

AAQTF Greenhouse Gas and Volatile Organic Compounds Subcommittee
RESEARCH RECOMMENDATIONS FOR AGRICULTURE
Indianapolis, IN
5 October 2007

1. Agricultural Nitrous Oxide and Methane

- Develop field measurements and models including their validation of N emissions from agricultural lands under different cropping systems, including renewable energy crop production;
- Determine ways to increase N use efficiency, establish alternative management systems for N, and a protocol for N₂O emissions reductions;
- Document the effect of different animal manure nutrient management systems on N₂O emissions; and
- Develop total GHG accounting for agricultural lands and markets

2. Spatial and Temporal Variation in GHG's

- Quantify the spatial and temporal variation and its uncertainty among soils, topography, and climate (precipitation and temperature).
- Develop appropriate methods for scaling up from site measurements to regional scales and reporting uncertainties.

3. Biofuel Production

- ***Changes in land use, and potential conversion of crop and non-crop lands to biomass production.*** If such changes are indicated, science-based recommendations on practices to avoid unintended environmental or ecological impacts are warranted. 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,*** and impacts on food and feed availability and prices.
- ***Lifecycle assessment and GHG/C accounting*** for biofuels production. A low-carbon fuel standard will ensure the best total GHG outcomes.
- ***Assessing co-benefits of biofuel production,*** such as soil quality, reduced erosion from marginal crop lands, and enhanced wildlife benefits.
- ***Recommend sustainable residue removal rates*** to maintain soil organic matter levels for soil health.

4. Volatile Organic Compounds

- Research is needed on the measurements and quantification of emissions of volatile (VOCs) and semi-volatile (SVOCs) organic compounds and their fate. Research should also address the feedback effects on plant production.