Tri-Basin Irrigator

Volume 23, Issue 4 **June 22, 2023**

Program Information

EQIP: **2023 applications are being pre-approved as funds become available.**

CSP: **2023 applications are being pre-approved as funds become available.**

NSWCP: **New funds come July 1st for all conservation practices so have your applications complete by June 30th. Applications must be signed by the owner.**

ENERGY EFFICIENCY GRANT: **Next sign-up deadline is June 30th. For more information contact Jolene at Rural Development at the Kearney USDA Service Center at 308-455-9840 or at *jolene.jones@usda.gov*.**

Calendar of Events

July 3: CNPPID Board of Directors Meeting
July 4: Independence Day – Gov't offices closed
July 11: TBNRD Board Meeting
July 23-26: Phelps County Fair
July 27-29: Gosper County Fair
July 28-30: Kearney County Fair

Rain Infiltration – How and How Much?

What do you think the soil profile looks like in each of these nearby fields after this rain event in June 2006?

Tilled
(Runoff water in ditch)

vs.

No-Tilled
(No runoff water)

As you recall, things looked bleak moisture wise heading into planting season. We did not have a full profile to 4 feet. That is nice to have during the crop season. Starting in May, the rains started coming, some big some small. They have continued.

How does one capture this FREE moisture called RAIN and use it to fill our profile? Especially some of the bigger rains. It all starts with No-Till. The soil has more residue cover to prevent crusting. There is less soil disturbance resulting in worm holes, less compaction, and increased stability.

See attachment "Infiltration and Runoff". The rainfall simulator demonstration photos on the attachment demonstrate what the above fields are showing. Crusting prevents infiltration, thus increasing runoff. No-till prevents crusting, has worm holes to aide in higher infiltration rates getting water deeper, and it has better soil structure. The end result is the no-till field has a lot more free moisture in the soil for the crop than the tilled field. Soil moisture sensors will show you how much.

Curtis's Column

USDA United States Department of Agriculture
Natural Resources Conservation Service

UNL Corn Nitrogen Calculator for Nebraska

The UNL Corn Nitrogen Calculator for Nebraska (referred to as "Calculator") is a tool for calculating corn nitrogen recommendations. This Calculator is an Excel spreadsheet. Enter the proper data and let it calculate for you. I will provide an introduction in this issue and break it down in future issues.

Be consistent with the data you enter. It may take a couple of years to develop a consistent approach. In the last issue, I mentioned every field is a demo field. Be consistent in your field to see long term trends. Being consistent year in and year out enables one to really learn what's going on. Bouncing around and mixing things up year to year becomes a failure in learning and a reason why something doesn't work.

A sample of the Calculator is shown on the attachment. You will see 3 sections: the upper where one selects their nitrogen application program and dollars, the middle where the field information is entered, and the bottom section where the nitrogen recommendation and adjustments appear.

Focus on Lines 1-7 in the middle section where the field information is entered and Line B in the bottom section which is the nitrogen recommendation. Recommendation adjustments for pricing are for economic reasons only as I see it. Nitrogen and corn do not care what the price is and will not adjust in the field. Also, leave the program out of it. We should be focusing on how to apply nitrogen efficiently. Selecting fall in the Calculator recommends higher rates because nitrogen is lost to the groundwater and/or the atmosphere. That wastes money. Use your own field and your own operation to determine proper amounts of nitrogen to produce the most economical corn.

Is this Calculator perfect? No. No tool is perfect. There are so many variables each year that play a factor in yield including hybrids, soil, weather, tillage, etc. But this Calculator is an excellent tool to use and learn from with your own demo fields. You know your operation. Be honest with yourself and be consistent. This Calculator will also help you maintain that consistency year in and year out. You might save some money along the way. Wouldn't that be awesome!

Here's the link to download this Calculator: *https://cropwatch.unl.edu/download-your-corn-nitrogen-calculator*. Click the "UNL Soil Fertility Web site" link. Then scroll down to the Soil Management Software section and click the "Corn Nitrogen Recommendations Calculator" link.

If you have any questions, contact Curtis Scheele at 308-995-6121, Ext. 3 or at *curtis.scheele@usda.gov*.

