates in the NW BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 89 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 109.

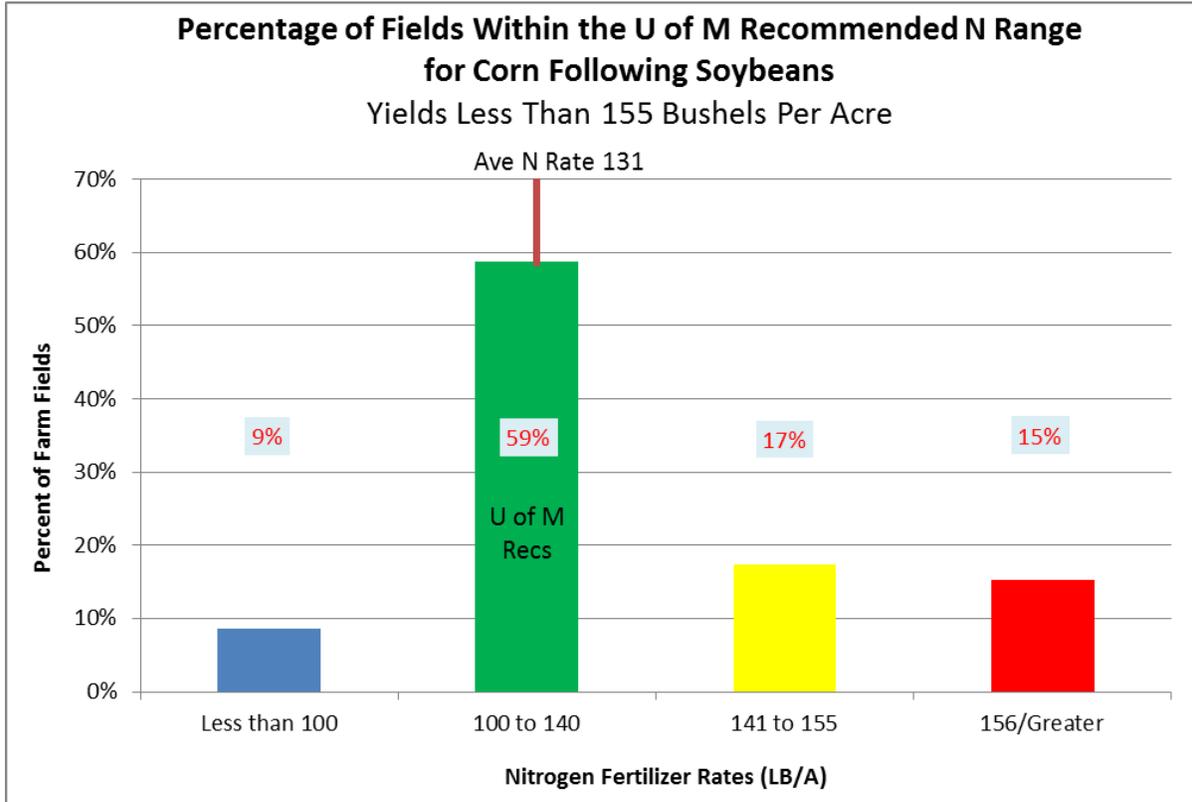


Figure 109. Percentage of fields within the U of M recommended range for corn following soybeans in the NW BMP region in 2010 on all fields yielding less than 155 bushels per acre: 46 fields.

Table 89. Pounds of nitrogen applied per acre to fields and yield of corn following soybeans in the NW BMP region for 2010 on all fields with less than 155 bushels per acre.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	114	135	135	151
Avg N-Rate LB/A	77	126	150	161

Figure 110 details the distribution of nitrogen fertilizer rates in the NW BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 90 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 110.

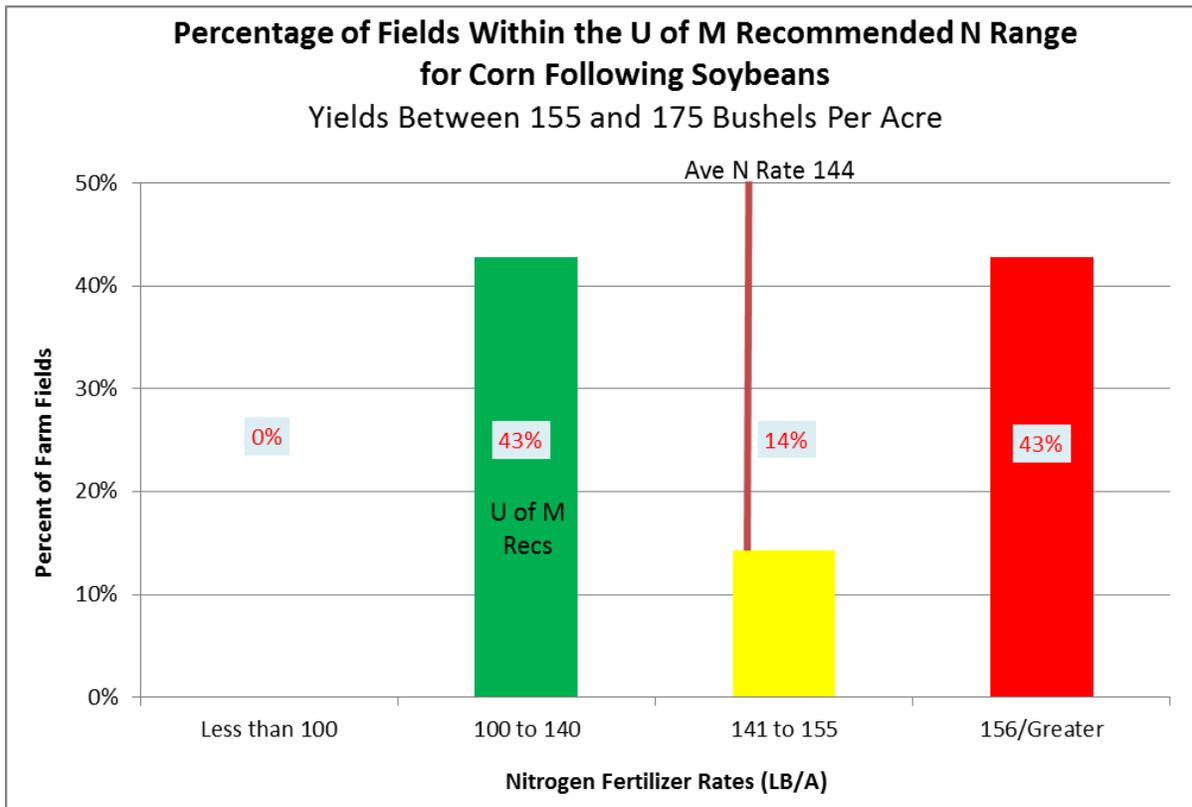


Figure 110. Percentage of fields within the U of M recommended range for corn following soybeans in the NW BMP region in 2010 on all fields yielding between 155 and 175 bushels per acre: 7 fields.

Table 90. Pounds of nitrogen applied per acre to fields and yield of corn following soybeans in the NW BMP region for 2010 on all fields between 155 and 175 bushels per acre.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	No Data	162	160	168
Avg N-Rate LB/A	No Data	128	145	160

Less than five farmers reported planting corn following soybeans in the NW BMP region for fields with yields greater than 175 bushels per acre.

Irrigated and Non-irrigated Sandy Soils Region: Corn Following Soybeans

Figure 111 details the distribution of nitrogen fertilizer rates in the IRR BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 91 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 111.

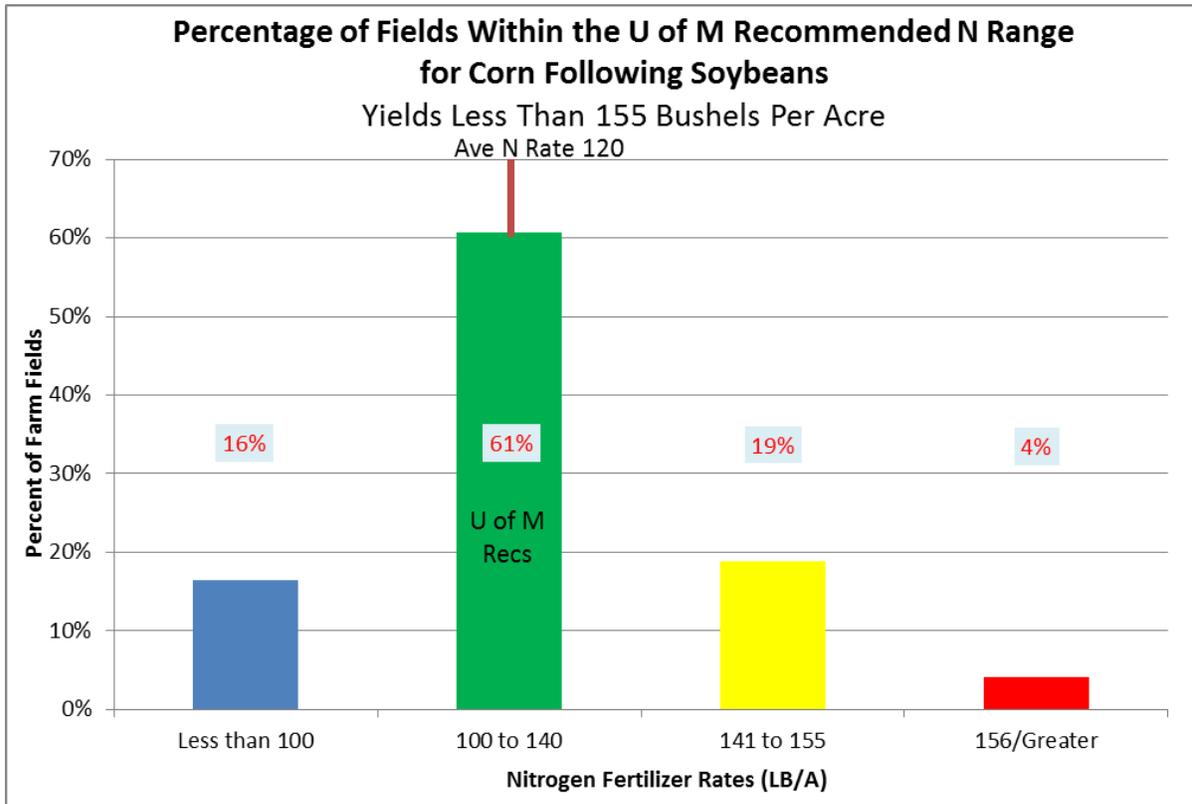


Figure 111. Percentage of fields within the U of M recommended range for corn following soybeans in the IRR BMP region in 2010 on all fields yielding less than 155 bushels per acre: 122 fields.

Table 91. Pounds of nitrogen applied per acre to fields and yield of corn following soybeans in the IRR BMP region for 2010 on all fields with less than 155 bushels per acre.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	101	126	139	150
Avg N-Rate LB/A	75	120	149	162

Figure 112 details the distribution of nitrogen fertilizer rates in the IRR BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 92 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 112.

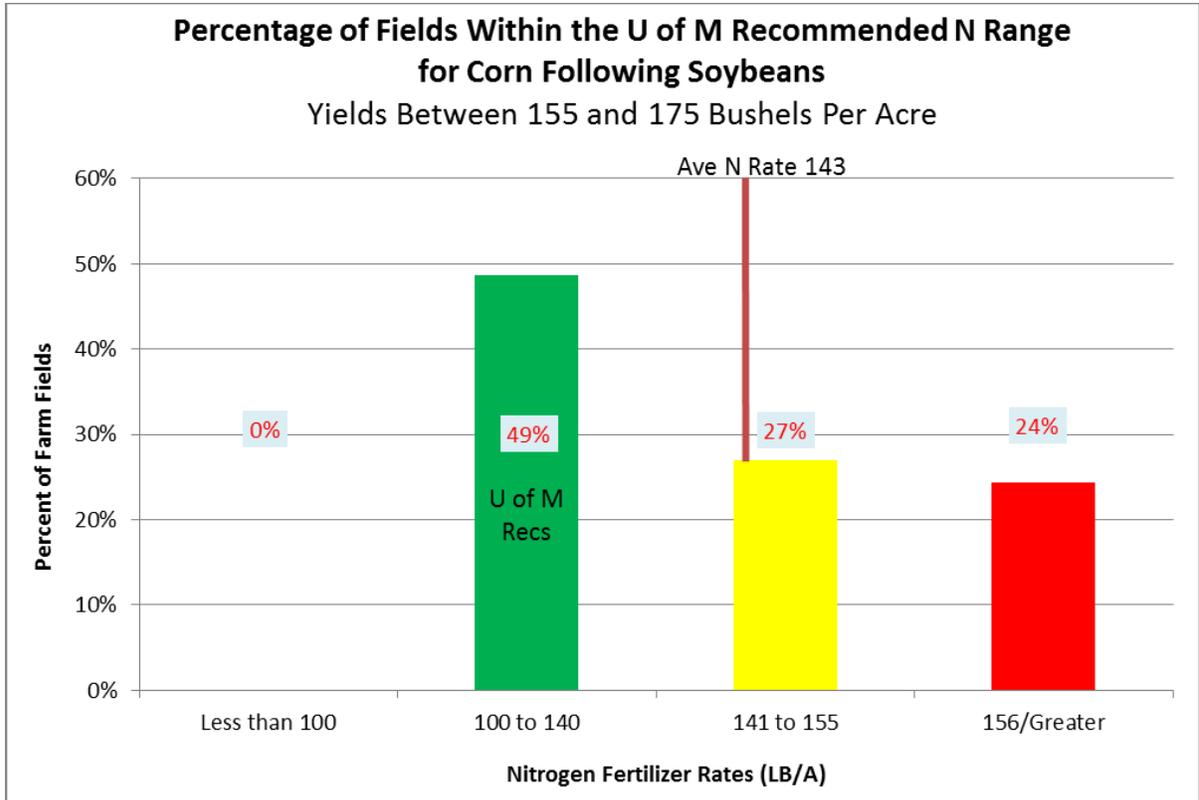


Figure 112. Percentage of fields within the U of M recommended range for corn following soybeans in the IRR BMP region in 2010 on all fields yielding between 155 and 175 bushels per acre: 37 fields.

Table 92. Pounds of nitrogen applied per acre to fields and yield of corn following soybeans in the IRR BMP region for 2010 on all fields between 155 and 175 bushels per acre.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	No Data	165	166	167
Avg N-Rate LB/A	No Data	126	149	172

Figure 113 details the distribution of nitrogen fertilizer rates in the IRR BMP region for corn following soybeans using a “nitrogen to corn price ratio” of 0.05. Table 93 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 113.

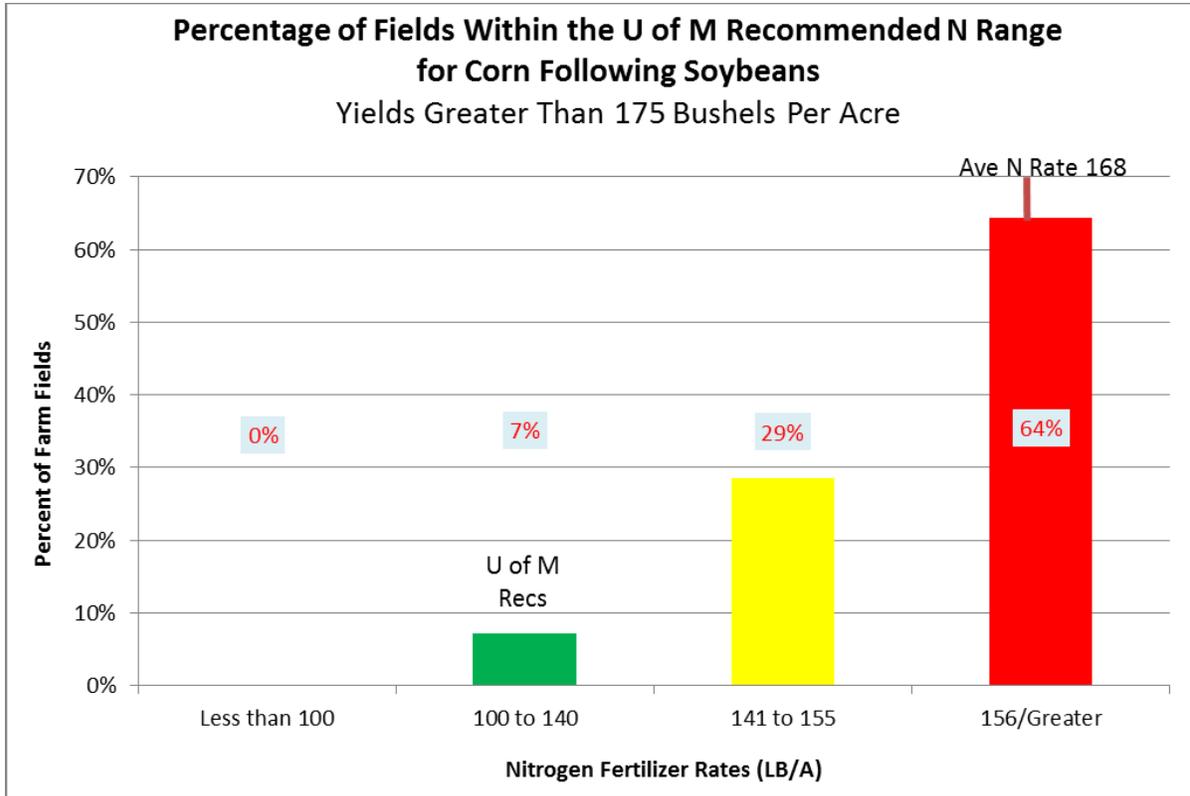


Figure 113. Percentage of fields within the U of M recommended range for corn following soybeans in the IRR BMP region in 2010 on all fields yielding greater than 175 bushels per acre: 14 fields.

Table 93. Pounds of nitrogen applied per acre to fields and yield of corn following soybeans in the IRR BMP region for 2010 on all fields greater than 175 bushels per acre.

N Fertilizer Ranges	<100 LB/A	100-140 LB/A	141-155 LB/A	156/Greater LB/A
Bu./Acre	No Data	190	185	196
Avg N-Rate LB/A	No Data	130	149	180

Statewide: Corn Following Corn

Figure 114 details the distribution of nitrogen fertilizer rates across Minnesota for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 94 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 114.

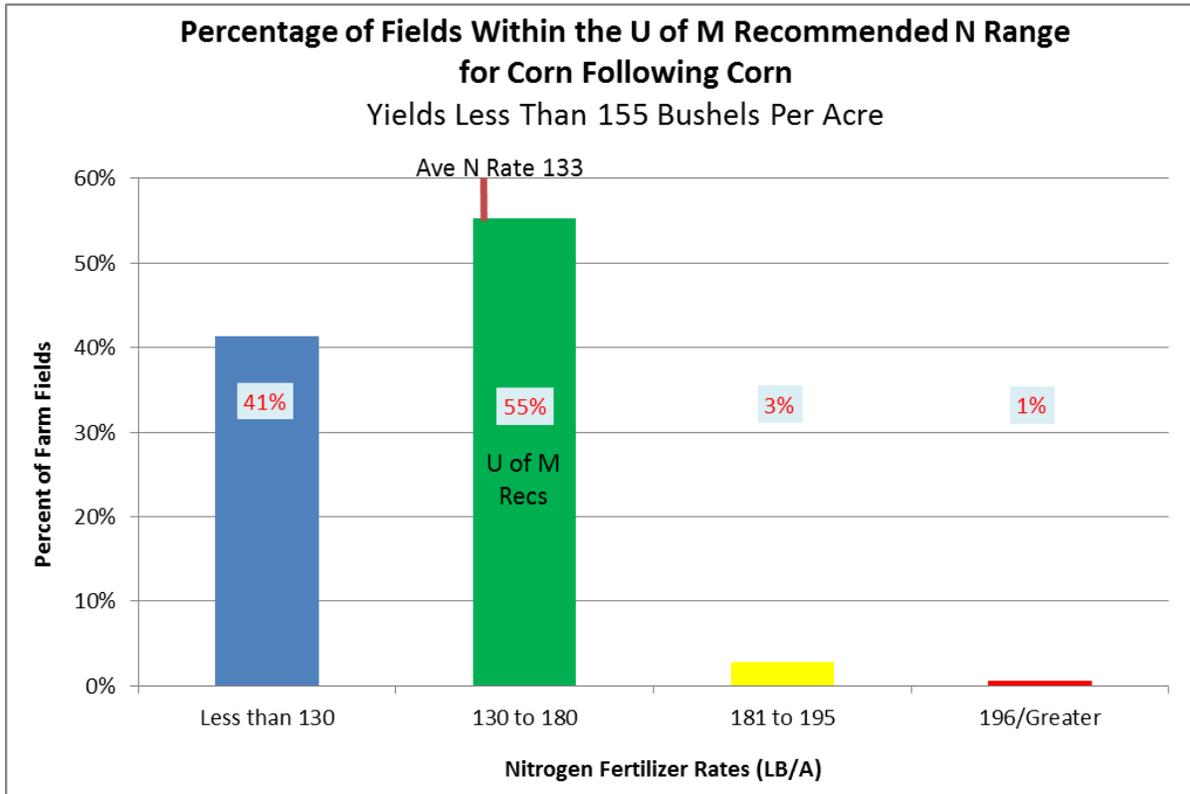


Figure 114. Percentage of fields within the U of M recommended range for corn following corn across Minnesota in 2010 on all fields yielding less than 155 bushels per acre: 179 fields.

