

Wall to wall carpet for corn

A. What is this research project?

This project involves the development and testing of farming practices that will maintain and protect soil and water resources while allowing harvest of corn stover for energy production. We are testing two cropping systems:

- a permanent living mulch of kura clover, a long-lived perennial legume, into which corn is seeded.
- helicopter seeding of winter rye into standing corn canopies in late summer, to establish a cover crop prior to harvest.

We are developing optimal management strategies to maximize the benefits of the rye and kura clover while minimizing competition with the corn.

B. What problem does it address?

Corn stover is normally returned to the soil during grain harvest, where it provides protection against erosion and returns carbon and nutrients to the soil as it decomposes. Prospective large-scale removal of corn stover from existing corn and corn/soybean production systems would have a substantial negative impact on soils and on water quality by increasing erosion and reducing soil organic matter.

C. How is the project different from or how does it enhance other projects?

- This project complements research that is being conducted in ARS laboratories, where scientists are developing methods to extract energy from corn stover.
- It also relates to research by ARS, universities, and private companies aimed at developing new harvesting equipment for simultaneous harvest of both grain and stover.

D. What are the potential benefits of partnering with ARS on this research?

ARS possesses the agronomic and environmental expertise as well as the long-term commitment necessary to conduct research of this nature.

E. Who are the potential customers?

U.S. corn growers, bioenergy production companies, and biofuel consumers are potential beneficiaries.



Corn growing in kura clover living mulch.



Kura clover living mulch after corn grain and stover harvest.

Stage of Development

This research began several years ago, and now includes both plot-scale studies and field-scale tests, where we are measuring biomass accumulation, surface cover, yield, nitrate leaching, and greenhouse gas emissions in both newly developed and conventional production systems.

Moving Forward

A major impediment to further progress is the lack of available field-scale equipment for one-pass harvest of both grain and stover.

Researchers

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Loading rye seed on a helicopter



A heli-seeded winter rye cover crop after stover harvest

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