Leaf Tissue Sample Guidelines

- 1 leaf sample / 40 acres or less per management system.
- ** Samples must be taken prior to tassel. **
- 15-20 plant leaves per sample.
- Sample leaves are ear shoot leaves. If samples prior to ear shoot leaf, samples will be the youngest mature leaf (top leaf with a collar).
- Dirty/dusty samples should be lightly rinsed. Over-rinsing can leach out soluble nutrients.
- Samples should be air dried or placed in a paper bag for shipping.
- Contact lab for additional info on sampling and analysis.

CNPPID Notes

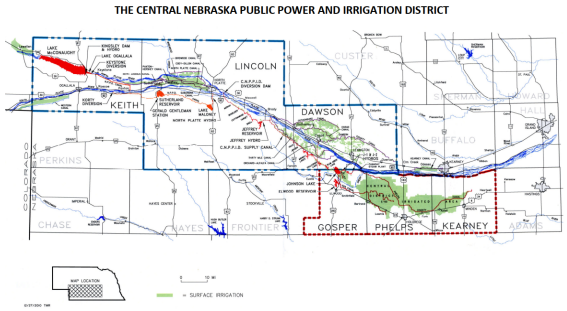
CNPPID Irrigation/Conveyance Systems

The Central Nebraska Public Power & Irrigation District serves over 108,000 irrigated acres with surface water for irrigation. This surface water is sourced from either water that is stored in Lake McConaughy and released downstream for irrigation or is natural flow out of the Platte River.

Water is transferred and delivered through four canal systems, which consist of a combination of hydroelectric power facilities, lakes, open ditches, pipelines, and siphons. The four canal systems provide surface water irrigation for Centrals customers in Lincoln, Dawson, Gosper, Phelps, and Kearney counties.

The combination of these canal systems also provides groundwater recharge, recreation, and habitat for many species of fish and wildlife.

Central's lakes and canal system also provides storage and conveyance of surface water for other irrigation districts.



Visit www.cnppid.com or follow @CNPPID on Facebook, Instagram and Twitter for updates throughout the year.

Tri-Basin NRD News

Groundwater Management Reminders

Groundwater Quantity Management (Water Use)

Check to see that your meters are working properly and notify the NRD if they are not.

Groundwater Quality Management (Nitrogen Management/GMA)

Phase II & III: Take water samples this July or August for your 2024 Nitrogen Management Crop Reports. If you have questions about these requirements or reports, call Pat at our office at 308-995-6688.

Water Quality Sampling: NRD Staff will be out collecting water samples around the district.

Chemigation

We are currently scheduling chemigation inspections for new and routine inspections. Inspections are required every three years in the Tri-Basin NRD for your system to remain renewable.

If you have problems with your system or make any changes, contact the NRD to have it inspected. If you have questions about these requirements or reports, call Dana or Sasha at our office at 308-995-6688.

Nebraska Extension Extras

New Sensor-based N-Time Fertigation Tool

Remote sensing crop canopy reflectance is the most efficient option for assessing in-season nitrogen needs. Accuracy of corn needs assessment increases at the 8th leaves (V8) growth stage or when 10 horizontal/droopy leaves develop (or later) when full canopy begins.

Late Spring Nitrogen Testing at Iowa State with soil and leaf samples being analyzed for projecting crop nutrient needs forward into the growing season. Then, in 2020, UNL launched the sensor-based fertigation management program. For this project, drones log weekly data and link the N-Time software used by Jackson Stansell, Sentinel Fertigation founder https://cropwatch.unl.edu/2023/sensor-based-fertigation-management-research-boosts-efficiency-profitability.

This program has now expanded into a high resolution satellite web-based imagery N-Time™ service capturing almost-daily data. For more 'Sentinel Fertigation https://www.sentinelfertigation.com/n-time

Crop Growth Rate Charts Available

Free ET (evapotranspiration) growth charts for corn, wheat; soybeans, potatoes, sorghum, and alfalfa are available at the link: https://cropwatch.unl.edu/et_resources. Scroll to "Crop Water Use by Plant Growth Stage and click on your crop choice

Free Corn Split Nitrogen Economics Tool

Free High Plains Regional Climate Center tools (using 31+ years of historical climate data) is available free of charge for corn growers. These tools include crop maturity simulators.

The '**Corn Split N' (nitrogen) Tool** allows users to compare economic decisions for nitrogen application timing based on the historical weather combined with fieldwork data. Simulated economic returns can be instantaneously adjusted according to: corn planting dates; fertilizer applications plant stage(s); side-dress application amounts; fertilizer prices and corn prices. Click on the link below for more county/site specific GPA location information.