Table 94. Pounds of nitrogen applied per acre to fields and yield of corn following corn in Minnesota for 2010 on all fields with less than 155 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	116	139	147	140
Avg N-Rate LB/A	101	152	189	236

Figure 115 details the distribution of nitrogen fertilizer rates across Minnesota for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 95 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 115.

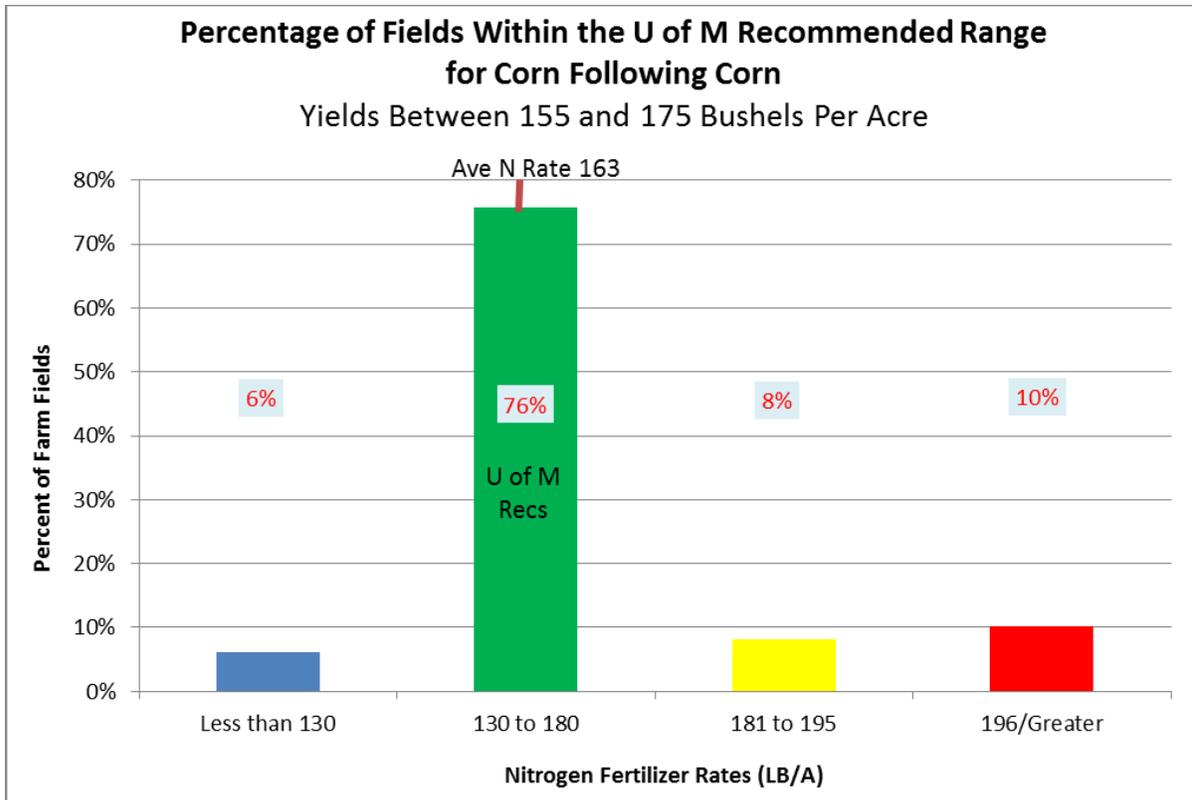


Figure 115. Percentage of fields within the U of M recommended range for corn following corn across Minnesota in 2010 on all fields yielding between 155 and 175 bushels per acre: 198 fields.

Table 95. Pounds of nitrogen applied per acre to fields and yield of corn following corn in Minnesota for 2010 on all fields between 155 and 175 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	166	168	170	169
Avg N-Rate LB/A	115	158	187	207

Figure 116 details the distribution of nitrogen fertilizer rates across Minnesota for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 96 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 116.

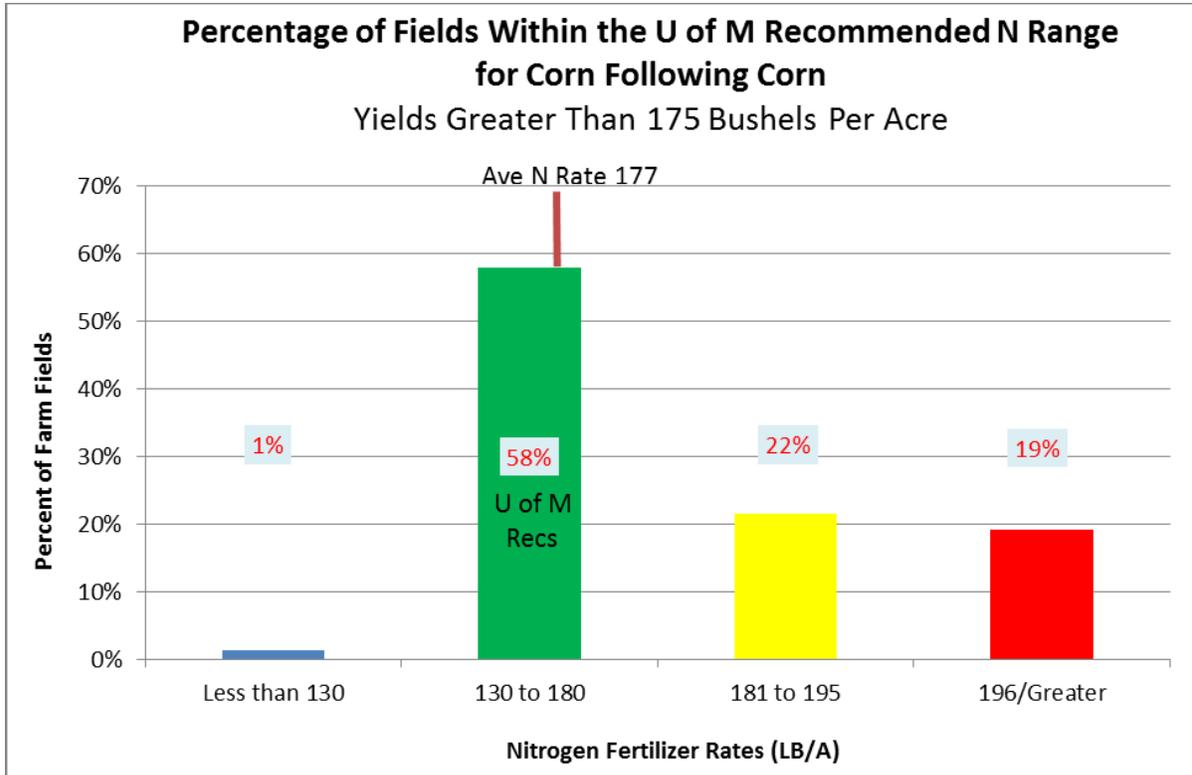


Figure 116. Percentage of fields within the U of M recommended range for corn following corn across Minnesota in 2010 on all fields yielding greater than 175 bushels per acre: 288 fields.

Table 96. Pounds of nitrogen applied per acre to fields and yield of corn following corn in Minnesota for 2010 on all fields greater than 175 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	184	188	191	192
Avg N-Rate LB/A	120	165	188	206

Southeastern Region: Corn Following Corn

Figure 117 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 97 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 117.

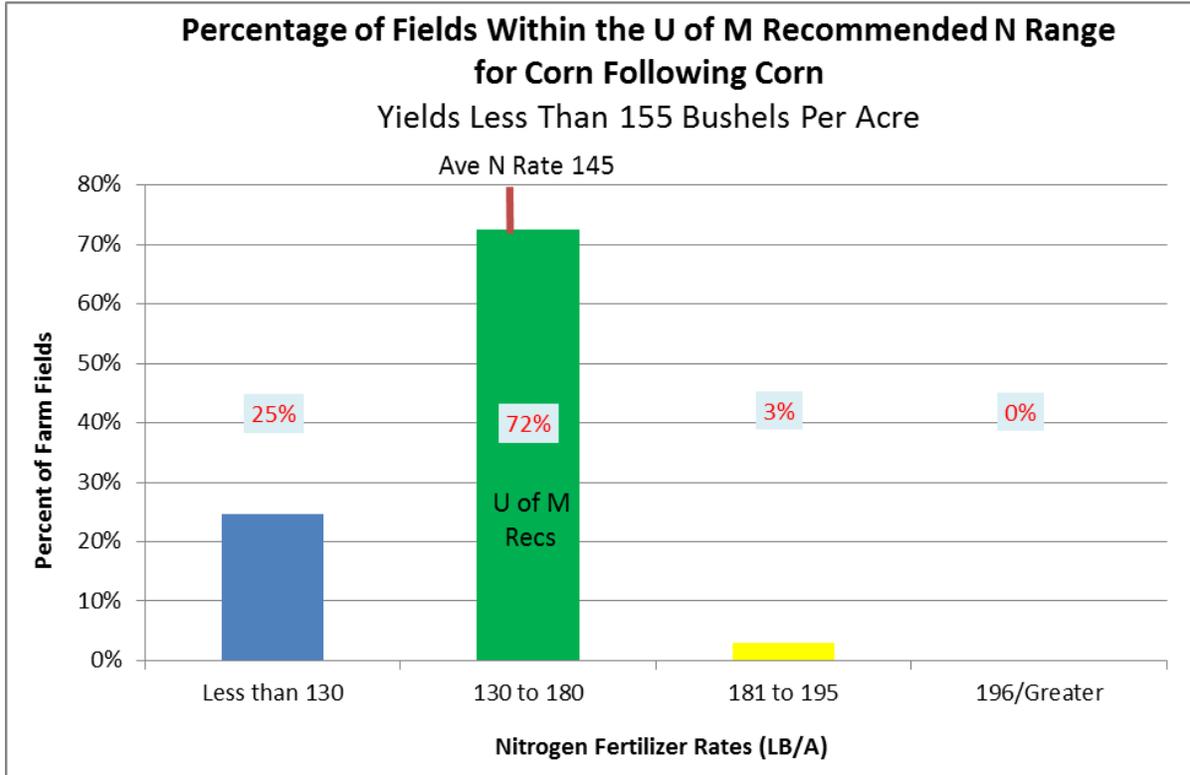


Figure 117. Percentage of fields within the U of M recommended range for corn following corn in the SE BMP region in 2010 on all fields yielding less than 155 bushels per acre: 69 fields.

Table 97. Pounds of nitrogen applied per acre to fields and yield of corn following corn SE BMP for 2010 on all fields less than 155 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	128	111	148	No Data
Avg N-Rate LB/A	142	156	190	No Data

Figure 118 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 98 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 118.

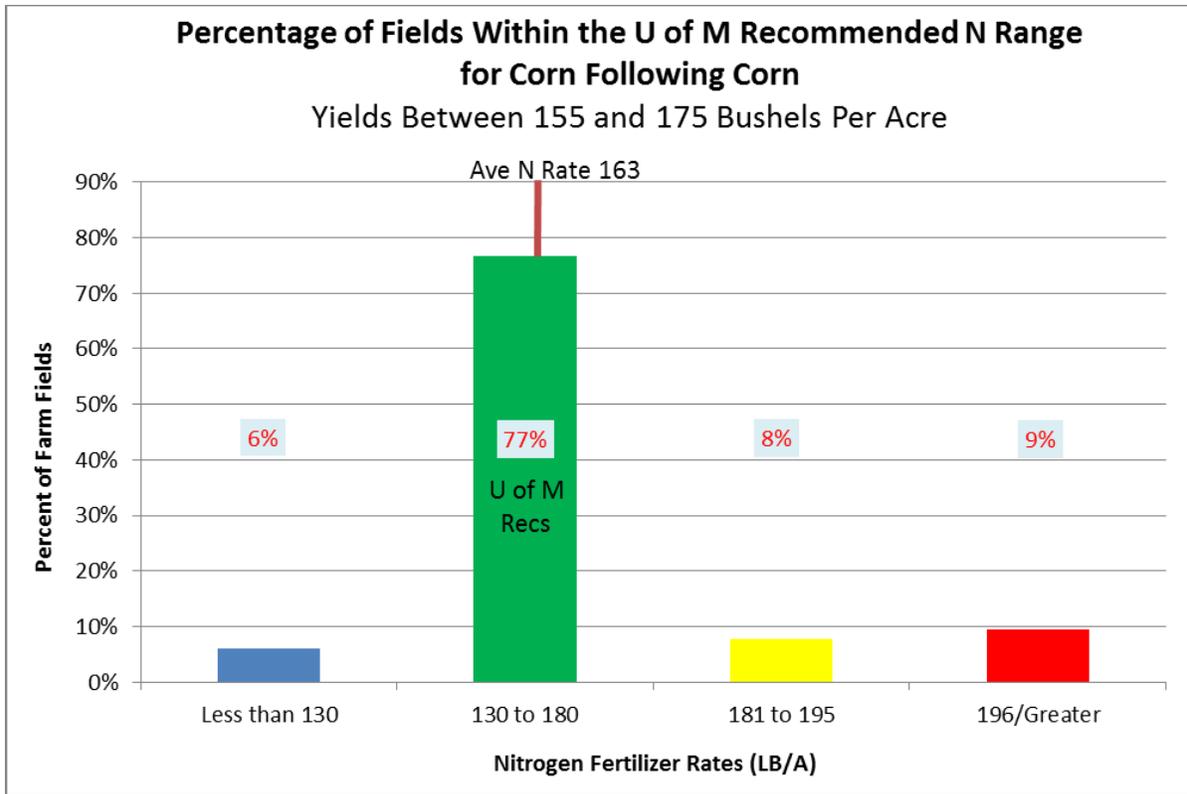


Figure 118. Percentage of fields within the U of M recommended range for corn following corn in the SE BMP region in 2010 on all fields yielding between 155 and 175 bushels per acre: 116 fields.

Table 98. Pounds of nitrogen applied per acre to fields and yield of corn following corn SE BMP for 2010 on all fields between 155 and 175 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	164	168	168	169
Avg N-Rate LB/A	115	158	186	210

Figure 119 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 99 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 119.

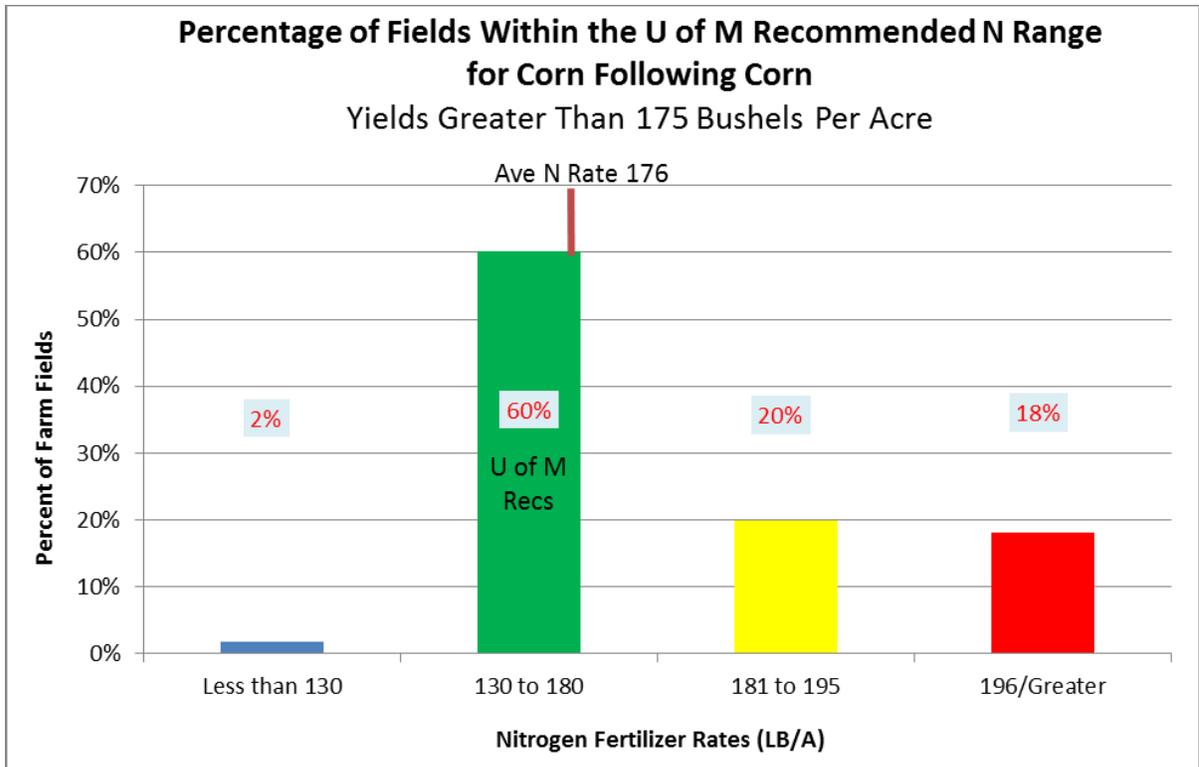


Figure 119. Percentage of fields within the U of M recommended range for corn following corn in the SE BMP region in 2010 on all fields yielding greater than 175 bushels per acre: 176 fields.

Table 99. Pounds of nitrogen applied per acre to fields and yield of corn following corn SE BMP for 2010 on all fields greater than 175 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	185	185	191	189
Avg N-Rate LB/A	120	164	188	207

South Central Region: Corn Following Corn

Figure 120 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 100 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 120.

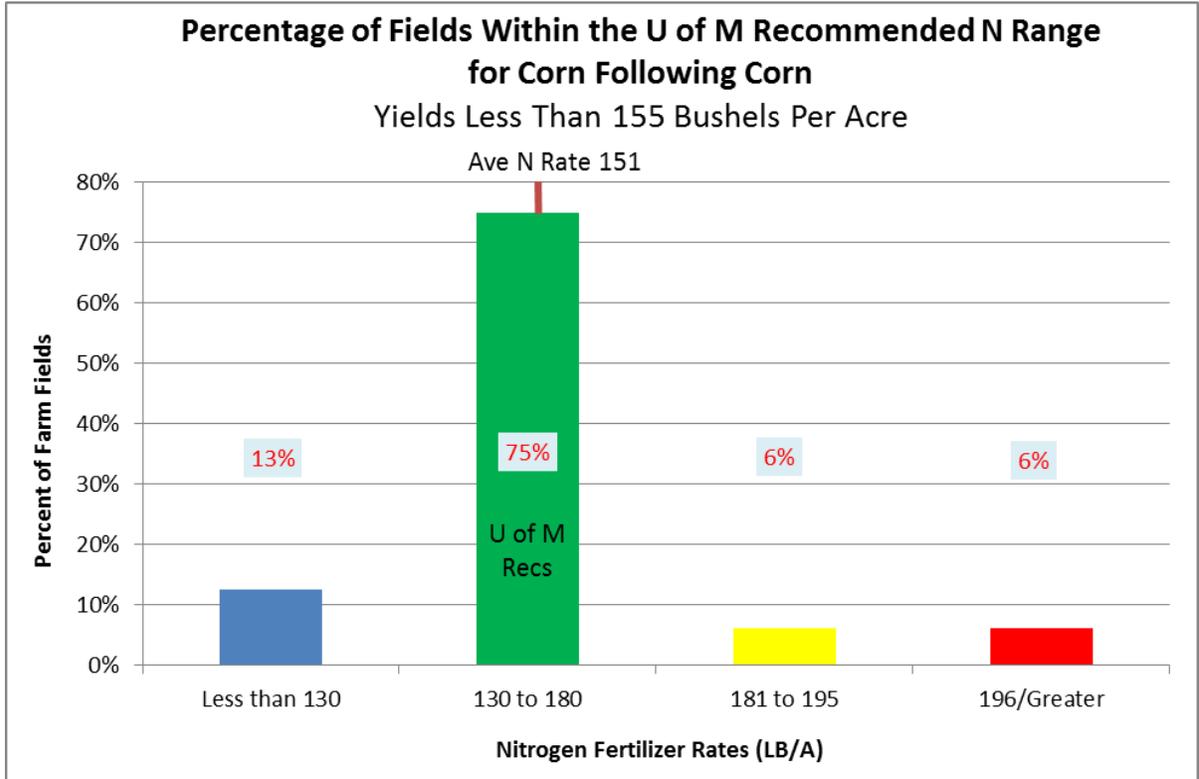


Figure 120. Percentage of fields within the U of M recommended range for corn following corn in the SC BMP region in 2010 on all fields yielding less than 155 bushels per acre: 16 fields.

Table 100. Pounds of nitrogen applied per acre to fields and yield of corn following corn SC BMP region for 2010 on all fields less than 155 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	150	138	150	140
Avg N-Rate LB/A	125	146	185	236

Figure 121 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 101 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 121.

