

Monsanto Commitment to Ag Sustainability: Green Chemistry and Beyond

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Annual Conference, Savannah GA
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Monsanto Focused on Farmer Success



Focused on the farmer

“We succeed when farmers succeed.”

-Hugh Grant, Monsanto CEO

and the future of agriculture

Monsanto is 100% focused on agriculture.



Green Chemistry and Beyond

- Examples of Green Chemistry within Monsanto today
 - Annual Pledge Report on eco-efficiency metrics
 - Pre-Serve: Glyphosate Endangered Species Initiative
- Monsanto involvement with Industry-wide efforts
 - Sustainable Yield Initiative
 - Field to Market Keystone Alliance
- What does the future hold for agriculture?
 - New traits for climate mitigation and adaptation

Monsanto's Annual "Pledge Report"

- Began in 1980's with a focus on emission reduction



MONSANTO ANNOUNCES ITS COMMITMENT TO REDUCE CARBON DIOXIDE EMISSIONS AND JOINS CHICAGO CLIMATE EXCHANGE



In 2007, Monsanto joined the Chicago Climate Exchange (CCX), North America's only voluntary, legal greenhouse gas emissions reduction, registry, and

As part of its agreement, by 2010 Monsanto will reduce its own direct carbon emissions at major U.S. facilities to 2000 levels or

Water Consumption and Chemical Oxygen Demand (COD)



Issue Discussion

CLIMATE CHANGE: MONSANTO FELLOWS ASSESS CHALLENGES AND OPPORTUNITIES



its 2000 levels or pursuant to the terms specified in the CCX contract.

“Reducing our own carbon footprint is a key way for farmers to improve their productivity,” said Jerry Stein, a Monsanto fellow. “Reducing our own carbon footprint is a key way for farmers to improve their productivity,” said Jerry Stein, a Monsanto fellow.

Conclusions of Monsanto's Climate Change Panel

- Climate change is real
- Monsanto is reducing its carbon impact

include increases in the range and reproductive capabilities of weeds, increased geographic range of insect pests, increases in the incidence of mycotoxins (toxic fungi that form at the site of

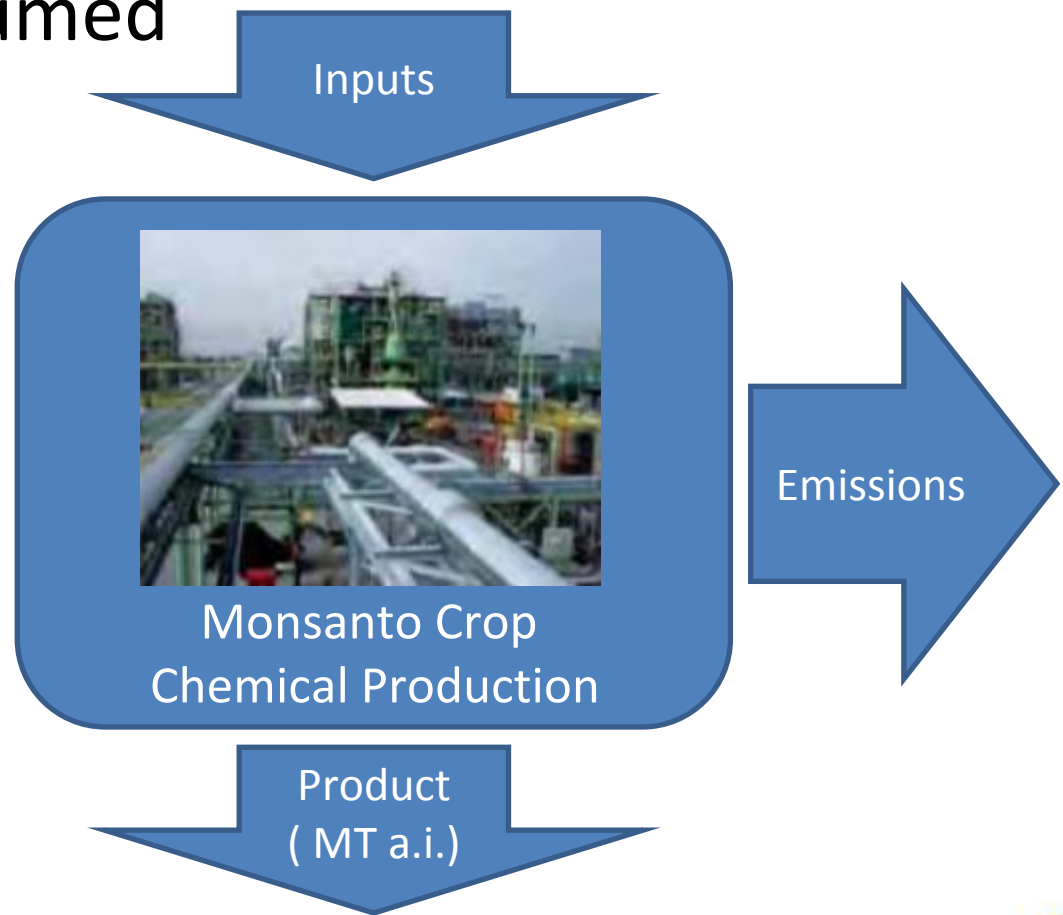
sequestration in 2005 were equal to the removal from the roads of almost 4 million cars.⁸

