

Soybeans: Add the Inoculum but Forget the Starter N

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Soybean acreage in New York increased from 20,000 acres in 1985 to 130,000 acres in 1999, but has remained about the same during the last 4 years. Consequently, most soybean growers in New York have produced the crop for at least 4 years so most of their fields have been planted to soybeans at least twice. Most growers routinely apply inoculum to soybean seed at planting, despite a field history of soybeans. A significant number of growers also apply a small amount of starter N fertilizer at planting to provide available N to soybeans in June before soybeans begin fixing their own N at the onset of flowering in early July. We conducted a 4-year study on fields that had been planted to soybeans previously at least 3 times to evaluate the response of soybeans to inoculum and starter N fertilizer.

When averaged across the 4 years, soybeans did not respond to inoculum or starter N fertilizer (Table 1). Soybeans, however, responded to inoculum in 2000 and 2001, years when significant drought did not occur. Soybeans did not respond to the inoculum in 1999 and 2002, low-yielding years because of severe drought. The cost of inoculum is less than \$2/acre so growers should apply inoculum at all times to reap the yield benefit in years of no severe drought.

Soybeans did not respond to starter N fertilizer in any year of the study, including the cool and wet 2000 growing season (Table 1). Soybeans that received the starter N fertilizer were deeper green in color in June but this green color response did not translate into a yield response at harvest. These results suggest that soybeans do not require starter N fertilizer under New York growing conditions.

We recommend that soybean growers in New York apply inoculum to the seed at planting even in fields with a soybean history because of the likelihood of a response in years when there is no severe drought. Soybean growers in New York should not apply starter N fertilizer at planting because of the likelihood of no response even in cool wet years. Soybeans look greener in June but that does not justify the cost and time of applying starter N fertilizer.

Table 1. Soybean yields with and without inoculum and starter N fertilizer in 1999, 2000, 2001, and 2002 at the Aurora Research Farm.					
Treatment	1999	2000	2001	2002	Mean
	-----bu/acre-----				
Inoculum [†] & Starter [‡]	32	45	42	24	36
Inoculum	31	44	42	26	36
Starter	31	43	40	25	35
Check	32	42	39	27	35
LSD 0.05	NS	2	3	NS	NS
[†] Hi-Stick inoculant					
[‡] A liquid starter fertilizer was applied at 15 lbs N and 55 lbs P ₂ O ₅ /acre.					