

**N-deficient soybean response to POST N, Cathay, 2002.** (G. Endres, E. Aberle and R. Henson) The objective of the trial was to measure crop response with rescue POST nitrogen (N) treatments to soybean visually yellow, with no detectable nodules, grown in a low N soil, and field with no prior history of soybean production. The trial was established in a commercial soybean field in cooperation with Chris and Mark Sellie. The trial had a randomized complete block design with four replications. Plot size was 10 by 25 ft. ‘Cropland 0292’ soybean was seeded in 12-inch rows with a Concord seeder on May 22, 2002 at 75 lb/acre (225,000 seeds/acre) on 2001 corn ground. Corn stalks were shredded in the fall and soybean direct seeded. Soybean seed was inoculated with ‘Nod+’. Soil analysis from July 22 sampling: N = 12 lb/acre at 0- to 6-inch depth and 21 lb/acre at 6- to 24-inch depth (33 lb/acre total); P = 11 ppm (medium); organic matter = 3.5%; pH = 7.5; soluble salts = 0.58 mmho/cm at 0- to 6-inch depth and 0.56 mmho/cm at 6- to 24-inch depth; K, S, Zn, and Cu = high. POST N treatments included: untreated check, urea (46-0-0) at 50 and 100 lb N/acre, and UAN (liquid 28-0-0) at 50 and 100 lb N/acre. Immediately prior to applying N treatments on July 23, untreated plants (24/rep.) were sampled at the R3 (early pod) growth stage for analysis of nitrate and ureide content. Urea was broadcast and UAN was applied with a hand-boom plot sprayer equipped with ‘Nitro bar’ nozzles. Very light rainfall occurred during application, slightly wetting the soil surface and foliage (0.03 inch measured during rainfall event). About 0.85 inch of rainfall occurred on July 31. The trial was harvested with a plot combine on October 2.

Treatment (lb N/acre and source)	Seed yield (bu/acre)	Test weight (lb/bu)	Seed weight (g/250 seeds)	Oil (%)	Protein (%)
Untreated	21.9	56.3	28.4	22.3	25.7
50 urea	25.9	56.9	28.8	21.8	26.3
100 urea	34.5	56.4	30.6	21.1	29.3
50 UAN	29.0	56.6	29.7	21.5	27.5
100 UAN	32.9	57.1	30.9	21.2	29.1
<i>mean</i>	<i>28.8</i>	<i>56.7</i>	<i>29.7</i>	<i>21.6</i>	<i>27.6</i>
<i>C.V. %</i>	<i>14</i>	<i>1</i>	<i>3</i>	<i>2</i>	<i>4</i>
<i>LSD 0.05</i>	<i>6.2</i>	<i>0.6</i>	<i>1.3</i>	<i>0.5</i>	<i>1.6</i>

Untreated plant nitrate (200-300 ppm N) and ureide (100-200 ppm N) levels were low, indicating plants had a N deficiency. N loss likely occurred due to field conditions during application and delay of substantial rainfall until 8 days after N application. Seed yield improved by 7.1 bu/acre with 50 lb UAN and 11.0 to 12.6 bu/acre with 100 lb N as urea or UAN, compared to the untreated check yield (21.9 bu/acre). Seed weight also improved with these three treatments. Seed oil declined with applied N. Seed protein improved 1.8 percentage points with 50 lb UAN and slightly over 3 percentage points with 100 lb N compared to the untreated check protein content (25.7%).