

**Bazile Groundwater Management Area
2018 Survey Report
Sarah Nevison – UENRD**

- 271 total surveys
- 98 “landowners” completed survey (only top portion) = 36%, or one third of respondents
- 173 “producers” completed survey (completed more than just top portion) = 64%, or two thirds

1- How concerned are you with the nitrate levels in your groundwater?

Results: Overall averaged = 3.70 on a scale of 1 to 5

Landowners averaged 3.87 (n = 97), Producers averaged 3.60 (n = 171)

This is likely a significant difference (t-test, $P = 0.090$) between landowners and producers, with landowners being *more concerned* about nitrate levels in their groundwater than producers.

2- What do you think is causing the high nitrate levels in the groundwater?

47% of Landowners said fertilizer, nitrogen, or over application; 34% of Producers said the same.

Landowners were:

- 2x likely to say fertilizer/nitrogen
- 3x likely to say chemicals, herbicides, etc.

Producers were:

- 3x likely to say past practice/old bad habits
- 2x likely to say it is naturally occurring

Categorized responses below. Percent of Landowners means percent of landowners which responded with that response, and Percent of Producers means percent of producers which responded with that response. See [Appendix A](#) for all responses.

CAUSES	% of Landowners	% of Producers
over application/single/fall/poor management	24%	24%
Fertilizer/N	23%	10%
feedlots/CAFO/manure	10%	10%
Soil/sand/leaching	8%	9%
past practices/old bad habits	3%	10%
Other	5%	8%
don't know/no one knows	4%	7%
naturally occurring	3%	7%
chemicals/herbicides/insecticides	8%	2%
Lawns/urban/cities/golf courses	4%	2%
runoff	4%	2%
rain/over watering	1%	3%
City/rural septic systems	1%	2%
don't have a problem	1%	2%

3- Are you aware that there are health effects associated with high nitrate levels in drinking water?

Only 6% of landowners said they were unaware of health effects, and only 3% of producers.

If YES, what is your level of concern with nitrate related health effects?

Results: Overall average = 3.89 on a scale of 1 to 5

Landowners averaged 4.14 (n = 90), Producers averaged 3.75 (n = 165)

This is a very significant statistical difference (t-test, $P = 0.007$) between landowners and producers, with landowners being *significantly more concerned* about health effects than producers.

4- What suggestions do you have for reducing nitrate levels in the groundwater?

The most common response was to split apply/timing/rate, 22% of landowners and 28% of producers.

Landowners were:

- 6x more likely to say education

Producers were:

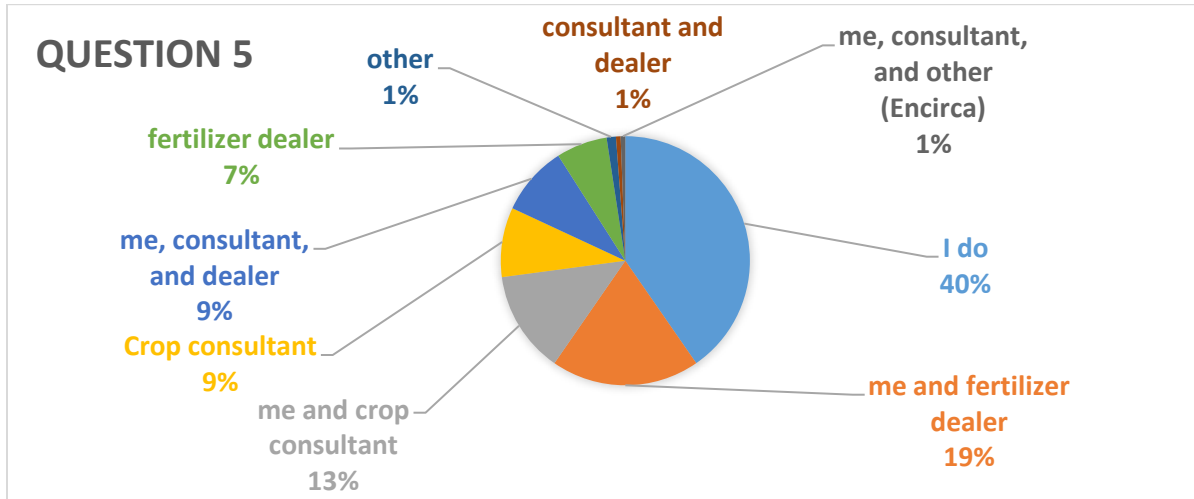
- 2x likely to say better management/stewardship/care
- 3x likely to say monitor feedlots
- Only producers commented that its fine/will take time/stop blaming farmers

Categorized responses below. See Appendix B for all responses.

SOLUTIONS	% of Landowners	% of Producers
split apply/less N/timing/rate/spoon feed/no fall N	22%	28%
Other	9%	10%
don't know/none/not much we can do	10%	7%
soil sample/soil knowledge	10%	7%
BMPs (buffers, use credits, stabilizers/inhibitors, crop rotation, no till, water testing)	5%	8%
cover crops	7%	4%
technology/test (tissue, stalk)	4%	5%
better management/stewardship/care	3%	5%
less corn/more forage/variety/grass	3%	4%
alternative farming/more organic/no N	5%	3%
Education	8%	1%
regulate/monitor/enforce/charge fertilizer apps	4%	3%
monitor feedlots/reduce/move	1%	4%
doing fine/will take time/stop blaming farmers	0%	4%
watch/regulate cities/lawns/golf courses	3%	2%
pump it out	1%	3%
home filter/RO/drill new well	3%	2%
figure out cause/better understanding/ask UNL	3%	1%