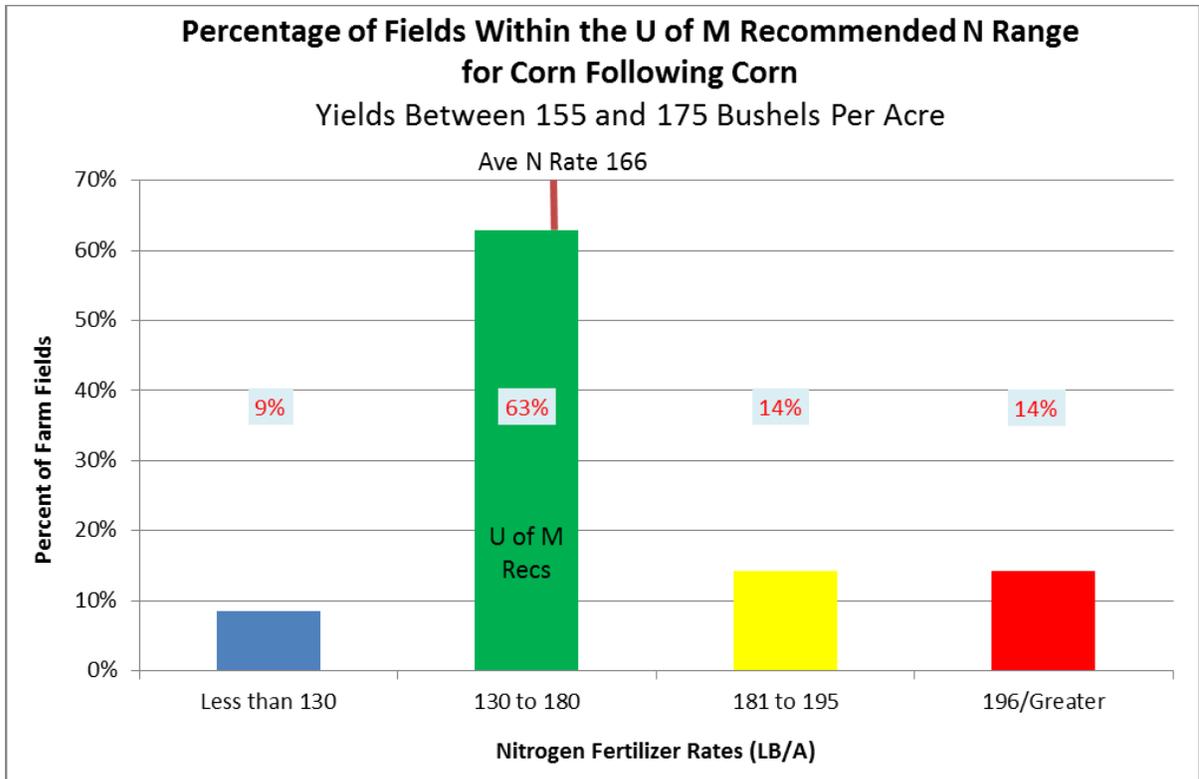


Figure 121. Percentage of fields within the U of M recommended range for corn following corn in the SC BMP region in 2010 on all fields yielding between 155 and 175 bushels per acre: 35 fields.

Table 101. Pounds of nitrogen applied per acre to fields and yield of corn following corn SC BMP region for 2010 on all fields between 155 and 175 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Yield	168	167	171	167
Avg N-Rate LB/A	123	159	189	201

Figure 122 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 102 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 122.

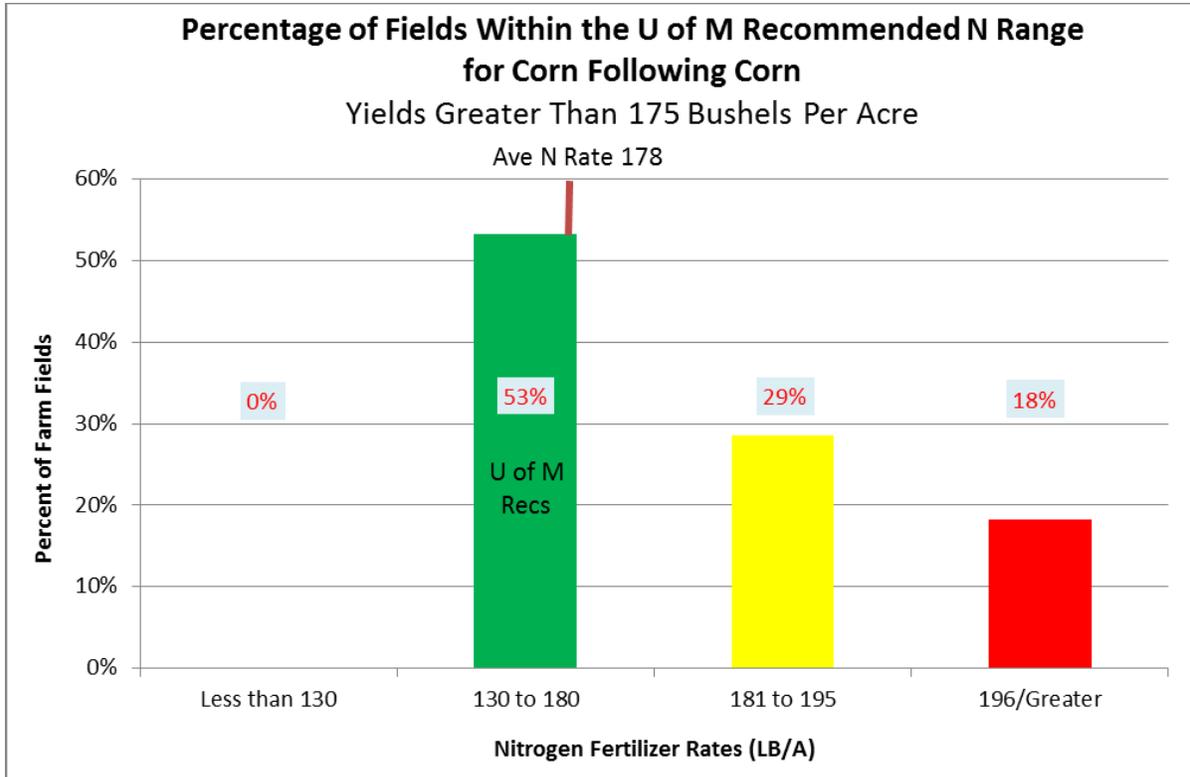


Figure 122. Percentage of fields within the U of M recommended range for corn following corn in the SC BMP region in 2010 on all fields yielding greater than 175 bushels per acre: 77 fields.

Table 102. Pounds of nitrogen applied per acre to fields and yield of corn following corn SC BMP region for 2010 on all fields greater than 175 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	No Data	188	191	199
Avg N-Rate LB/A	No Data	164	187	207

Southwestern Region: Corn Following Corn

Figure 123 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 103 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 123.

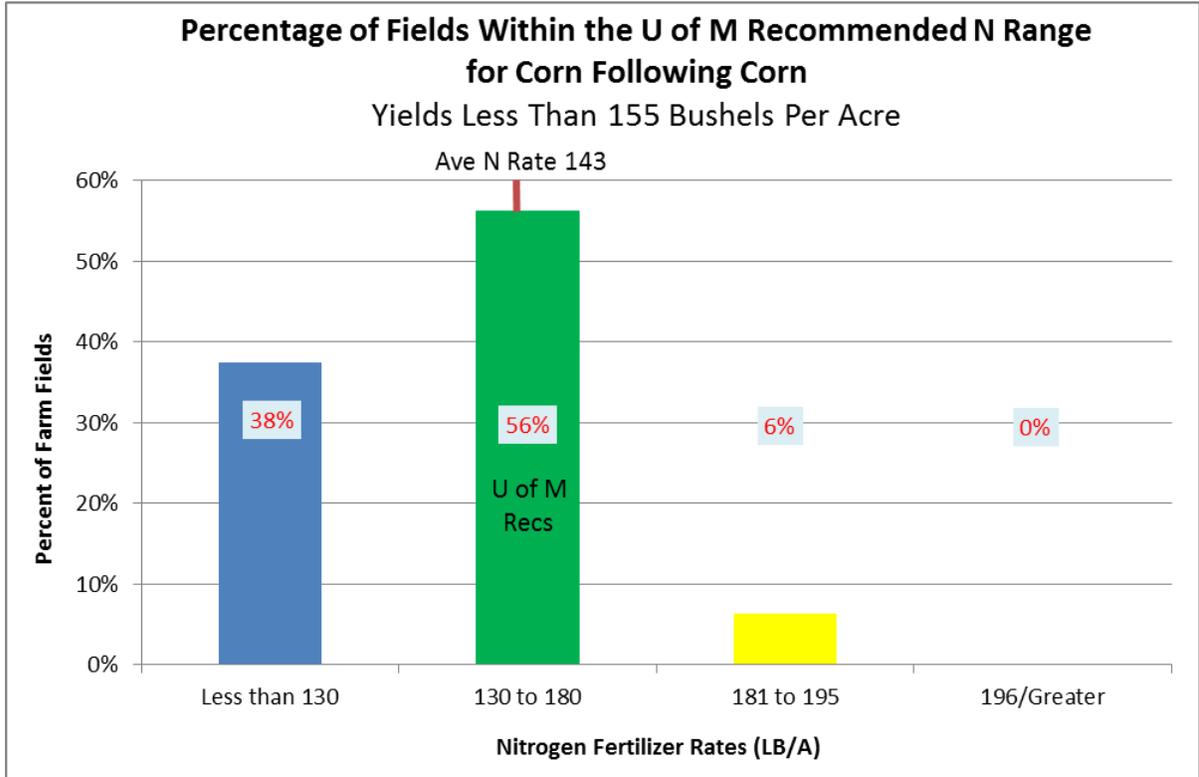


Figure 123. Percentage of fields within the U of M recommended range for corn following corn in the SW BMP region in 2010 on all fields yielding less than 155 bushels per acre: 16 fields.

Table 103. Pounds of nitrogen applied per acre to fields and yield of corn following corn SW BMP region for 2010 on all fields less than 155 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	122	147	140	No Data
Avg N-Rate LB/A	110	159	191	No Data

Figure 124 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 104 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 124.

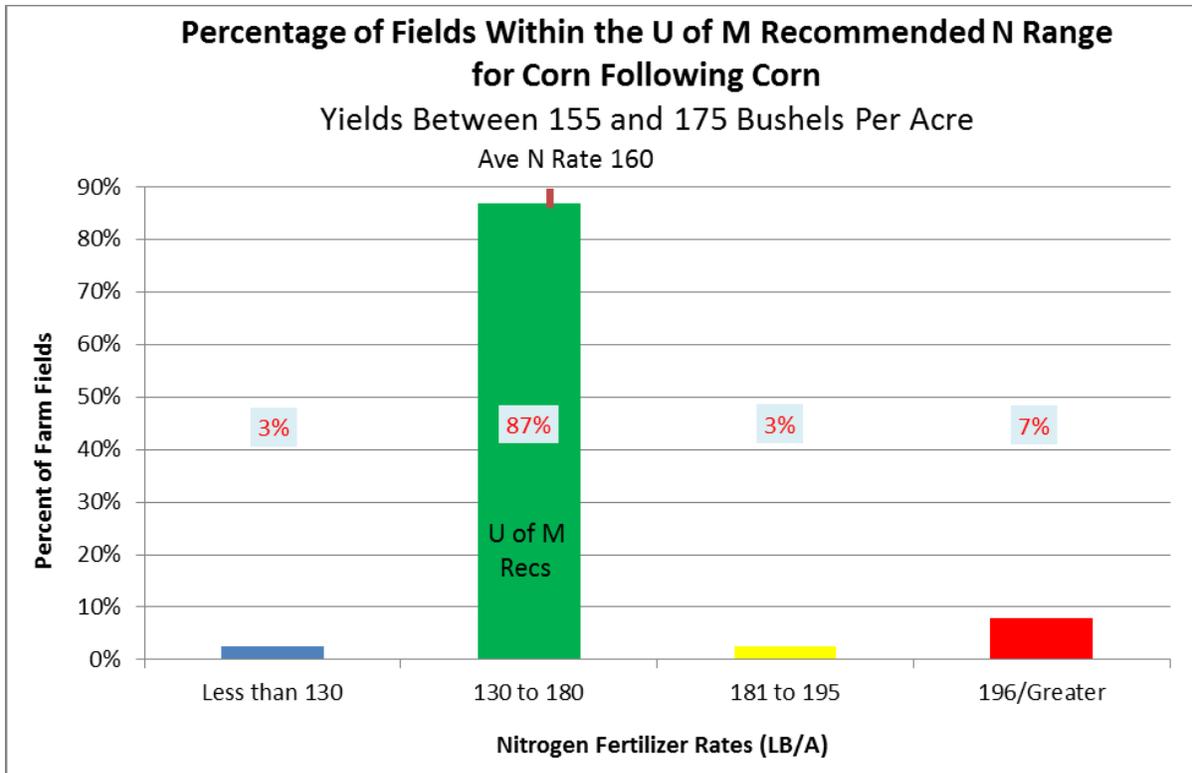


Figure 124. Percentage of fields within the U of M recommended range for corn following corn in the SW BMP region in 2010 on all fields yielding between 155 and 175 bushels per acre: 38 fields.

Table 104. Pounds of nitrogen applied per acre to fields and yield of corn following corn SW BMP region for 2010 on all fields between 155 and 175 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	175	166	175	172
Avg N-Rate LB/A	110	157	183	207

Figure 125 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 105 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 125.

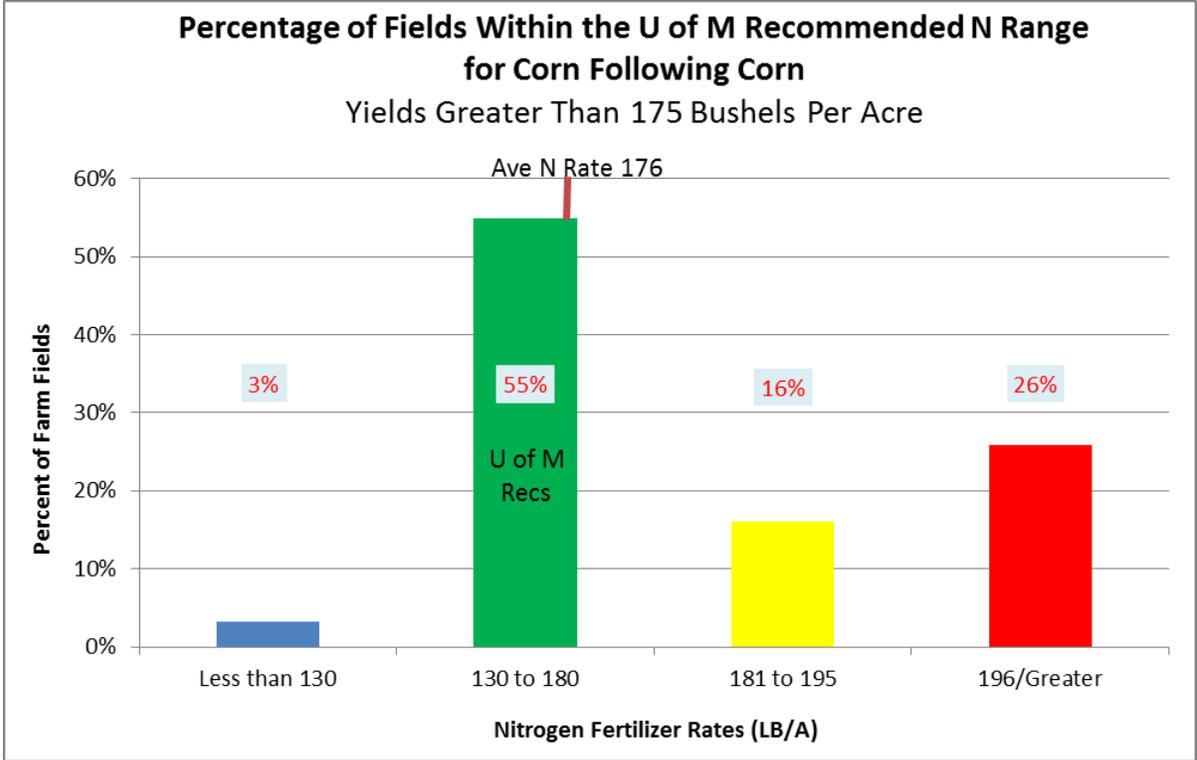


Figure 125. Percentage of fields within the U of M recommended range for corn following corn in the SW BMP region in 2010 on all fields yielding greater than 175 bushels per acre: 31 fields.

Table 105. Pounds of nitrogen applied per acre to fields and yield of corn following corn SW BMP region for 2010 on all fields greater than 175 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	180	183	188	189
Avg N-Rate LB/A	120	162	188	203

Northwestern Region: Corn Following Corn

Less than five farmers reported planting corn following corn in the NW BMP region for fields with yields less than 155 bushels per acre.

Less than five farmers reported planting corn following corn in the NW BMP region for fields with yields between 155 and 175 bushels per acre.

Less than five farmers reported planting corn following corn in the NW BMP region for fields with yields greater than 175 bushels per acre.

Irrigated and Non-irrigated Sandy Soils Region: Corn Following Corn

Figure 126 details the distribution of nitrogen fertilizer rates in the IRR BMP region for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 106 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 126.

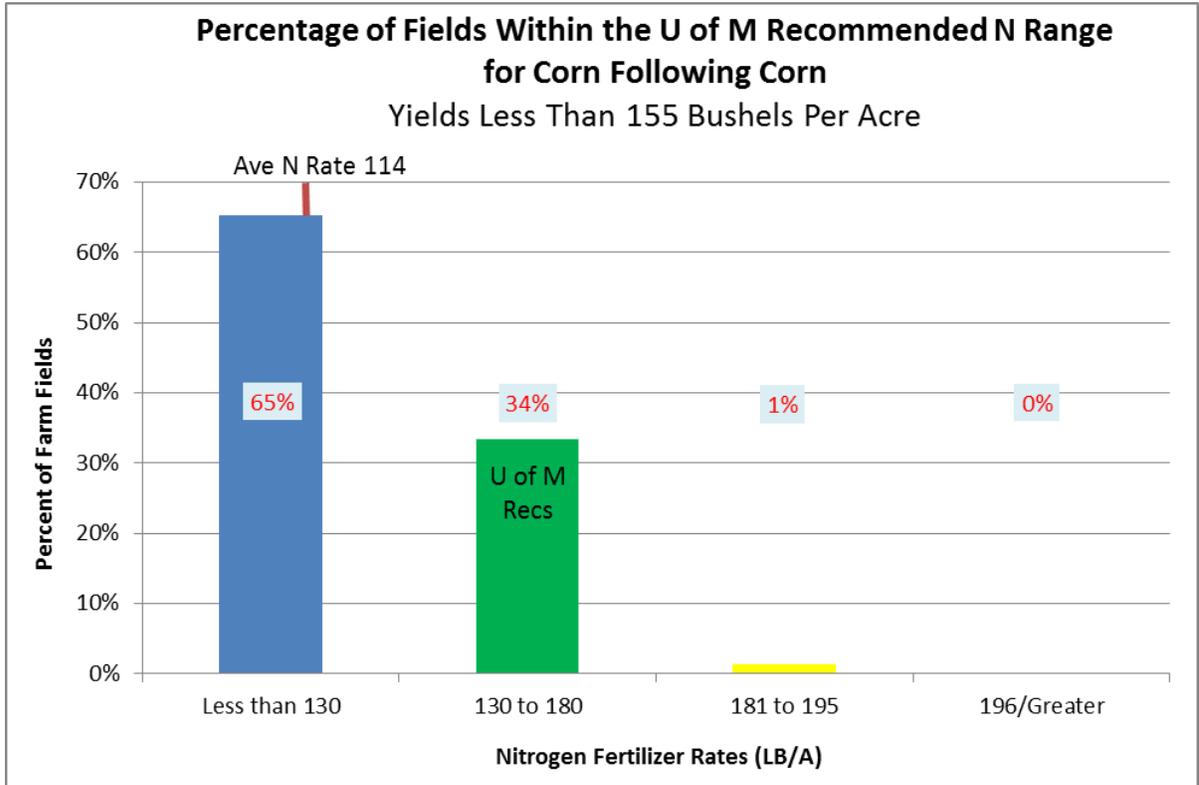


Figure 126. Percentage of fields within the U of M recommended range for corn following corn in the IRR BMP region in 2010 on all fields yielding less than 155 bushels per acre: 75 fields.

Table 106. Pounds of nitrogen applied per acre to fields and yield of corn following corn IRR BMP region for 2010 on all fields less than 155 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	110	131	150	No Data
Avg N-Rate LB/A	96	164	190	No Data

Figure 127 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 107 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 127.