The panel also found that Monsanto's future technologies can help crops adapt to the climate and weather results of rising global temperatures. Through plant breeding, Monsanto is producing more resilient, better-adapted crops by continuous selection as local conditions change. The pace of change in temperature and climate in general is consistent with the pace at which Monsanto already adapts plants through its breeding programs.



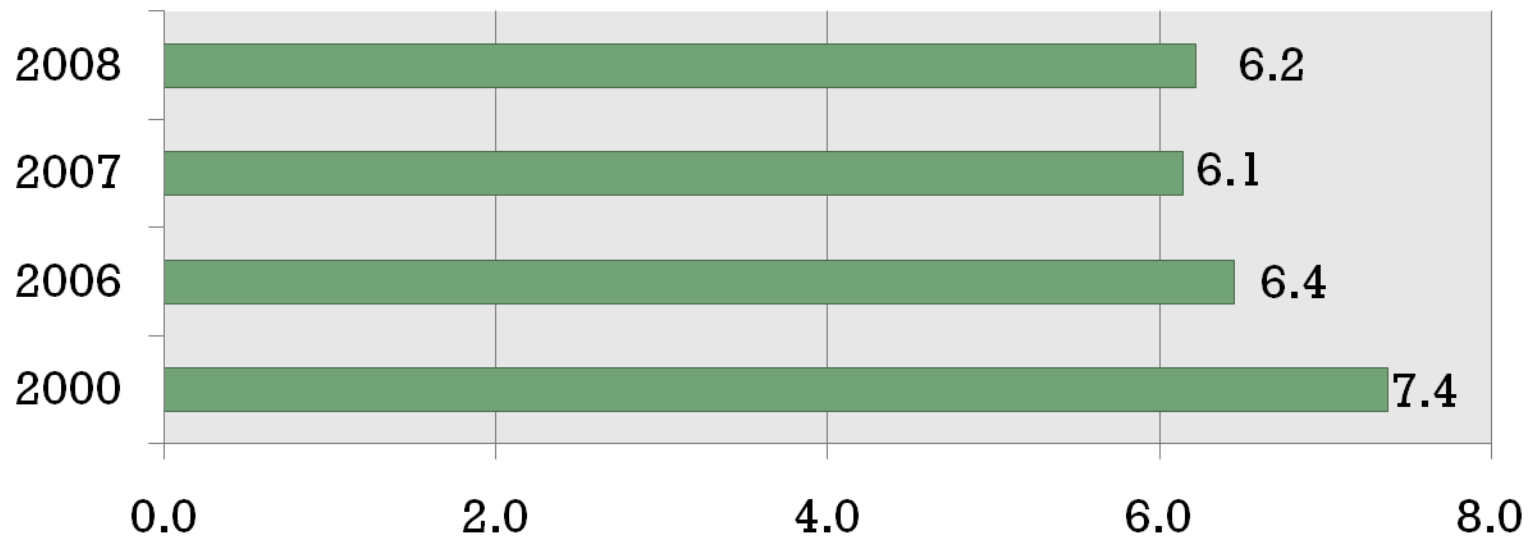
Monsanto Pledge Report Contains Crop Chemical Eco-Efficiency Metrics