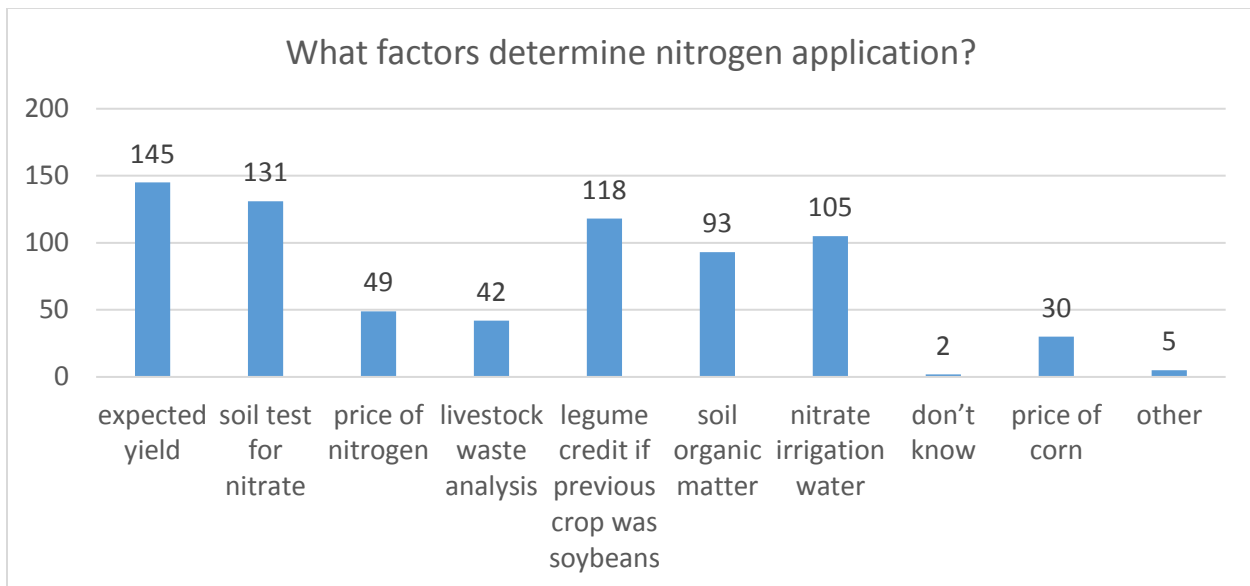
5- Who determines how much nitrogen you apply to your crops?

Producers take part in nitrogen management 83% of the time.
 Fertilizer dealers take part in nitrogen management 36% of the time.
 Crop consultants take part in nitrogen management 33% of the time.

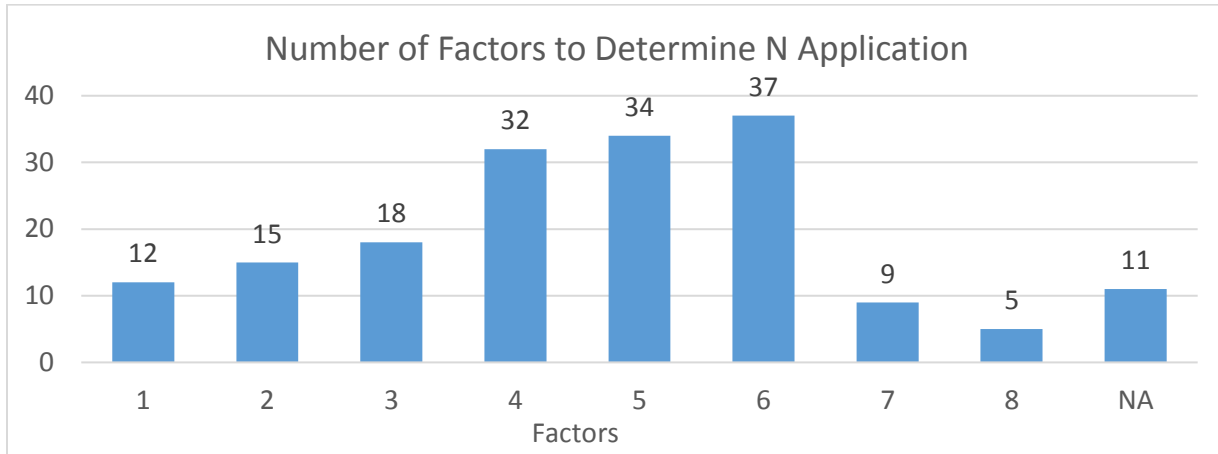


6- What factors do you use to determine how much nitrogen to apply?

Most common factors: expected yield, N soil test, legume credit, organic matter, and N irrigation water.
 Least common factors: price of nitrogen, price of corn, and livestock waste analysis.



Most producers checked more than one factor, average = 4.4 factors used, range = 1-8. Median = 5 factors.

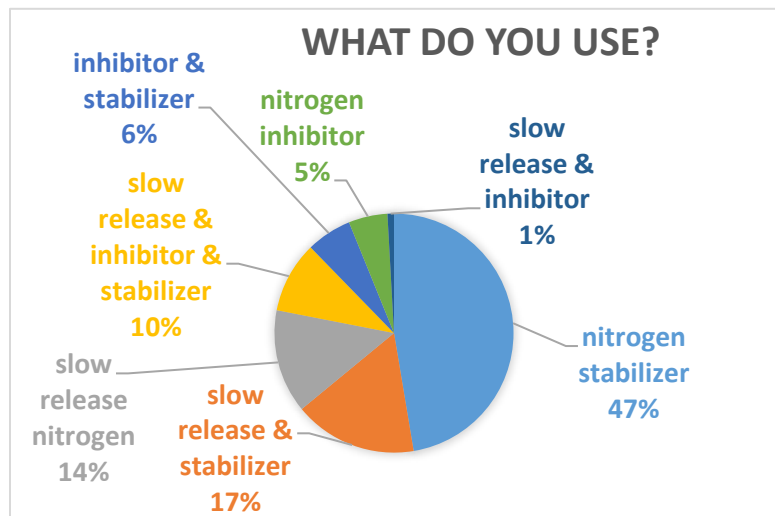


7- Do you use slow release nitrogen, a nitrogen inhibitor, or a nitrogen stabilizer?

Most producers said YES: 70%.
 21% said NO. 8% did not answer.
 2% said sometimes.

If YES, what do you use?

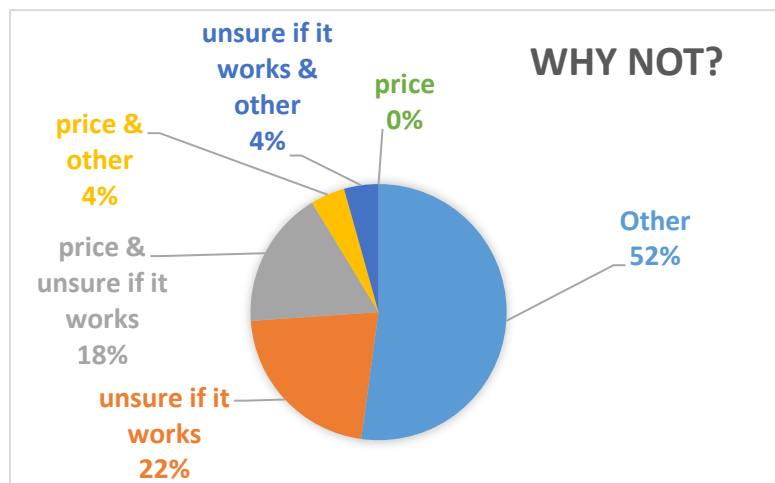
Of those that said **YES** or **SOMETIMES** and provided what kind they use:
 80% incorporate a nitrogen stabilizer
 41% incorporate slow release nitrogen
 22% incorporate a nitrogen inhibitor



If NO, what is your reason?

