What are **COVER CROPS**?

Cover crops are grasses, legumes, or forbs planted for **seasonal vegetative cover** with the purpose of **protecting and enriching soils** when land would otherwise be bare

- In northeast Wisconsin, cover crops are typically planted after wheat, corn silage, or vegetable crops or may be interseeded/overseeded into corn grain or soybeans

- Common cover crops include: cereal rye, barley, oats, annual ryegrass, triticale, red clover, crimson clover, Austrian winter peas, turnips, oilseed radishes, and rape

Why plant **COVER CROPS**?

Depending on the species planted, plant growth attained, number of years covers are grown, beginning soil conditions, and the inclusion of other soil health promoting practices into the cropping system, **cover crops may provide the following environmental and agronomic benefits**:

Short-term

- Reduce wind and water erosion; reduce the amount of nutrients and sediments delivered to surface waters
- Scavenge and store nutrients from the previous crop and/or manure applications; reduce nutrient leaching and runoff
- Legume species convert atmospheric nitrogen to plant available nitrogen; nitrogen may be available to the next crop
- Suppress weed seed germination and growth; reduce the need for chemical and physical weed control measures
- Reduce populations of soil-borne plant diseases and plant-damaging insects; reduce the need for pesticides
- Attract beneficial insects, such a pollinators and insect predators
- Provide high quality, supplemental forage available for grazing or haying

Long-term

- Increase soil organic matter; a key component of soil biological, chemical, and physical factors related to soil health
- Alleviate compaction through pore channel creation, increased soil biological activity, and improved soil aggregation
- Improve water infiltration and plant available water storage; reduce nutrient runoff and leaching
- Improve biological nutrient cycling; potentially reduce the need for additional fertilizer
- Improve cropping system resiliency; reduce crop yield susceptibility to weather challenges

What are the challenges of using **COVER CROPS**?

Depending on the species planted, plant growth attained, and time at which the crop is terminated, cover crops may:

- Serve as habitat for detrimental crop insects, including armyworms, cutworms, and/or slugs
- Serve as an alternative host for plant diseases, such as white mold
- Tie-up (immobilize) plant available nitrogen upon termination; may result in spring nitrogen deficiencies in next crop
- Act as a weed in next crop, if cover crop is not adequately terminated or if seed germination is delayed
- May increase or decrease soil moisture due to reduced evaporation or increased transpiration (depending on the growing season, these factors could also be a benefit)
- Increase need for agronomic management and planning; increase labor requirements at critical times of the year
- Increase cost of production expenses due to seed, establishment and termination costs

COVER CROPS Partial Budget

A partial budget is a decision-making framework focused only on changes in income and expenses resulting from implementation of an alternative...in this instance, introduction of cover crops into a crop rotation.

The following summarizes partial budget survey data from approximately 83 Iowa farms associated with cover crop use followed by corn, for all cover crop species, all planting methods, and where the cover crop was terminated with herbicides. Dollar values indicate the change in revenue or cost associated with adopting cover crops into a crop rotation.

Adapted from: Plastina, Alejandro; Liu, Fangge; Sawadgo, Wendiam; Miguez, Fernando E.; Carlson, Sarah; and Marcillo, Guillermo, "Annual Net Returns to Cover Crops in Iowa" (2018). Economics Working Papers: Department of Economics, Iowa State University. 18005. https://lib.dr.iastate.edu/econ_workingpapers/39

Revenue/Costs	Median ($/A)	Range ($/A)
Revenue		
Change in corn yield following cover crop	0	-108 to 80*
Savings/extra revenue from grazing or harvesting cover crop for forage	22	3 to 100
Costs		
Cover crop seed	16	5 to 47
Cover crop planting (non-custom)	17	2 to 25
Additional termination herbicides (herbicides used in typical rotation)	0	0 to 17
Extra labor with termination (herbicides used in typical rotation)	0	0 to 130
Additional termination herbicides (herbicides NOT used in typical rotation)	8	4 to 24
Extra labor with termination (herbicides NOT used in typical rotation)	8	3 to 15
Change in nitrogen costs	0	-20 to 5
Change in insecticide costs	0	-12 to 3
Change in fungicide costs	0	-16 to 4

* Corn yield change following cover crops ranged from -27 to +20 bu/A

According to Sustainable Agriculture Research and Education's fact sheet

COVER CROPS IMPROVE SOIL CONDITIONS AND PREVENT POLLUTION

On average, cover crops:

- **REDUCED** sediment losses by **EROSION** by **20.8 tons per acre on conventional-till fields**, **6.5 tons per acre on reduced-till fields**, and **1.2 tons per acre on no-till fields**
- **INCREASED** water **INFILTRATION** into the soil surface by more than **six-fold**
- **REDUCED NITROGEN LOSSES** by **48%** and **TOTAL PHOSPHORUS LOADS** to waterways by **15% to 92%**
- **INCREASED SOIL ORGANIC MATTER** by **8% to 114% with legume crops** and **4% to 62% with non-legume crops**