- Raw materials consumed
- Energy consumed
- Water consumed
- GHG emissions
 - Direct
 - Indirect



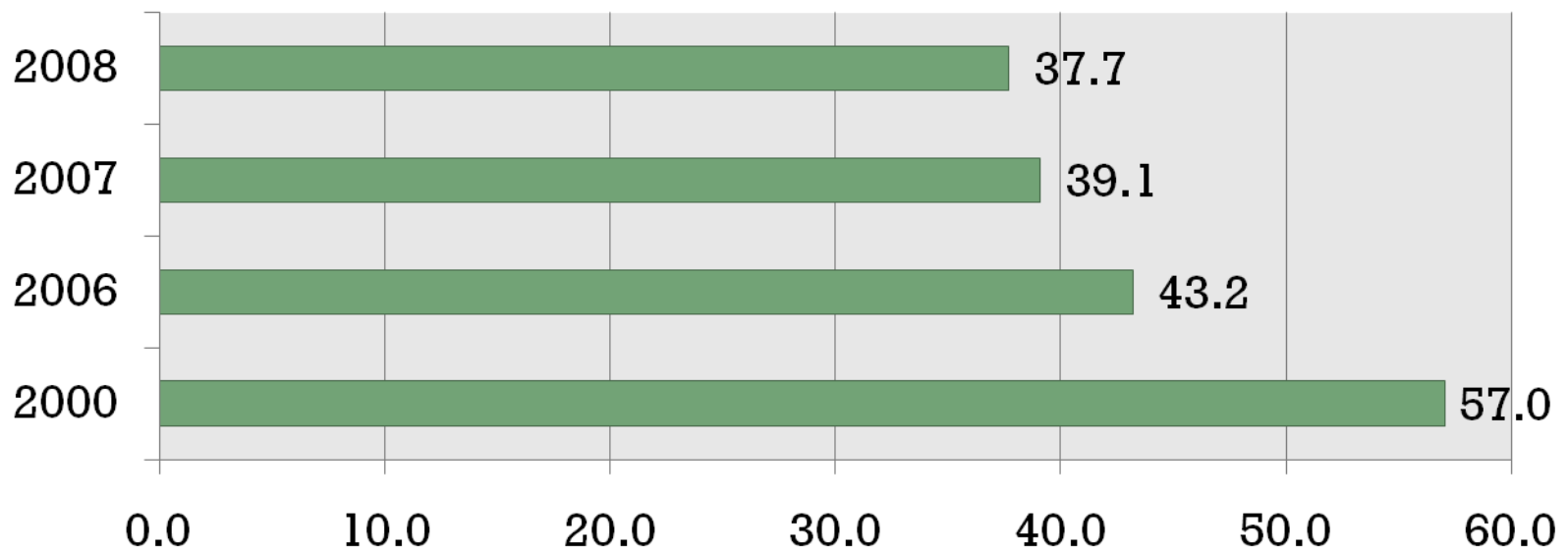
Raw Material Consumption

**Material Consumption
(MT Material / MT Product)**



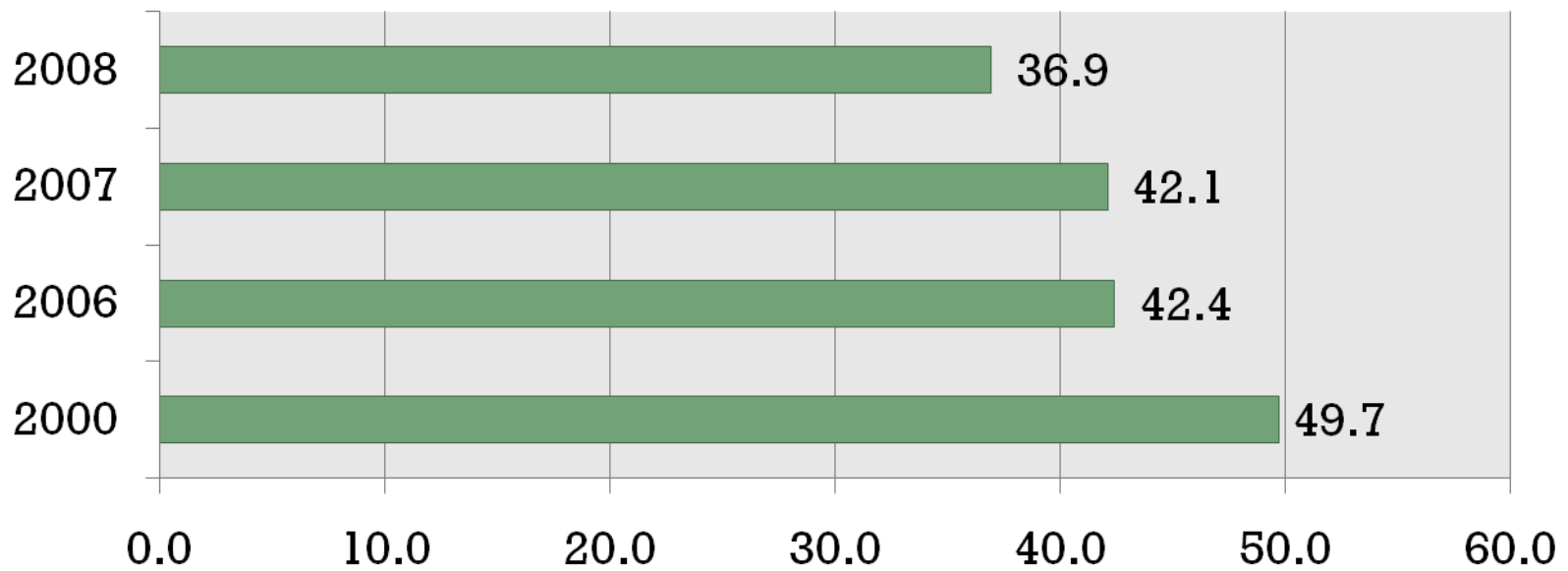
Energy Consumption

Energy Consumption (GJ / MT Product)