Of those that said **NO** or **SOMETIMES** and provided a reason why not:
 61% included some other reason
 44% included unsure if it works
 22% included price

Note: NO ONE said PRICE ALONE was the reason they don't use slow release/inhibitors/stabilizers.



Comments for why they don't use stabilizers/inhibitors/slow release:

SOMETIMES –

- Sometimes depending on weather

NO –

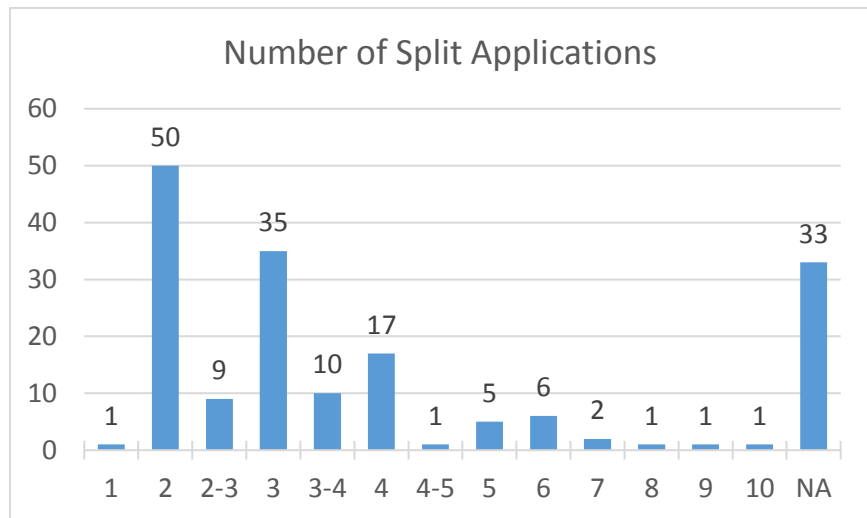
- Have in past but can't tell the difference. Apply late enough and water it in
- Don't use it
- Health reasons
- Split apply as needed
- Spoon feed
- Harvest more lbs of N than put on for 25 years
- I don't use nitrogen fertilizer, I farm organically using only dried chicken manure which is 4% N and ear worm casting, 1% N
- Side dress
- Split apply without yield benefit

8- Do you split apply nitrogen?

Most producers said YES: 87%. 8% said NO. 5% did not answer.

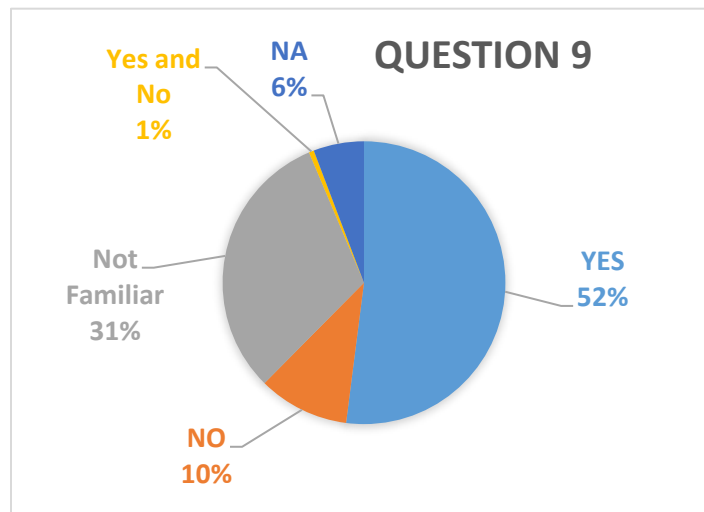
If YES, how many applications per season?

Average = 3.1, Range 1 – 10, Mode/Most Common = 2.



9- Do you have confidence in the University of Nebraska's Corn Nitrogen algorithm for calculating the needed rate of nitrogen for corn?

About half of producers have confidence in the UNL Algorithm, 52%. 31% are not familiar with it.



If NO, please describe why you disagree with the UNL's algorithm:

Answers varied, with most common being other calculators/consultants are better, and that the UNL recommendation is too high. See categorized responses below, and see [Appendix C](#) for all comments.

Disagree Reason	Number of Responses	%
other calculators/consultants are better	5	21%
recommendation is too high	5	21%
research is outdated	3	13%
every field/year is different	3	13%
it costs them yield/too conservative	2	8%
inaccurate for organic matter/soil type	2	8%
UNL has no clue	1	4%
should be done by farmer testing fields	1	4%
rain and weather can affect crops	1	4%
technology is not good enough yet	1	4%

10- Would you like to improve your nitrogen fertilizer efficiency?

Most producers said YES: 74%.

13% said NO. 13% didn't answer.

If YES, please describe the technology or type of information you would benefit from.

Answers varied, most common were variable rate application and nitrogen stabilizers/slow release/inhibitors. Categorized responses below. See [Appendix D](#) for all responses.

Technology or Information of Benefit:	Number of responses	%
variable rate application	10	16%
nitrogen stabilizer/slow release/inhibitors	7	11%
Other (sugars, strip till banding, CRP, prescription planting, infrared photos, fertility levels, chemistry for improving N efficiency)	7	11%
any/all/on farm data	5	8%
grid sampling/soil sampling	4	7%
Encirca by Pioneer	4	7%
fertigation/chemigation/split apply	4	7%
financial assistance/save \$/specifically user friendly	4	7%
tissue/stalk sampling	3	5%
we are doing this/we all want to	3	5%
variety of hybrids	2	3%
zone testing/specific area testing	2	3%
types of fertilizer	2	3%
variable rate irrigation/irrigation tests	2	3%

11- What crops do you produce in the BGMA?