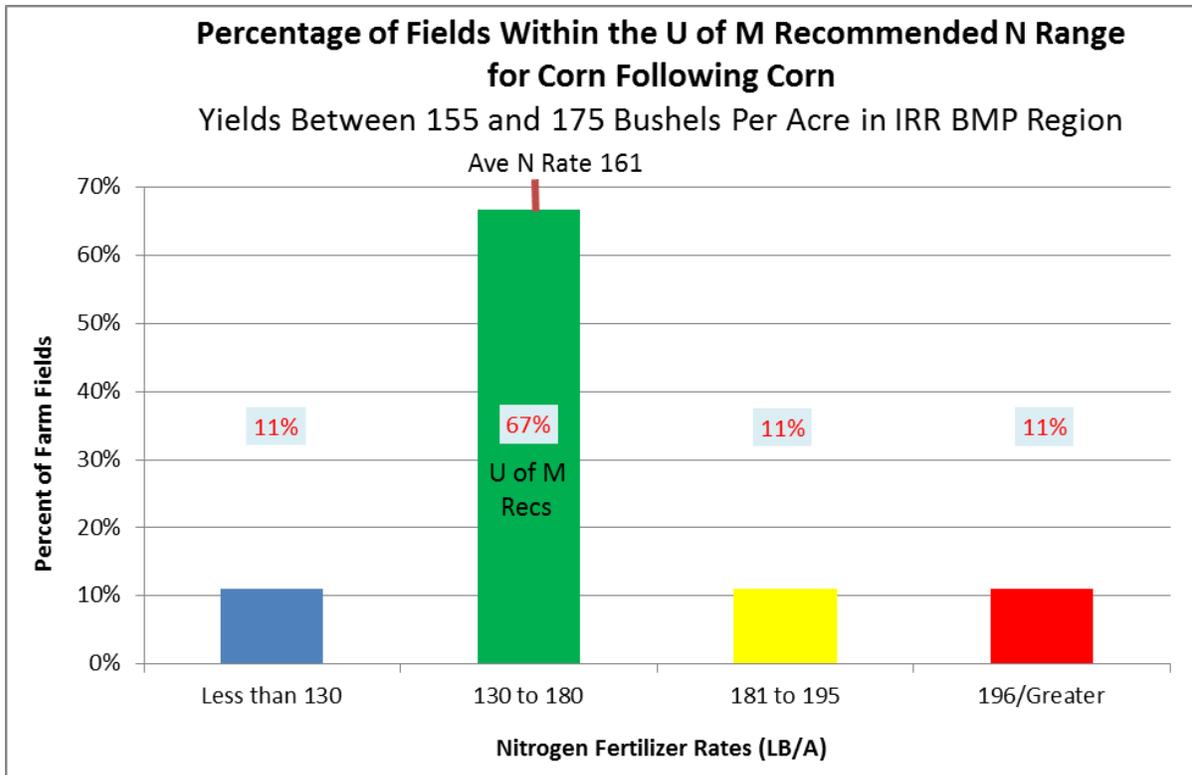


Figure 127. Percentage of fields within the U of M recommended range for corn following corn in the IRR BMP region in 2010 on all fields yielding between 155 and 175 bushels per acre: 9 fields.

Table 107. Pounds of nitrogen applied per acre to fields and yield of corn following corn IRR BMP region for 2010 on all fields between 155 and 175 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	165	165	170	175
Avg N-Rate LB/A	100	159	190	210

Less than five farmers reported planting corn following corn in the IRR BMP region for fields with yields greater than 175 bushels per acre.

Statewide: Corn Following Corn Following Alfalfa

Figure 128 details the distribution of nitrogen fertilizer rates across Minnesota for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 108 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 128.

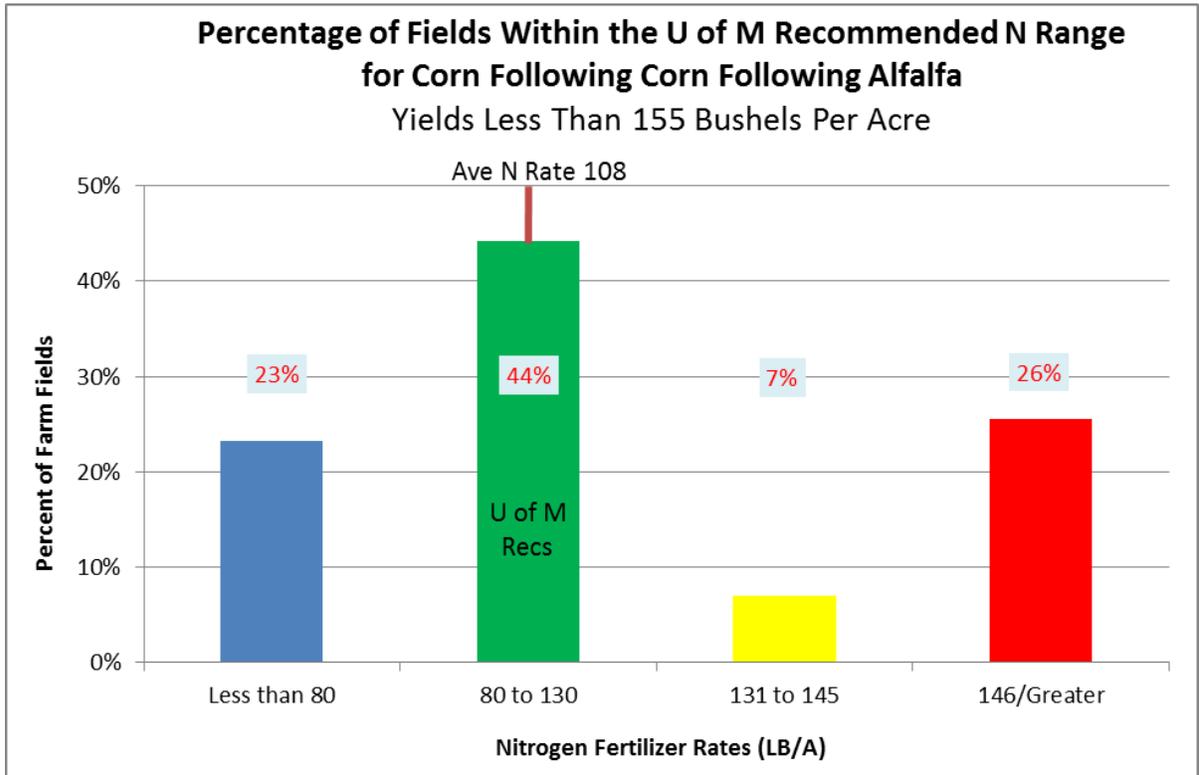


Figure 128. Percentage of fields within the U of M recommended range for corn following corn following alfalfa across Minnesota in 2010 on all fields yielding less than 155 bushels per acre: 43 fields.

Table 108. Pounds of nitrogen applied per acre to fields and yield of corn following corn following alfalfa in Minnesota for 2010 on all fields less than 155 bushels per acre.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	110	138	145	145
Avg N-Rate LB/A	43	109	138	162

Figure 129 details the distribution of nitrogen fertilizer rates across Minnesota for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 109 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 129.

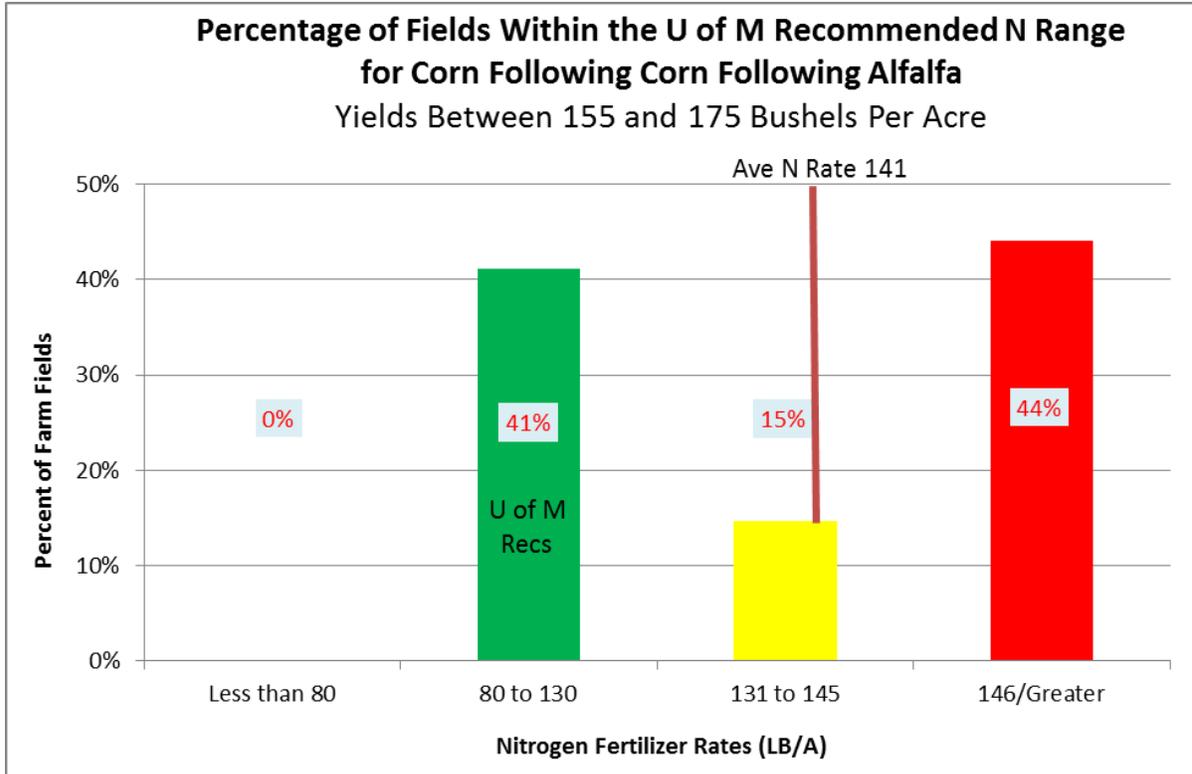


Figure 129. Percentage of fields within the U of M recommended range for corn following corn following alfalfa across Minnesota in 2010 on all fields yielding between 155 and 175 bushels per acre: 34 fields.

Table 109. Pounds of nitrogen applied per acre to fields and yield of corn following corn following alfalfa in Minnesota for 2010 on all fields between 155 and 175 bushels per acre.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	No Data	166	170	167
Avg N-Rate LB/A	No Data	113	137	169

Figure 130 details the distribution of nitrogen fertilizer rates across Minnesota for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 110 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 130.

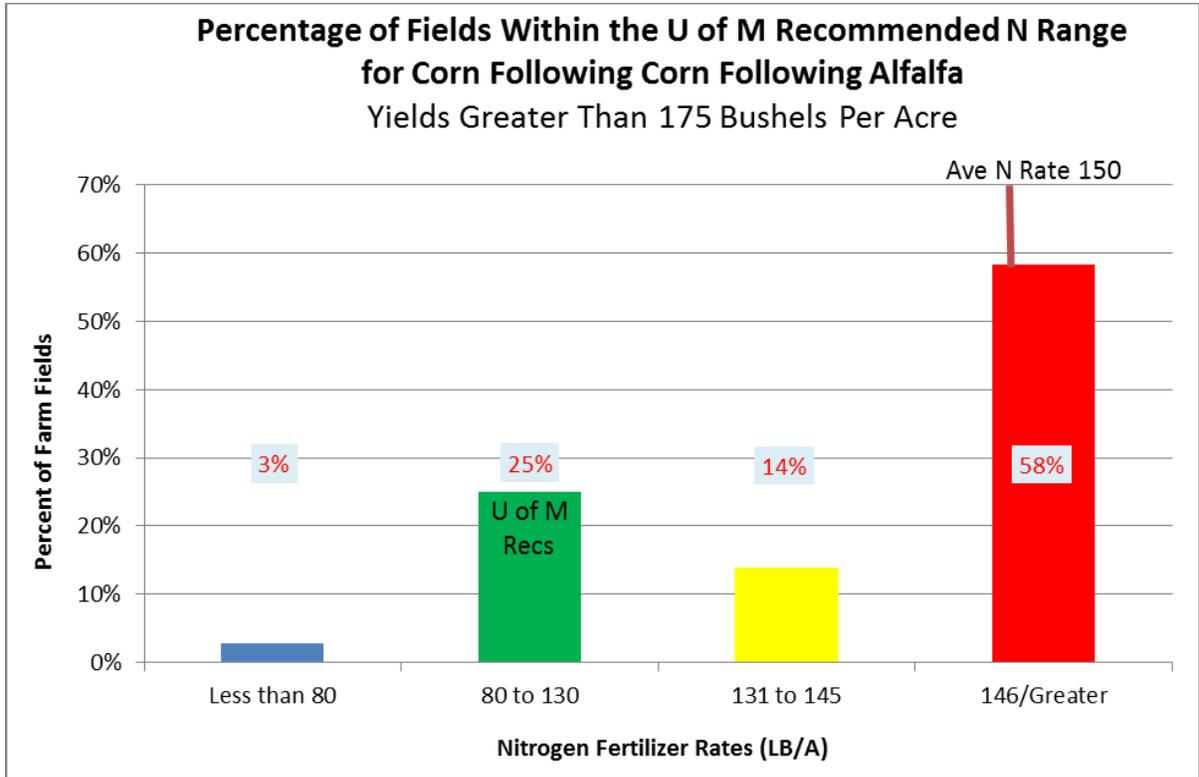


Figure 130. Percentage of fields within the U of M recommended range for corn following corn following alfalfa across Minnesota in 2010 on all fields yielding greater than 175 bushels per acre: 36 fields.

Table 110. Pounds of nitrogen applied per acre to fields and yield of corn following corn following alfalfa in Minnesota for 2010 on all fields greater than 175 bushels per acre.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	180	184	185	189
Avg N-Rate LB/A	75	117	138	170

Southeastern Region: Corn Following Corn Following Alfalfa

Figure 131 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 111 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 131.

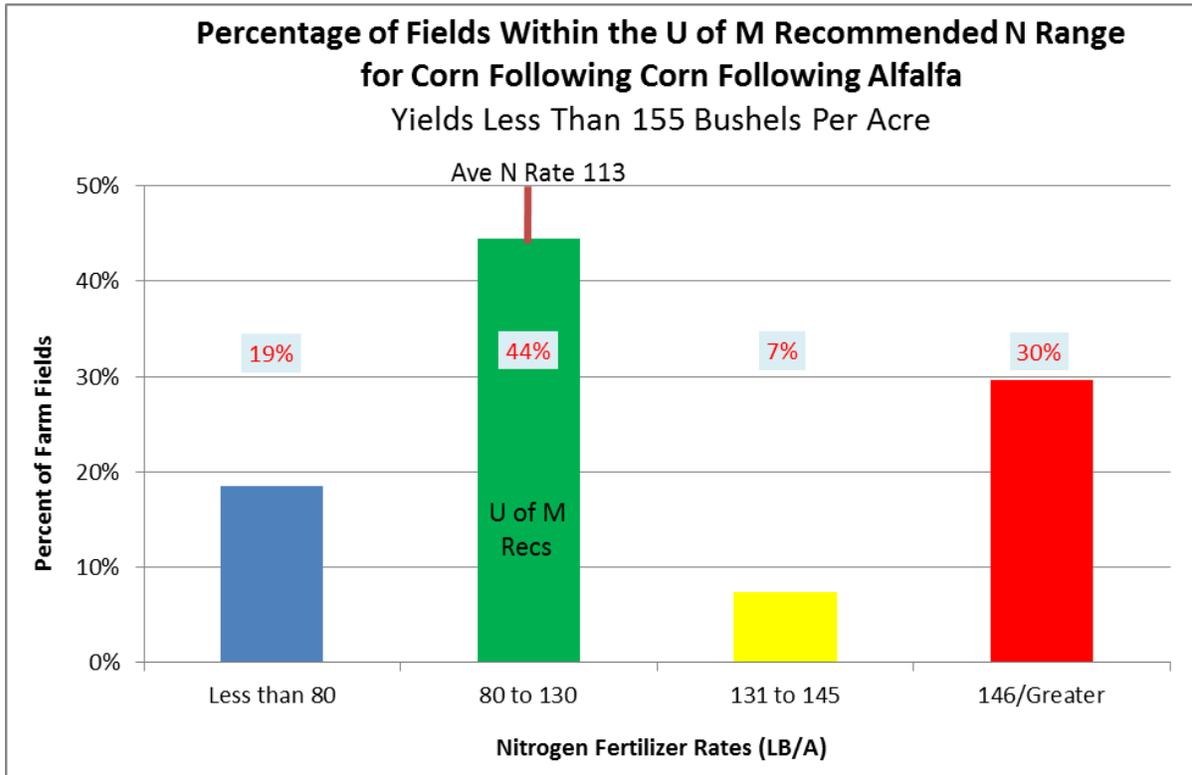


Figure 131. Percentage of fields within the U of M recommended range for corn following corn following alfalfa in the SE BMP region in 2010 on all fields yielding less than 155 bushels per acre: 27 fields.

Table 111. Pounds of nitrogen applied per acre to fields and yield of corn following corn following alfalfa SE BMP region for 2010 on all fields less than 155 bushels per acre.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	122	140	150	146
Avg N-Rate LB/A	33	111	138	159

Figure 132 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 112 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 132.

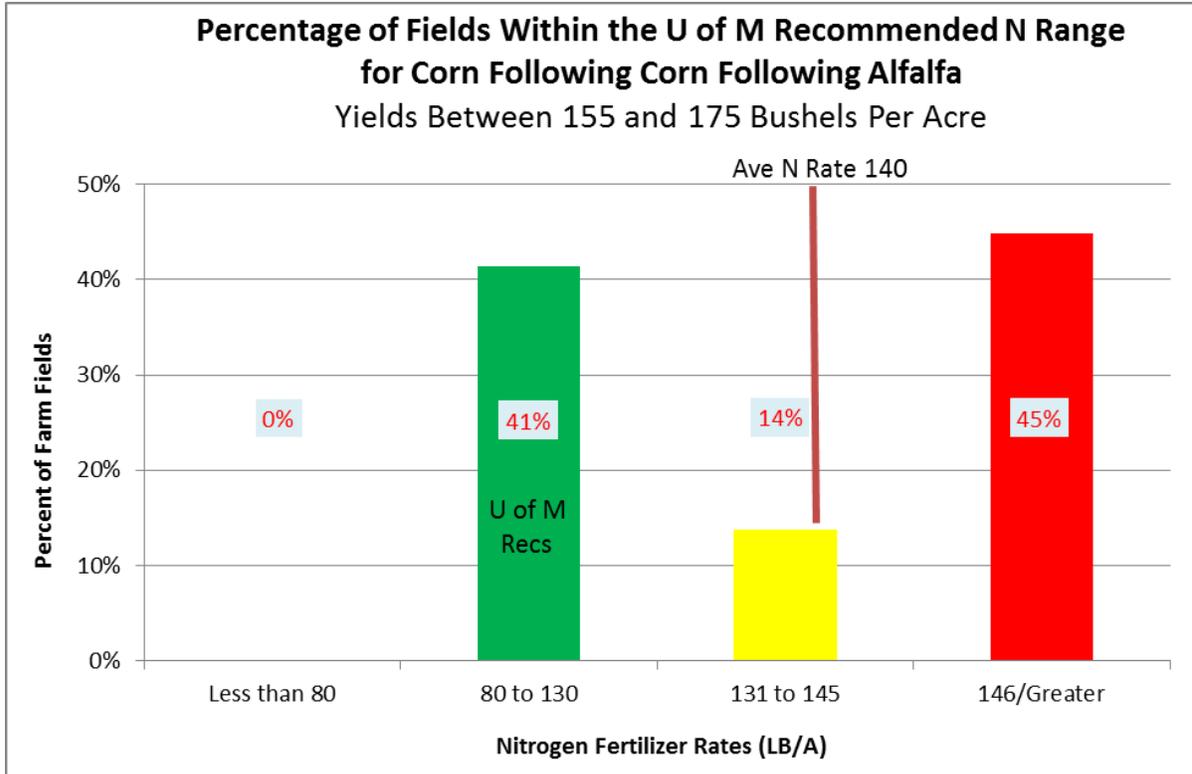


Figure 132. Percentage of fields within the U of M recommended range for corn following corn following alfalfa in the SE BMP region in 2010 on all fields yielding between 155 and 175 bushels per acre: 29 fields.

Table 112. Pounds of nitrogen applied per acre to fields and yield of corn following corn following alfalfa SE BMP region for 2010 on all fields between 155 and 175 bushels per acre.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	No Data	166	170	167
Avg N-Rate LB/A	No Data	112	137	167

Figure 133 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 113 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 133.

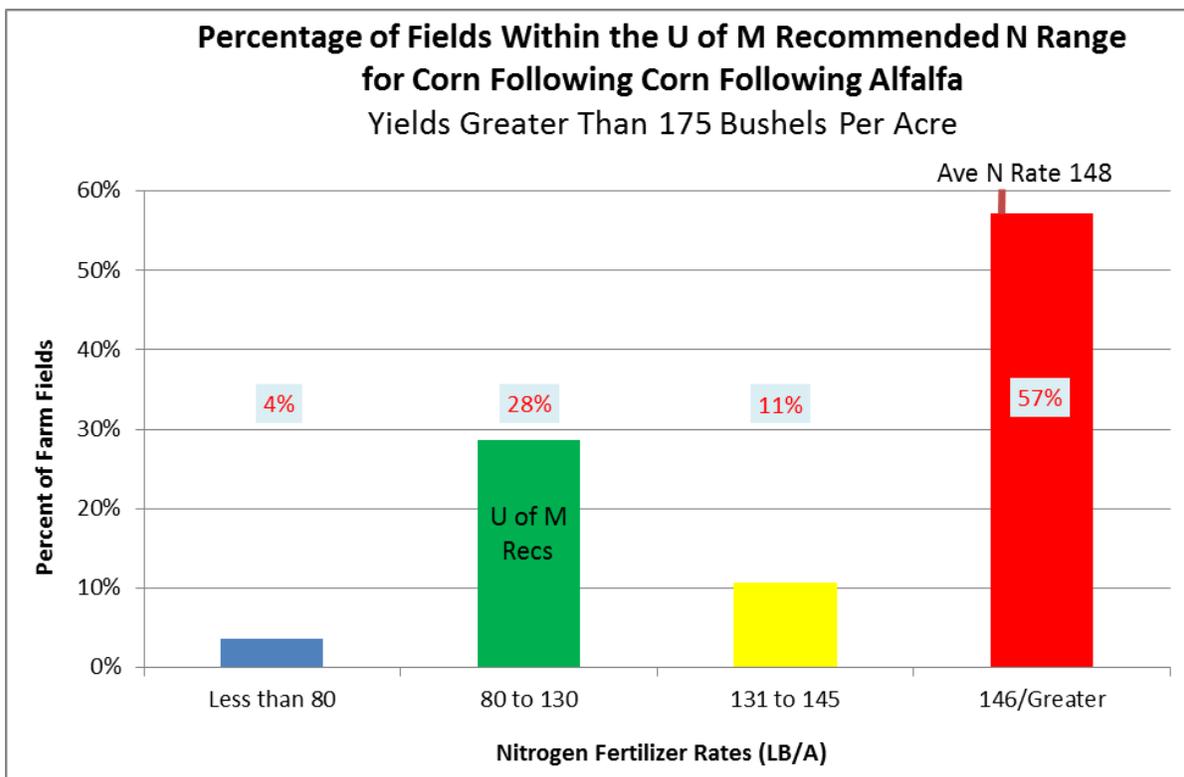


Figure 133. Percentage of fields within the U of M recommended range for corn following corn following alfalfa in the SE BMP region in 2010 on all fields yielding greater than 175 bushels per acre: 28 fields.

