

What's Cropping Up?

A NEWSLETTER FOR NEW YORK FIELD CROPS & SOILS

VOLUME 11, NUMBER 3, MARCH-APRIL, 2001

Soybeans usually follow corn in the rotation, a crop that frequently receives liberal amounts of N, P, and K. Consequently, New York farmers typically plant soybeans into fields that test medium-high to high in P. For these fields, Cornell University typically recommends the addition of not more than 15-25 lbs P_2O_5 and a similar amount of N. Because soybeans are generally planted in late May or June when soil temperatures average 60°F or above, the question rises whether a small amount of N and P starter fertilizer is needed or not and how seed inoculation affects the recommendations.

We initiated a study in 1999 examining the response of soybeans to Cell-Tech and Hi-Stick seed inoculum and starter fertilizer application (15 lbs N and 55 lbs of P_2O_5 applied as 14 gallons/acre of 10-34-0) on fields testing high in soil test P (Morgan extractable P of 25 to 40 lbs P/acre). Responses were tested in fields that were never planted to soybeans or had been planted at least 4 times to soybeans in the 1990s. This study was continued through 2000. The 1999 growing season was ex-

Soybean Fertilization

Bill Cox and
Quirine Ketterings
Dept. of Crop &
Soil Sciences
Cornell University

tremely dry while 2000 was a very wet year.

Neither inoculum nor starter fertilizer application significantly increased the 2-year average soybean yields for fields with a soybean history (Table 1). A year x treatment interaction existed, however, because in the wet growing season of 2000 soybeans did show a significant 2 to 4 bu/acre response to seed inoculation in the absence of starter fertilizer. A 2 bu/acre response to the Hi-Stick inoculum was found as well when starter fertilizer had been applied (compare the starter with the starter+Hi-Stick treatment in Table 2). Soybean yields did not increase with starter N and P application without inoculation under the dry field condi-

tions in 1999. Overall, yields were higher in 2000 but no response to fertilizer application was found in that year either, despite a month of cool and wet conditions after the May 17 planting date.

The 2-year average soybean yields (1999 and 2000 data) for fields without a soybean history showed a significant 3 bu/acre response to inoculum in the absence of starter fertilizer and a 4 bu/acre increase with the Cell-Tech inoculum in the presence of starter fertilizer (Table 2). Once again, soybeans did not respond to starter N and P fertilizer in the absence of an inoculum. A starter fertilizer response was absent in the inoculated soybeans as well.

We will continue this study for one more year. Results obtained thus far indicate that soybean growers will most likely benefit from the use of inoculum especially in fields that have no soybean history. Our results also suggest that starter fertilizer addition is not likely to increase yields for soils that test high in P.

Table 1. Soybean yields under different inoculum and starter fertilizer combinations in fields *with soybean history* in 1999 and 2000. This study was conducted at the Aurora Research Farm.

Treatments	1999	2000	2-year Average
	-----bu/acre-----		
Cell-Tech+ Starter [†]	30	46	38
Cell-Tech	30	46	38
Hi-Stick + Starter	32	45	39
Hi-Stick	31	44	38
Starter	31	43	37
Check	32	42	37
LSD 0.05	NS	2	NS

[†] Starter fertilizer was applied at a rate of 15 lbs N and 55 lbs P_2O_5 /acre. Soils tested high for phosphorus availability.

Table 2. Soybean yields under different inoculum and starter fertilizer combinations in fields *without soybean history* in 1999 and 2000. This study was conducted at the Aurora Research Farm.

Treatments	1999	2000	2-year Average
	-----bu/acre-----		
Cell-Tech+ Starter [†]	25	52	39
Cell-Tech	25	49	37
Hi-Stick + Starter	23	50	37
Hi-Stick	22	51	37
Starter	24	45	35
Check	21	47	34
LSD 0.05	NS	7	3

[†] Starter fertilizer was applied at a rate of 15 lbs N and 55 lbs P_2O_5 /acre. Soils tested high for phosphorus availability.