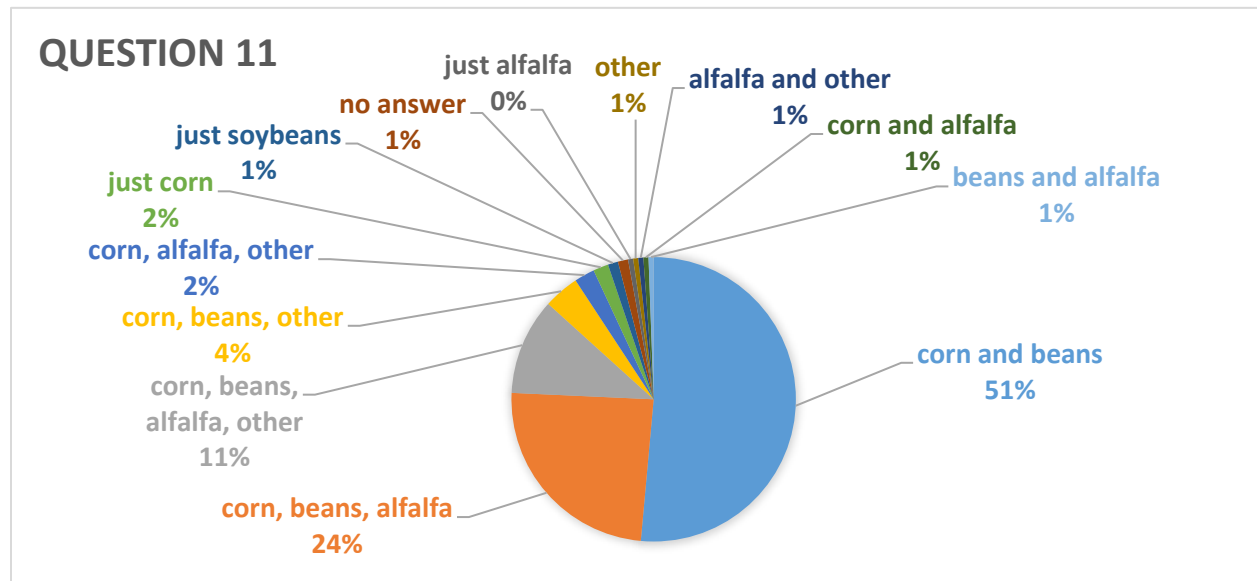
Most commonly corn and beans: 51%.

95% of producers include corn.

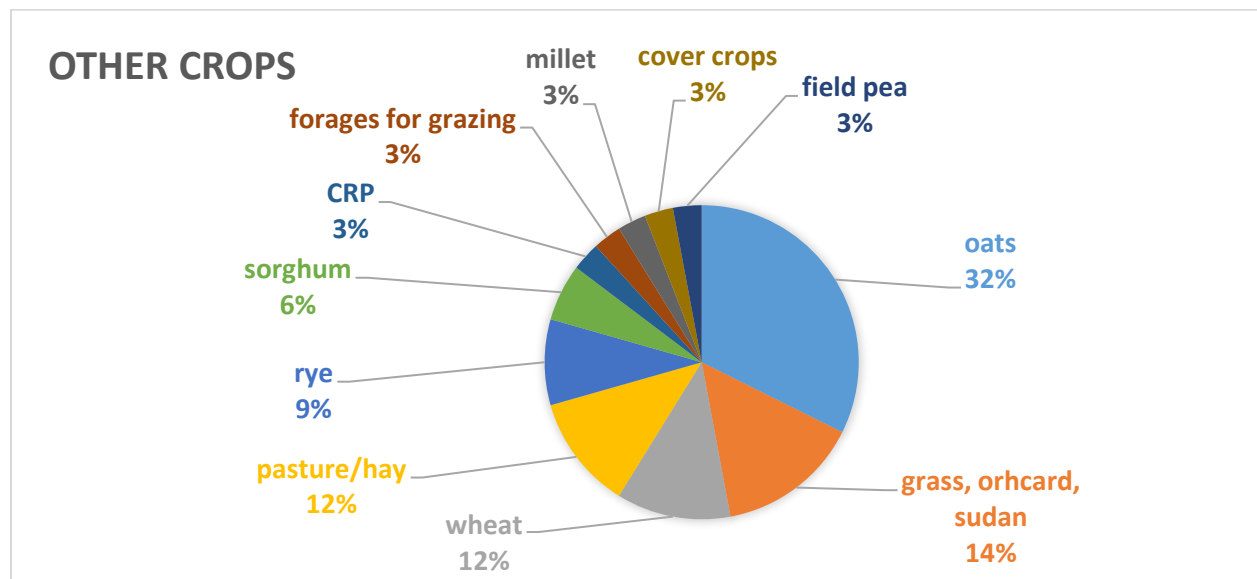
93% of producers include soybeans.

40% of producers include alfalfa.

19% of producers include other crops.



Of the other crops listed, oats was most common: 32%.



12- What is your typical yield and nitrogen rate for corn?

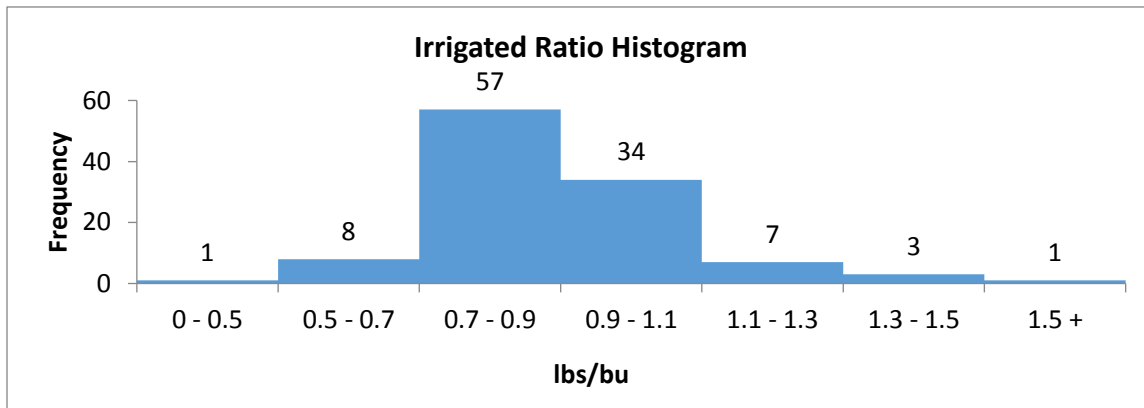
111 producers completed **irrigated** corn yield and nitrogen application:

Irrigated corn yield goal averaged 230 bu/ac, rate of nitrogen applied averaged 208 lbs/ac = 0.90 lbs/bu

Yield goal ranged from 110 to 300 bu/ac, median = 230 bu/ac.

Application ranged from 0 to 483 lbs/bu, median = 200 lbs/bu.

