

Soybean response to rhizobia bacteria seed inoculation methods, Carrington, 2017.

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An irrigated field trial was conducted at the Carrington REC with support from the ND Soybean Council to examine the response of soybean to various rhizobia bacteria seed inoculation methods, including double inoculation. In addition, sampling and tests to determine soil rhizobia bacteria and plant tissue ureide-N levels were conducted to add to a database to predict yield response to seed inoculation. Experimental design was a randomized complete block with four replications. Previous crops were barley in 2016, corn in 2015, and soybean in 2014. Manure at 34.3 tons/A was applied and incorporated on May 4, with predicted nitrate-N at 137 lb/A and P at 158 lb/A available during the 2017 season. Spring soil test indicated 51 lb nitrate N/acre, 10 ppm P (Olsen), 215 ppm K, 2.9% organic matter, 7.9 and 8.3 pH (0-6" and 6-24" soil depth), and 0.28 and 0.18 mmho/cm soluble salts (0-6" and 6-24" soil depth). Soil rhizobia bacteria count was 189/g soil. Proseed '30-20 RR2Y' was seeded in 14-inch rows on May 23. Plant samples were taken for ureide-N analysis at the R2 soybean stage on July 21. Seed was harvested with a plot combine on October 6.

Plant development and stand were statistically similar among treatments (Table). Ureide-N levels were similar among treatments though the full rate of granular inoculant tended to have higher ureide-N levels than the untreated check. The untreated check averaged above 1500 ppm, which suggests N fixation was adequate without seed inoculation. Seed yield, test weight, seed count, and seed oil and protein content were statistically similar among treatments, including double inoculation.

