

# ENERGY

## Field Operations

Soil

Water

Air

Plants

Animals

**Energy**

Inefficient Use

Equipment and  
Facilities

Field Operations

### Inefficient Energy Use - Field Operations

The inefficient use of energy increases costs and dependence on non-renewable energy sources.

#### What is it?

Inefficient energy use occurs whenever equipment or machinery operates more hours than needed to meet production goals. It may also occur when equipment or machinery becomes worn out, outdated, or poorly controlled.

#### Why is it important?

High energy prices have put considerable pressure on the U.S. economy. High input costs and the inability to set prices leave the agricultural sector with limited options to be economically viable. Reducing energy use helps our nation to be energy independent and reduces costs, helping producers stay competitive in the marketplace.

#### What can be done about it?

Money can be saved and energy dependency can be reduced by improving the efficiency of field operations, and by adopting practices that help reduce energy-intensive inputs, such as soil amendments, fertilizers, or pesticides. For improved efficiency, Natural Resources Conservation Service (NRCS) staff will most likely start by evaluating field operations used to till, plant, cultivate, and harvest crops. This assessment helps identify steps to take to reduce field operations or improve efficiency. The NRCS Residue Management Energy Estimator tool can be used to estimate potential energy savings associated with changes in tillage, cultivation, and fertilizer use. By using a guidance system on tractors and equipment, application overlaps can be reduced and application rates can be optimized to account for variability in soil types, elevation, soil chemistry, fertility, and productivity within fields. These steps can reduce the need for fuel, fertilizer, herbicide, and insecticide, and save money. For reduced inputs, adoption of Integrated Pest Management techniques of prevention, avoidance, monitoring, and suppression can reduce pesticide and fuel use and lower environmental risk. Substituting manure for commercial fertilizer, or using nitrogen-fixing legumes as cover crops or in crop rotations can reduce the use of fossil fuel-based commercial fertilizer. Tractor operations are likely to increase, but usually money is saved. Overall energy use is lower because less natural gas will be used to produce commercial nitrogen fertilizer (that was not purchased).

### Field Operations at a Glance

Problems / Indicators - Unacceptably high energy costs	
Causes	Solutions
<ul style="list-style-type: none"> <li>• Unnecessary trips across the field</li> <li>• Overlap when applying fertilizer, pesticides</li> <li>• High use of commercial fertilizer</li> </ul>	<ul style="list-style-type: none"> <li>• Convert to conservation tillage</li> <li>• Global positioning system guided spraying equipment</li> <li>• Incorporate nitrogen-fixing legumes into rotation or as cover crop</li> </ul>