The ratio of lbs/bu ranged from 0.00 to 2.1 lbs/bu, **averaged = 0.90 lbs/bu**. See histogram below:



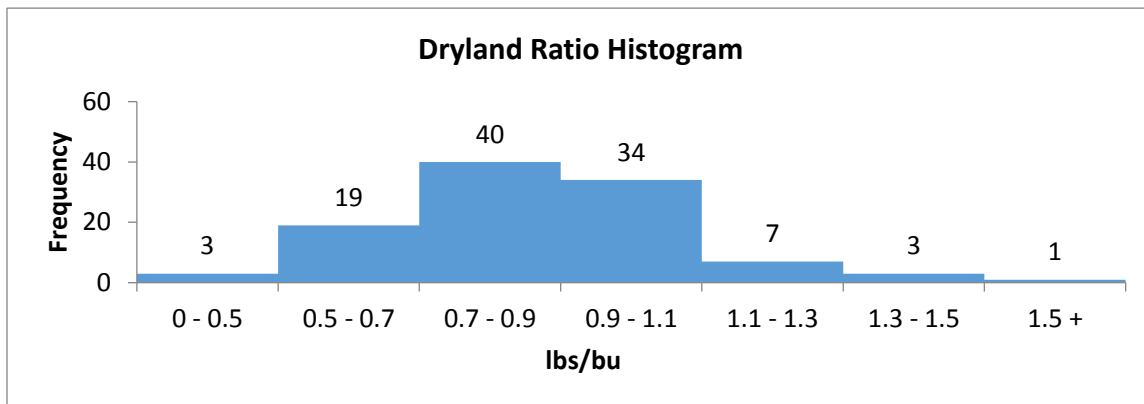
107 producers completed **dryland** corn yield and nitrogen application:

Dryland corn yield goal averaged 146 bu/ac, rate of nitrogen applied averaged 127 lbs/ac = 0.87 lbs/bu

Yield goal ranged from 50 to 225 bu/ac, median = 150 bu/ac.

Application ranged from 0 to 225 lbs/bu, median = 122 lbs/bu.

The ratio of lbs/bu ranged from 0.00 to 1.8 lb/bu, **averaged = 0.88 lbs/bu**. See histogram below:



13- What percentage of the acres you manage to you plant cover crops on?

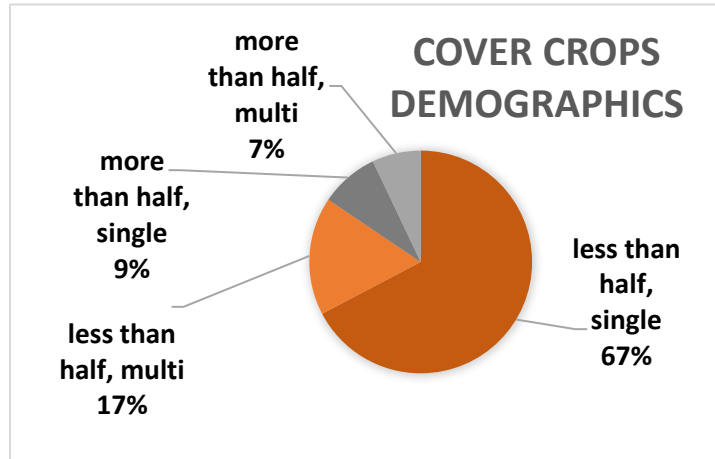
About half of producers do no plant cover crops: 51%.
 38% plant cover crops on less than half of their acres.
 7% plant cover crops on more than half of their acres.
 4% did not answer.

If you plant cover crops do you plant single species or multi species?

Of those that plant cover crops, 76% do single species and 24% do multi species.

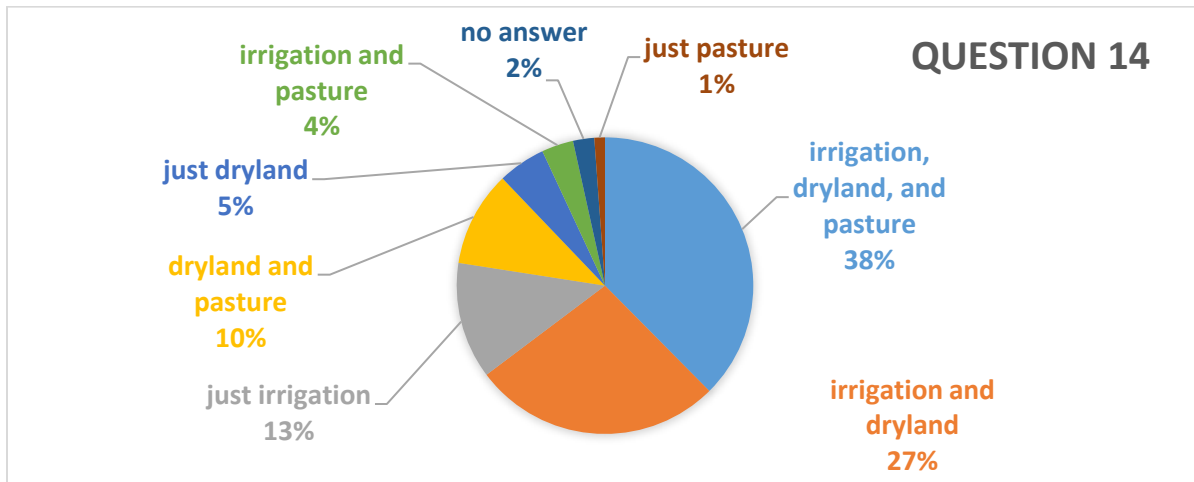
Additional Comments on Question 13:

