

USE OF AGRI-SC AND GYPSUM TO IMPROVE THE SOIL CONDITION OF A CRUSTING-PRONE SOIL

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Introduction

A number of products continue to be marketed in the region for use in helping soil condition factors such as surface crusting, permeability to water and alleviating soil compaction. A recent study (Franzen et al., 2008) demonstrated surface-crusting was reduced slightly by Wet-Sol® for a short time and by gypsum for a longer time. Agri-SC® (Four Star Services, Inc., Bluffton, IA) has been marketed in the region for about 20 years as a soil conditioner. The objective of this study was to evaluate the use of Agri-SC for alleviation of soil crusting and compaction in a soil with a tendency to crust.

Methods

The experiment was conducted at the NDSU Experiment Station Prosper Research Farm on a Perella soil (fine-silty, mixed, frigid, Typic Haplaquolls), which tends to crust in certain years. The study was located at one end of a previously seeded experiment and received several passes with heavy equipment prior to the establishment of the Agri-SC study, resulting in spring compaction. The experimental design was a randomized complete block with 6 treatments (untreated check; Agri-SC at 6 oz/acre; Agri-SC at 6 oz/acre, followed 2 weeks later by another application of 6 oz/acre; Gypsum at 100 lb/acre; Gypsum at 200 lb/acre; Gypsum at 500 lb/acre) and for replications. Each individual plot was 10 feet wide and 10 feet long. Penetrometer readings were obtained using a Spectrum Industries Field Scout digital penetrometer. Readings in psi were obtained every inch of depth from 1 inch to 6 inches. The first reading was taken the day of the experiment establishment, 5/27/2010, before treatments were applied. Subsequent readings were taken 6/9 and 7/9. The plot area was fallow and Roundup Max was applied twice at 22 oz/acre with ammonium sulfate for weed control.

Results

There were no differences between treatments in the 6/9 readings, 7/9 readings, or the differences between the initial readings and the 6/9 or 7/9 readings. None of the treatments improved the surface 1-2 inches of soil density, which would have indicated an improvement in crusting, or the soil density at deeper depths, which would have indicated an improvement in subsurface compaction.

References

D.W. Franzen, 2009. Studies regarding the activity of WetSol and other soil amendments on soil compaction, crusting surface compaction and soil salinity 2007-2008. *In* 2008 Sugarbeet Research and Extension Reports, Vol. 39, p. 111-117. Sugarbeet Research and Education Board of Minnesota and North Dakota. Fargo, ND.