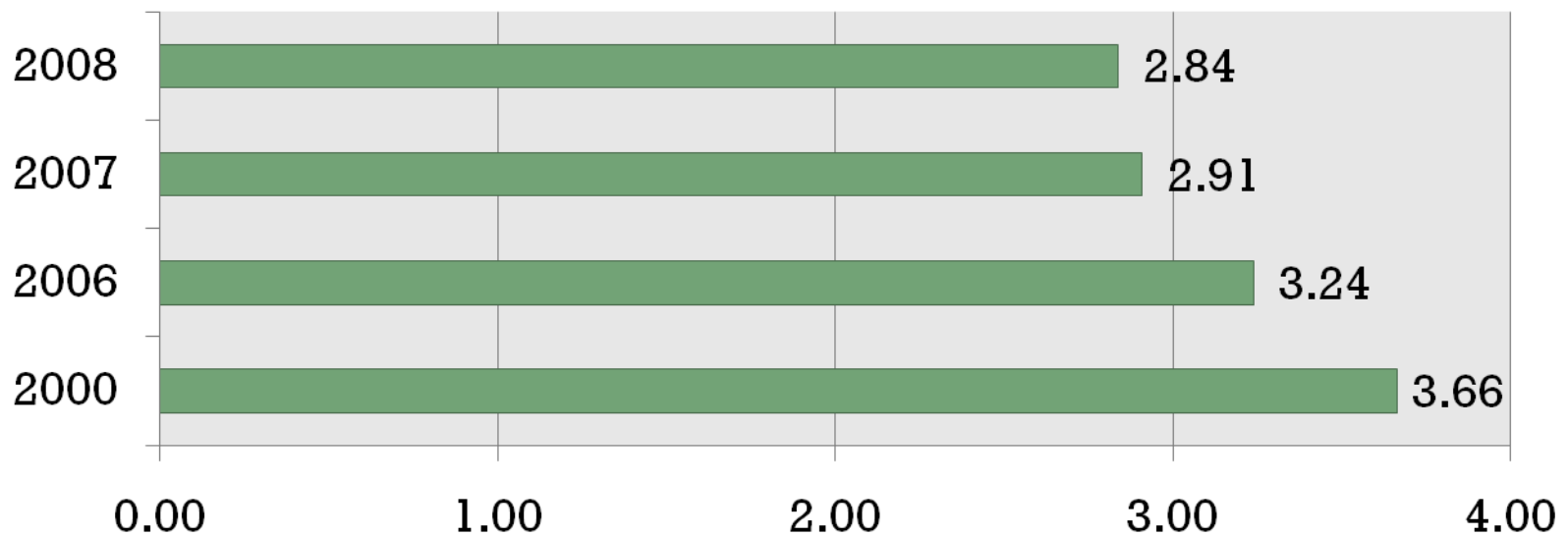
Water Consumption

**Water Consumption
(MT H₂O / MT Product)**



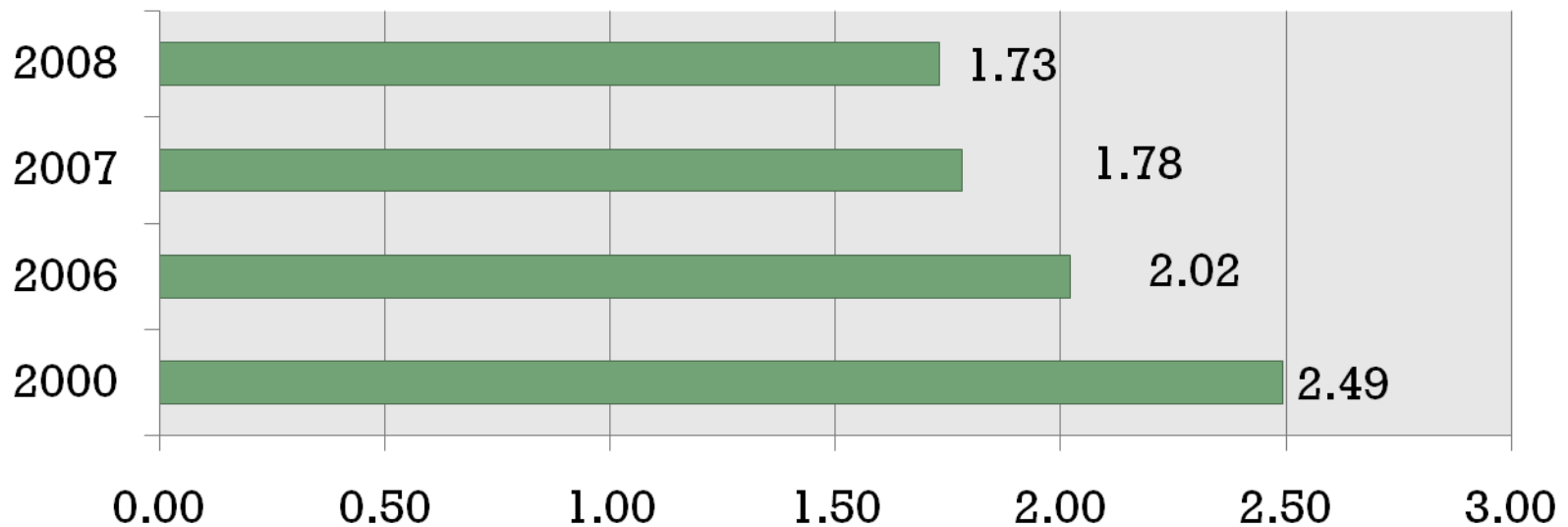
Direct GHG Emissions

**Direct Greenhouse Gas Emissions
(MT CO₂-eq / MT Product)**



Indirect GHG Emissions

**Indirect Greenhouse Gas Emissions
(MT CO₂-eq / MT Product)**



Pre-Serve: Endangered Species Protection

Pre-Serve

Glyphosate Mitigation Instructions

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For any questions, call toll-free, 1-800-332-3111.

Step 1: Select your state **Step 2: Find your field** **Step 3: Compare to use limitation areas** **Step 4: Print map and instructions**

In four easy steps, you find out what mitigation instructions apply to your field. Please click on your state to begin.

Legend:

- Gray-green:** If your state or County is gray-green, no mitigation is specified by Pre-Serve.
- Beige:** If your County is only beige, spray droplet size must be medium or larger for all aerial applications of glyphosate products.
- Purple:** If there is no purple in your County, there are no additional mitigations and you may exit this tool.
- Purple:** If there is any purple in your County, please select a state below to continue to Step 2.