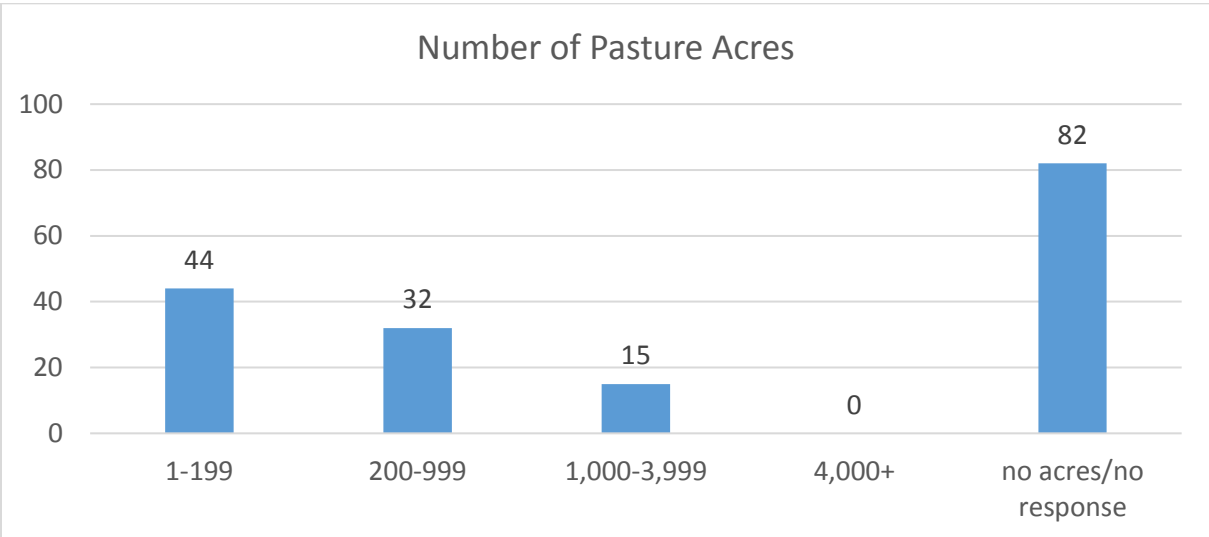
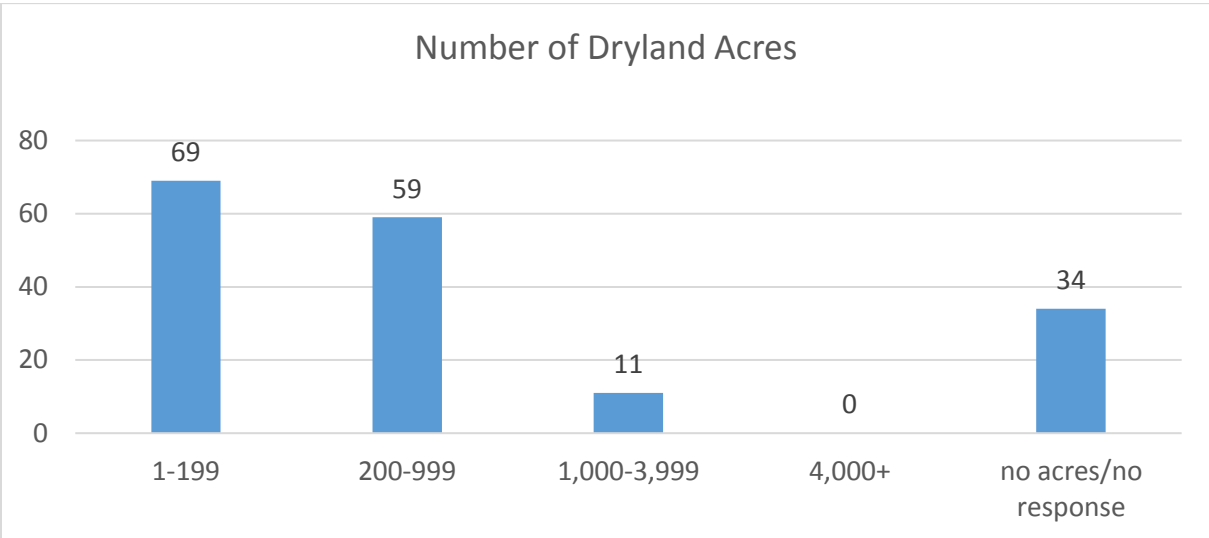
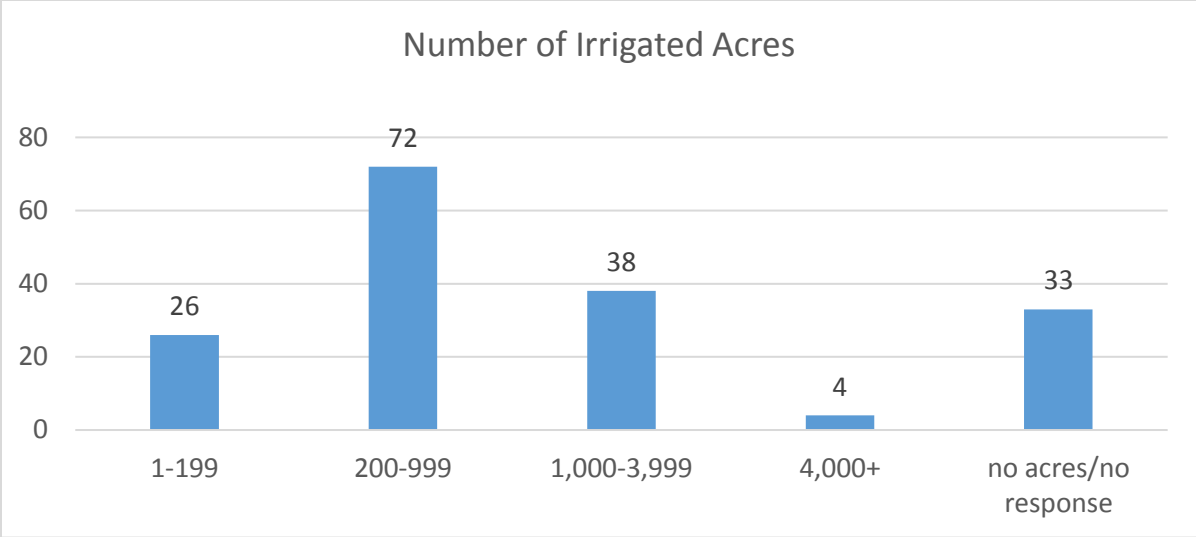
- I'm a stuart [sp] of the land!
- We don't get enough rain to use these



14- What size crop operation do you manage?

81% of producers include irrigation.
 80% of producers include dryland.
 53% of producers include pasture.