Table 113. Pounds of nitrogen applied per acre to fields and yield of corn following corn following alfalfa SE BMP region for 2010 on all fields greater than 175 bushels per acre.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	180	184	188	188
Avg N-Rate LB/A	75	116	138	169

South Central Region: Corn Following Corn Following Alfalfa

Less than five farmers reported planting corn following corn following alfalfa in the SC BMP region for fields with yields less than 155 bushels per acre.

Less than five farmers reported planting corn following corn following alfalfa in the SC BMP region for fields with yields between 155 and 175 bushels per acre.

Figure 134 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 114 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 134.

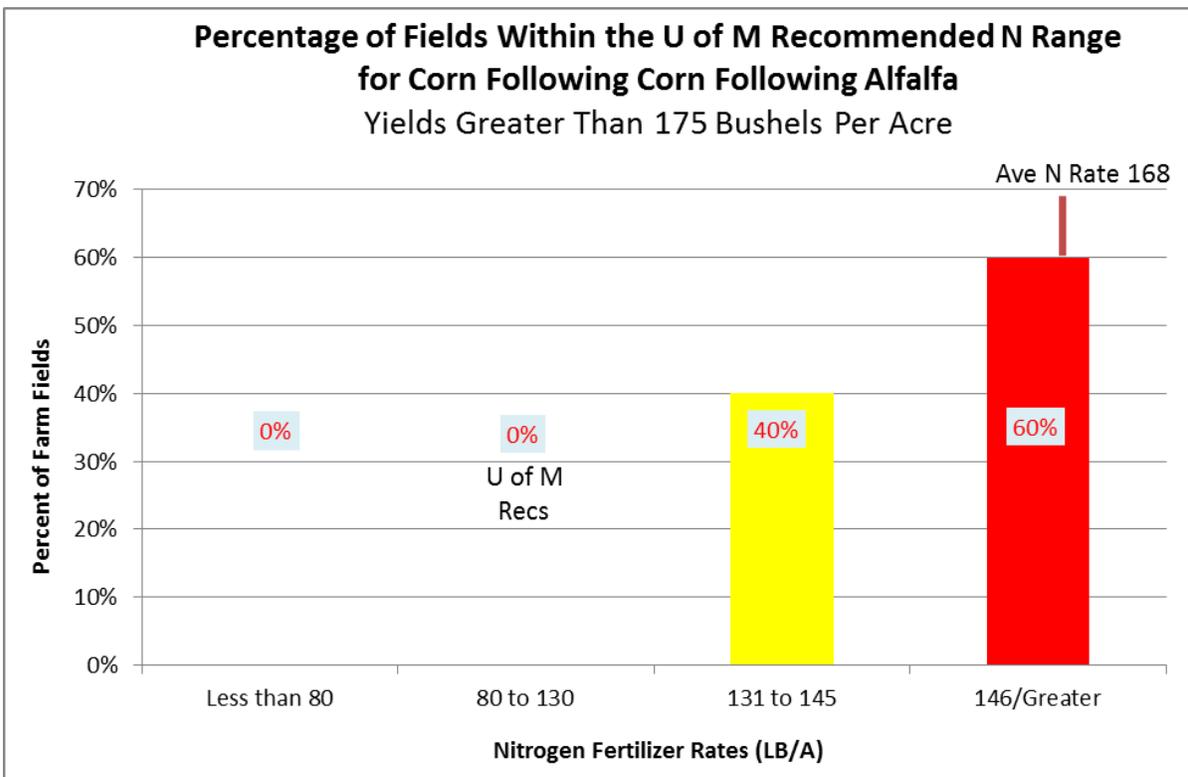


Figure 134. Percentage of fields within the U of M recommended range for corn following corn following alfalfa in the SC BMP region in 2010 on all fields yielding greater than 175 bushels per acre: 5 fields.

Table 114. Pounds of nitrogen applied per acre to fields and yield of corn following corn following alfalfa SC BMP region for 2010 on all fields greater than 175 bushels per acre.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	No Data	No Data	180	193
Avg N-Rate LB/A	No Data	No Data	138	188

Southwestern Region: Corn Following Corn Following Alfalfa

Less than five farmers reported planting corn following corn following alfalfa in the SW BMP region for fields with yields less than 155 bushels per acre.

Less than five farmers reported planting corn following corn following alfalfa in the SW BMP region for fields with yields between 155 and 175 bushels per acre.

Less than five farmers reported planting corn following corn following alfalfa in the SW BMP region for fields with yields greater than 175 bushels per acre.

Northwestern Region: Corn Following Corn Following Alfalfa

Less than five farmers reported planting corn following corn following alfalfa in the NW BMP region for fields with yields less than 155 bushels per acre.

Less than five farmers reported planting corn following corn following alfalfa in the NW BMP region for fields with yields between 155 and 175 bushels per acre.

Less than five farmers reported planting corn following corn following alfalfa in the NW BMP region for fields with yields greater than 175 bushels per acre.

Irrigated and Non-irrigated Sandy Soils Region: Corn Following Corn Following Alfalfa

Figure 135 details the distribution of nitrogen fertilizer rates in the IRR BMP region for corn following corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 115 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 135.

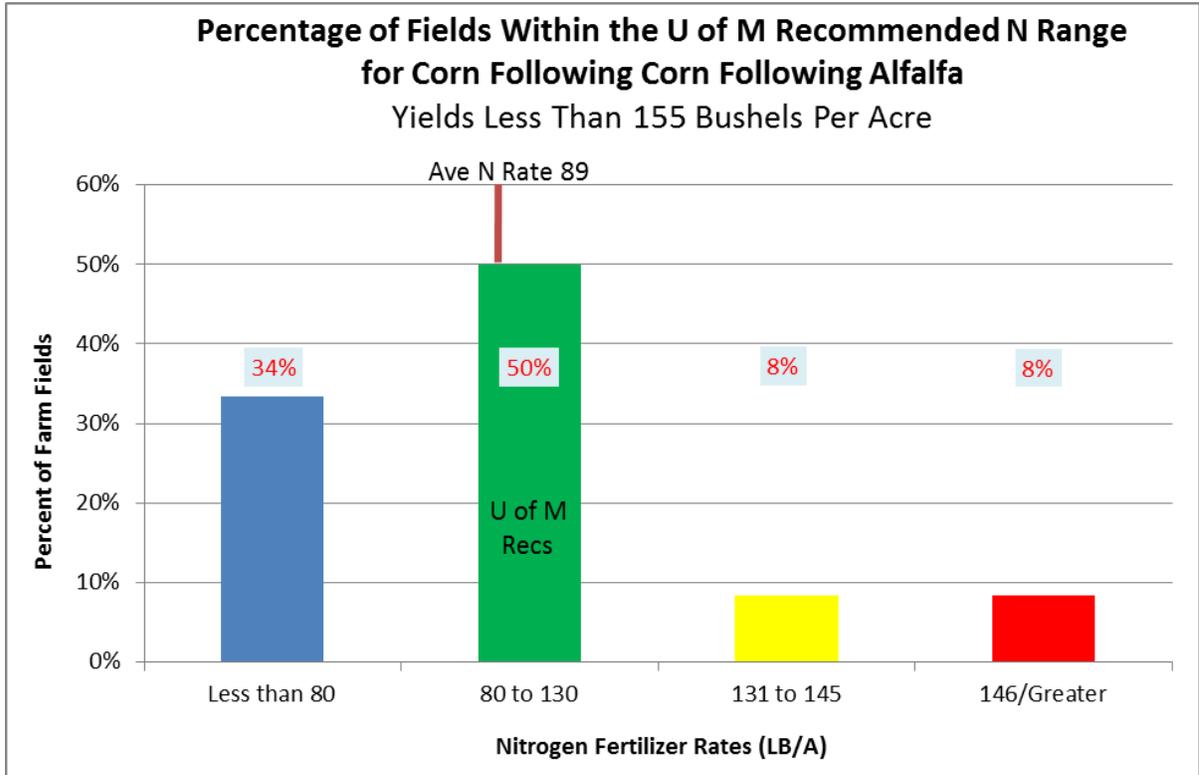


Figure 135. Percentage of fields within the U of M recommended range for corn following corn following alfalfa in the IRR BMP region in 2010 on all fields yielding less than 155 bushels per acre: 12 fields.

Table 115. Pounds of nitrogen applied per acre to fields and yield of corn following corn following alfalfa IRR BMP region for 2010 on all fields less than 155 bushels per acre.

N Fertilizer Ranges	<80 LB/A	80-130 LB/A	131-145 LB/A	146/Greater LB/A
Bu./Acre	88	133	135	130
Avg N-Rate LB/A	48	97	140	150

Less than five farmers reported planting corn following corn following alfalfa in the IRR BMP region for fields with yields between 155 and 175 bushels per acre.

Less than five farmers reported planting corn following corn following alfalfa in the IRR BMP region for fields with yields greater than 175 bushels per acre.

Statewide: Corn Following Alfalfa

Figure 136 details the distribution of nitrogen fertilizer rates across Minnesota for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 116 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 136.

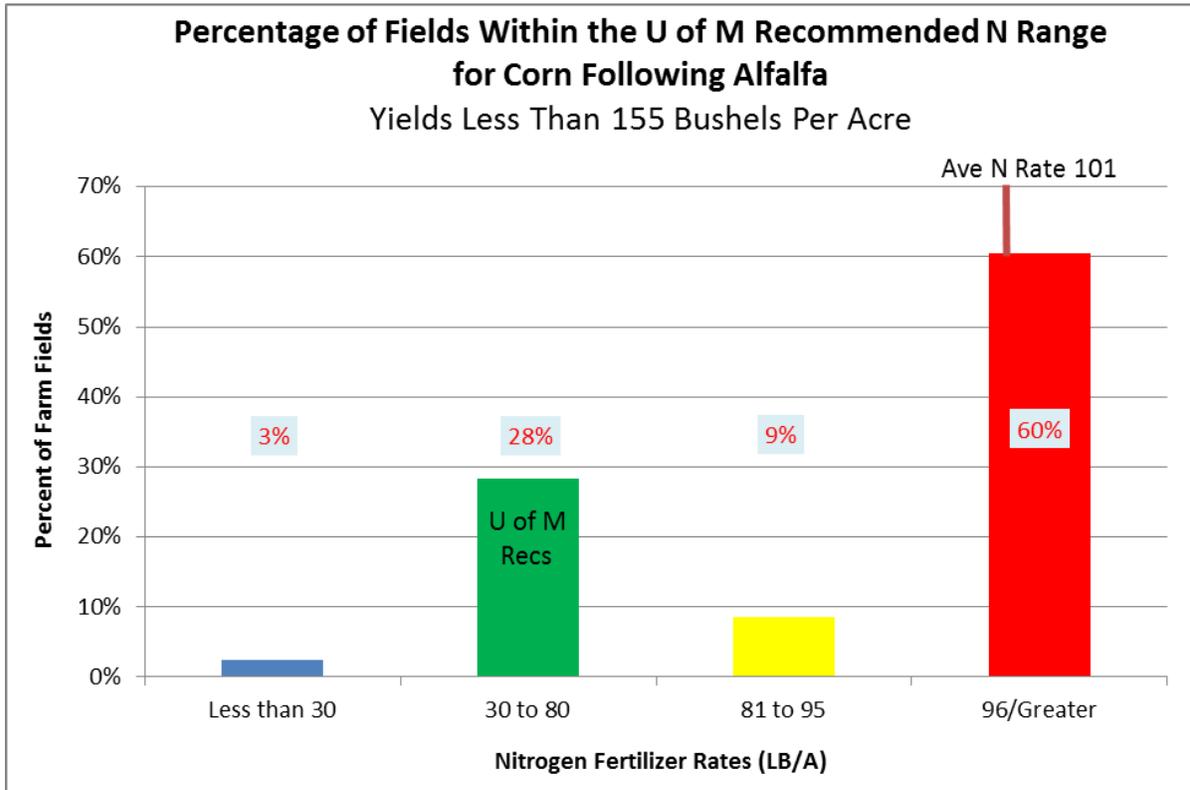


Figure 136. Percentage of fields within the U of M recommended range for corn following alfalfa across Minnesota in 2010 on all fields yielding less than 155 bushels per acre: 81 fields.

Table 116. Pounds of nitrogen applied per acre to fields and yield of corn following alfalfa across Minnesota for 2010 on all fields less than 155 bushels per acre.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	121	131	134	146
Avg N-Rate LB/A	55	106	139	156

Figure 137 details the distribution of nitrogen fertilizer rates across Minnesota for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 117 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 137.

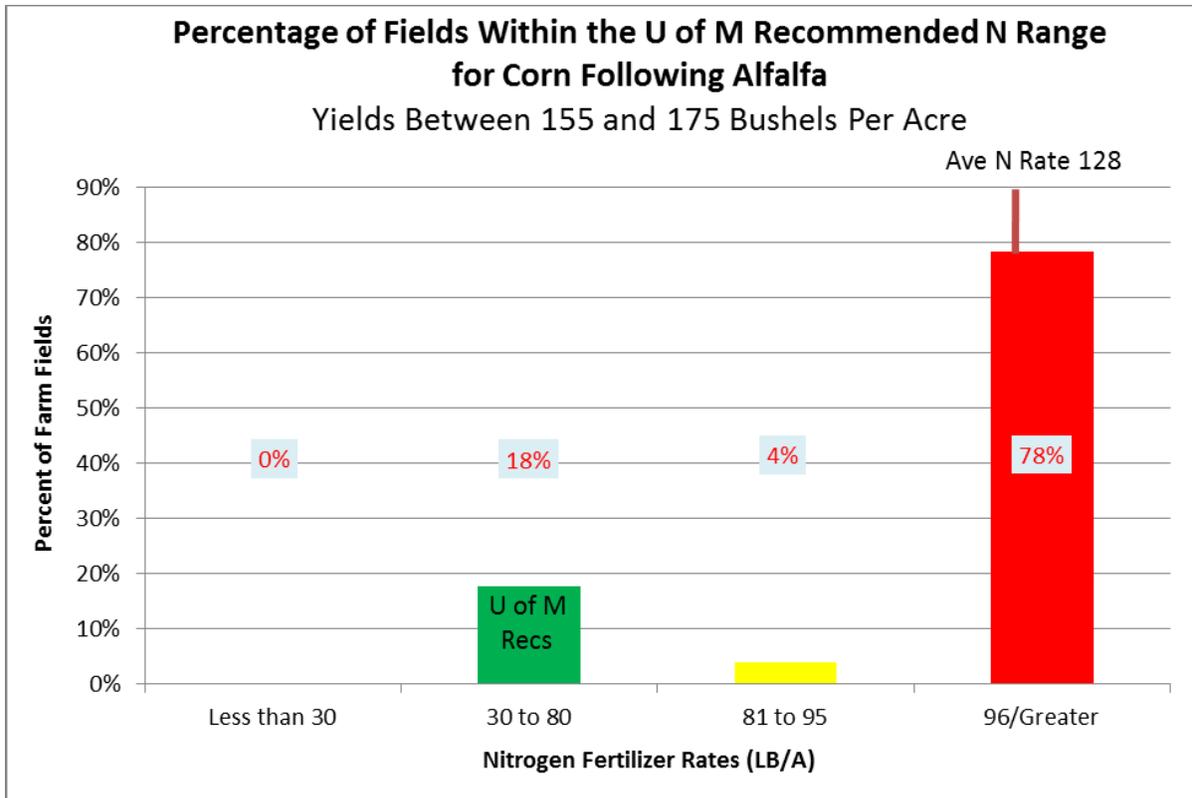


Figure 137. Percentage of fields within the U of M recommended range for corn following alfalfa across Minnesota in 2010 on all fields yielding between 155 and 175 bushels per acre: 51 fields.

Table 117. Pounds of nitrogen applied per acre to fields and yield of corn following alfalfa across Minnesota for 2010 on all fields between 155 and 175 bushels per acre.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	No Data	166	168	167
Avg N-Rate LB/A	No Data	63	87	144

Figure 138 details the distribution of nitrogen fertilizer rates across Minnesota for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 118 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 138.

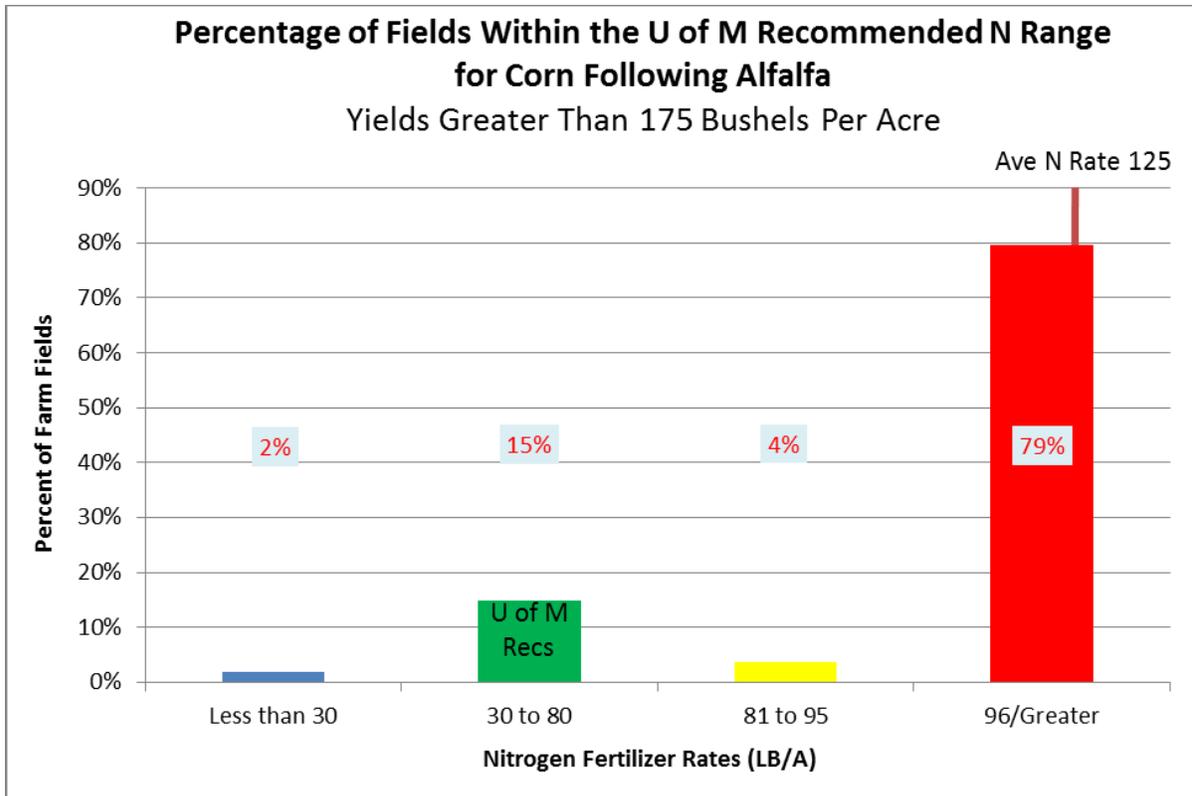


Figure 138. Percentage of fields within the U of M recommended range for corn following alfalfa across Minnesota in 2010 on all fields yielding greater than 175 bushels per acre: 54 fields.

Table 118. Pounds of nitrogen applied per acre to fields and yield of corn following alfalfa across Minnesota for 2010 on all fields greater than 175 bushels per acre.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	185	195	188	190
Avg N-Rate LB/A	15	63	90	141

Southeastern Region: Corn Following Alfalfa

Figure 139 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 119 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 139.

