

## Corn ethanol emits 51pc less greenhouse gas than gasoline

23/01/2009 11:05:00 AM

Corn ethanol directly emits an average of 51pc less greenhouse gas than does gasoline, as much as three times the reduction reported in earlier research, a new research report says.

According to the University of Nebraska-Lincoln, US, research, much of the reduction in greenhouse gas emission (GHG) emissions comes from improvements in efficiency throughout the production process.

This research is the first to quantify these impacts.

These improvements in the corn-ethanol production process arise from improved crop output, improved biorefinery operations and co-product use, Ken Cassman, UNL agronomist says.

Previous studies, which found ethanol to have a much smaller edge over gasoline in GHG emissions, relied on estimates based on corn production, ethanol plant performance and co-product use as they were seven years ago.

More recently built - and more efficient --plants now represent about 60pc of total ethanol production and will account for 75pc by the end of 2009, Cassman says.

These newer biorefineries have increased energy efficiency and reduced GHG emissions through the use of improved technologies. Also, many are located near cattle feeding or dairy operations, which allows efficient use of the co-product distillers grains as cattle feed.

For example, the distillers grains don't have to be dried to facilitate long-distance travel - drying uses up to 3pc of total energy use in the ethanol plant.

Also contributing to corn ethanol's GHG performance are improvements in how the crop is grown, including improved crop and soil management, and better hybrids that help farmers achieve a steady increase in corn yields without having to increase fertilizer or energy inputs.

The net energy ratio is 1.5-1.8 to 1 in the recent research, Cassman sats - which means that for every unit of energy it takes to make ethanol, 1.5 to 1.8 units of energy are produced as ethanol.

That compares with 1.2 to 1 in earlier studies.

Even more striking is the corn ethanol's potential to replace oil.

This new study estimates that 10-19 US gallons of ethanol are produced for every gallon of petroleum used in the entire corn-ethanol production life cycle.

The range in the ethanol-oil replacement value, as well as the ranges measured for net energy efficiency and GHG emissions reduction, are due to differences in crop management practices and ethanol plant performance.

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