NRCS Energy Management Initiative

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Energy From Agriculture Conference

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Background

About 30 Percent of Agricultural Production costs are energy related

- Fuel $10.2 billion
- Electricity $3.3 billion
- Fertilizer and Pesticides $ 21.2 billion

Background

Largest on-farm energy users:

- Irrigation
- Tillage
- Transportation
- Inorganic fertilizers
- Petroleum based pesticides
- Buildings and motors
- Grain drying
- Plastics

Background

Direct and Indirect energy consumption by Agriculture (2002):

- 1.7 percent of energy consumed in the US
- 1.0 percent of gasoline
- 6.0 percent of diesel
- 2.3 percent of LP gas
- 0.25 percent of natural gas
- 1.0 percent of electricity

Background

- Oil prices have increased from less than $30.00 per barrel in 2002 to around $60 a barrel in the fall of 2005.

- Nitrogen fertilizer prices have risen from around $200 per ton in the 1990's to over $400 per ton in the fall of 2005.

- This fall's nitrogen price is 22 percent higher than it was a year ago.

Background

"Although the global economic expansion appears to have been on a reasonably firm path through the summer months, the resent surge in energy prices will undoubtedly be a drag from now on."

Federal Reserve Chairman Alan Greenspan

in a recent speech to Japanese business groups


Drainage
Water
Management
Conservation
Tillage
Conservation
Saves
Energy!
Digesters
Rotational
Grazing
Manure
Management
Irrigation
Water
Management
NRCS

Opportunity to expand adoption of conservation practices with links to energy conservation

- Residue Management
- Irrigation Water Management
- Nutrient Management
- Pesticide Management
- Drainage Water Management
- Rotational Grazing

Opportunity to expand adoption of conservation practices with links to energy conservation

Conservation Applied with NRCS Assistance In 2005

- Residue Management - 6.7 m ac planned, 4.5 m ac applied
- Irrigation Water Mgmt - 1.8 m ac planned, 1.2 m ac applied
- Nutrient Management – 8.6 m ac planned, 4.1 m ac applied
- Pesticide Management – 9.3 m ac planned, 3.9 m ac applied
- Prescribed Grazing – 24.0 m ac planned, 16.3 m ac applied

Fossil fuel energy can be conserved on-farm by…

- Reducing tillage operations
- Reducing trips to field
- Reducing fertilizer/pesticide/plastic inputs
- Being more conservative in grain drying
- Increasing irrigation efficiency
- Recycling
- Substituting renewable energy
- Moving to rotational grazing

NOTE: Many of these practices also conserve **soil, water** and **air**.

Saving energy and water

- Improve irrigation efficiency by:
  - Reducing crop water requirement
  - Reducing pump pressure
  - Increasing pump efficiency
  - Up-grading equipment (Variable frequency drives)
- Benefits:
  - Reduced energy costs
  - Reduced runoff
  - Reduce chemical inputs

Saving energy and reducing crop fertilizer requirements

Nutrient management includes

- Crop rotations
- Cover crops
- Residue management
- Manure management
- Timing
- Application method
- Nitrogen inhibitors
- Soil tests

On-farm renewable energy technologies…

- Biogas (methane digesters)
- Wind turbines
- Bio-fuels
- Hydro
- Geothermal
- Solar

Energy Conservation

Crop Residue Management

- Can save at least 3.5 gallons of fuel per acre by going from conventional tillage to no-till
- On a farm with 1,000 acres of cropland, this adds up to 3,500 gallons of diesel fuel per year valued at $7,700.

Energy Conservation

Nutrient Management

- 2.7 million tons of manure-based nitrogen are applied on agricultural land.
- It takes 40,000 cubic feet of natural gas to produce a ton of commercial nitrogen fertilizer.
- Doubling the application of manure-based nitrogen could save approximately $1.2 billion worth of natural gas each year.
- Substituting manure for commercial fertilizer can reduce fertilizer costs as much as $85 per acre.

Energy Conservation

Irrigation Water Management

- 27 million acres are under sprinkler irrigation.
- 80 % of these acres use center pivot systems.
- Converting from medium-pressure to low-pressure systems could save about $9.00 per acre.
- Converting from high-pressure to low-pressure systems could save up to $41 per acre.