Step 1: Select your state

State:

Footnote:

- In addition to this website, mitigations from other local, state, or federal protection programs and/or landowner agreements may apply, and must be followed, where applicable.
- For applications of glyphosate products in California, mitigations specified in the California [PRESCRIBE](#) system must also be followed.

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Use of Pre-Serve: Drill Down to Individual Fields

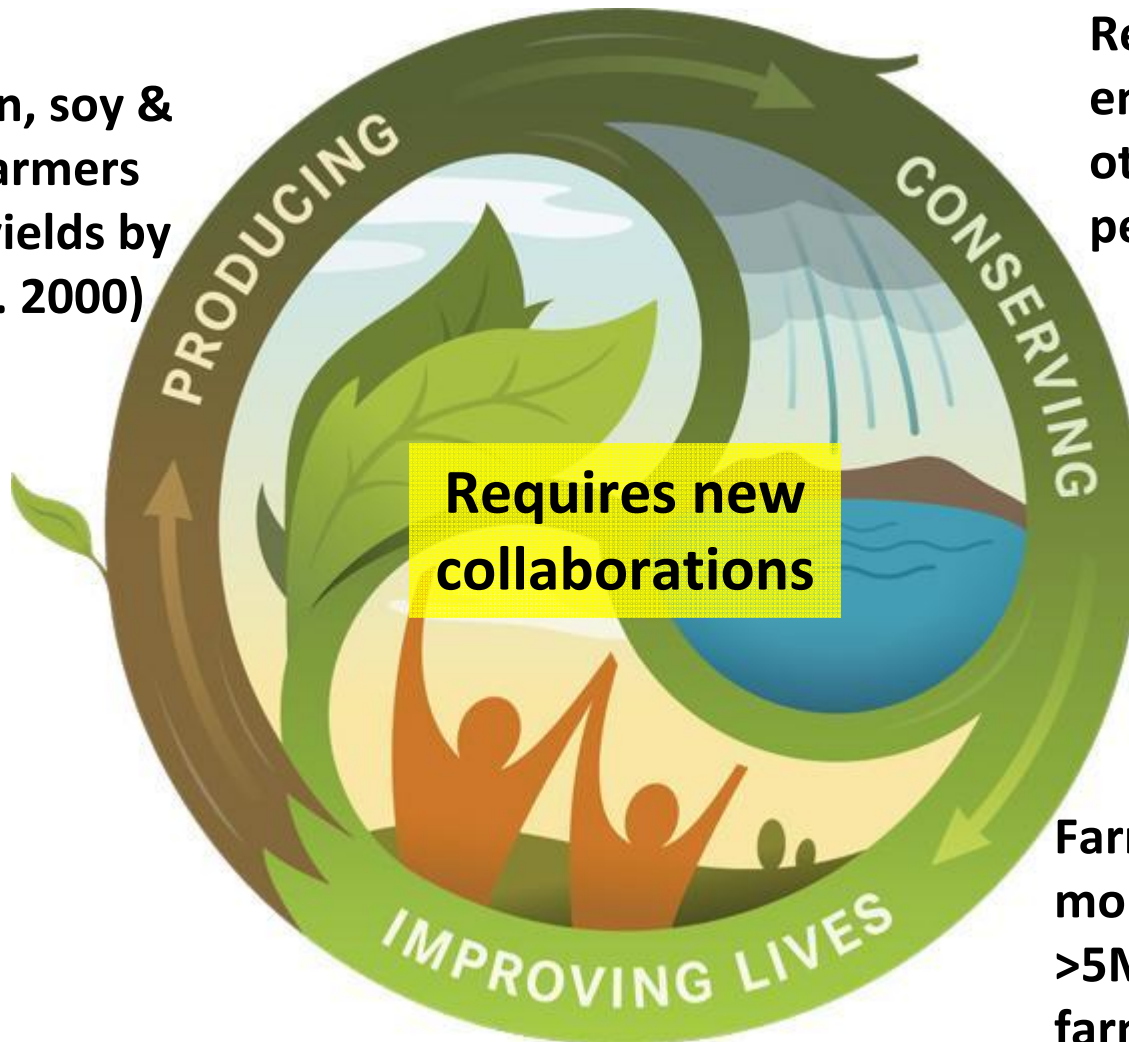
The image displays two screenshots of the Pre-Serve web application, illustrating the process of drilling down to individual fields. Both screenshots show the 'Pre-Serve' logo and 'Glyphosate Mitigation Instructions' at the top. The top right corner of each screenshot contains the copyright notice: 'Copyright 2008 Monsanto Company. Data Sources | Legal Notice | Privacy Policy. For any questions, call toll-free, 1-800-332-3111.'