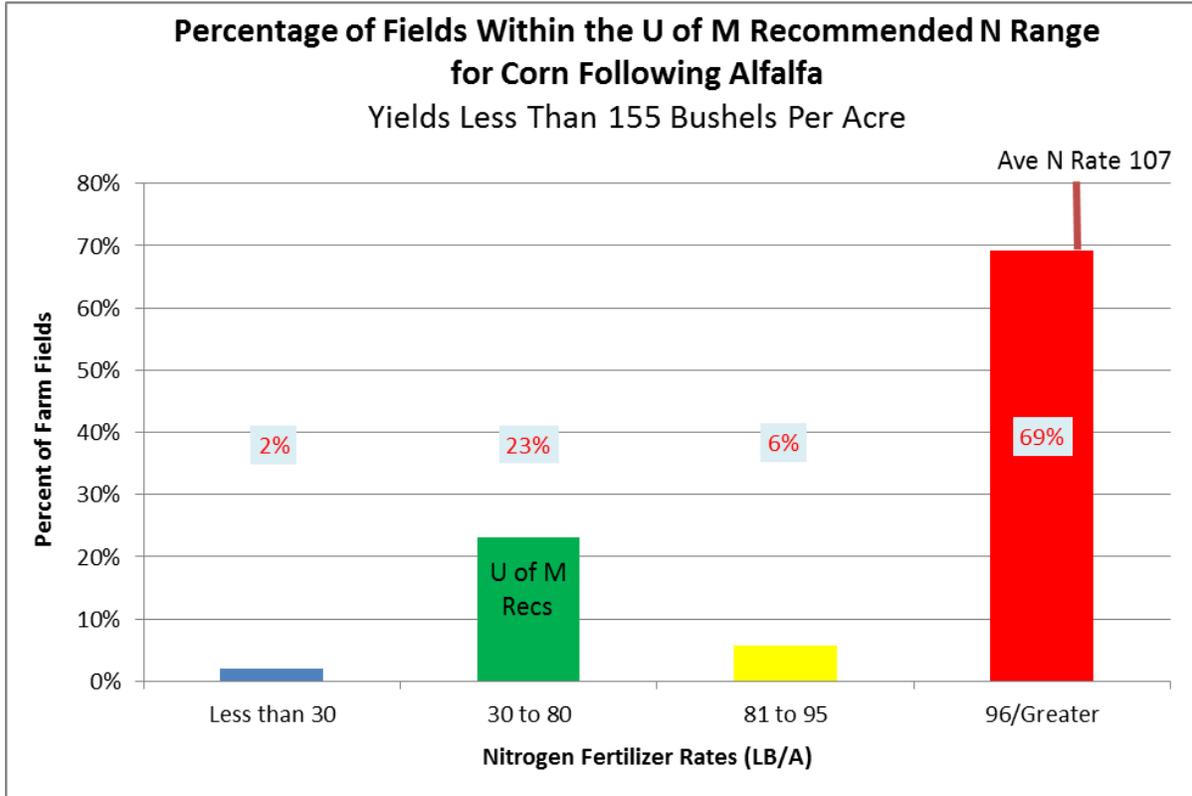


Figure 139. Percentage of fields within the U of M recommended range for corn following alfalfa in the SE BMP region in 2010 on all fields yielding less than 155 bushels per acre: 52 fields.

Table 119. Pounds of nitrogen applied per acre to fields and yield of corn following alfalfa for SE BMP region for 2010 on all fields less than 155 bushels per acre.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	150	133	133	138
Avg N-Rate LB/A	9	63	90	126

Figure 140 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 120 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 140.

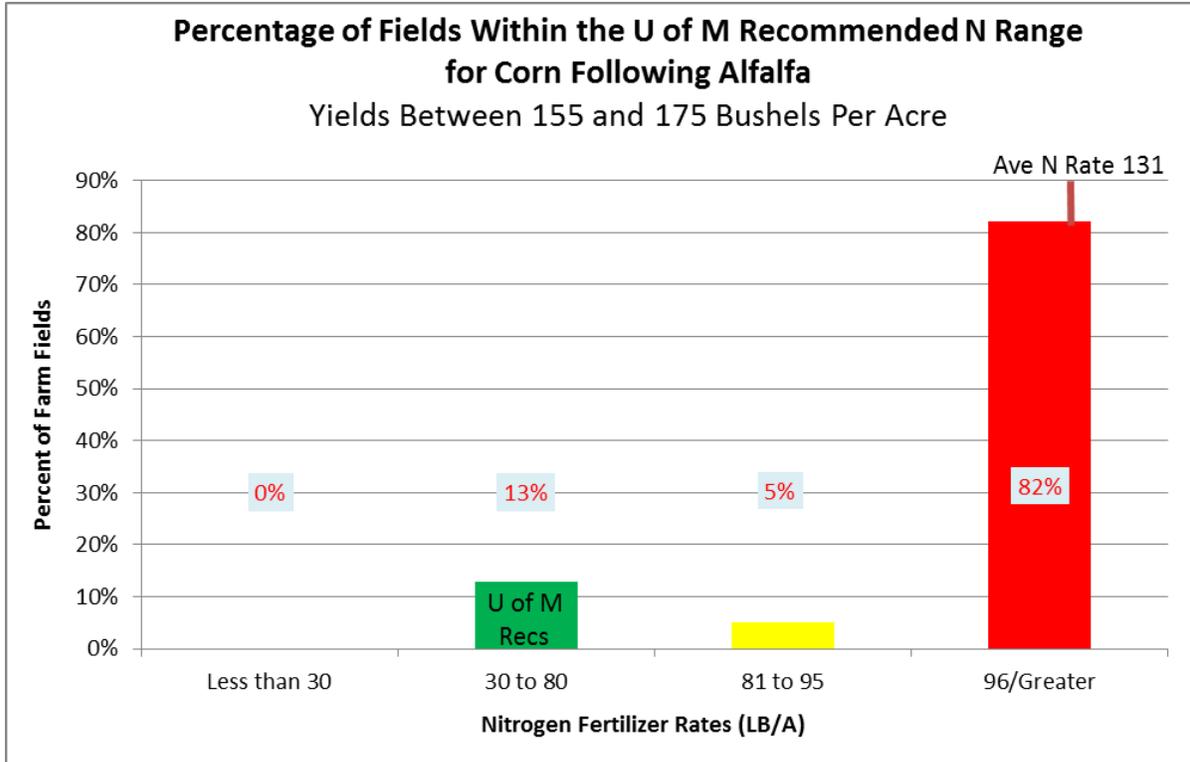


Figure 140. Percentage of fields within the U of M recommended range for corn following alfalfa in the SE BMP region in 2010 on all fields yielding between 155 and 175 bushels per acre: 39 fields.

Table 120. Pounds of nitrogen applied per acre to fields and yield of corn following alfalfa for SE BMP region for 2010 on all fields between 155 and 175 bushels per acre.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	No Data	168	168	168
Avg N-Rate LB/A	No Data	53	87	146

Figure 141 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 121 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 141.

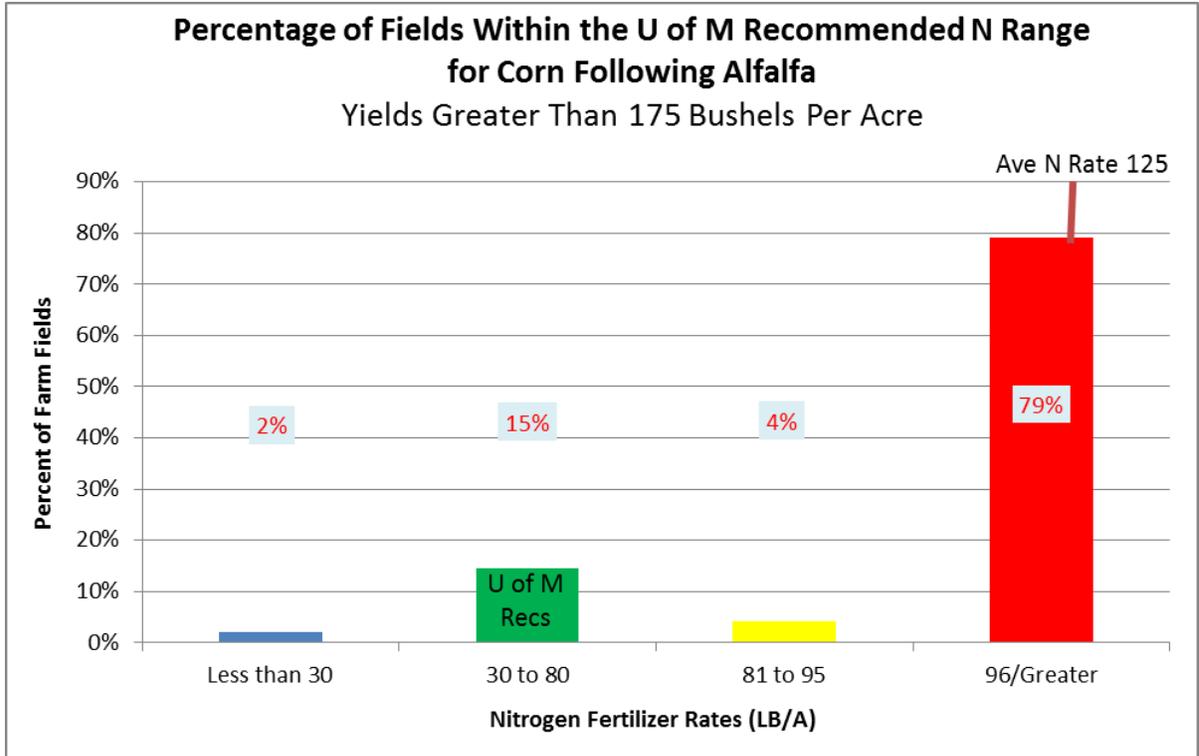


Figure 141. Percentage of fields within the U of M recommended range for corn following alfalfa in the SE BMP region in 2010 on all fields yielding greater than 175 bushels per acre: 48 fields.

Table 121. Pounds of nitrogen applied per acre to fields and yield of corn following alfalfa for SE BMP region for 2010 on all fields greater 175 bushels per acre.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	185	195	188	190
Avg N-Rate LB/A	15	63	90	141

South Central Region: Corn Following Alfalfa

Less than five farmers reported planting corn following alfalfa in the SC BMP region for fields with yields less than 155 bushels per acre.

Less than five farmers reported planting corn following alfalfa in the SC BMP region for fields with yields between 155 and 175 bushels per acre.

Less than five farmers reported planting corn following alfalfa in the SC BMP region for fields with yields greater than 175 bushels per acre.

Southwestern Region: Corn Following Alfalfa

Figure 142 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 122 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 142.

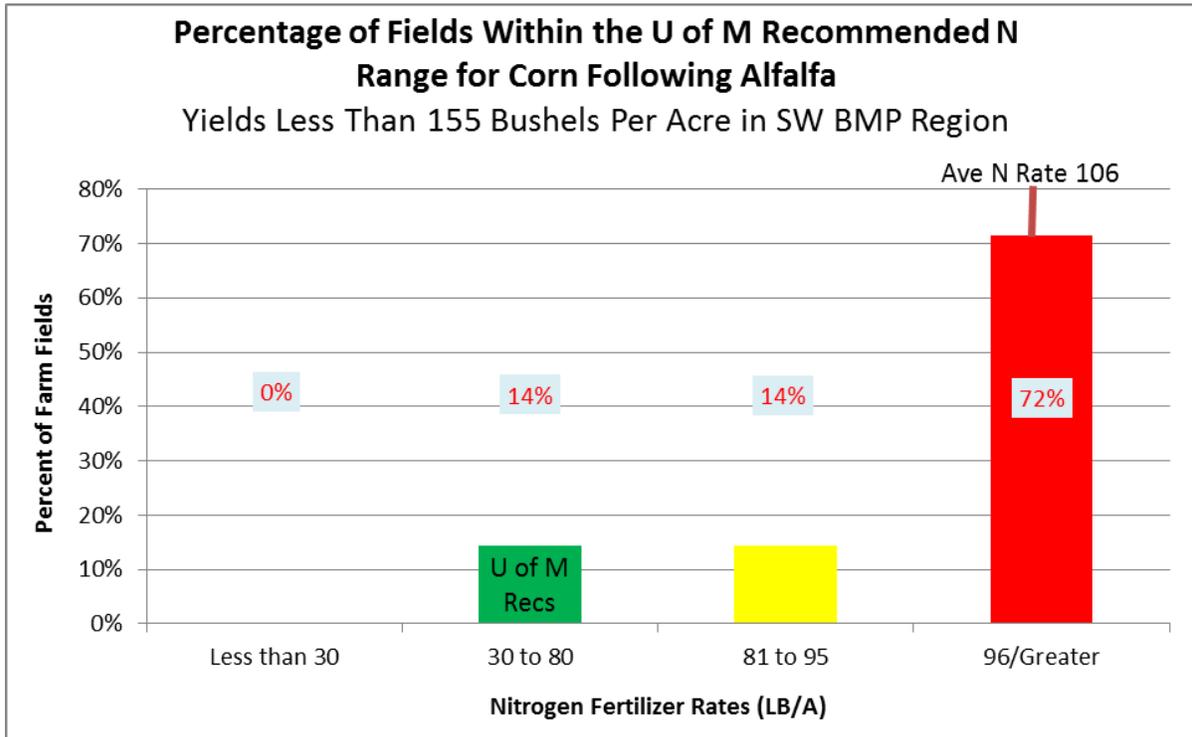


Figure 142. Percentage of fields within the U of M recommended range for corn following alfalfa in the SW BMP region in 2010 on all fields yielding less than 155 bushels per acre: 7 fields.

Table 122. Pounds of nitrogen applied per acre to fields and yield of corn following alfalfa for SW BMP region for 2010 on all fields less than 155 bushels per acre.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	No Data	100	120	134
Avg N-Rate LB/A	No Data	38	85	106

Less than five farmers reported planting corn following alfalfa in the SW BMP region for fields with yields between 155 and 175 bushels per acre.

Less than five farmers reported planting corn following alfalfa in the SW BMP region for fields with yields greater than 175 bushels per acre.

Northwestern Region: Corn Following Alfalfa

Less than five farmers reported planting corn following alfalfa in the NW BMP region for fields with yields less than 155 bushels per acre.

Less than five farmers reported planting corn following alfalfa in the NW BMP region for fields with yields between 155 and 175 bushels per acre.

Less than five farmers reported planting corn following alfalfa in the NW BMP region for fields with yields greater than 175 bushels per acre.

Irrigated and Non-irrigated Sandy Soils Region: Corn Following Alfalfa

Figure 143 details the distribution of nitrogen fertilizer rates in the IRR BMP region for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 123 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 143.

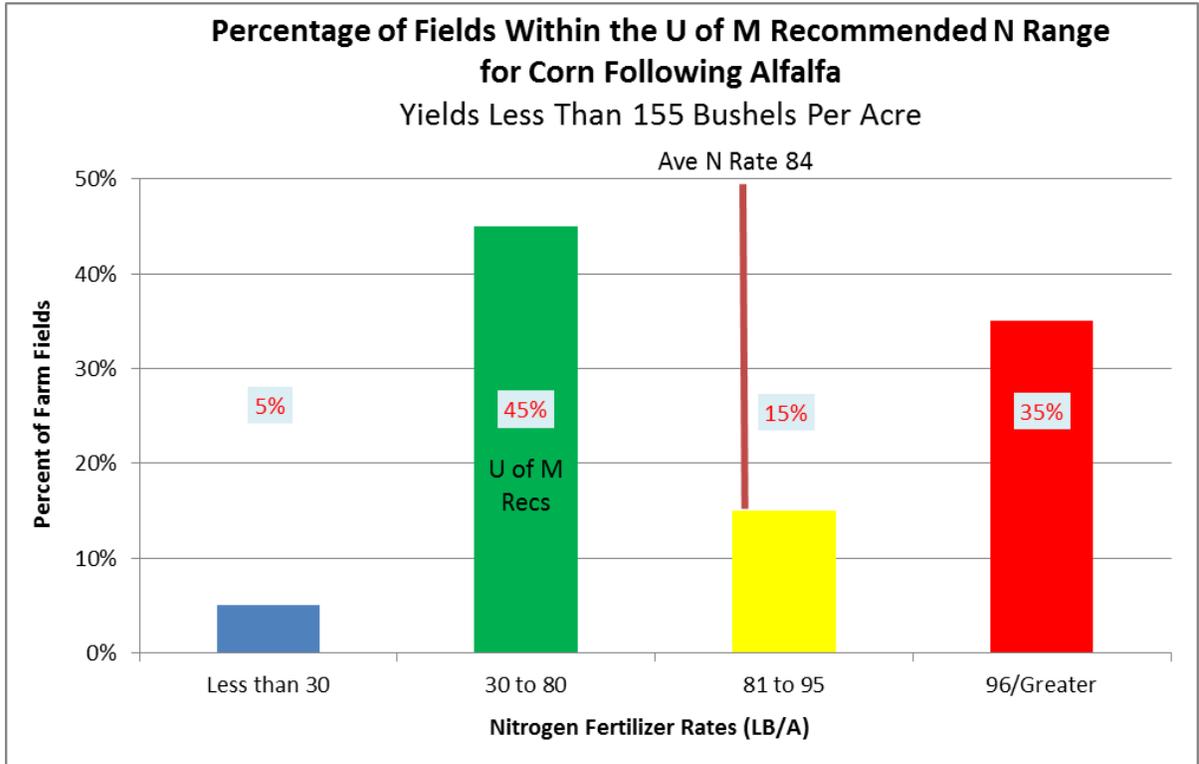


Figure 143. Percentage of fields within the U of M recommended range for corn following alfalfa in the IRR BMP region in 2010 on all fields yielding less than 155 bushels per acre: 20 fields.

Table 123. Pounds of nitrogen applied per acre to fields and yield of corn following alfalfa for IRR BMP region for 2010 on all fields less 155 bushels per acre.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	70	113	123	126
Avg N-Rate LB/A	25	61	92	119

Figure 144 details the distribution of nitrogen fertilizer rates in the IRR BMP region for corn following alfalfa using a “nitrogen to corn price ratio” of 0.05. Table 124 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 144.

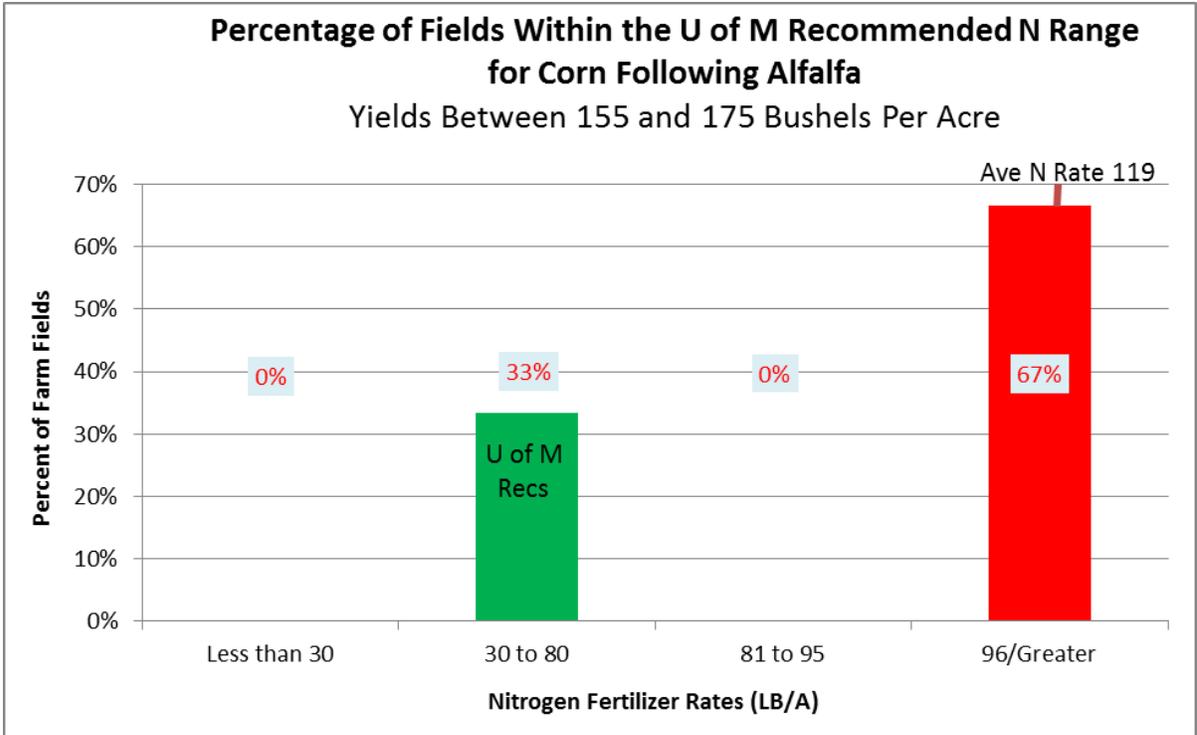


Figure 144. Percentage of fields within the U of M recommended range for corn following alfalfa in the IRR BMP region in 2010 on all fields yielding between 155 and 175 bushels per acre: 6 fields.

Table 124. Pounds of nitrogen applied per acre to fields and yield of corn following alfalfa for IRR BMP region for 2010 on all fields between 155 and 175 bushels per acre.

N Fertilizer Ranges	<30 LB/A	30-80 LB/A	81-95 LB/A	96/Greater LB/A
Bu./Acre	No Data	168	No Data	161
Avg N-Rate LB/A	No Data	80	No Data	139

Less than five farmers reported planting corn following alfalfa in the IRR BMP region for fields with yields greater than 175 bushels per acre.

Statewide: Corn Following Small Grains

Figure 145 details the distribution of nitrogen fertilizer rates across Minnesota for corn following small grains using a “nitrogen to corn price ratio” of 0.05. Table 125 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 145.

