



PureGrade Liquid Plant Food

Soil Limitations for Row Placement of Fertilizer

Row placing fertilizer requires knowledge of local soil and moisture conditions. Whenever the soil Cation Exchange Capacity (CEC) and/or the Organic Matter (OM) is low, such as is the case with sandy soils, we suggest reducing the amount of fertilizer placed in seed contact or switching to an analysis with a lower salt index.

Local experience is the best predictor of seed-placed fertilizer safety in various soil types, but when that isn't available the following tables offer guidelines. Refrain from placing fertilizer in seed contact in dry soil conditions.

TABLE 1. Row Placement Limitations for Corn in 30-inch rows (GoldStart or Diamond) ^{1,2}		
CEC and Organic Matter	6-24-6, 3-18-18, 5-15-15, 6-30-10 gal/A	9-18-9 & 10-10-10 gal/A
CEC: 15 or greater and OM: 2.5% or greater	6	5
CEC: 12 -- 15 and OM: 2.0 – 2.5%	5	4
CEC: 6 -- 12 and OM: 0.6 -- 2.0%	3-4	3
CEC: Less than 6 and OM: Less than 0.6	0 (Use local experience as guide)	0

¹Milo: Use 1 gallon less than shown in the table.
²Southern states: Use 1 gallon less than shown in the table.

TABLE 2. Corn Row Width Application Rate Table where there are no soil restrictions						
Analysis	30 inch rows		20 & 22 inch rows		15 inch rows	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
3-18-18, 5-15-15, 6-24-6, 6-30-10	3	6	4.5	9	6	12
9-18-9 and 10-10-10	3	5	4.5	8	6	10

Minimum rates are determined by the practical limitations of application equipment. Lower rates are possible, but restrictors will be needed to insure a steady flow of fertilizer into the seed furrow. Maximum rates are those judged to be safe in non-sandy soils based on the relative salt indexes of the products. Application recommendations should be determined according to soil test results, yield goals and soil properties such as organic matter and cation exchange capacity.

TABLE 3. Soybean row width and maximum seed placed low salt index fertilizer.	
Row Spacing	gal/A
Greater than 16 inches	0
11 to 16 inches	3
10 inches or less	5

Note: **Do not dilute fertilizer with water.** Diluting fertilizer with water increases the potential for seed or germination damage in soybeans.

Soil Soluble Salts

Natural salts in the soil can add risk to placing fertilizer in contact with the seed. This is not a problem in most soils, but where a salt hazard exists, soil tests that include a “Soluble Salts Rating” are useful in managing that risk. The following Soluble Salts table is used to modify the rates given in Tables 1, 2 and 3.

TABLE 4. Soluble Salts and row placement	
Soluble Salts Rating in mmho/cm ⁴	Row placement restriction
0 to 0.8	None
0.8 to 1.6	Reduce rates by half
Greater than 1.6	Use row placed fertilizer with caution
⁴ Based on a 1:1 suspension for a loamy soil.	

TABLE 5. Typical CEC of Some Soil Texture Classes ⁵	
Soil Texture	Typical CEC Range meq/100 gms
Sand	2-6
Sandy Loam	3-8
Loam	7-15
Silt Loam	10-18
Clay and Clay Loam	15-30
⁵ Source: California Fertilizer Association 1995. <i>Western Fertilizer Handbook</i> , 8th ed. Interstate Publishers, Inc.	

TABLE 6.* Salt Index of Selected Nutra-Flo liquid formulations.			
Formulation	Salt index	Salt index per unit of nutrient (20 lb)	Recommendation for Seed Row
PureGrade 3-18-18	8.5	0.22	Yes for corn, milo, wheat on non-sandy soils. Application to soybeans is row width dependent.
PureGrade 6-24-6	11.5	0.32	
PureGrade 9-18-9	16.7	0.48	
10-34-0	20.0	0.45	Use caution for seed row placement with the above listed crops. Do not use for seed row placement on soybeans or other crops not listed.
7-21-7	27.8	0.79	No.
4-10-10	27.5	1.18	
28% UAN	63.0	2.25	
*Adapted from Mortvedt, John J., Calculating Salt Index, Fluid Journal, Spring 2001.			