Post-planting Nitrogen Application Tool: Useful to Usable (U2U) (unl.edu)

Pocket Gopher & Mole Control

Pocket gophers can be a nuisance in alfalfa, pastures and row crop fields. Both gophers and moles may be controlled using traps although each rodent type requires a different style of trap. For pocket gophers, traps should be placed (tines first) into the entrance of the deeper main tunnel. Traps should be staked with a wire or light cable extended to the soil surface to prevent the rodent from chewing through twine or plastic string. Then, stake traps to the surface using wire marking flags.

Toxicant baits are labelled for controlling pocket gophers. When soil conditions are dry, the 2% zinc phosphide grain baits can work well for pocket gopher control. The key is keeping this bait dry and not covered up the baits in tunnels. For wet conditions, the waxed or paraffin moisture-proof bait blocks with chlorophacinone or diphacinone toxins work well. These & zinc phosphide are *non-anticoagulant 2nd* generation products.

Fumigants are labeled for pocket gophers; but new NE Dept of Agriculture rules require a commercial applicator license.

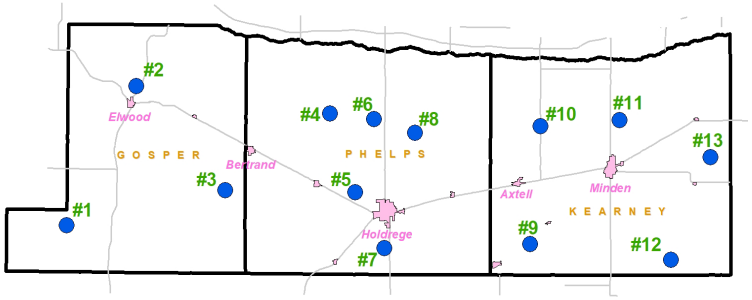
NebGuide 'Controlling Pocket Gophers' G1509 and the free Stephen Vantassel, UNL Wildlife Control emeritus, YouTube can provide more info."How to control pocket gophers" available at: https://www.youtube.com/watch?v=eldpMmfoQVw.

NAWMN Crop ET Information

Additional Information and other ET resources can be found at websites listed under "Crop ET Information" below.

Inches of Crop Water Use (ET) = Evaporation x Kc

	June 5 – June 11		June 12 – June 18	
Site	Evaporation	Rain	Evaporation	Rain
1	1.80	0.28	1.80	0.94
2	1.30	0.35	1.90	1.20
3	1.80	0.48	1.80	0.80
4	NA	NA	NA	NA
5	1.80	0.78	1.60	2.12
6	1.70	1.56	1.70	0.56
7	1.70	1.10	1.60	1.25
8	1.40	1.08	1.70	0.69
9	1.70	0.41	1.60	0.10
10	1.70	0.30	1.80	0.55
11	1.70	0.74	1.70	0.18
12	1.60	0.68	2.00	0.60
13	1.70	1.50	1.70	0.10



2023 Map of NAWMN Sites across the Tri-Basin NRD

Crop Coefficients (Kc)

Corn Stage	Kc	Soybeans Stage	Kc
2 leaf	0.10	Cotyledon (VC)	0.10
4 leaf	0.18	1st Node (V1)	0.20
6 leaf	0.35	2nd Node (V2)	0.40
8 leaf	0.51	3rd Node (V3)	0.60
10 leaf	0.69	Beg. Bloom (R1)	0.90
12 leaf	0.88	Full Bloom (R2)	1.00
14 leaf	1.01	Beg. Pod (R3)	1.10
16 leaf	1.10	Full Pod (R4)	1.10
Silk – Beg. Dent	1.10	Beg. Seed (R5)	1.10
¼ Milk Line	1.04	Full Seed (R6)	1.10
Full Dent (½ Milk)	0.98	Yellow Leaf (R6.5)	1.00
¾ Milk Line	0.79	Beg. Mat. (R7)	0.90
Black Layer	0.60	Full Mat. (R8)	0.20
Full Maturity	0.10	Mature	0.10

Crop Stage Information

Corn (V4-4 Leaf to V14-14 Leaf stage): Nutrients and water are in greater demand at V10. V15 is the beginning of the most crucial period of plant development in terms of seed yield.

Avg. daily water use from June 12 – June 18 was 0.04"-0.25".

