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Research update: Kernza intermediate wheatgrass

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Sandra Wayman, a research support specialist at the Cornell University School of Integrative Plant Sciences and a co-author on the paper, samples biomass of intermediate wheatgrass in the field. Photo by Eugene Law.

Back in July 2021, we told you about research led by the University of Wisconsin–Madison on the effects of nitrogen and forage harvest on roots in Kernza intermediate wheatgrass (IWG) used both as a grain and forage crop. Recently a team from Cornell University, in a study published in *Agronomy Journal*, reported more Kernza findings on the effects of intercropping the crop with red clover.

Kernza is the trademark name for the grain of an IWG variety being developed at **The Land Institute**. It offers promise as a sustainable alternative to more resource-hungry annual grain and forage crops. Studies have shown that its environmental benefits, when compared with annual crops, include improved soil and water quality, pest and pathogen control, resilience to climate change, and habitat for microbes, macroinvertebrates, and wildlife. Requiring less fuel and labor and the potential for better carbon storage are additional plusses.

In the first study on IWG to be conducted in the northeastern U.S., researchers compared performance of the crop to annual hard red winter wheat over three years. They tested both crops with and without intercropping red clover. In some ways, the winter wheat outperformed the IWG. Most notably, its grain yield was almost five times higher than Kernza's. In other ways, however, IWG had the edge: Its straw yield was higher than winter wheat and increased over the course of the study while weed biomass did not change. In the winter wheat, straw yield decreased and weed biomass

increased.

Another key finding was that when researchers intercropped the IWG with red clover, it produced more forage, and suppressed weeds better, than monoculture IWG without any sacrifice to grain yield. However, the Cornell team did observe some negative weed issues with the IWG: After two years, weed communities in those plots were dominated by perennial grasses rather than less problematic annuals.

The findings, the researchers wrote, point to the need to continue improving IWG breeding and management practices for better yields. The perennial is already the clear winner in terms of ecosystem services but needs more development to become a better agronomic performer that can hold its own with annual grains.

Dig deeper

For more detail on the effects of nitrogen and forage harvest on dual-use Kernza, check out the original *CSA News* article, "Perennial, Dual-Use Kernza for Food and Forage," here: **https://doi.org/10.1002/csan.20522**.

Read the recent *Agronomy Journal* study out of Cornell University, "Intercropping Red Clover With Intermediate Wheatgrass Suppresses Weeds Without Reducing Grain Yield," here: **https://doi.org/10.1002/agj2.20914**.

- Ranjith P. Udawatta, Biyensa Gurmessa, Miguel Salceda Gonzalez, Sidath S. Mendis, Sarah T. Lovell, Short‐term effects of Kernza and alfalfa on microbial communities, Agrosystems, Geosciences & Environment, 10.1002/agg2.20509, **7**, 2, (2024).

- Seth C. Murray, Perennial Alternatives, CSA News, 10.1002/csan.21115, **68**, 9, (19-21), (2023).

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Back to home

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