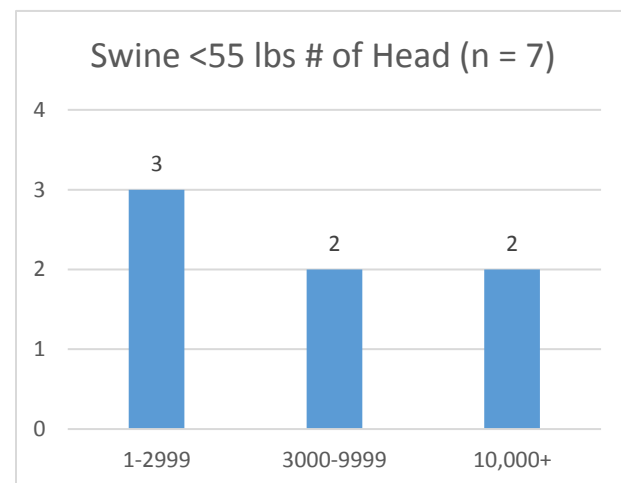
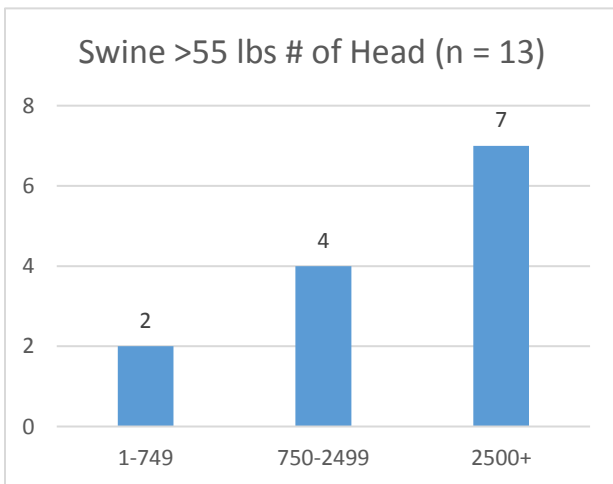
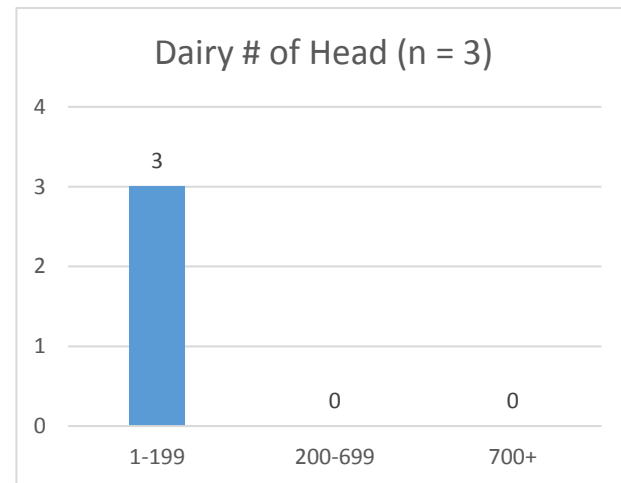
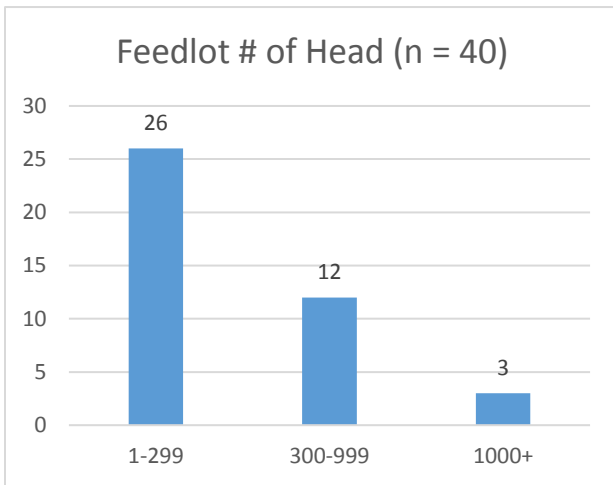
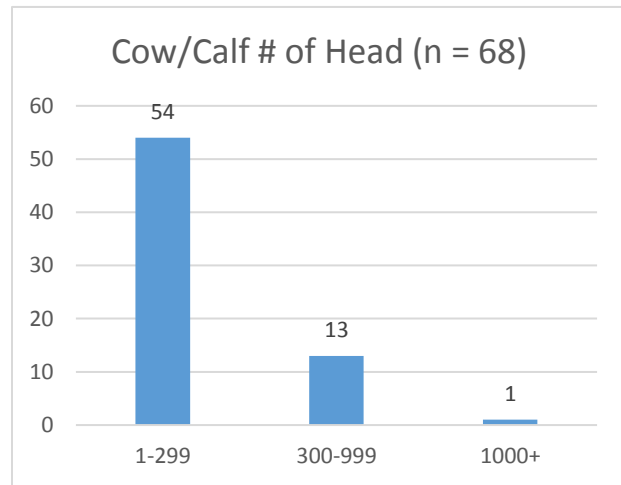




15- What size livestock operation do you manage?

57% of producers manage some livestock, 43% do not manage livestock.

Of those that manage livestock:
 69% manage cow/calf
 41% manage feedlot
 3% manage dairy
 13% manage swine >55 lbs
 7% manage swine <55 lbs
 1% manager other (sheep)



16- Are you aware there are cost-share programs for nitrogen management practices in the BGMA?

Most producers are aware of cost-share programs, 62%.
33% said no, and 5% did not answer.

17- What types of practices would you like to see covered with cost share assistance programs?

Answers varied, but most common was soil samples. See [Appendix E](#) for further comments.

Cost Share Preferences	Number of Responses	%
soil samples	11	14%
tissue sampling	9	12%
cover crops/diversification	8	10%
soil moisture sensors	6	8%
variable rate fert./application	6	8%
doing good	6	8%
none/don't know	6	8%
water samples	6	8%
convert to grass/alfalfa	5	7%
nitrogen inhibitors/stabilizers	4	5%
variable rate irrigation/flowmeter	3	4%
cattle confinement buildings/sheds	2	3%
buffer strips	1	1%
cross fence in pasture	1	1%
infrared photos	1	1%
Pioneer's Encirca	1	1%
no till	1	1%

**Appendices for Bazile Groundwater Management Area
2018 Survey Report
Sarah Nevison – UENRD**

Appendix A:

All answers to Question 2: “What do you think is causing the high nitrate levels in the groundwater?” # of Land. and # of Prod. are the total number of landowners and producers with that response. Total Percent is total number of people who had that response divided by 271.

CAUSES	# of Land.	# of Prod.	TOTAL	TOTAL PERCENT
over application/excess/single	21	33	54	20%
Fertilizer/N	21	20	41	15%
feedlots/CAFO/manure	9	21	30	11%
Soil/sand/leaching	7	18	25	9%
past practices/old bad habits	3	21	24	9%
don't know/no one knows	4	14	18	7%
naturally occurring	3	14	17	6%
chemicals/herbicides/insecticides	7	5	12	4%
ignorance/carelessness/poor management	1	9	10	4%
Lawns/urban/cities/golf courses	4	5	9	3%
runoff	4	5	9	3%
agriculture/farming in general	3	4	7	3%
fall application	0	5	5	2%
don't have a problem/not my problem	1	4	5	2%
rain/weather	1	3	4	1%
over watering	0	3	3	1%
from a specific city system (O'Neill, Page, Plainview, Orchard)	1	2	3	1%
lots of things	0	3	3	1%
cheap N/companies	0	2	2	1%
water level near surface	0	2	2	1%
crop residue	1	1	2	1%
know someone who put N in well	1	1	2	1%
not using credits	0	2	2	1%
septic tanks/outhouses	0	2	2	1%
well casings	0	1	1	0%
water movement	0	1	1	0%
gravel pit	0	1	1	0%
not being allowed to pump it out	0	1	1	0%

Appendix B:

All answers to Question 4: “What suggestions do you have for reducing nitrate levels in the groundwater?” # of Land. and # of Prod. are the total number of landowners and producers with that response. Total Percent is total number of people who had that response divided by 271.