Energy Conservation

Prescribed Grazing Systems

- Every month that cows can remain on pasture reduces energy costs by about $11.00 per cow.
- Reduces feeding costs
- Reduces manure handling costs

Energy Conservation

Windbreaks and Shelterbelts

- Windbreaks and shelterbelts can reduce wind-induced erosion and save heating and cooling costs associated with farmsteads.
- When properly placed to shield farm buildings from strong winds, windbreaks can lower heating and cooling costs by up to 20 percent.

Energy Conservation

Pesticide Management

- Pesticide production depends heavily on energy.
- Integrated Pest Management reduces energy use and environmental risk while maintaining product quality.
- For example, some cherry producers have abandoned traditional spraying schedules to spray based on in-the-field microclimate information obtained from monitoring equipment and scouting.
- Typical herbicide costs can be reduced by about $40 per acre with a 25 percent reduction of herbicide application.

Energy Estimator: Tillage

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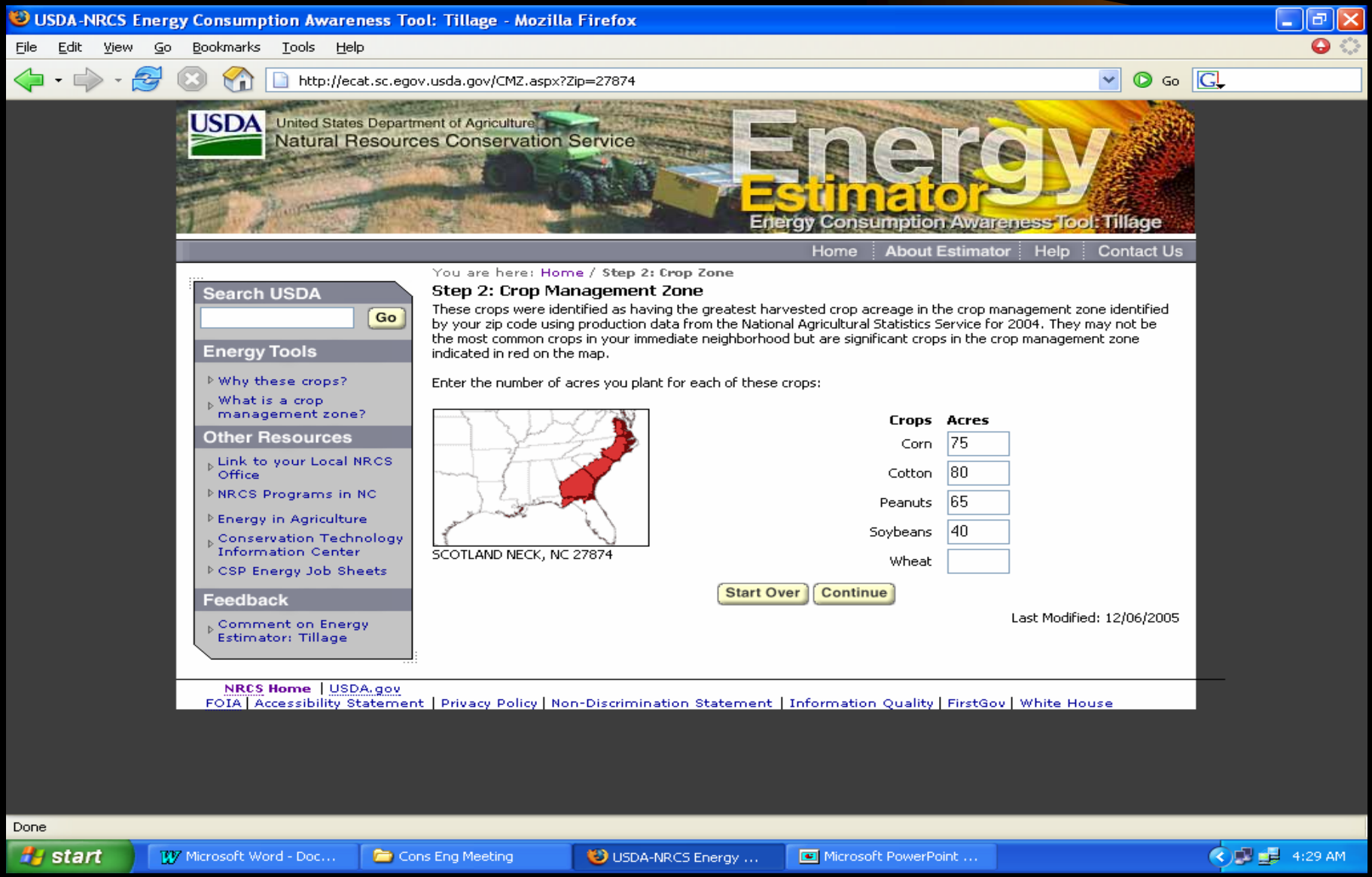