Soybeans (V2-2nd Node to V6-6th Node stage): From V2-V5, the lateral roots will grow rapidly in the top 6 inches between the rows. By V5, they will completely reach across a 30" row.

Avg. daily water use from June 12 – June 18 was 0.09"-0.20".

June12-June 18 (12 of 13 NAWMN sites reporting): Average weekly rainfall was 0.76 (range 0.10 to 2.12. Average weekly ET for corn was 0.96 and for soybeans was 1.07.

Crop ET Information

NAWMN: *https://nawmn.unl.edu/ETdata/DataMap*
TBNRD: *https://www.tribasinnrd.org/tbawmn*
UNL CropWatch: *https://cropwatch.unl.edu/gdd-etdata* **NEW**
Texting (Daily): Sasha @ TBNRD: 308-995-6688
Email (Weekly): Curtis @ NRCS: 308-995-6121, Ext. 3

CORN STAGE		DESCRIPTION
V4	4 Leaves	Leaf stage is defined by number of leaves with visible collars. The collar is a discolored line where the leaf meets the stalk. This line circles the stalk. TIP: Mark the 6th leaf or a higher leaf by cutting a notch in it or some other way so as to know that leaf number. Reason is the lower leaves will be lost as the plant develops. Flag or somehow mark the plant in the field as a reference plant when determining later leaf (vegetative) stages.
V10	10 Leaves	
V16	16 Leaves	

SOYBEAN STAGE		DESCRIPTION
V2	Second Node	V2 has 2 nodes on main stem with a trifoliate leaf with unfolded leaflets (leaflet edges are no longer touching). (Plant has 3 nodes total: 1 unifoliate + 2 trifoliates)
V5	Fifth Node	V5 has 5 nodes on main stem with a trifoliate leaf with unfolded leaflets. Plant as 6 nodes total: 1 unifoliate + 5 trifoliates
R1	Beginning Bloom	At least one open flower is present at any main stem node.

Lake and River Levels

CNPPID Reservoir Elevation and Capacity as well as Platte River Flow data listed below and other locations can be found on CNPPID's website at http://cnppid.com/wp-content/uploads/2016/06/lakeRiverData.html.

	June 22, 2023, 8:00 AM	1 Year Ago
El. & Cap. – Lake McConaughy	3234.0 ft - 55.0%	3237.0 ft - NA%
Inflows to Lake McConaughy	869 cfs	108 cfs
Flows on the North Platte at North Platte	305 cfs	1370 cfs
Flows on the South Platte at North Platte	6060 cfs	101 cfs
Flows on the Platte at Overton	4440 cfs	922 cfs

Happy Birthday America! – July 4th – Video Tribute
Why I Love Her by John Wayne

https://www.bing.com/videos/search?&q=4th+of+July+youtube&view=detail&mid=3EDB108CA1BB08790E2A3EDB108CA1BB08790E2A&FORM=VDRVRV&ajaxhist=0

Websites of Interest

NRCS Nebraska	www.ne.nrcs.usda.gov
Farm Service Agency	www.fsa.usda.gov
TBNRD Home Page	www.tribasinnrd.org/
Central Irrigation District	www.cnppid.com/
UNL Cropwatch	cropwatch.unl.edu
UNL Extension	extensionpubs.unl.edu/
K-State SDI Website	www.ksre.ksu.edu/sdi
No-till On The Plains	www.notill.org
Soil Health:	www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/
NE State Irrig Assoc	www.nebraskastateirrigationassociation.org/

Rainfall

Rainfall amounts listed below and other locations come from NeRAIN which can be found at website https://nednr.nebraska.gov/NeRain/Maps/maps.

Location:	June 8 – June 21	May 1 – June 21
Elwood 1.81 mi. NW:	2.30	6.71
Loomis 0.2 mi. SW:	2.57	7.10
Holdrege 1.7 mi. W:	1.26	6.04
Minden 7.2 mi. W:	0.86	5.13
Minden 5.8 mi. E:	0.67	4.68

Average Rain for May-June in Holdrege = 8.04 Inches

*** If you wish to receive this newsletter via e-mail, or have any questions, comments or ideas, feel free to contact Curtis Scheele at the NRCS office in Holdrege or you can email him at curtis.scheele@usda.gov. ***

USDA - Natural Resources Conservation Service

USDA United States Department of Agriculture
Natural Resources Conservation Service

