



Cover Cropping for Wildlife

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About

The University of Missouri's Division of Food Systems and BioEngineering aims to improve health and quality of life by advancing medical technologies and enhancing the use and delivery of agricultural outputs in a safe, efficient and environmentally friendly manner. The extension programs residing in the division cover an array of outreach activities ranging from water quality, precision agriculture, rural safety and health, waste management, and value-added processing to food safety.

The Sustainable Agriculture Research and Education (SARE) Program is driven to advance—to the whole of American agriculture—innovations that improve profitability, stewardship and quality of life by investing in groundbreaking research and education.

The Basics

Wildlife in an agricultural ecosystem require three habitat components:

1. A variety of food sources (vegetation, insects, vertebrates)
2. Cover for protection from predators and the elements
3. Undisturbed nesting/reproduction areas

Conventional Midwestern row-cropped fields are missing at least one of these requirements for part of the year. In a corn and soybean rotation, there can be little to no living vegetation in a field for 6+ months per year. Grassland birds and insects are especially affected by the winter/spring habitat gap.



A typical row-cropped field in Missouri appears devoid of aboveground life for and offers no food or cover for wildlife for much of the year (left: a soybean field in February). Weeds provide minimal cover even in May (right).

Cover Crops Can Fill the Habitat Gap

Cover crops have the potential to meet at least some of the habitat requirements of wildlife. There is little research to date on how cover crops will affect various species.



Cover cropped fields are not always green (left, a mix in February following wheat), but they certainly look like better wildlife habitat than a bare field. In spring (right, cereal rye), their potential is quite evident

Pilot Study at LTAR

We placed game cameras on a cover cropped and non-cover cropped fields October 2018 through June 2019.

Field 1: LTAR site near Centralia, MO. Corn/soybean/wheat rotation, no-till. Fall 2018 followed wheat and consisted of a cover crop mix of warm-season plants as well cereal rye.

- 3 cameras on the perimeter and 2 in the interior

Field 2: Conventionally managed continuous soybean. No cover crop, no fall tillage.

- 2 cameras on perimeter and 1 in the interior

Results

- 9 species of mammals
- 7 or more species of birds

The cover cropped field had almost triple the average nightly detections

Perimeter cameras captured more than interior cameras, cover cropped interior cameras recorded ~5 times the detections of uncovered fields.



Cover crops provide stopover habitat for migrants (left) and overwintering habitat for residents like quail (right)



Larger insect and small mammal populations bring in predators like owls (top-left) and coyotes (bottom-left). Forest omnivores also venture out into cover crops (top-right).

Selecting a Cover Crop

Different cover crops have different strengths. For wildlife, it's best not to overthink it. Diverse cover crop mixes provide a variety of food and nesting opportunities. Including a flowering broadleaf is especially helpful to increase insect diversity and abundance.



Grass cover crops can still provide benefits to wildlife, such as fawning cover (left) but diverse mixes are ideal (right).

Managing Cover Crops

Maximize cover crop period by:

- Plant early as possible, ideally interseeding into a standing crop
- Terminate as late as possible: plant green
- Minimize pesticide use with IPM



June interseeding into corn

Dealing with Pests

Some crop loss to deer, raccoons, and other wildlife may be unavoidable. Many farmers are already accustomed to those animals. For cover croppers, voles are likely to cause the most concern.