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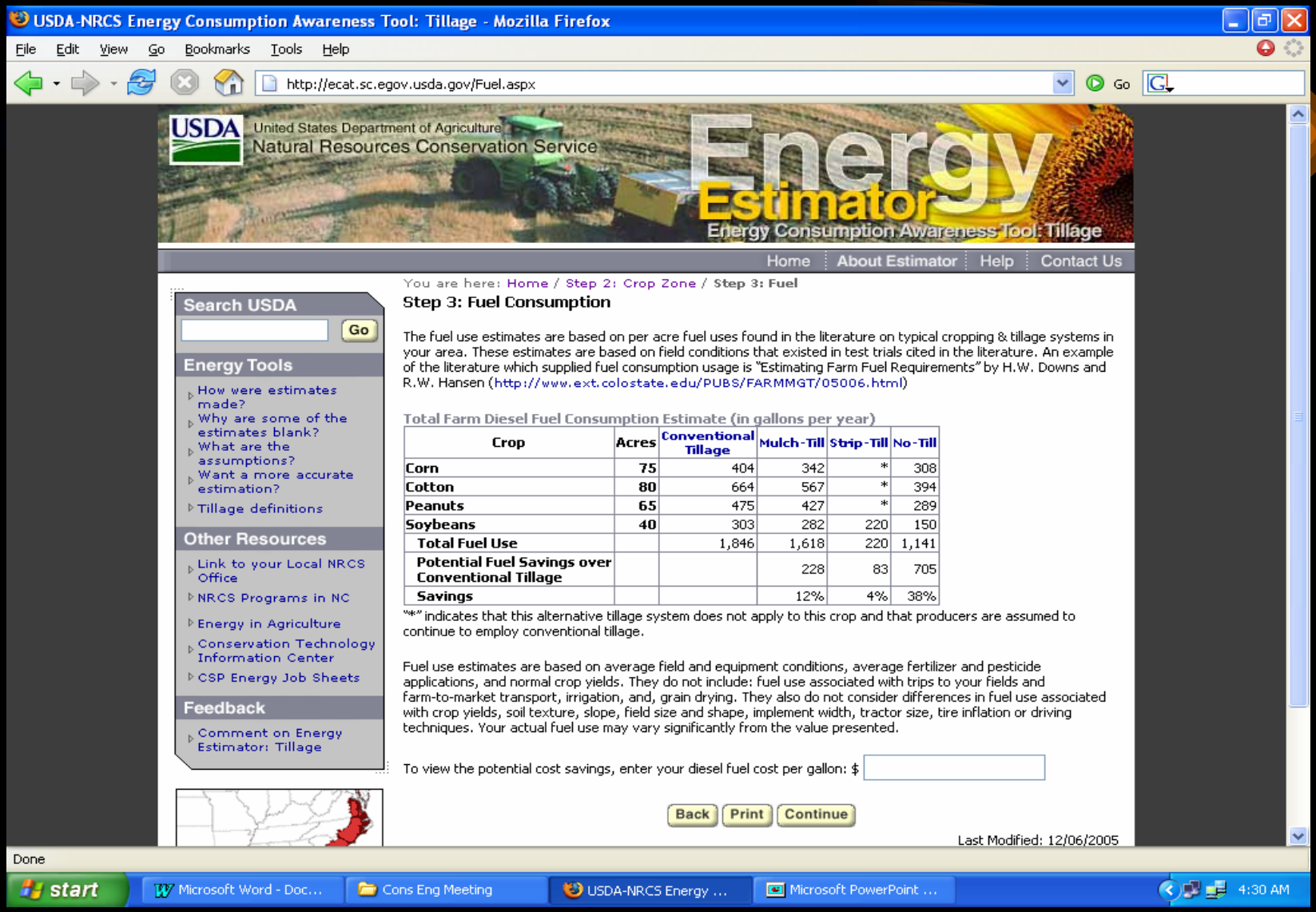

