



Green Lands
Blue Waters

Continuous Living Cover & Perennial Grains in NRCS Practices

Kernza Variety Trials at Williston Research Extension Center, Williston, ND; 2020. Credit C. Keene

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Continuous Living Cover

Continuous Living Cover (CLC) systems and rotations address multiple conservation resource concerns, making CLC a highly efficient use of United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) funding and technical assistance. CLC farming establishes and maintains *year-round* live plant cover in ways that diversify and bolster the farmer's economic portfolio while also protecting and nurturing natural resources. **There is great potential to enhance conservation outcomes if more program funds are prioritized to deploy CLC systems.**

Green Lands Blue Waters (GLBW) and its partners promote five CLC farming strategies in the Upper Midwest: agroforestry, perennial biomass, perennial forage, **perennial grains**, and rotation/cover crops/winter annuals. Recently, **perennial grains were formally adopted into the national Conservation Practice Standard Code 328, Conservation Crop Rotation** (current Conservation Stewardship Program enhancement #E328O, *Perennial Grain Crop Conservation Rotation*) to support farmers' adoption of a perennial grain crop as part of a three-crop sequence of warm and cool season crops in rotation on the same ground.

Perennial Grains Address NRCS Resource Concerns

Perennial grains are crops that live year-round and are productive for more than one year. They offer a variety of natural resources benefits.

- Deeper root systems and longer growing seasons mean that these crops hold more rainwater with improved nutrient capture – reducing runoff with erosion and nutrient leaching.
- Compared to annual crops, perennial grains need less tillage and, due to improved nutrient cycling, often require less fertilizer and herbicide, resulting in cumulative system benefits.
- Perennial grains improve soil health and often store carbon through additive benefits, namely reduced tillage and root biomass accumulation.



Perennial grains can specifically improve the following agency resource concerns¹:

- Soil erosion
- Soil quality (OM, compaction, salinity)
- Water quantity (excess or insufficient)
- Water quality (excess nutrients, pesticides, pathogens, salts, chemicals, sediment, temperature)
- Air quality (particulate matter, greenhouse gas)
- Plant health (productivity and health, structure and composition, pest pressure, wildfire hazard from biomass accumulation)
- Fish and wildlife habitat (quantity/quality of food, water, shelter)
- Livestock production limitations (feed/forage, water, shelter)
- Energy resources (equipment/facilities, field operations)



Credit: Aaron Reser

Perennial Grains Research & Development

Perennial grain researchers are working to develop perennial intermediate wheatgrass, wheat, sorghum, and rye species. Intermediate wheatgrass (IWG) (*Thinopyrum intermedium*) is a promising new perennial grain species, providing an edible grain for human food (trade name Kernza®) and also forage for livestock feed from plant vegetative biomass. Kernza is the first perennial grain commercially available in the U.S. after years of development led by [The Land Institute](#) in Salina, KS and the [Forever Green Initiative](#) at the University of Minnesota. A national team of over 35 researchers is now coordinating efforts through a project called KernzaCAP, awarded as a USDA National Institute of Food and Agriculture (NIFA) Agriculture and Food Research Initiative (AFRI) Sustainable Agriculture Systems (SAS) Coordinated Agricultural Project (CAP). This project brings together the nation's Kernza research and outreach network to work in a coordinated fashion on extensive intermediate wheatgrass development efforts and on-farm trials across the U.S. and is underpinned by over 40 years of species

development. Research is focused on improving yield and productive lifespan, increasing nutritional value, streamlining production practices, and enhancing environmental quality impacts. Significant resources are also targeted to implementation activities - education and extension, policy supports, technical assistance, and farmer adoption, as well as processing, market development, and supply and value chain relationships. This article describes this web of support from a farmer perspective: [N.D. native returns to century-old farm to plant new perennial grain](#)².

KernzaCAP updates can be found at kernza.org/kernzacap and Kernza production basics can be found at kernza.org/growers. An up-to-date Kernza® Production Guide will be released later in 2022.

Find more information in the [GLBW paper, NRCS Opportunities for Increasing Continuous Living Cover Farming Systems](#).

This paper provides tables identifying specific CLC strategies by the CSP and EQIP practices and enhancements that could support them.

¹ National Resource Concern List and Planning Criteria;

<https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=44299.wba>

² <https://www.morningagclips.com/celebrating-earth-day-n-d-native-returns-to-century-old-farm-to-plant-new-perennial-grain/>



NRCS Practice Standards & Funding Priorities

Adoption of CLC is broadly included in several NRCS practice standards. The section below outlines existing practices to support farmer adoption and sample funding pool language. This language is intended as a starting point for NRCS professionals to increase funding and producer support for CLC production practices by leveraging alignment with existing practice standards and enhancements.

For more information, [this paper](#)³ outlines NRCS EQIP and CSP practices and enhancements that encourage CLC and support IWG plantings for source water protection.

Practices include establishment or inclusion of perennial grains in:

- Conservation crop rotation (#E3280);
- Riparian buffers or filter strips; i.e., MN practices allow for planting 100% IWG stands - Contour Buffer Strips (#332), Filter Strips (#393), and Cross Wind Trap Strips (#589C);
- Working grasslands for forage; i.e., through EQIP, the Prairie Pothole program in North Dakota, South Dakota, Minnesota, Iowa, and Montana will help producers with expiring Conservation Reserve Program contracts keep their lands as working grasslands or haylands through implementation of prescribed grazing and other conservation practices;
- Soil Health Initiatives; for example the Iowa Soil Health EQIP Initiative has provided additional payments to producers who implement a minimum of three of the following practices:
 - Residue and Tillage Management, No-Till (#329)
 - Cover Crops (#340)
 - Nutrient Management (#590)
 - Conservation Crop Rotation (#328)



Credit: Mette Nielsen

Language Sample for a Perennial Grains Funding Pool

This funding pool provides financial and technical assistance to producers establishing perennial grains on croplands (in a three-crop rotation), grasslands, and haylands to address soil health (organic matter, erosion, reduced tillage), water quality (filtration, nitrate leaching) and environmental health (carbon sequestration, reduced fuel and inputs, wildlife habitat) concerns. Priority is given to practices that promote continuous living cover (CLC) that keep live plant cover and/or roots in the soil all year long.

Green Lands Blue Waters and partners are conducting essential research, improving the genetics of old and new crops, translating knowledge into Continuous Living Cover farming systems, developing new extension and outreach capacity, working in farm fields, shaping policy, building profitable markets for new crops, and changing the narrative around what's possible through agriculture. The value of Continuous Living Cover farming comes in yields and profits, but also in improved soil health, cleaner water, new economic opportunities, diverse agricultural communities, more wildlife, reduced risk, and resiliency in the face of a changing climate.

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³ Green Lands Blue Waters, NRCS Opportunities for Increasing Continuous Living Cover Farming Systems, <https://greenlandsbluwaters.org/resources/makingclchappen/#clc-nrcs-programs>

