Section 9 of 22 (9n - Gypsum ($CaSO_4 \cdot 2H_2O$) & Elemental Sulfur (S^0) Soil Amendment Guide)

NOTE: If you're not sure of the benefits of gypsum or elemental sulfur, then demonstrate on a small portion of a field & evaluate results.

Soil Texture	% Clay	CEC Range (meq/100 g)	Cation Exchange Capacity (CEC) is based on % Clay & mineral type (e.g. Kaolinite, Montmorillonite) & % Organic Matter	Soil Bulk Density (g/cm^3)
Sands	2 – 8	2 – 6		1.65
Loamy Sands	2 – 14			1.6
Fine Sands	2 – 8			1.65
Very Fine Sands				
Loamy Fine Sands	2 – 14			1.6
Loamy Very F. Sands				
Sandy Loam	2 – 18	3 – 8		1.56
Fine Sandy Loam				
Very F. Sandy Loam		7 – 15		1.53
Loam	10 – 26			1.42
Silt Loam	2 – 26	10 – 19		1.46
Silt	2 – 10			1.47
Sandy Clay Loam	22 – 36			1.4
Silty Clay Loam	28 – 38			1.27
Clay Loam				1.32
Sandy Clay	38 – 54			1.33
Silty Clay	42 – 58	15 - 30		1.23
Clay	42 - 98			1.25

Soils Intake Family	Inches Applied 1.0	2.0	3.0
	Infiltration Time (Hrs)		
0.1	2.8	10.5	22.3
0.3	1.0	3.5	6.8
0.5	0.63	2.0	3.8
0.75	0.48	1.5	2.8
1.0	0.33	1.0	1.8
1.25	0.28	0.8	1.5
1.5	0.23	0.7	1.3
1.75	0.20	0.6	1.1

Infiltration Assessment

SAR	Restriction on Use Units: ECiw (dS/m) None	Slight to Mod.	Severe
0 – 3	> 0.7	0.7 – 0.2	< 0.2
3 – 6	> 1.2	1.2 – 0.3	< 0.3
6 – 12	> 1.9	1.9 – 0.5	< 0.5
12 – 20	> 2.9	2.9 – 1.3	< 1.3
20 - 40	> 5.0	5.0 – 2.9	< 2.9

Soil Structure	Downward Movement of water
Single Grain	Rapid
Granular	
Blocky	Moderate
Prismatic	
Platy	Slow
Massive	

constant x soil depth x bulk density x CEC x (initial SAR – final SAR) x multiplication factor ÷ gypsum purity ÷ 2000 = gypsum requirement

(23.1) x (feet) x (g/cm^3) x (meq/100 g) x (initial SAR – final SAR) x (1.25) ÷ (%) ÷ (2000) = (tons/ac)

Gypsum Example	23.1 x 0.5 ft x 1.34 g/cm^3 x 14.0 meq/100 g x (13 – 6) x 1.25 ÷ 0.80 ÷ 2000 = 1.2 tons of Gypsum/ac
Sulfur Example	1.3 tons/ac of pure gypsum needed x 0.19* = 0.25 tons of Elemental Sulfur/ac needed (or 494 lbs./ac)

Considerations in the use of soil amendments: Soils Intake Family, Water Quality (ECiw & SAR), Soil Structure, Stratified Soils, Irrigation Water Management, crop rotations (residue management), leaching requirement, tillage operations (i.e., Soil Conditioning Index (SCI) and Soil Tillage Intensity Rating (STIR)), % Soil Organic Matter, etc. **Important:** Are Soils characterized as Saline, Saline-Sodic or Sodic.

*Use 0.19 to convert an equivalent amount of pure gypsum into an S^0 requirement (Ref. NRCS Salinity Mgmt. for Soil & Water – pg. 5.42). rudy.garcia.2008

Agronomy Tech Note 76 (http://www.nm.nrcs.usda.gov/technical/handbooks/iwm/nmiwm.html)