Welcome to the NDSU gypsum requirement (GR) mobile app. The calculations are based on the equation of Oster et al. (1999). To determine GR (in Mg/ha; e.g. 1 Mg/ha = 1.1 tons/acre) the equation requires knowledge of the **1)** depth, *D*, (in meters; e.g. 0.15 m = 6 inches) to which the gypsum will be applied, **2)** the bulk density, *Bd*, of the soil (in Mg/m3; e.g. 1 Mg/m3 = 1 g/cm3; default value in the calculator is 1.47 Mg/m3), **3)** the cation exchange capacity, *CEC*, of the soil (in mmolc/kg; e.g. 100 mmolc/kg = 10 cmolc/kg = 10 meq/kg), **4)** the reaction efficiency factor, *F*, which is unitless (e.g. choose 1.3 if the final ESP is 5 and 1.1 if the final ESP is 15 or greater), **5)** the initial ESP, *ESPi*, which is determined by a qualified laboratory (ESP is a % of the Na ions on the soil’s exchange sites), **6)** the target, final ESP, *ESPf*, and 7) the purity of the gypsum being used (in %).

You will need to adjust the final mass of gypsum based on the moisture content of the product you are using. For example, *if* the moisture content is 20% then take GR x 1.2 to get the mass of moist gypsum needed to supply GR.

You can substitute the sodium adsorption ratio (SAR) determined from a saturated paste extract for the ESP if the ESP is less than 50.

The cost of applying gypsum will be much greater than the costs for determining the soil metrics outlined above so have your soils analyzed by your regional soil testing laboratory. Depth of your soil sample should be great enough to understand the depth that gypsum should be incorporated. Gypsum should be placed as near to the depth of sodic behavior as possible to maximize its effectiveness.

Oster, J.D., I. Shainberg, and I.P. Abrol. 1999. Reclamation of salt-affected soils. In 806 Agricultural Drainage. Agronomy Monograph no. 38. American Society of Agronomy, 807 Crop Science Society of America, Soil Science Society of America, 677 S. Segoe Rd. 808 Madison, WI 53711. USA. p.659-691.