

Relay Cropping: Rows of Opportunity

Relay cropping is a crop management system that produces multiple crops with overlapping growing seasons. The sustainable method of planting efficiently uses natural resources and diversifies production.¹

After the first crop has been planted and has started to grow, the second crop—or “relay crop”—is planted alongside it in a way that allows separate maintenance and harvest. This method allows farming operations to extend their traditional growing seasons and produce two crops that generate income.²

In the Midwest, winter wheat, rye, and other cereal grains are common choices for relay cropping with soybeans.³ Other regions commonly pair wheat, sorghum, or cotton with a selection of legumes, potatoes, canola, and sunflowers.⁴

“When we produce only warm season crops, we’re using just a short part of the year that we can grow things. In early spring, the ground is thawed, the sun is shining, there’s liquid water in the top 4 inches of soil, and you can grow something.”

—Jason Russell,
Big Boulder Farms in eastern Iowa



Photo courtesy of Drew Dietz

Sources

- 1 Bunger, Marcia. “New Relay Cropping Practice Insurable by Written Agreement for Soybeans Seeded into a Small Grain Crop for the 2022 and Succeeding Crop Years.” U.S. Department of Agriculture, Risk Management Agency, Feb. 7, 2022, [rma.usda.gov/en/Policy-and-Procedure/Bulletins-and-Memos/2022/MGR-22-002](https://www.rma.usda.gov/en/Policy-and-Procedure/Bulletins-and-Memos/2022/MGR-22-002). Accessed January 2023.
- 2 Ibid.
- 3 Personal communication, Jason Russell, owner and operator of Big Boulder Farms, Sept. 8, 2022.
- 4 Tanveer, Mohsin, et al. “Relay cropping as a sustainable approach: problems and opportunities for sustainable crop production.” *Environmental Science and Pollution Research*, Springer, Jan. 13, 2017, doi.org/10.1007/s11356-017-8371-4. Accessed January 2023.

Benefits

The most financially significant benefit of relay cropping is the increased production from growing two cash crops within the year.

Relay cropping has also been shown to produce average or higher-than-average yields for each individual crop.⁵ The stable and increased yields are often attributed to the improved soil health that results from relay cropping. Having living roots in the soil for a longer portion of the year helps improve soil stability, thereby improving water absorption, and reducing erosion and nutrient runoff.⁶

“[After relay cropping] we have better soil aggregates and better water infiltration.”

—Jason Russell,
Big Boulder Farms in eastern Iowa

Relay cropping can also reduce the need for insecticides.⁷ The increased biodiversity in the field can help protect against infestations by creating a balanced ecosystem that can keep predator and prey species in check.⁸

The benefits also extend to weed prevention. Additional soil cover provided by relay cropping can reduce weed emergence and overall pressure.⁹ The varied planting time can also disrupt weed growth cycles, improving weed control.¹⁰ This improved control leads to decreased need for herbicides, which is another financial benefit.

“It all made agronomic sense to us, having living roots in the ground all year. Serves the best of both worlds by suppressing weeds and having two crops instead of one.”

—Noah Wendt,
A&W Farms in central Iowa

5 Personal communication, Jason Russell, owner and operator of Big Boulder Farms, Sept. 8, 2022.

6 Ibid.

7 Bunger, Marcia. “New Relay Cropping Practice Insurable by Written Agreement for Soybeans Seeded into a Small Grain Crop for the 2022 and Succeeding Crop Years.” U.S. Department of Agriculture, Risk Management Agency, Feb. 7, 2022, [rma.usda.gov/en/Policy-and-Procedure/Bulletins-and-Memos/2022/MGR-22-002](https://www.rma.usda.gov/en/Policy-and-Procedure/Bulletins-and-Memos/2022/MGR-22-002). Accessed January 2023.

8 Ibid.

9 Personal communication, Jason Russell, owner and operator of Big Boulder Farms, Sept. 8, 2022.

10 Ibid.



Benefits, continued

Relay cropping also increases carbon sequestration. This system stores more carbon deeper in the soil than traditional row crops.¹¹ Land used for agricultural production is at higher risk of soil organic carbon loss, which can decrease soil health.¹² Relay cropping helps combat this risk and returns carbon and organic matter to soils, maintaining and improving soil health.

Relay cropping's positive impacts on soil and water quality, along with its financial benefits for producers, make it a win-win.

"The first time we did relay cropping on a large scale it was what I would consider a huge success."

—Jason Russell,
Big Boulder Farms in eastern Iowa

Risks

While relay cropping carries many benefits, there are potential risks. Relay cropping requires adopting more complex management practices.¹³ These practices may require speciality equipment, which come at a cost.¹⁴ Additional labor may be required for management and harvest, increasing production costs.¹⁵ Producers should consider their available markets to ensure they have a place to sell their new cash crop if it is not already a part of their standard rotation. It may also be difficult to find other producers relay cropping in your area, so you may need to cast a wide net to create a support system.

Crop insurance for relay cropping

The U.S. Department of Agriculture's Risk Management Agency (RMA) announced in 2022 that relay cropped acres, specifically soybeans with a cereal grain, could be insured with federal crop insurance for the first time.

"RMA came out and said we could insure relay cropping, and we did. It's a safety net for us."

—Noah Wendt,
A&W Farms in central Iowa

Relay cropping coverage is available by written agreement, a case-by-case arrangement made for individual coverage. Producers will work alongside their crop insurance agents to put together a request. When in place, coverage will protect in the event of multiple natural perils, such as hail, freeze, drought, and excessive precipitation, but will not protect against damage caused by planting, harvesting, and maintenance.

The application process will require evidence that relay cropping is a viable practice in the producer's region. This is most commonly achieved by including a letter written by a local agronomist, but letters from conservation professionals and agricultural organizations may also be accepted.

Some additional requirements exist based on location. Producers in Zone 1, as shown in the map on page 3, are not required to provide prior relay cropping actual production history. Those in Zone 2 must submit at least two of the most recent years of their relay cropping actual production history for their county, and those in Zone 3 must provide the actual production history for their county from the past three years.



To find a crop insurance agent, visit public-rma.fpac.usda.gov/apps/AgentLocator/#/.

Sources, continued

11 Meena, Ram Swaroop, et al. "Soil Carbon Sequestration in Crop Production, Nutrient Dynamics for Sustainable Crop Production." Springer, Sept. 7, 2019, doi.org/10.1007/978-981-13-8660-2_1. Accessed January 2023.

12 Bergman, Kayla. "Conservation Practice Impact on Carbon Sequestration." Center For Rural Affairs, March 2022, cfra.org/publications/conservation-practice-impact-carbon-sequestration. Accessed January 2023.

13 Huss, C P, et al. "Benefits and Risks of Intercropping for Crop Resilience and Pest Management." Journal of Economic Entomology, vol. 115, no. 5, pp. 1350-1362, October 2022, doi.org/10.1093/jee/toac045. Accessed January 2023.

14 Ibid.

15 Ibid.



Figure 1. NRCS Zone Guidance Map

