



Biofuels and Greenhouse Gas Mitigation

Energy independence and global climate change are two significant factors that have contributed to an increased focus on U.S. bioenergy production from clean, renewable fuel sources. Increased bioenergy production can benefit agriculture and rural economies by boosting demand for renewable energy feedstocks. Policies to enhance ethanol and biodiesel production and other renewable fuels such as butanol offer many environmental, energy security, and economic development opportunities for the U.S. and for U.S. agriculture.

U.S. agriculture provides the underpinnings of a strong and vibrant economy by ensuring continued production of food and fiber. Soils are agriculture's greatest natural resource and asset, and must be protected and enhanced to support increased bioenergy production. As biomass is utilized for increasing biofuel production, attention must be given to conserving and restoring the soil resource and to protecting the organic matter content of soils. Organic matter content is the key to soil health, fertility, productivity, and erosion avoidance.

As a research-based consortium focused on the sustainability of the nation's soil resource, CASMG has the expertise, critical mass, and rapid-response capability to examine potential impacts of large-scale biofuels production on:

- ***Changes in land use, and potential conversion of conservation lands to biomass production.*** If such changes are indicated, science-based recommendations on practices to avoid unintended environmental or ecological impacts are warranted. For example, targeting biofuel crop production in different climates and soils to optimize biomass production and soil protection should be a focus of research now to support existing and future policies for bioenergy production. If biofuels production results in a loss of soil organic matter (carbon) the future capacity of the soil to produce food and fuel will be compromised.
- ***Changes in water needs, availability, and water quality impacts.***
- ***Competition for grains and oilseeds*** such as corn or soybeans, and impacts on food and feed availability and prices.
- ***Competition for "waste" biomass*** such as corn stover, rice hulls, and other crop materials used to reduce soil erosion and restore and improve soil fertility, particularly when cellulosic energy production becomes more widely used.
- ***Lifecycle analyses and GHG/C accounting*** for biofuels production. A low-carbon fuel standard will ensure the best total GHG outcomes.
- ***Determining which biofuel feedstock and fuel production systems will provide the greatest climate benefits.***
- ***Assessing co-benefits of biofuel production***, such as soil quality, reduced erosion from marginal crop lands, and enhanced wildlife benefits.
- Bioenergy and biofuels can play an important role in mitigating global climate change. However, not all biofuels or biofuel conversion processes are equal in terms of associated GHG emissions.