1609 Burlington Street
PO Box 798
Holdrege, NE 68949-0798
308-995-6121, Ext. 3

309 Smith Street
PO Box 41
Elwood, NE 68937-0041
308-785-3307, Ext. 3

1005 South Brown Street
Minden, NE 68959-2601
308-832-1895, Ext. 3

Central Nebraska Public Power & Irrigation District

CENTRAL Nebraska Public Power and Irrigation District

415 Lincoln Street
PO Box 740
Holdrege, NE 68949
308-995-8601

Tri-Basin Natural Resources District

Tri Basin Natural Resources District

1723 Burlington Street
Holdrege, NE 68949
308-955-6688

Nebraska Extension

N EXTENSION

1308 2nd Street
Holdrege, NE 68949

308-995-4222

PO Box 146
Elwood, NE 68937

308-785-2390

424 North Colorado
PO Box 31
Minden, NE 68959
308-832-0645

Infiltration and Runoff

A rainfall simulator demonstrates infiltration and runoff. See photos below to see how a Holdrege Silt Loam soil fared with different tillage and residues.

Rain applied was 1 inch in 5 minutes. The front jars caught runoff while the back jars caught infiltration. Note when the soils were flipped what the 2-3 inch depth below the soil surface demonstrated. Wet soil due to better infiltration.

1. Bare Tilled Soil – Crusting quickly occurred producing lots of runoff and very little infiltration. Note the dry soil at the 2-3 inch depth.

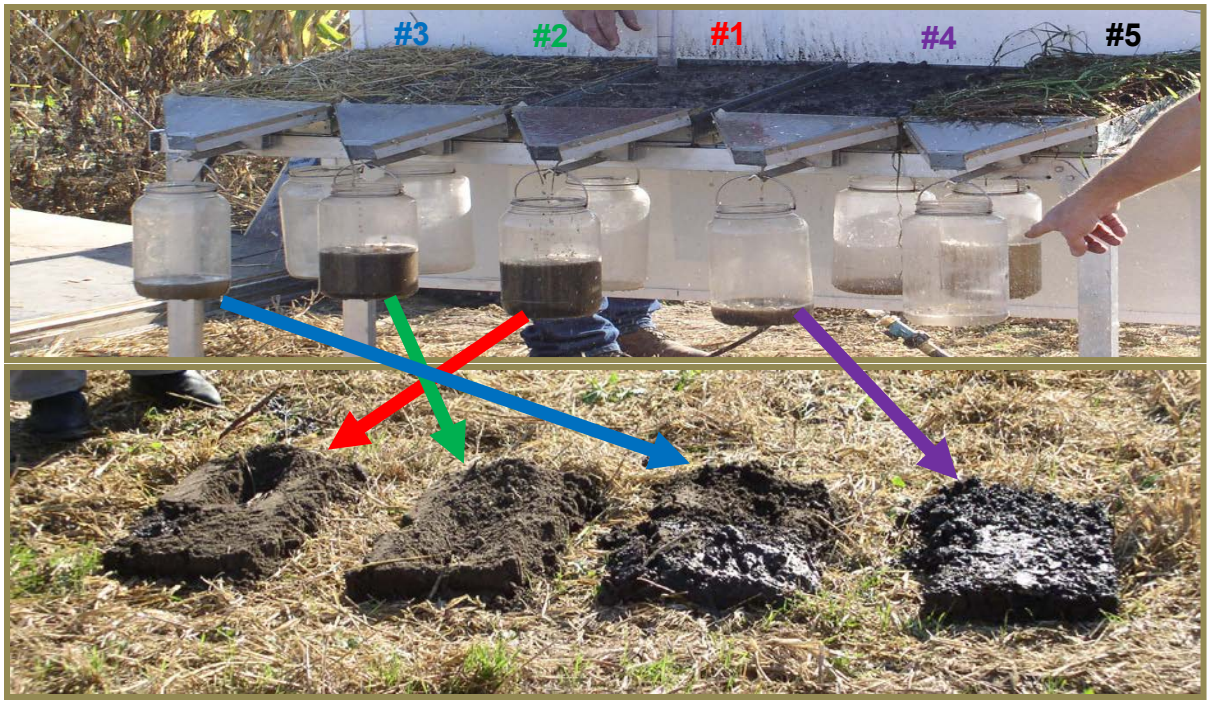
2. Tilled Soil w/ 30% Cover – A little less runoff and a little more infiltration than #1.

