Are You Giving Credit Where Credit is Due? Thoughts on Nutrient Management Planning

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In between trying to get corn off the field and hoping the snow waits just a little longer, you are also supposed to be thinking about a field plan for next year. What will you plant, what herbicides will you need and what fertilizers will you use? Did you spread manure on your fields? If you did, does that manure have a fertilizer value and are you considering that when you make your fertility plans?

The total nitrogen (N) in solid beef manure is 50% available to plants during the first growing season. That means if the manure you used has 13 pounds of total N/ton of manure (ND beef manure average), 6.5 pounds of that is available for plant growth. Given you spread 25 tons of manure/acre you have 325 pounds of total N with 162.5 pounds of that available during the first growing season. What happens to the other 162.5 pounds? In year 2, 20 percent of the total N, or in this example, 65 pounds of N would be available during the second growing season. Are you taking that credit into consideration as you map out your nutrient management plan for the next growing season?

Let's say you plan to plant corn grain in eastern North Dakota in medium-textured soils with historic yields greater than 160 bu/ac. You have a previous crop (soybean) credit and you have 20 pounds N/ac in your soil. (You know all of this because you tested your soils and you used the ND Corn Nitrogen Calculator.) The N recommendation for your yield goals would be 162 pounds/ac.

According to this example, in year 1, you wouldn't need to add any other nitrogen fertilizer to reach your yield goals. Looking at phosphorus (P), if you have 6 pounds of P/ton of manure (ND beef manure average) and you're spreading at 20 ton/ac you have 120 pounds of total P. Eighty percent of the total P in solid beef manure is available for plant growth during the first growing season, so 96 pounds of P/ac would be available. If your soils are in the medium range (8-11 ppm) according to the Olsen test, you would need 52 pounds of P/ac. So your N and P requirements are already met.

Let's move on to year 2. You're going to plant soybean in the field described above following the corn crop. You have no previous crop credit. Your soil test says you have 15 pounds of N and you know from above that you have 65 pounds of N from manure. So you have 80 pounds of N fertilizer right away. According to the North Dakota Fertilizer Recommendation Tables and Equations, you will need zero pounds of N fertilizer for a 60 bu/ac yield potential. Ten percent of the total P in manure is available in year two for plant use. The P credit from the manure would be 12 pounds/ac. Because of the excess P that was applied during year 1, your soil test P will very likely be in the high to very high range, neither of which require additional P fertilizer.

Often times in the Midwest, producers aren't instructed to give manure fertilizer credit value but we have to remember that along with the added organic matter and beneficial organisms, we are also adding useful nutrients when manure is spread on a field. Let's give credit where credit is due.

Additional resources:

- Find a North Dakota custom manure hauler: https://www.ag.ndsu.edu/lem
- Regional Manure and Soil Health Blog: http://soilhealthnexus.org/blog/
- e-Xtension Animal Manure Management: http://articles.extension.org/pages/8647/manure-nutrient-management

Weather Summary

Monthly Temperatures (°F) and Normals

	Max Temp				Min Temp				Monthly Avg. Temp			
Month	2017	Norm*	2016	2015	2017	Norm*	2016	2015	2017	Norm*	2016	2015
Apr	54	55	51	58	31	31	31	29	43	37	41	43
May	69	68	70	64	41	43	43	40	55	54	56	52
June	77	76	76	76	52	53	53	54	65	63	65	65
July	83	82	81	80	58	58	57	58	71	65	69	69
Aug	77	81	80	80	52	55	54	53	64	65	67	66
Sept	70	71	70	75	46	45	47	48	58	58	58	62
Avgs:	72	72	71	72	47	47	48	47	59	57	59	60

*Normals = 1981-2010 averages

Monthly Precipitation (in) and Normals

	2017 Monthly Precipitation*				
Month	NDAWN	NOAA	Normal[1]	2016	2015
Apr	1.43	1.37	1.17	2.73	0.44
May	0.94	1.44	2.76	1.14	4.53
June	3.62	3.98	3.77	1.76	2.10
July	1.13	1.47	3.39	4.52	4.43
Aug	3.45	3.74	2.31	3.66	1.69
Sept	2.68	2.89	1.91	1.78	0.81
Totals:	13.26	14.89	15.31	15.60	13.99

[1] Normals = 1981-2010 averages * NDAWN and NOAA are two different weather stations at the CREC.

Monthly Growing Degree Days and Normals

	Wheat GDD				Sunflower GDD				Corn GDD		
Month	2017	Norm*	2016	2015	2017	Norm*	2016	2015	2017	Norm*	2016
Apr	341	357	318	382	---	---	---	---	---	---	---
May	718	717	761	596	395	386	438	333	290	282	314
June	976	925	982	908	619	609	625	607	447	448	458
July	1198	1082	966	1044	826	786	774	750	625	624	579
Aug	1004	1000	1269	940	632	721	717	672	456	561	534
Sept	785	717	789	797	442	417	456	537	314	320	319
Totals	5022	5155	5085	5106	2914	3006	3010	2994	2132	2235	2204

*Normals = 1981-2010 averages

Growing season GDD Totals, Normals, and Killing Frost Dates

Year	Frost Date	Corn Temp (°F)	Total GDD	Frost Date	Sunflower Temp (°F)	Total GDD
2015	*Sept 29	30	2194	**Oct 16	24	2994
2016	*Oct 19	29	2306	**Oct 24	22	2963
2017	*Sept 29	31	2121	**Oct 9	27	2740

*Normal Corn GDD for date = 2231 **Normal Sunflower GDD for date = 2960

Total corn GDD = May 1 to frost date Total sunflower GDD = May 20 to frost date

Normals=1981-2010 averages Source: NDAWN