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First-year silage corn economically optimized without nitrogen fertilization

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Researchers harvesting silage corn plots in a study looking at tillage, herbicide, and corn fertilizer N rate. Photo by Jason Clark.

Planting of glyphosate-resistant (GR) alfalfa has led to the need to re-evaluate the timing and methods used to terminate alfalfa stands. The date and method of termination has the potential to influence the amount and timing of nitrogen (N) provided to the following corn crop from N mineralization.

New *Agronomy Journal* research compared the effect of five tillage type/timings (fall conventional till, spring conventional till, fall strip-till, spring strip-till, and no-till), three herbicide application dates for alfalfa termination (fall, spring, and in-crop), and four corn N rates on silage corn yield, quality, and economic return.

Silage corn yield and quality following GR alfalfa was economically optimized without N fertilization regardless of tillage type/timing and herbicide application date. Estimated animal milk production per hectare from silage corn was greatest and similar for all herbicide application dates with conventional tillage and spring herbicide application with strip-till and no-till (26–38 Mg milk ha⁻¹).

Therefore, decomposing GR alfalfa regardless of herbicide application timing in both conventional and conservation tillage systems can provide the full N requirement of first-year silage corn. Further, these results demonstrate how utilizing certain crop rotations can reduce our reliance on synthetic fertilizers to optimize crop production.

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Clark, J.D., Yost, M.A., Griggs, T.C., Cardon, G.E., Ransom, C.V., & Creech, J.E. (2021). Nitrogen fertilization and glyphosate-resistant alfalfa termination method effects on first-year silage corn. *Agronomy Journal*, 113, 1712–1723.

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