

2003 CMDC

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An Understanding of Soil Yield Potential and Problem Soils

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COOP MANAGEMENT & DIAGNOSTIC CLINIC

2003julycmdc30x40-001

University of Nebraska Com Nitrogen Recommendations The Com Nitrogen Needs Calculator for Nebraska

Farm name:		Agronomist:		Date & time:											
Field or management area		Risk Information						Yield		Risking benefits					
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
Prefer crop	Soil N (ppm)	Current N (ppm)	Current N (ppm)	Current N (ppm)	Current N (ppm)	Current N (ppm)	Soil N (ppm)	Organic N (ppm)	Mineral N (ppm)	Mineral N (ppm)	Mineral N (ppm)	Mineral N (ppm)	Mineral N (ppm)	Mineral N (ppm)	
corn	22	15	0	129	262	70	0							82	
corn	11.7	1.8	0	129	262	94	6							121	
corn	2.7	1.8	0	129	262	70	6							145	
Change		10	2		129	262	78	6						131	

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2003julycmdc30x40-002

Current Manure Application Nitrogen Credits* The Com Nitrogen Needs Calculator for Nebraska

Farm name		Agronomist:					
Field or management area	Manure type & storage	Manure application		Nitrogen content of the manure (available N) (%)	Total N available from current application	Total N available from current application	Total N available from current application
		Rate	Use				
A	Manure	1000 gal/acre	"Apply 1/3 in 4-6 inch furrow"	26.5	16.1	121	31
B			"Apply 1/3 in 4-6 inch furrow"	26.5	16.1	121	82
C	Manure	1000 gal/acre	"Apply 1/3 in 4-6 inch furrow"	26.5	16.1	121	34
D			"Apply 1/3 in 4-6 inch furrow"	26.5	16.1	121	30

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2003julycmdc30x40-003

Treatments, calculated N and N soil and plant measures

Treatment	Incorporation	Calculated		Total N (ppm)	Chlorophyll
		Fertilizer N (lb/acre)	Manure N (lb/acre)		
		Fertilizer N (lb/acre)	Manure N (lb/acre)	Available N (ppm)	Available N (ppm)
A	Immediate	0	121	121	
B	15m 5 days	0	94	94	
C	15m 5 days	50	94	94	
D	15m 2 days	50	30	120	

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Property	Saline	Sodic (alkali)	Saline-sodic
Electrical conductivity (mmhos/cm)	>4	>4	>4
pH	<8.5	>8.5	>8.5
Exchangeable Na percentage (ESP, Na/(Ca+Mg))	<15%	>15%	>15%
Soil appearance	White alkali	Black alkali	White and black alkali
Salts anions	Chloride, sulfate, bicarbonate, carbonate		
Salts cations	Na, Ca, Mg	Some but relatively more Na	
Effects on plants	Water imbalance, ionic imbalances		
Effects on soil		Na disperses soil particles, poor water movement	
Soil amendment	Leaching	Gypsum + leaching	

Exchangeable sodium ratio (ESR), exchangeable sodium percentage (ESP), and sodium adsorption ratio (SAR) are various measures of the sodic condition.

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Location	pH	EC	K	Na	Mg	Ca	ESP	SAR
Soil sample ID		mmhos/cm	cmol/kg	cmol/kg	cmol/kg	cmol/kg		
HAVELOCK	7.89	0.21	1.24	4.59	3.89	19.15	14.39	15.49
BURCHARD	7.95	0.91	0.92	0.29	8.26	18.20	1.05	0.28
SALT CREEK	8.50	0.38	0.49	7.98	1.49	9.91	80.82	54.88
LIFFORN	7.94	0.89	1.37	0.92	3.18	95.73	0.78	0.58

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Platte Valley Yellows (lime induced chlorosis), high moisture


- Symptoms of iron deficiency but adequate Fe in plant
- Management
 - Tolerant species and varieties
 - Close spacing within row
 - FeEDDHA in planting furrow



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Gypsum: useful for high sodium (sodic/alkali) soils; displace sodium and improve soil aggregation.



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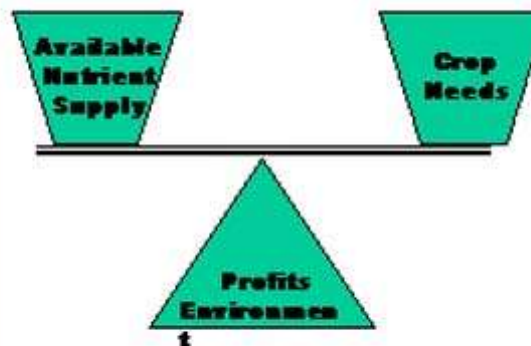
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Manure/Nutrient Management

- Nutrient value of manure
- Use manure as a nutrient source
- Determine agronomic rates
- Demonstrate potential nitrogen losses from various application strategies

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Manure Analysis (Mead Cattle Co. 2002)

	Analysis as received	Less 1000 gals available	Less 1000 gals available
Organic Nitrogen % N	0.79	4.4	
Ammonium % N	0.34	28.5	
Nitrate ppm N	0.07	0.0	
Total Nitrogen % N	0.39	44.5	
Phosphorus % P ₂ O ₅	0.30	28.6	
Potassium % K ₂ O	0.48	48.7	
Sulfur % S	0.09	7.4	
Calcium % Ca	0.79	28.9	
Magnesium % Mg	0.77	9.7	
Sodium % Na	0.03	4.7	
Zinc ppm Zn	37	0.3	
Iron ppm Fe	37	0.6	
Manganese ppm Mn	74	0.72	
Copper ppm Cu	30	0.32	
Soluble Sulfur (micromoles)		11.49	
pH	6.4		
Dry Matter %	10.0		

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← North Demonstration Layout 2003

	4 rows			
	A	B	C	D
	10 ft wide	10 ft	10 ft	10 ft
	Manure	Manure	Manure	Manure
Earl No.			50 Beh prep/1000 gal	50 Beh prep/1000 gal
Manure	4000 gal	4000 gal	4000 gal	4000 gal
Incorporation	immediately	Feb 3 days later	Feb 3 days later	2 days later

Treatments, calculated N and N soil and plant measures

Treatment	Incorporation (days)	Calculated		Total N Available ppm	15NRI	Chlorophyll index
		Fertilizer N	Manure N			
A	immediate	0	191	191		
B	Plan 5 days	0	94	94		
C	Plan 5 days	50	94	94		
D	heap, 2 days	50	30	190		

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