



BEET TOPICS

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Dive Into Your Fertility Program

As fertilizer prices continue on an upward trend, there is no better time than now to take a dive into your sugarbeet fertility program to “trim some fat” where you can. While reviewing soil tests the past couple years, as a coop, we’ve noticed many soil samples get submitted under the fertility recommendations of “7lbs of Nitrogen per/ton of projected yield”. While these recommendations work in Idaho and drier climates where they have the ability to shut off water, they don’t fit the growing conditions of the Red River Valley. This is because nitrogen moves to plants mostly via mass flow – mass flow is movement of water through the soil and into the roots. Where the water can be shut off, you can control nitrogen uptake more than we can here.

Conditions for a good crop are conditions for good nitrogen use efficiency (NUE).

In a tough year, a higher amount of N/ton to produce a crop is needed, but the yield potential is knocked due to poor conditions. In a good year, a lower amount of N/ton to produce a crop is needed because the NUE increases. Additionally, weather for a great crop is weather for great mineralization — the soil will help provide any N that might be lacking.

Nitrogen Recommendations for Minn-Dak:

0-2 ft soil sample = 100 lb N/acre

0-4 ft soil sample = 130 lb N/acre

There is no fixed “X” pounds of nitrogen = “X” tons of yield.

Time to Sugar Up!

We want to see the crop beginning to yellow about 6 weeks before main harvest—roughly the middle of August. To achieve this, we need the crop to run out of nitrogen. While we can’t shut water off to control this, we can achieve it through the depletion of all soil nitrogen. Nitrogen is plant mobile, meaning that plants have the ability to move nitrogen from old leaves to make new leaves. In an excess nitrogen environment, sugarbeets don’t move nitrogen from old leaves to new leaves because nitrogen is still being supplied from the soil. We want sugarbeets to draw nitrogen from old leaves — if they don’t, we end up with a large, lush canopy that, while eye catching, shifts the sugarbeets’ main focus to preservation and production of leaves. This means the sugarbeet puts all of its time, resources, and energy into maintaining that canopy. But, when we draw nitrogen from the old leaves, they senesce and die. **This pattern actually signals the sugarbeets to “pack their bags” or pack on the sugar because it’s time to move on.**

What About Phosphorus?

Sugarbeets use phosphorus for energy compounds. Phosphorus has been proven to increase root yield in soils that test “low” without affecting quality. Since phosphorus is immobile in the soil, a 6-8” soil sample is sufficient. Phosphorus tests actually do not measure the chemical form utilized by plants like the nitrate test does — the phosphorus soil test is actually an index correlated to crop response to phosphorus fertilizer field trials.

When selecting a phosphorus test:

- soil pH < 7.4 use Bray
- soil pH >7.4 use Olsen

One way to cut some phosphorus cost could be to utilize a starter and decrease the broadcast rate. Research has shown that if using the Olsen test and the soil sample result < 8ppm phosphorus, use 3 gal/acre 10-34-0 in-furrow AND 40 lb/acre P₂O₅ broadcast. If using the Olsen test and the soil sample result is 8-16 ppm phosphorus, use either 3 gal/acre 10-34-0 OR the recommended broadcast rate P₂O₅.

Phosphorus Soil Test, ppm					
Test	VL	L	M	H	VH
Bray 1**	0-5	6-10	11-15	16-20	21+
Olsen	0-3	4-7	8-11	12-15	16+
----- Broadcast Rate P ₂ O ₅ lb/A -----					
	80	55	35	10	0