SOLUTIONS	# of Land.	# of Prod.	TOTAL	TOTAL PERCENT
split apply/less N/timing/rate/spoon feed	17	40	57	21%
soil sample/soil knowledge	6	10	16	6%
don't know/none	8	7	15	6%
cover crops	5	6	11	4%
technology/test (tissue, stalk)	3	7	10	4%
better management	1	7	8	3%
less corn/more forage/variety/grass	2	6	8	3%
alternative farming/more organic/no N	4	4	8	3%
education	6	2	8	3%
regulate/monitor/enforce fertilizer apps	3	4	7	3%
monitor/reduce/move feedlots	1	6	7	3%
watch/regulate cities/lawns/golf courses	2	3	5	2%
economy/cost/survival	2	3	5	2%
pump it out	1	4	5	2%
test water	0	4	4	1%
home filter/RO	2	2	4	1%
monitor/manage	0	4	4	1%
not much we can do	0	4	4	1%
figure out cause/better understanding/ask UNL	2	2	4	1%
no till	0	3	3	1%
crop rotation	2	1	3	1%
no fall N	0	3	3	1%
certify N users	1	2	3	1%
don't farm sand	0	2	2	1%
stabilizers/inhibitors	0	2	2	1%
use credits	1	1	2	1%
use griding system	2	0	2	1%
buffers	1	1	2	1%
stewardship/care	1	1	2	1%
less monitoring/less NRD involvement	2	0	2	1%
stop blaming farmers	0	2	2	1%
will take years to fix	0	2	2	1%
we are doing well	0	2	2	1%
charge a fee for N	0	1	1	0%
chemigation	0	1	1	0%

10 lb N per 1 point CEC	0	1	1	0%
BMPs	0	1	1	0%
drill new well	0	1	1	0%
reduce mega farmers/more small farmers	0	1	1	0%
use animals to use N	1	0	1	0%
N is good for crops	1	0	1	0%
only irrigated amount	0	1	1	0%

Appendix C:

All comments from Question 9: "Do you have confidence in the University of Nebraska's Corn Nitrogen algorithm for calculating the needed rate of nitrogen for corn? If NO, please describe why you disagree with the UNL's algorithm."

NO:

- There are private ones that are better
- Uses consultants rates
- Feel the algorithm costs yield
- Recommendation is too high
- Under or over estimating organic matter
- Worked for UNL, they have no clue
- Too conservative and most of research is outdated
- I use my knowledge from many sources, not just fertilizer people trying to see for 300 bushel corn
- Walk your fields, use soil probe, tissue samples, do this yourself
- I use research information from other state universities (Iowa, Ohio, Indiana, etc.) that likely use more state of the art current data and modelling
- If you have things working right in the ground and plant, it doesn't take that much nitrogen to raise a good crop
- Every field is different, every year is different, every management practice is different
- It is too high for today's genetics also too expensive to apply that much. Better yields can be achieved with less
- Seems outdated

YES:

- If practices have not worked for 25 years, maybe feedlots should be included in strategy
- UNL is the best
- But excess rain fall and cool weather can affect crop response

Not Familiar:

- Soil types vary a lot
- I don't disagree, I just don't know anything about it
- We have our own way to calculate our N needs, it works and we use less N than the university recommends

Yes and No:

- N:bu is different for everybody, tech is not good enough yet

No Answer:

- Reasonable confidence, but I think the formula causes us to over apply N. And no one want to be short on N do they!
- I only farm about 100 acres corn and beans + 200 acres pasture. I haven't used ANY fertilizer in 4 or 5 years, probably won't use any in the future. I rotate 100% corn beans. I don't need large yields.

Appendix D:

All answers to Question 10: "Would you like to improve your nitrogen efficiency? If YES, please describe the technology or type of information you would benefit from."

Technology or Information of Benefit:

- Variety of hybrids
- financial assistance
- sugars
- zone testing
- grid sample, variable rate application
- Better nitrogen stabilizers
- VRF spreader, soil sampling
- specific area testing
- Encirca is good for production and savings
- variable rate application
- anything to save money on
- application methods, types of fertilizer, rate of irrigation, strip till banding
- variable rate application, fertigation
- CRP
- tissue and stalk sampling
- slow release N
- slow release N products, other practices that help soil retain N
- cost savings
- grid sampling, corresponding application of fertilizer, prescription planting and fertilizer application, infrared photos
- hybrids that require less N
- type of N
- if other fertility levels are high enough
- more chemistry to help improve N efficiency
- VRT applications, Y drops, slow release N, make programs user friendly and describe the process of how to sign up for the programs, there is no clear description of deadlines and what we can sign up for
- farm data that compares different N stabilizer products and tools that help make it easier to do more split applications of N
- unknown
- Encirca by Pioneer
- more split application
- we all would
- best practices for application
- variable rate in season nitrogen application
- web-based nitrogen loss calculators (Climate, Encirca, etc..) have been helpful
- hopefully Encirca by Pioneer
- any new information would be helpful
- we are doing this
- we do our own on farm testing
- would like to improve knowing if its efficient. Don't know what you lose to air, etc.

- an instrument that would test plant nitrate levels in the field, so we could decide the best time to apply the next app. of nitrogen
- tissue sampling
- slow release or stabilizers that are proven to work
- soil tests and irrigation tests
- don't know
- timing N application to growth stage of corn
- not sure
- chemigate
- maybe variable rate/not sure
- whatever information you have
- more stabilizer and inhibitors

Appendix E:

Comments from to Question 17: "What types of practices would you like to see covered with cost share assistance programs?", and categorized by response to Question 16: "Are you aware there are cost-share programs for nitrogen management practices in the BGMA?"

YES, I am aware of cost share:

- Seems discriminatory to not qualify because I already do it
- No money when applied
- You have to be approved a year ahead of time and plans change
- Why should tax payers pay for this? Good farmers don't need tax money. Good operators and small farmers don't need your money. Crop rotation from good farmers take care of the land and don't waste fertilizer. Big farmers put all the N on with huge floaters to get all those acres done
- Don't like cost share, too many people tell me how to run my farm
- Less paperwork
- Stuartship [sp] to the land/self-controlled or helped in need be but don't force the process too much!
- Variable rate irr. Excess water in draws need more hills more efficient, less water used
- Pay SOME COST SHARE to farmers using no fertilizer, pay NO cost share to farmers using fertilizer
- LENRD covers most already. Additional paperwork is what normally deters me from using cost share
- I just bought a variable rate dry spreader to vary my urea application but was told that there was no cost share for it.
- Equipment to regulate (anhydrous) rate --> regulatory equipment to be proactive not reactive
- I tried your program one year and my corn field was 39 BU. You can't have this anymore

NO, I am not aware of cost share:

- Do not increase my taxes to support specialty program or agency expansion to administer new programs
- None. If producer caused the problem - he should be responsible for costs
- Deep soil samples, we need more in UENRD cause that's I'm located