3. Tilled Soil w/ 100% Cover – Less runoff and more infiltration than 1 & 2. Infiltrated through the soil on the down slope side of the soil pan.

4. Bare No-Tilled Soil – Very little runoff. Water infiltrated throughout the pan. What if residue was left on this sample as the case in a no-tilled field?

5. No-Till Grass – Pan wasn't flipped but look at all the infiltration (finger pointing to) and how very little runoff there was.

Looking at the white board behind the soils, note the raindrop splash on the bare soils versus the covered soils. Also note the little splash on the bare no-till versus the bare tilled.



The UNL Corn Nitrogen Calculator for Nebraska

Revision Date: 10/19/21

Farm: Home Quarter
Agronomist: Crop Consultant
Date: 3/2/2023

Enter N management programs to consider	Time of application	Proportion % of total N	N source for each	N content %	Price $/ton	Appl. cost $/acre
Split	Fall		1 AA	82		
change names in boxes	Pre-plant & starter	50	1 AA	82	$820	$18.00
	Sidedress	30	5 UAN 32	32	$430	$7.00
	Fertigation	20	4 UAN 28	28	$400	$7.00
Pre-plant	Fall		1 AA	82		
	Pre-plant & starter	80	1 AA	82	$820	$18.00
	Sidedress		5 UAN 32	32		
	Fertigation	20	4 UAN 28	28	$400	$7.00
Fall	Fall	100	1 AA	82	$820	$18.00
	Pre-plant & starter		1 AA	82		
	Sidedress		4 UAN 28	28		
	Fertigation		4 UAN 28	28		

Enter short names in the column headers below (#1 to #4)

	Enter field-specific information in columns E to H			Rep 1	Rep 2	Rep 3	Rep Avg
1	Yield goal	5-yr avg. yield + 5-10%	bu/acre	250	250	250	250
2	Soil texture			Med./Fine	Med./Fine	Med./Fine	Med./Fine
3	Soil organic matter (OM)	in 0-8" depth	%	2.1	2.1	2.1	2.1
4	Soil test nitrate-N	Effective rooting depth	inches	48	48	48	48
		Soil layers sampled	no.	2 Layers	2 Layers	2 Layers	2 Layers
		Layer 1 bottom	inches	8	8	8	8
		Layer 2 bottom	inches	36	36	36	36
	select nitrate unit in box	Layer 3 bottom	inches				
	ppm	Layer 1 nitrate	ppm	13.1	10.9	12.7	12.2
		Layer 2 nitrate	ppm	5.1	6.4	4.2	5.2
		Layer 3 nitrate	ppm				
5	Previous crop			02 Soybean	02 Soybean	02 Soybean	02 Soybean
6	Irrigation	Water amount	inches	6.5	6.5	6.5	6.5
		Water nitrate-N	ppm	12	12	12	12
7	Manure	Type					
		Terms (unit for application)					
		Amount (tons or 1000 gal/acre)					
		Ammonium N	lb/unit				
		Organic N	lb/unit				
		Year applied					
		Application method					
8	Nitrogen management program						
9	Expected corn value		$/bu				
10	N applied since harvest		lb/acre				

do not enter anything below

	UNL N recommendation		Unit	Rep 1	Rep 2	Rep 3	Rep Avg
A	N algorithm components	Crop N requirement	lb/acre	335	335	335	335
		SOM credit	lb/acre	74	74	74	74
		Soil nitrate-N credit	lb/acre	48	51	43	47
		Legume N credit	lb/acre	45	45	45	45
		Irrigation N credit	lb/acre	18	18	18	18
		Manure N credit	lb/acre	Manure?	Manure?	Manure?	Manure?
B	**Recom. N amount (unadjusted)**		**lb/acre**	**151**	**148**	**156**	**152**
C	Average nitrogen price		$/lb N	N progr.?	N progr.?	N progr.?	N progr.?
D	Corn price : N price ratio			Corn price?	Corn price?	Corn price?	Corn price?
E	**Recom. N amount (adjusted for time and prices)**		**lb/acre**	**#N/A**	**#N/A**	**#N/A**	**#N/A**
F	Total N application cost		$/acre	#N/A	#N/A	#N/A	#N/A
G	Total cost of N fertilizer + N application		$/acre	#N/A	#N/A	#N/A	#N/A