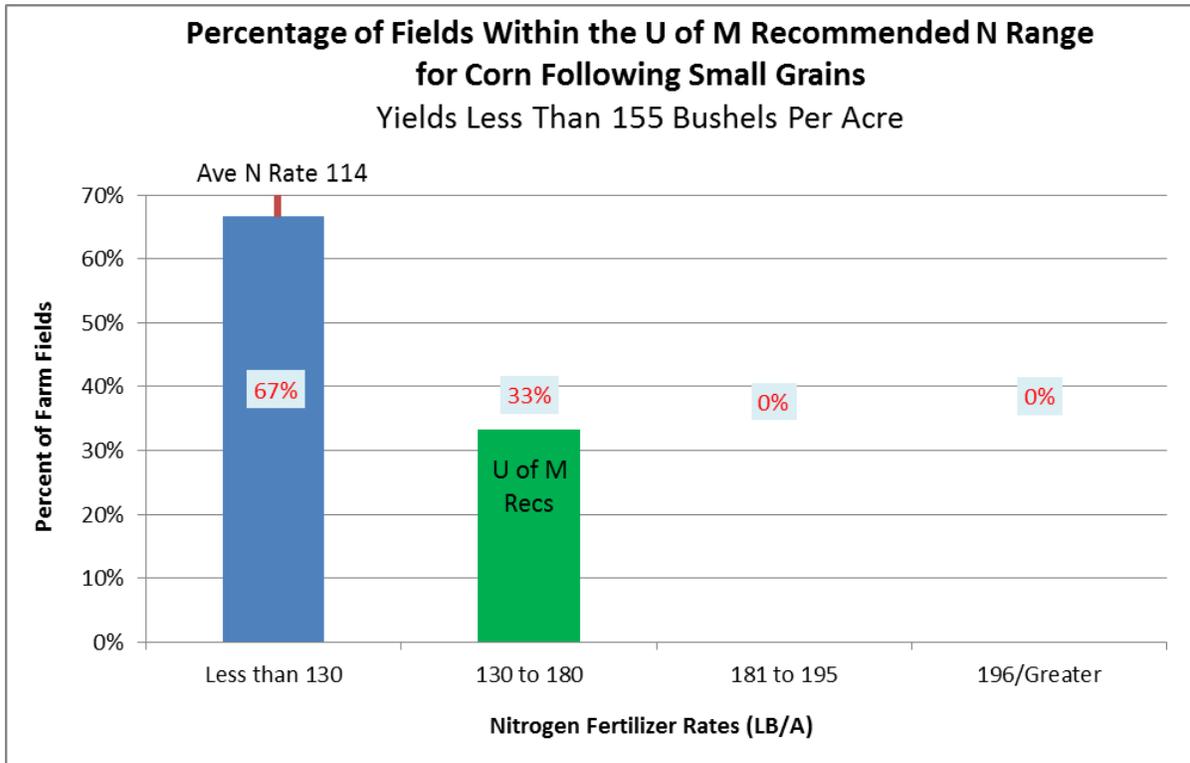


Figure 145. Percentage of fields within the U of M recommended range for corn following small grains across Minnesota in 2010 on all fields yielding less than 155 bushels per acre: 63 fields.

Table 125. Pounds of nitrogen applied per acre to fields and yield of corn following small grains across Minnesota for 2010 on all fields less than 155 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	114	133	No Data	No Data
Avg N-Rate LB/A	98	146	No Data	No Data

Figure 146 details the distribution of nitrogen fertilizer rates across Minnesota for corn following small grains using a “nitrogen to corn price ratio” of 0.05. Table 126 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 146.

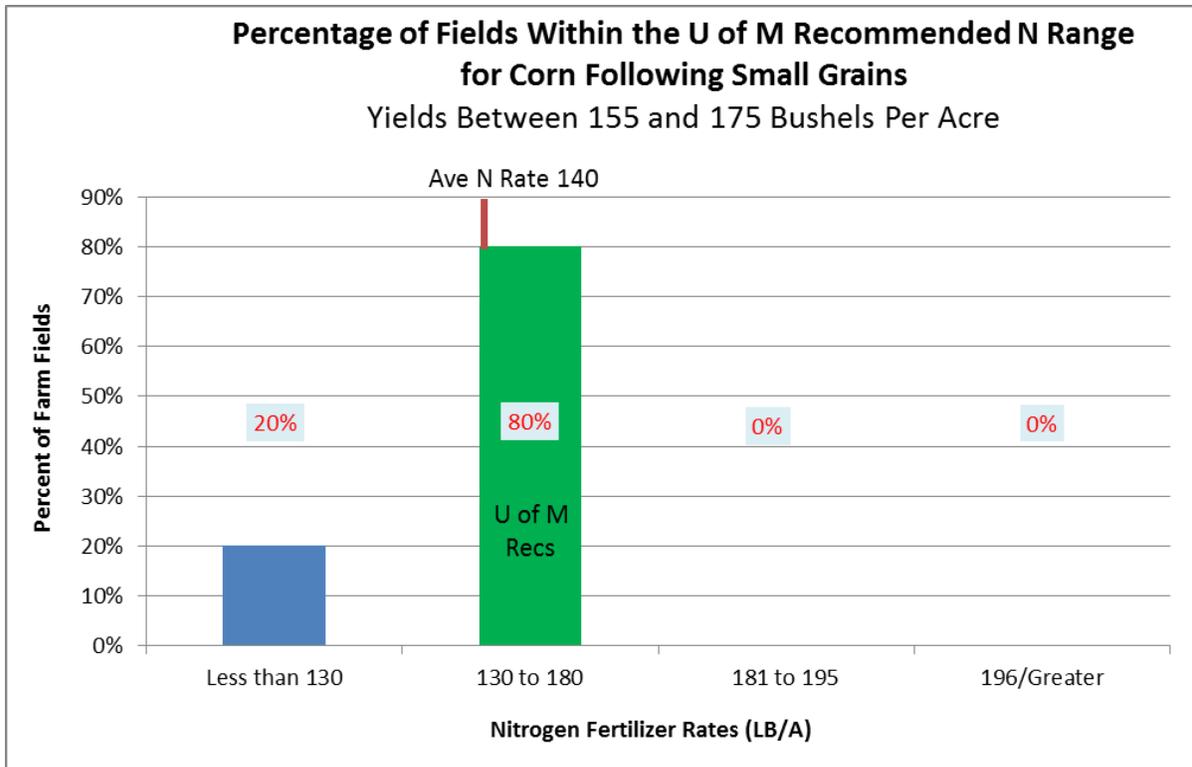


Figure 146. Percentage of fields within the U of M recommended range for corn following small grains across Minnesota in 2010 on all fields yielding between 155 and 175 bushels per acre: 10 fields.

Table 126. Pounds of nitrogen applied per acre to fields and yield of corn following small grains across Minnesota for 2010 on all fields between 155 and 175 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	162	162	No Data	No Data
Avg N-Rate LB/A	118	145	No Data	No Data

Figure 147 details the distribution of nitrogen fertilizer rates across Minnesota for corn following small grains using a “nitrogen to corn price ratio” of 0.05. Table 127 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 147.

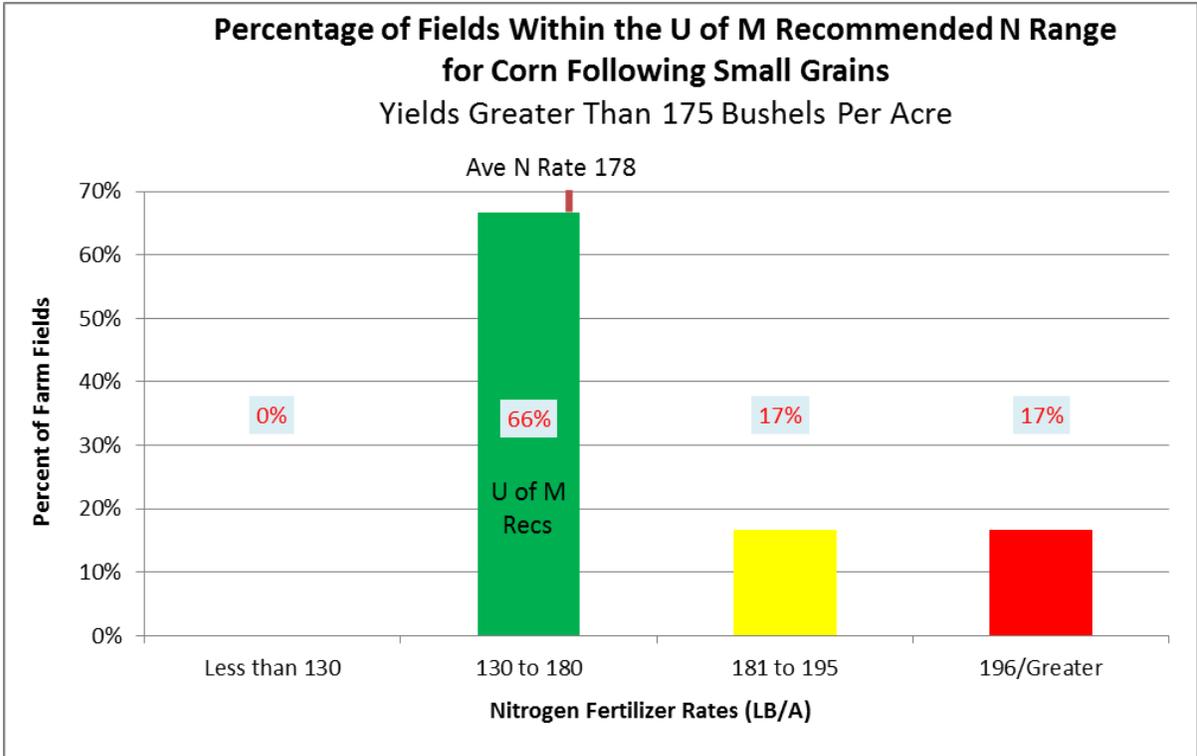


Figure 147. Percentage of fields within the U of M recommended range for corn following small grains across Minnesota in 2010 on all fields yielding greater than 175 bushels per acre: 6 fields.

Table 127. Pounds of nitrogen applied per acre to fields and yield of corn following small grains across Minnesota for 2010 on all fields greater than 175 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	No Data	185	185	178
Avg N-Rate LB/A	No Data	165	190	220

Southeastern Region: Corn Following Small Grains

Figure 148 details the distribution of nitrogen fertilizer rates in the SE BMP region for corn following small grains using a “nitrogen to corn price ratio” of 0.05. Table 128 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 148.

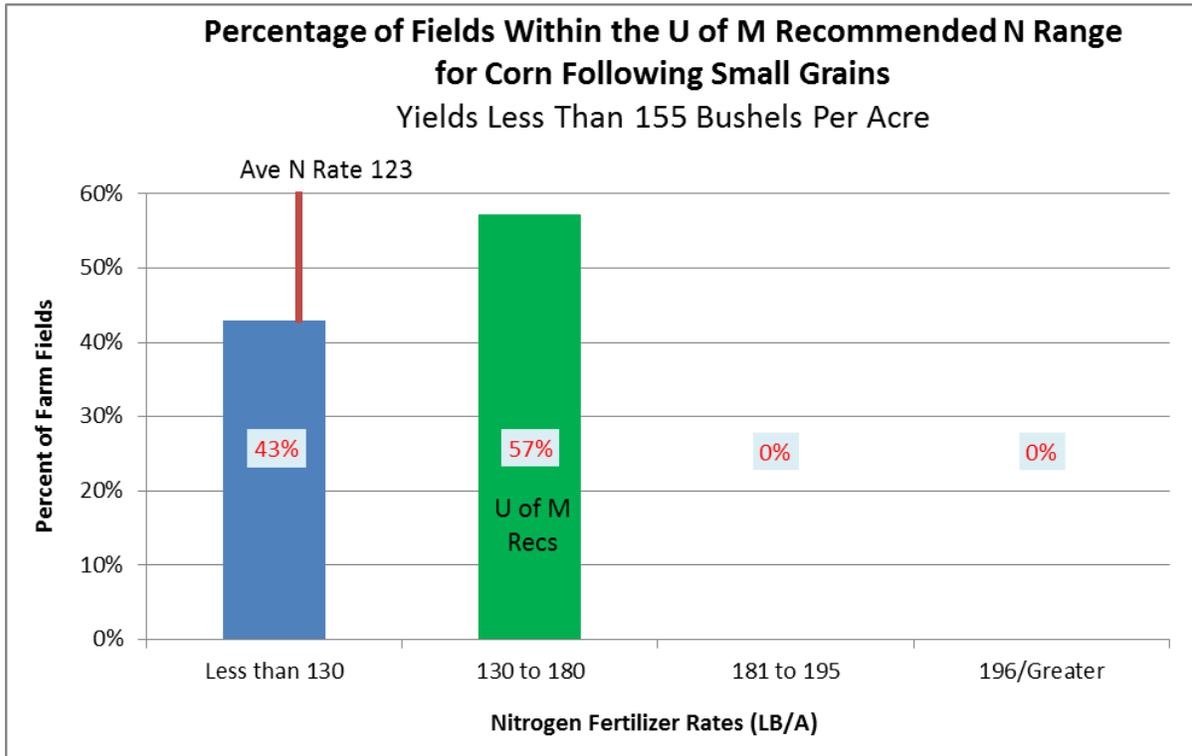


Figure 148. Percentage of fields within the U of M recommended range for corn following small grains in the SE BMP region in 2010 on all fields yielding less than 155 bushels per acre: 7 fields.

Table 128. Pounds of nitrogen applied per acre to fields and yield of corn following small grains SE BMP region for 2010 on all fields less than 155 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	110	138	No Data	No Data
Avg N-Rate LB/A	91	147	No Data	No Data

Less than five farmers reported planting corn following small grains in the SE BMP region for fields with yields between 155 and 175 bushels per acre.

Less than five farmers reported planting corn following small grains in the SE BMP region for fields with yields greater than 175 bushels per acre.

South Central Region: Corn Following Small Grains

Less than five farmers reported planting corn following small grains in the SC BMP region for fields with yields less than 155 bushels per acre.

Less than five farmers reported planting corn following small grains in the SC BMP region for fields with yields between 155 and 175 bushels per acre.

Less than five farmers reported planting corn following small grains in the SC BMP region for fields with yields greater than 175 bushels per acre.

Southwestern Region: Corn Following Small Grains

Figure 149 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following small grains using a “nitrogen to corn price ratio” of 0.05. Table 129 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 149.

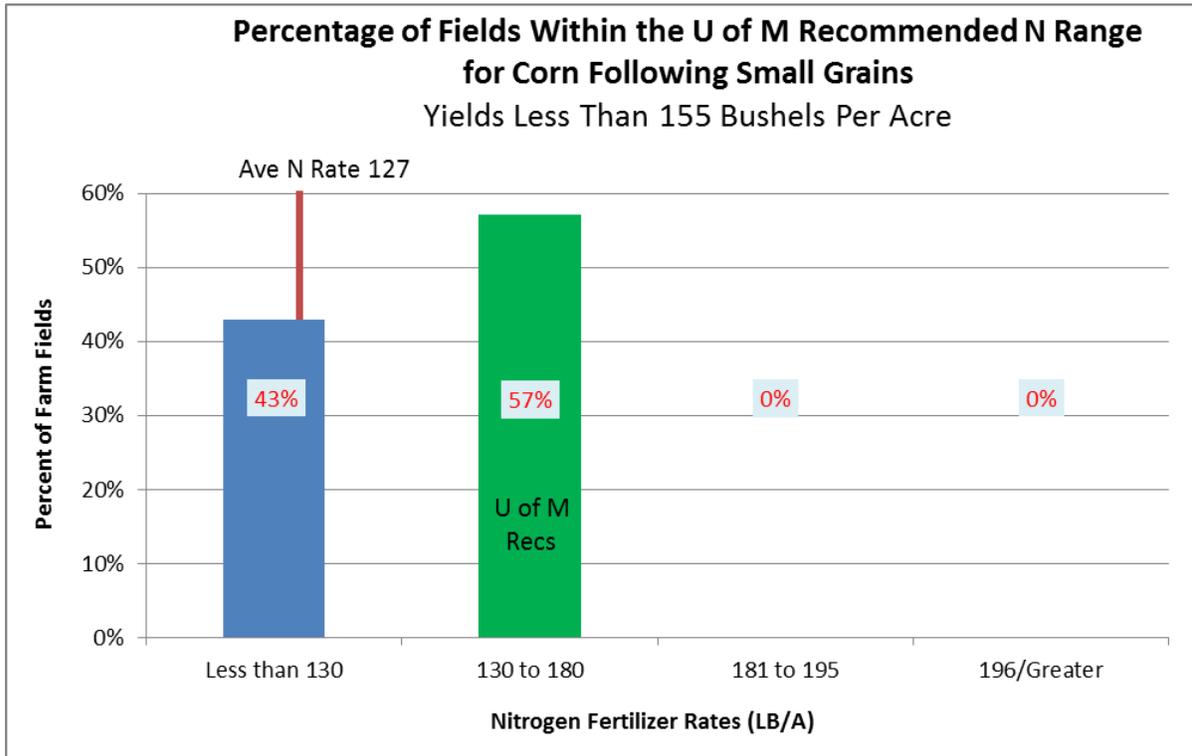


Figure 149. Percentage of fields within the U of M recommended range for corn following small grains in the SW BMP region in 2010 on all fields yielding less than 155 bushels per acre: 14 fields.

Table 129. Pounds of nitrogen applied per acre to fields and yield of corn following small grains SW BMP region for 2010 on all fields less than 155 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	131	137	No Data	No Data
Avg N-Rate LB/A	103	145	No Data	No Data

Less than five farmers reported planting corn following small grains in the SW BMP region for fields with yields between 155 and 175 bushels per acre.

Less than five farmers reported planting corn following small grains in the SW BMP region for fields with yields greater than 175 bushels per acre.

Northwestern Region: Corn Following Small Grains

Figure 150 details the distribution of nitrogen fertilizer rates in the NW BMP region for corn following small grains using a “nitrogen to corn price ratio” of 0.05. Table 130 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 150.

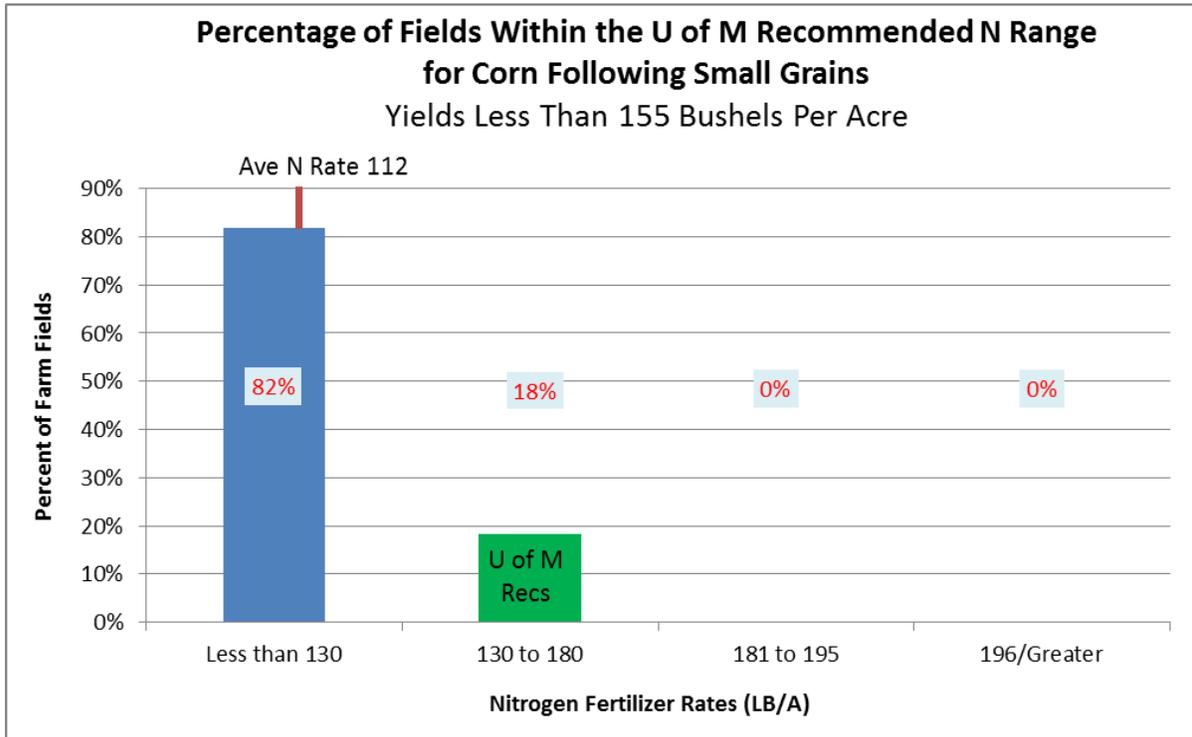


Figure 150. Percentage of fields within the U of M recommended range for corn following small grains in the NW BMP region in 2010 on all fields yielding less than 155 bushels per acre: 11 fields.

Table 130. Pounds of nitrogen applied per acre to fields and yield of corn following small grains NW BMP region for 2010 on all fields less than 155 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	122	120	No Data	No Data
Avg N-Rate LB/A	107	136	No Data	No Data

** less than five responses

Less than five farmers reported planting corn following small grains in the NW BMP region for fields with yields between 155 and 175 bushels per acre.

Less than five farmers reported planting corn following small grains in the NW BMP region for fields with yields greater than 175 bushels per acre.

Irrigated and Non-irrigated Sandy Soils Region: Corn Following Small Grains

Figure 151 details the distribution of nitrogen fertilizer rates in the IRR BMP region for corn following small grains using a “nitrogen to corn price ratio” of 0.05. Table 131 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 151.