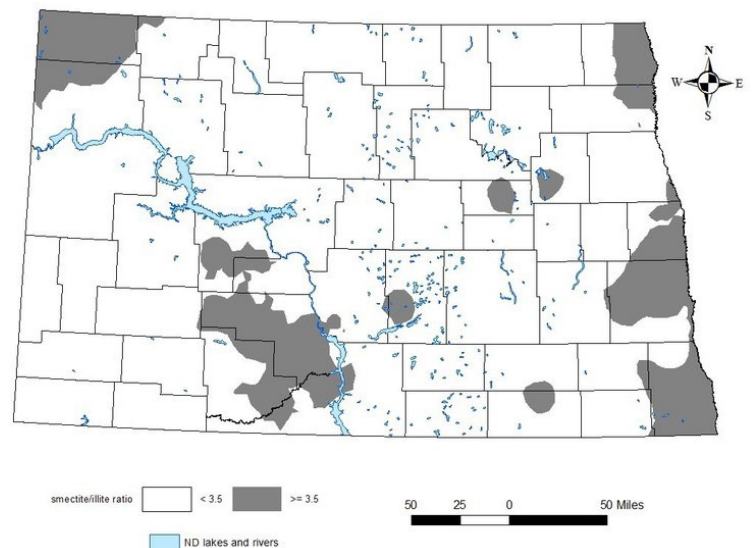
What About Potassium?

Potassium is also immobile in the soil, meaning a 6-8” soil sample is sufficient. We recommend that you broadcast potassium fertilizer due to negative germination effects when using starters that contain potassium.

Potassium Soil Test, ppm					
	VL	L	M	H	VH
	0-40	41-80	81-120	121-150	150+
----- Broadcast Rate K ₂ O lb/A -----					
MN ‡	110	80	50	15	0
ND 1	120	90	50	0	0
ND 2	120	120	90	60	0

ND 1 refers to soil with a smectite/illite ratio < 3.5

ND 2 refers to soil with a smectite/illite ratio > 3.5



<https://www.ag.ndsu.edu/publications/crops/fertilizing-sugar-beet-in-north-dakota>

Nutrient In The Soil		Interpretation				1st Crop Choice			2nd Crop Choice		
		VLow	Low	Med	High	S. Beets 130/101			S. Beets 7 lbs		
	0-48" 36 lb/acre	*****				YIELD GOAL			YIELD GOAL		
Nitrate						28 Tons			SUGGESTED GUIDELINES		
	Olsen 3 ppm	*****				Broadcast			Broadcast		
Phosphorus						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION		
Potassium	69 ppm	*****				N	100		N	196	
	0-48" 24 lb/acre	*****				P ₂ O ₅	80	Broadcast	P ₂ O ₅	112	Broadcast
Chloride						K ₂ O	86	Broadcast	K ₂ O	121	Broadcast
	0-48" 42 lb/acre	*****				Cl	0		Cl	0	
Sulfur						S	0		S	0	
Boron	0.2 ppm	***				B	2	Broadcast	B	2	Broadcast
Zinc	0.49 ppm	*****				Zn	1	Broadcast	Zn	3	Broadcast
Iron	7.8 ppm	*****				Fe	0		Fe	0	
Manganese	1.0 ppm	*****				Mn	0		Mn	0	
Copper	0.35 ppm	*****				Cu	0		Cu	0	
Magnesium	385 ppm	*****				Mg	0		Mg	0	
Calcium	3913 ppm	*****				Lime			Lime		
Sodium	22 ppm	***				Soil pH	Buffer pH	Cation Exchange Capacity	% Base S		
Org.Matter	1.0 %	****							% Ca	%	
Carbonate(CCE)	4.1 %	*****				0-6" 8.2		23.0 meq	(65-75) 84.9	(15 1.1	
Sol. Salts	0-48" 0.22 mmho/cm	*****									

Fertilizer Prices 3/10/2022

N - P - K	Lb/Ac	100	80	85	
Product	Lb/Ac	Price/Ac	Price/Ton	Cents/Lb	
Urea lbs/Ac	181	\$96.17	\$ 1,065	\$0.53	
11-52-0 lbs/Ac	154	\$77.69	\$ 1,010	\$0.51	
Potash lbs/Ac	142	\$60.92	\$ 860	\$0.43	
	Price/Ac	\$234.78			
28 Ton					
N - P - K	Lb/Ac	196	112	121	
Product	Lb/Ac	Price/Ac	Price/Ton	Cents/Lb	
Urea lbs/Ac	375	\$199.46	\$ 1,065	\$0.53	
11-52-0 lbs/Ac	215	\$108.77	\$ 1,010	\$0.51	
Potash lbs/Ac	202	\$86.72	\$ 860	\$0.43	
	Price/Ac	\$394.95			
			Difference	\$160.17	