Tips for controlling voles:

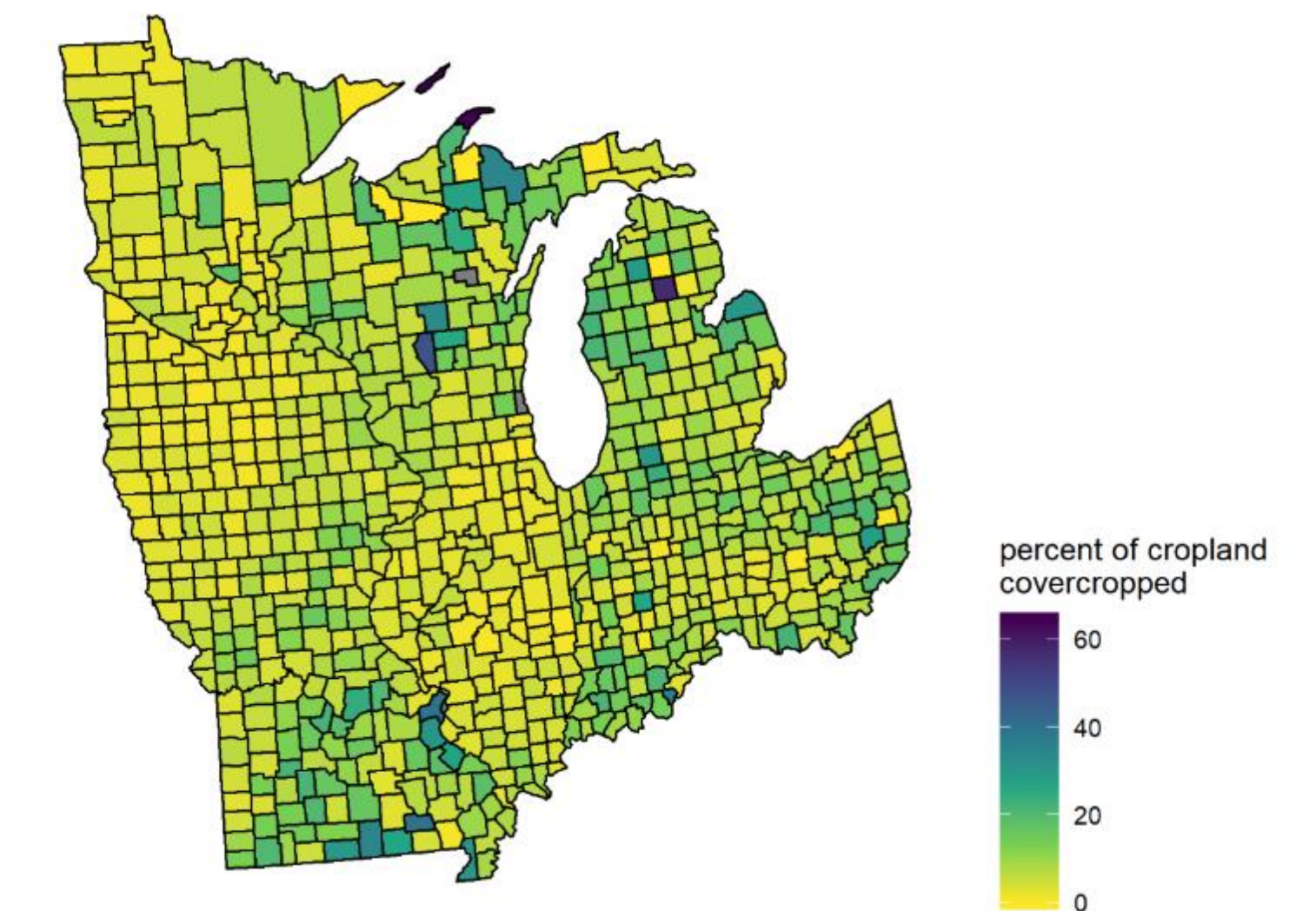
- Remember- vole populations are cyclical. Populations are unlikely to explode in consecutive years
- Close the seed slot for cash crops
- Drill soybeans to protect the seed. The drill will physically kill more voles as well
- Use a lower seeding rate or include winter-killed species to open the canopy in the spring
- Support predator populations-raptor perches, leave coyotes
- Give supplemental feed when seedlings are vulnerable



Vole damage in soy beans (left). A vole from the LTAR pilot study (right).

