

Biofuel from Corn Stover

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ARS research has shown that harvesting 40 percent of corn stover in fields of the northern Great Plains only increases soil erosion by 0.25 tons an acre per year.

(PhysOrg.com) -- How much corn crop residue, or stover, can be removed for biofuels without harming soil? An Agricultural Research Service (ARS) study of a 10-mile circle around the University of Minnesota's Morris campus offers some clues.

Dave Archer, an agricultural scientist at the ARS Northern Great Plains Research Laboratory in Mandan, N.D., chose that circle area because of the university's plans to heat its buildings with gas released by a controlled burning of corn stover -- a process called gasification.

Using the ARS Environmental Policy Integrated Climate (EPIC) model, Archer found that if farmers in that area harvested 40 percent of the stover, this would increase [soil erosion](#) by only 0.25 tons an acre per year. Erosion levels could be minimized by harvesting stover from areas less susceptible to erosion, by removing stover at lower rates, and by using conservation tillage, diverse crop rotations, and other conservation cropping practices.

Archer used EPIC to estimate costs, including the expense of replacing nutrients lost from the stover removal.

The Morris study is part of the ARS Renewable Energy Assessment Project (REAP). ARS has scientists in 10 states involved in the project, in collaboration with universities participating in the Sun Grant Initiative funded by the U.S. departments of Transportation, Energy, and Agriculture.

Also participating in REAP is Archer's colleague, Jane Johnson, an ARS soil scientist at Morris. Johnson and colleagues at Morris are studying whether returning the co-products of gasification to the [soil](#) can replace lost carbon and nutrients and help prevent erosion. If so, then additional stover could be harvested from soils treated with co-products.

Provided by USDA Agricultural Research Service

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