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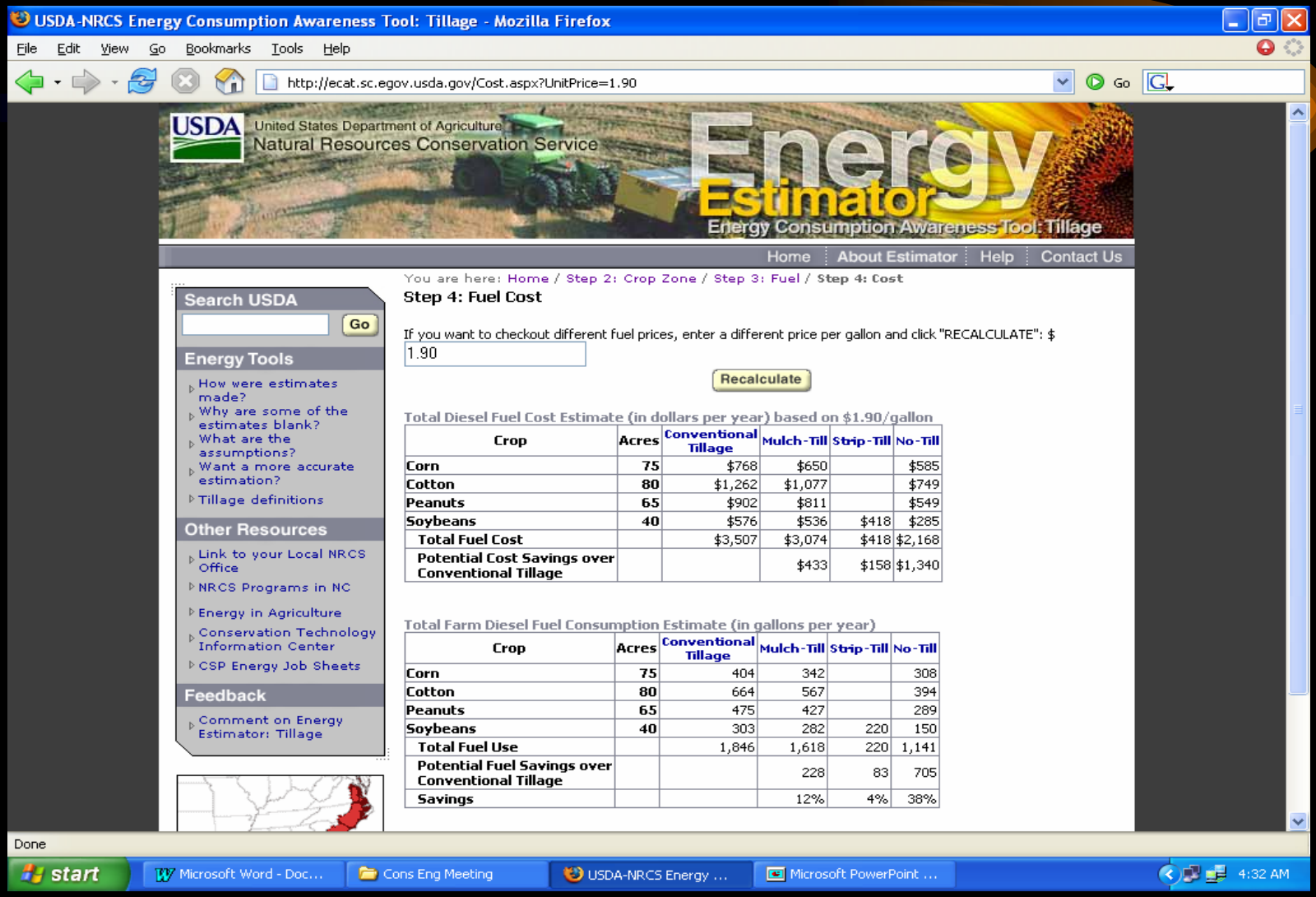

Energy Estimator

- **Forthcoming Energy Tools:**
  - Nitrogen
  - Irrigation
  - Integrated energy estimator
  - Energy use Self-Assessment

NRCS Energy Management Initiative

Energy Management Initiative Goals:

1. Modify NRCS program and technology policy.
2. Develop tools and technologies.

NRCS Energy Management Initiative

Energy Management Initiative Goals:

3. Enhance existing and develop new partnerships.
4. Communicate critical information to NRCS personnel and the public.
5. Enhance NRCS' energy conservation, renewable energy use, and bio-based products purchases.


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