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