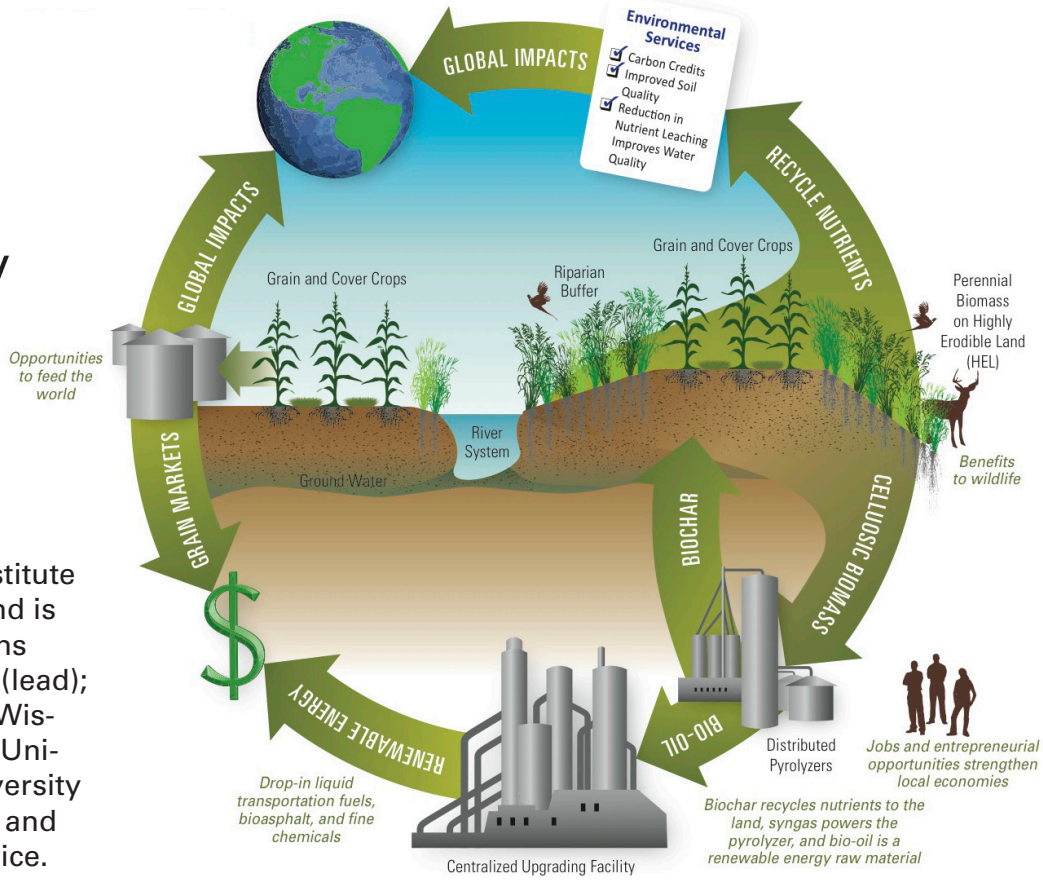
cenusa bioenergy

CenUSA Bioenergy's vision is to create a Midwestern regional system for producing advanced transportation fuels and bio-products using perennial grasses grown on marginal lands.

It is funded by USDA National Institute of Food and Agriculture (NIFA) and is a collaboration of eight institutions including: Iowa State University (lead); Purdue University; University of Wisconsin; University of Minnesota; University of Nebraska-Lincoln; University of Illinois; University of Vermont; and USDA Agricultural Research Service.



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CenUSA Biochar Research Findings

http://www.biorenew.iastate.edu/biochar

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Photo: David Laird, CenUSA project; Iowa State University Armstrong Research Farm

- Developed a biochar module within the APSIM cropping system model that predicts the impact of biochar amendments on crop yields and environmental outcomes, such as CO_2 and N_2O emissions and NO_{3-} leaching.
- Quantified corn crop yields and soil quality responses to biochar applications for high quality Midwestern soils.
- Determined that both feedstock and peak pyrolysis temperature influence the changes in biochar surface chemistry that occur on aging (weathering) in soils and developed a rapid laboratory aging technique that mimics most of the processes that occur during prolonged field aging of biochar.
- Determined that the original Boehm titration method for determining surface change does not work with biochars because of interference from soluble ash and organic compounds in biochar and developed a modified Boehm titration method that does work with biochars.
- Determined that oxonium groups (oxygen heterocycles) are the source of pH independent positive charge on biochar surfaces, hence the source of anion exchange capacity, and showed that oxonium groups in bridging positions are stable against weathering.

CenUSA Master Gardener Biochar Study

https://cenusa.iastate.edu/master-gardener-and-youth-programs

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In cooperation with the University of Minnesota and Iowa State University extension programs, CenUSA has been working with Master Gardeners to determine if biochar is a good soil amendment for home gardens.