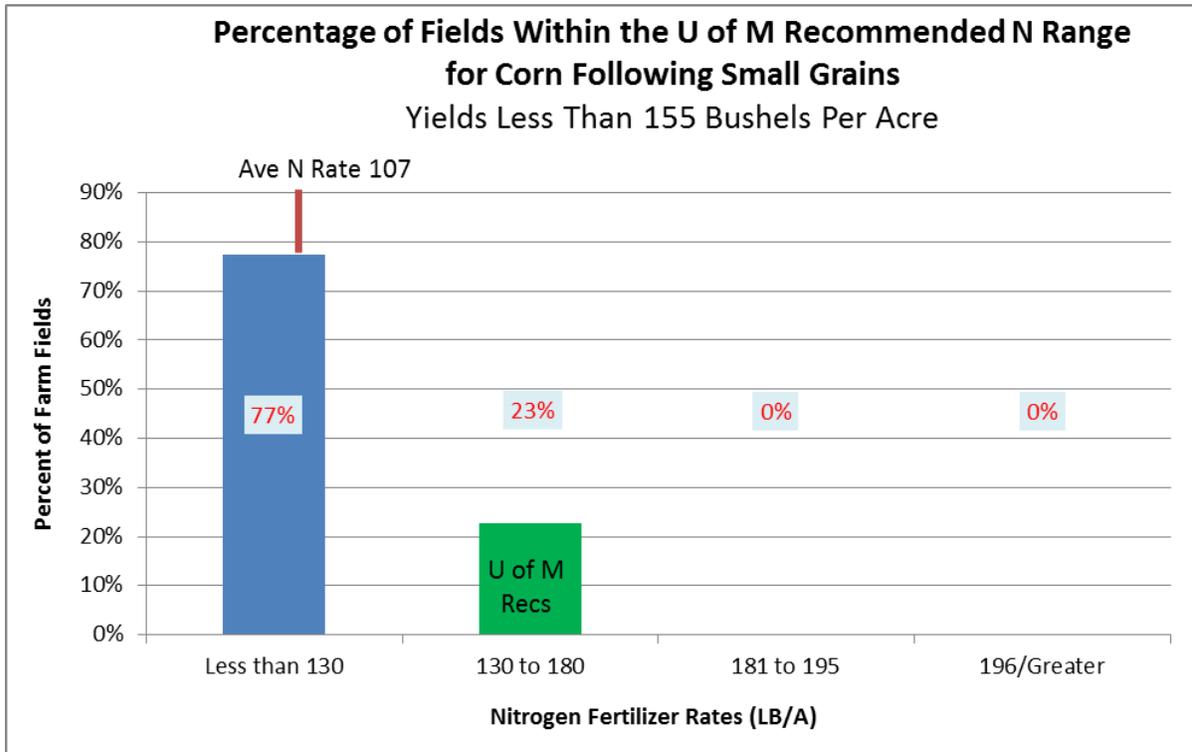


Figure 151. Average nitrogen fertilizer rate in pounds per acre on corn following corn following alfalfa IRR BMP region for 2010 on all fields less than 155 bushels per acre: 31 fields.

Table 131. Pounds of nitrogen applied per acre to fields and yield of corn following small grains IRR BMP region for 2010 on all fields less than 155 bushels per acre.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	107	131	No Data	No Data
Avg N-Rate LB/A	94	150	No Data	No Data

Less than five farmers reported planting corn following small grains in the IRR BMP region for fields with yields between 155 and 175 bushels per acre.

Less than five farmers reported planting corn following small grains in the IRR BMP region for fields with yields greater than 175 bushels per acre.

Analysis of Nitrogen Fertilizer Rate Applications on Corn Following Corn on Manured Acres by Average Yield Per Acre

Analysis was limited to statewide categories by livestock type due to limited data. In 2010 crop history was not reported on manured acres. Therefore nitrogen recommendations were defaulted to corn on corn recommendations where there were no credits for any legumes. A price to nitrogen ratio of 0.05 was used for all manured acres.

Figure 152 details the distribution of nitrogen fertilizer rates with all manure sources compared to the U of M recommended rates for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 132 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 152.

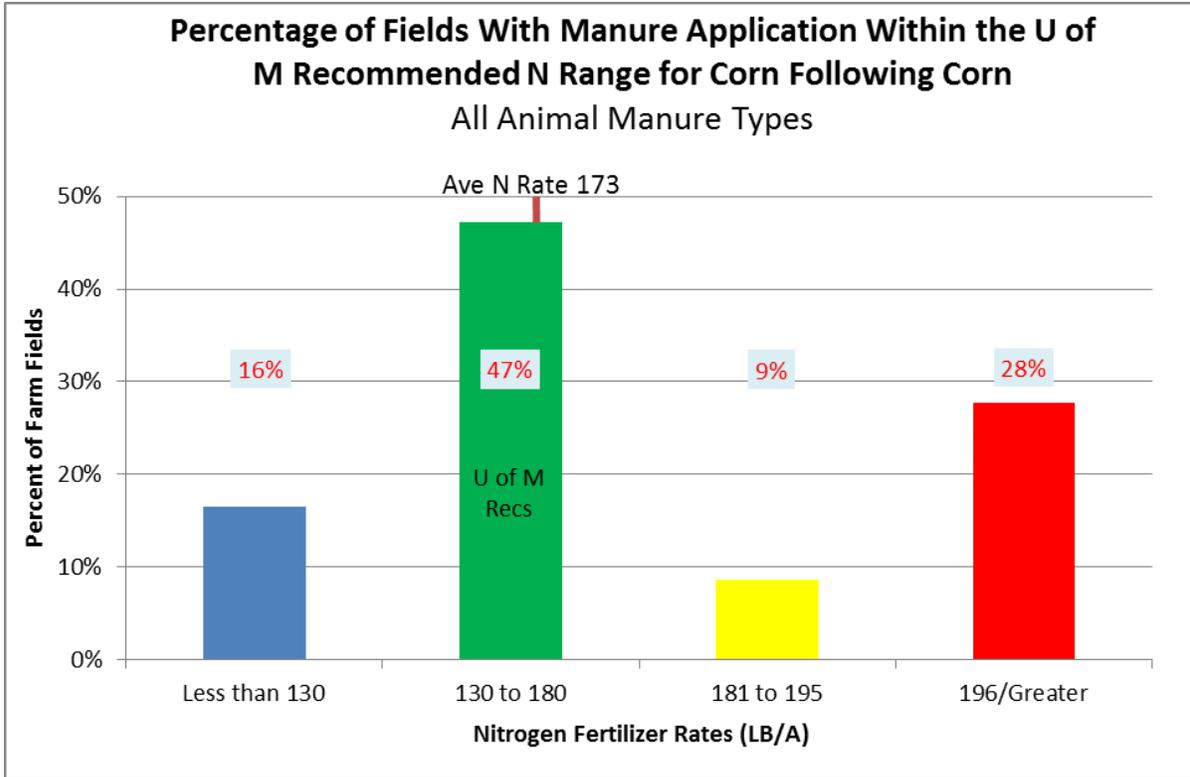


Figure 152. Percentage of fields within the U of M recommended nitrogen application range for corn following corn with all manure types across Minnesota in 2010: 292 fields.

Table 132. Pounds of nitrogen applied per acre as fertilizer and manure to fields on corn following corn with corresponding yields in Minnesota for 2010.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	161	183	189	188
Avg N-Rate LB/A	97	159	190	237

Figure 153 details the distribution of nitrogen fertilizer rates with dairy manure sources compared to the U of M recommended rates for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 133 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 153.

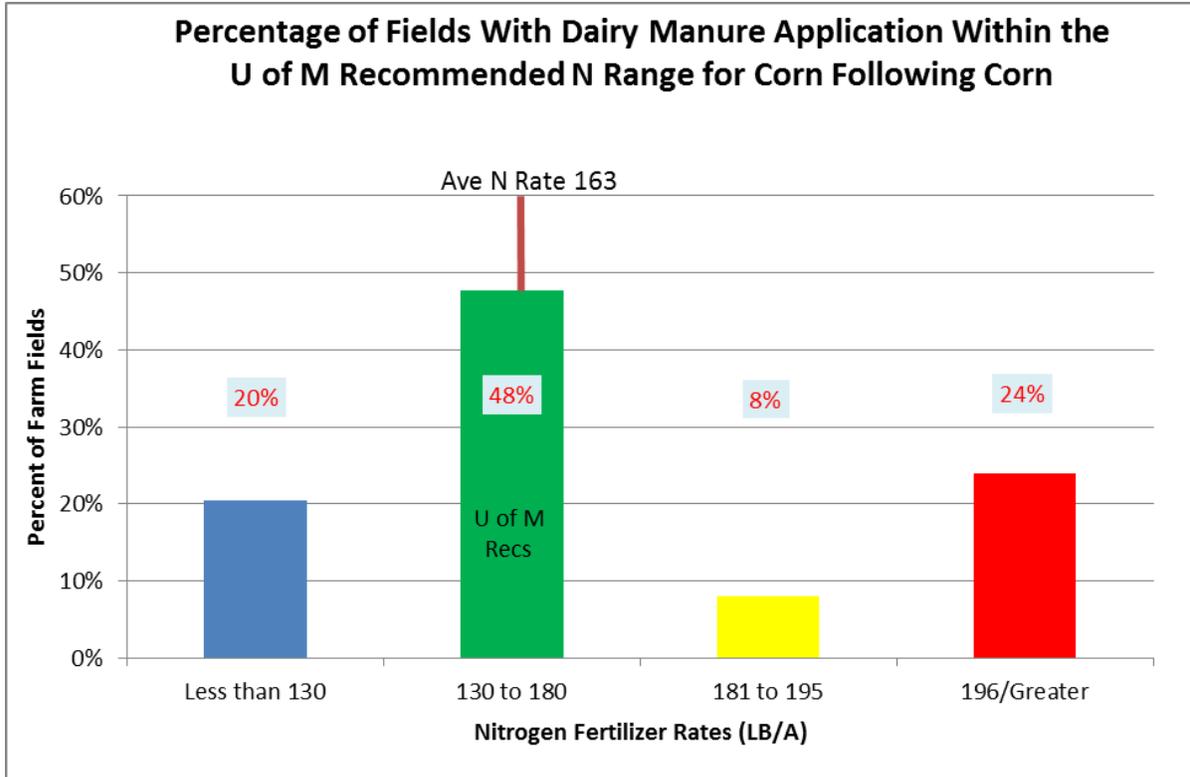


Figure 153. Percentage of fields within the U of M recommended nitrogen application range for corn following corn with dairy manure and nitrogen fertilizers across Minnesota in 2010: 88 fields.

Table 133. Pounds of nitrogen applied per acre as fertilizer and dairy manure to fields on corn following corn with corresponding yields in Minnesota for 2010.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	149	185	196	188
Avg N-Rate LB/A	90	155	189	233

Figure 154 details the distribution of nitrogen fertilizer rates with beef manure sources compared to the U of M recommended rates for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 134 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 154.

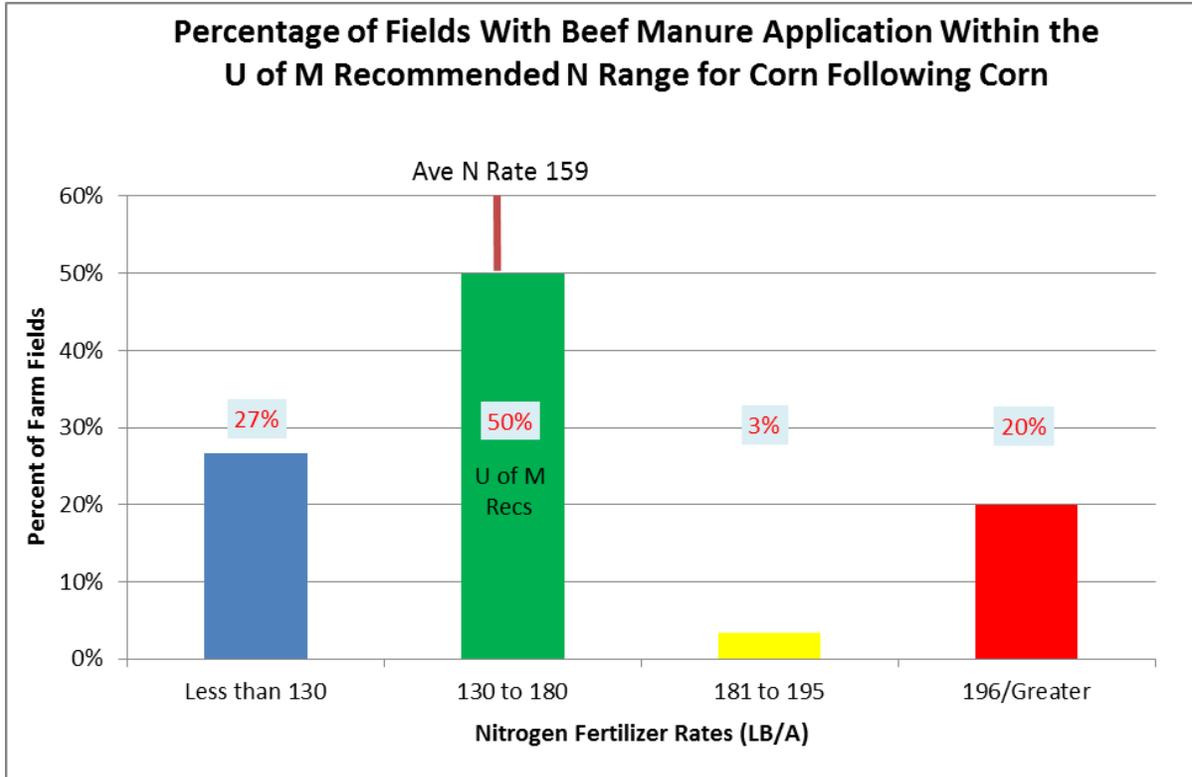


Figure 154. Percentage of fields within the U of M recommended nitrogen application range for corn following corn with beef manure and nitrogen fertilizers across Minnesota in 2010: 60 fields.

Table 134. Pounds of nitrogen applied per acre as fertilizer and beef manure to fields on corn following corn with corresponding yields in Minnesota for 2010.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	168	184	198	183
Avg N-Rate LB/A	101	157	190	233

Figure 155 details the distribution of nitrogen fertilizer rates with hog manure sources compared to the U of M recommended rates for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 135 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 155.

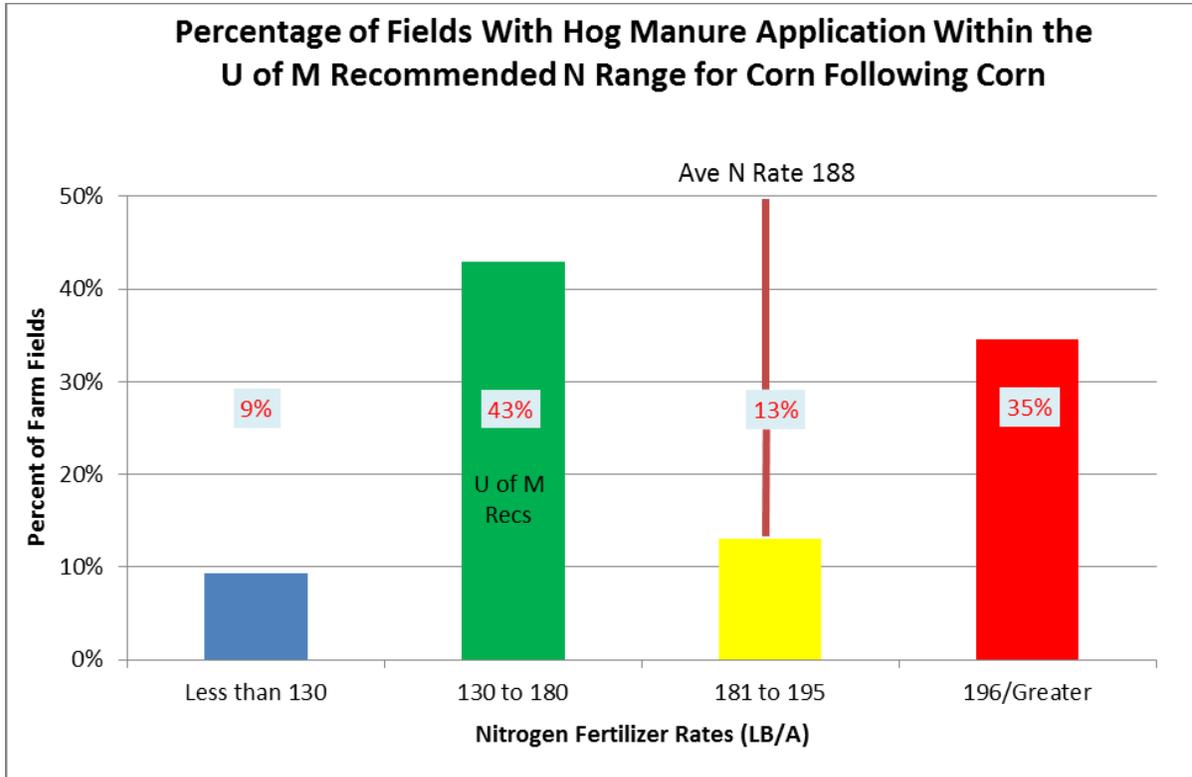


Figure 155. Percentage of fields within the U of M recommended nitrogen application range for corn following corn with hog manure and nitrogen fertilizers across Minnesota in 2010: 107 fields.

Table 135. Pounds of nitrogen applied per acre as fertilizer and hog manure to fields on corn following corn with corresponding yields in Minnesota for 2010.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	180	184	186	190
Avg N-Rate LB/A	97	163	190	241

Figure 156 details the distribution of nitrogen fertilizer rates with poultry manure sources compared to the U of M recommended rates for corn following corn using a “nitrogen to corn price ratio” of 0.05. Table 136 details the average yield and average nitrogen rate for each of the corresponding ranges in Figure 156.

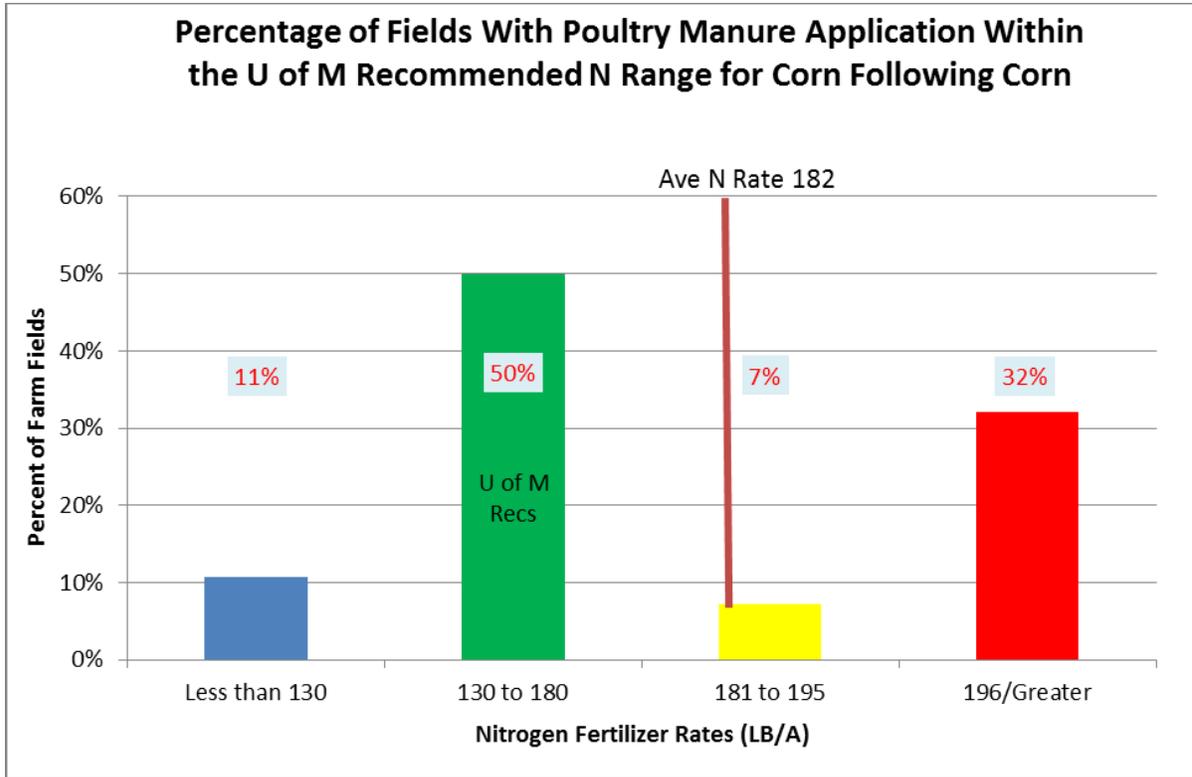


Figure 156. Percentage of fields within the U of M recommended nitrogen application range for corn following corn with poultry manure and nitrogen fertilizers across Minnesota in 2010: 28 fields.

Table 136. Pounds of nitrogen applied per acre as fertilizer and poultry manure to fields on corn following corn with corresponding yields in Minnesota for 2010.

N Fertilizer Ranges	<130 LB/A	130-180 LB/A	181-195 LB/A	196/Greater LB/A
Bu./Acre	133	181	180	186
Avg N-Rate LB/A	104	161	190	240

Use of Nitrogen survey data by other agencies

Other agencies such as the Minnesota Pollution Control Agency and the University of Minnesota have analyzed survey data also. Below is a chart that is used in the Nitrogen Reduction Strategy Plan detailing various crop scenarios. This data is using a 0.10 to 0.15 nitrogen fertilizer price to corn price ratio.

