Economics of Strip Cropping with Autonomous Machines

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Strips of soybeans alternate with strips of corn on a farm in Wisconsin. Photo courtesy of Julia Gerlach/No-Till Farmer.

Mixed cropping systems, including strip cropping, have long been known to increase productivity and biodiversity. These systems often combine a tall, sun-loving crop with a shorter, shade-tolerant crop and take advantage of complementary characteristics such as nitrogen fixation. However, complex crop combinations can be hard to manage in large-scale mechanized farming and where crop-specific fertilizers and pesticides may be used. Smaller equipment operated autonomously could allow mixed cropping to be a viable alternative.

In a study published in *Agronomy Journal*, researchers modeled economic scenarios for alternating strips of corn and soybean managed autonomously in central Indiana using linear programming. They found that yearly returns were $568/ha higher for autonomous strip cropping compared with sole crop fields with human operators.

Profitable autonomous strip cropping could help reconcile economic and agroecological goals. These results also open the door for a wide range of other studies focused on optimizing strip cropping and other mixed cropping, including experimentation with crops and rotations, strip widths, hybrids and varieties, pest management, and soil fertility.

Adapted from

Al-Amin, A. K. M. Abdullah, Lowenberg-DeBoer, J., Erickson, B. J., Evans, J. T., Langemeier, M. R., Franklin, K., & Behrendt, K. (2024). Economics of strip cropping with autonomous machines. Agronomy Journal, 116, 572–589. https://doi.org/10.1002/agj2.21536