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Do nitrogen decisions in corn affect subsequent soybeans?

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Soybean crop in Kansas. Photo by Constanza Mackrey, CiampittiLab.

Corn–soybean is the most frequent crop rotation in the U.S. Midwest, and nitrogen (N) is the most limiting nutrient for both crops. However, researchers have historically focused more on the N credits from soybean to corn while paying much less attention to the "legacy effect" of the corn phase on the following soybean crop.

New research in *Agronomy Journal* evaluates the impact of a wide range of N fertilizer rate treatments in corn (0 to 269 kg N ha^{-1}) on the following soybean crop, considering seed yield, soil N supply, and N fixation.

The team documented apparent N budgets (from fertilizer minus grain removal) from corn ranging from approximately -100 to +501 kg N ha^{-1}, which resulted in negligible carryover to the next season. Soil N availability, symbiotic N fixation (SNF), and seed yields in soybean were just slightly or not at all affected by nitrogen management of the previous corn crop. This study suggests that, most likely, farmers applying close to economic optimum fertilizer N rates to corn will not generate a N surplus that could compromise soybean crops by reducing the quantity of N derived from SNF more proportionally than the gain in soil N supply.

Dig deeper

Correndo, A. A., Adee, E., Rosso, L. H. M., Tremblay, N., Prasad, P. V. V., Du, J., & Ciampitti, I. A. (2022). Footprints of corn nitrogen management on the following soybean crop. *Agronomy Journal*, *114*, 1475–1488.
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