Potential for Conservation

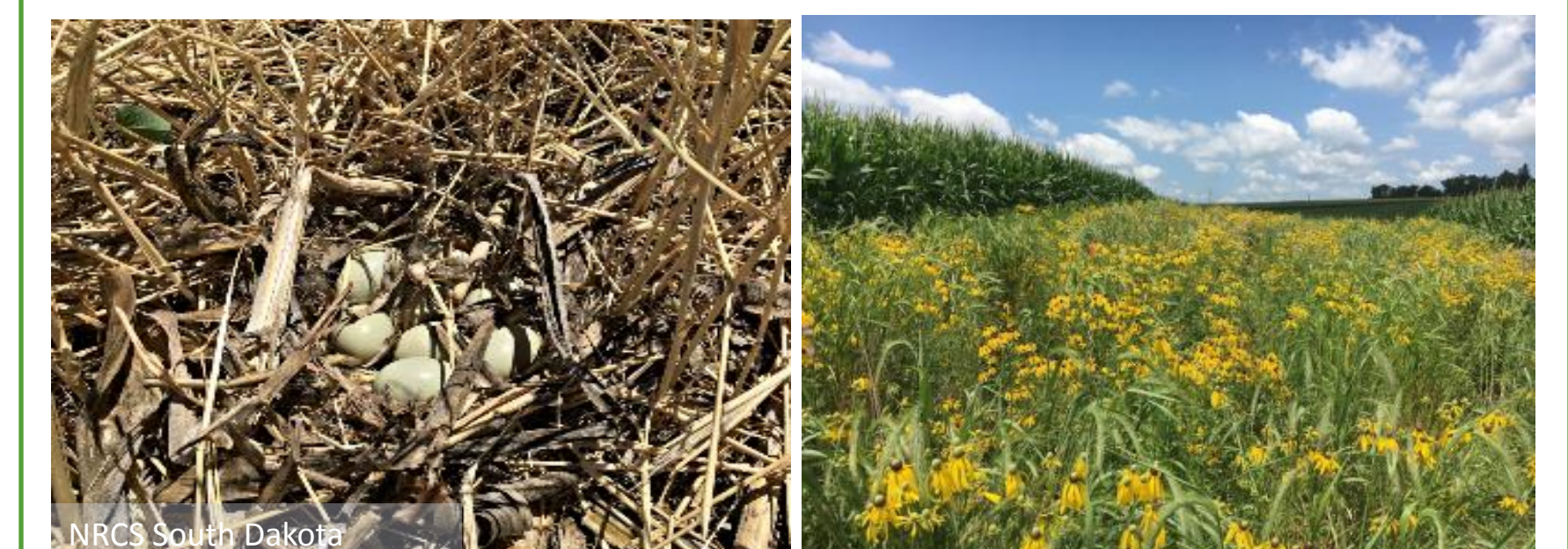
- Only about 5% of potential acres nationwide are cover cropped.
- 200 million acres could be transformed into better wildlife habitat
- In the Midwest ~110 million acres could be cover cropped.
- Cover crops could help save struggling species such as the eastern meadowlarks, rusty patched bumblebees, monarchs, and bobwhite quail



Maximizing Wildlife Benefits

The benefits of cover crops are amplified when combined with other conservation practices. Other practices include:

- **No-till:** tillage is a very destructive event for small mammals, insects, and birds nesting in cover crops. No-till planting could still destroy nests but likely allows for easier re-nesting
- **Diverse rotations:** Having at least three cash crops can be enormously helpful for wildlife. Adding wheat into a corn/soybean allows for a summer cover crop that could benefit wildlife, especially nesting birds.
- **Integrated perennial plantings:** Field buffers, prairie strips, trees, and pollinator strips can provide a refuge, allowing wildlife to use cover crops temporarily.



No-till fields offer better nesting opportunities than tilled fields (left). Perennial prairie plantings are even better (right: prairie strip)

Acknowledgements

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