

2023 SOIL HEALTH COLLABORATIVE REPORT SUMMARY

Building Knowledge About Wisconsin's Cover Crops

A FARMER CITIZEN SCIENCE PROJECT

This citizen science effort began in 2020 to address the need for locally relevant information on cover crop selection and establishment in Wisconsin. In 2020, 2021, and 2022, farmers shared cover crop data from 99 farm fields across Wisconsin. Project information is being aggregated to gain a long-term, regional understanding of the successes and challenges of adopting cover crops into diverse cropping systems, to improve decision support tools like SnapPlus, and guide practical cover crop recommendations for Wisconsin's diverse climatic, soil, and cropping systems.

HIGHLIGHTS 2022

- ◆ Fifty-eight farmer participants across 28 Wisconsin counties; more than 40% reported at least 7 years of experience planting cover crops
- ◆ Participants reported planting 22 different cover crop species, with cereal rye the most common, followed by radish, crimson clover, oats, and red clover
- ◆ Fifty-five percent of farmers planted multispecies mixes (3 species or more)
- ◆ Eighty-six percent of farmers drilled their cover crop; wheat was the most common previous cash crop followed by corn silage
- ◆ Despite drier than normal growing conditions in 2022, cover crop biomass production following winter wheat was comparable to previous years
- ◆ Sixty-four percent of participants were interested in expanding their farm's cover cropped acres; the most cited barrier to adoption was lack of remaining growing season after crop harvest
- ◆ Personal experience, agronomists, and producer-led networks were identified as the most important sources of cover cropping information

Project Design

Participating farmers used an online form to share cover cropping practices and answer questions on experience levels with cover crops, sources of cover cropping information, and external and internal factors influencing cover crop adoption.

- ◆ Project team members collect cover crop biomass samples from each participating farm in late November to gauge cover crop biomass production, nutrient uptake, and forage quality.
- ◆ Farmer participation is completely voluntary, and participants are solicited through emails and social media from the project group, as well as through Extension, county, state, and federal agency, non-governmental organization (NGO), and producer-led watershed partners.
- ◆ Farmer participants are provided an \$100 honorarium, as well as biomass and forage quality analysis results, for their time.

Summary of 2022 Findings

Agronomic Practices Data

- ◆ Preceding cash crop: Wheat (36%), corn silage (26%), corn grain (14%), soybeans (9%)
- ◆ Field preparation for cash crop: Conservation tillage/no-till (73%)
- ◆ Dominant field soil texture: >75% fine textured soils, silt loam (50%) most reported
- ◆ Cover crop establishment: Drilled, post crop harvest (86%)
- ◆ Cover crop: Mixes of 3 species or more (55%), single species (34%) or on 20 of 58 fields
- ◆ Cover crop species: Cereal rye (52%), radish (45%), crimson clover (31%), oats (28%), red clover (28%), field/forage pea (26%), hairy vetch (26%), turnips (24%), annual ryegrass (21%)

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The Wisconsin Cover Crop Farmer Citizen Science Project will continue in 2023! Surveys can be completed online, via phone, or on paper.

If you are interested in participating sign up online or contact Daniel H Smith at dhsmith@wisc.edu, or call 608-219-5170.



- ◆ Manure applications: Pre-cover crop planting (36%) or post-cover crop planting (26%), at a rate of 4,000 to 20,000 gallons or 1 to 15 tons per acre, most manure applications were on diverse cover crop mixes
- ◆ Estimated cover crop seed cost: \$10 to \$75 per acre
- ◆ Estimated cover crop planting cost: \$8 to \$60 per acre

Cover Crop Experience and Perceptions

- ◆ Cover cropping experience: 1 to 3 years (19%), 4 to 6 years (39%), 7 or more years (42%) of all participants.
- ◆ Interest in expanding cover crop acres: Would like to increase acres (66%); all acres already planted to covers (25%), no interest (9%)
- ◆ Barriers to expanding cover crop acres (from 36 comments): Weather/growing season limitations (53%), time to plant (27%), cost (17%). Seed availability, nutrient management, and uncertainty were other barriers mentioned.
- ◆ Need additional cover crop information: No (69%), Yes/always learning (26%). This year's data indicated that as experience with cover crops increases, so does expressed need for cover crop information

Most Cited Reasons

- ◆ Personal experience, agronomists, and producer-led networks were identified as the most important sources of cover cropping information
- ◆ Top motivations for cover cropping included: reduce runoff/erosion, improve soil structure, increase soil organic matter, improve water quality, increase resiliency to weather extremes, grow nitrogen credits

Cover Crop Field Data

Spring planting of cash crops was slightly delayed, with colder than normal temperatures in early May. Below normal precipitation and temperatures continued throughout the growing season, contributing to delayed crop development. However, overall cash crop yields were average to above average across most of the state. Fall 2022 planted cover crops and wheat emerged later than anticipated and, in many cases, only after timely rains in late September.

Fall Cover Crop Biomass Accumulation

- ◆ Biomass samples were collected on 36 farms. On 22 (38%) of participating farms we were not able to collect samples, in some cases because the cover crop had not emerged yet in mid-November.
- ◆ 2022 average: 0.79 tons per acre, 0.09 tons per acre greater than 2021
- ◆ 2022 low: 0.2 tons per acre, multispecies cover crop mix following silage corn (south central Wisconsin, planted 10/21/23); High - 2.5 tons per acre, multispecies cover crop mix following wheat (southeast Wisconsin, planted 7/15/22)

Fall Cover Crop Nutrient Content and Forage Quality

- ◆ Most cover crops had relative feed qualities (RFQs) of 160 or above, likely associated with early vegetative growth
- ◆ Cover crop nutrient concentrations were highly variable across our sites; additional years needed to provide more insights
- ◆ Limited forage production resulted in severely limited cover crop harvest and/or grazing potential

A comprehensive 2022 project report, as well as more information on the project, can be found at:

<https://cias.wisc.edu/our-work/farming-systems/cover-crops/ccrop/>