The left screenshot shows the 'Step 1: Select your state' and 'Step 2: Find your field' progress indicators. The main content area is titled 'Areas in or near Boulder County' and features a 'Use Limitation Areas' section. This section includes instructions: 'Using the map navigation tools below, zoom to the intended glyphosate use area, and continue to Step 4.' and a note: 'Note: Because Internet response times may vary, avoid multiple mouse clicks.' Below the text are map navigation tools (directional arrows, zoom in/out, and a scale bar) and a 'Continue to Step 4' button. A small inset map shows the location of Boulder County within the United States. A note at the bottom reads '* Adobe Acrobat or Adobe Reader'.

The right screenshot shows the 'Step 3: Compare to use limitation areas' and 'Step 4: Print map and instructions' progress indicators. The main content area is titled 'Areas in or near Boulder County, Colorado' and features the same 'Use Limitation Areas' section. The map navigation tools are present, and the 'Continue to Step 4' button is visible. A larger map shows a detailed view of a field area in Boulder County, Colorado, with a purple shaded region indicating the intended glyphosate use area. A scale bar at the bottom right indicates distances of 0.5, 0.25, 0, and 0.5 Miles. A note at the bottom reads '* Adobe Acrobat or Adobe Reader'.

Sustainable Yield Initiative

Help corn, soy & cotton farmers double yields by 2030 (vs. 2000)



Reduce use of energy, water, & other inputs by 1/3 per unit of output

Farmers of all sizes become more productive, including >5M people in resource-poor farm families

Field to Market Keystone Alliance Measures Agricultural Sustainability



HOME | ABOUT US | STAFF | SUPPORT US | EMPLOYMENT | AWARDS DINNER | SITE MAP | CONTACT US

Center for Science & Public Policy **Center for Education**

THE KEYSTONE CENTER

Keystone Science School
Professional Education & Leadership

POLICY AREAS

- Energy
- Environment
- Health

Scope of Work:
Advisory Boards
Keystone Dialogues
Joint Fact Finding
Leadership Summit
Published Works/Staff
Keystone Reports

PROJECTS: Agriculture | Biodiversity | Biotechnology | Climate Change | DOD Clean-up | Endangered Species | Hazardous Waste | Land & Forests | Marine & Oceans | Mining | Non-Stockpile Chemical Material Project (NSCMP) | Plant Genetics | Space Science | Sustainability | Sustainable Agriculture | Transportation | Waste Management

Field to Market: The Keystone Alliance for Sustainable Agriculture

Press Release, "Diverse Group Releases First-of-its-Kind Report Measuring Agriculture Sustainability," January 12, 2009

Environmental Resource Indicators for Measuring Outcomes of On-Farm Agricultural Production in the United States, First Report, January 2009

- Executive Summary - PDF (162KB)
- Full Report - PDF (1MB)
- Full Report - HTML

Click here to join the Field to Market interested parties e-mail list

Introduction

The Keystone Center convened a steering committee of people representing interests from growers, conservation organizations, and companies throughout the agriculture and food supply chain in September 2006 to determine if a further dialogue would be helpful in defining and motivating more sustainable production and supporting and encouraging implementation of more sustainable measures. The premise of the effort is to encourage broad grower involvement while at the same time creating value to growers, consumers, and society in general.

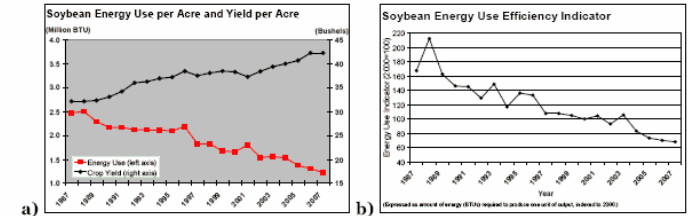


Figure I.I. Examples of Indicator Charts: (a) Per acre resource use or impact and per acre productivity and (b) Resource efficiency (resource use/ unit of output, indexed to the year 2000)

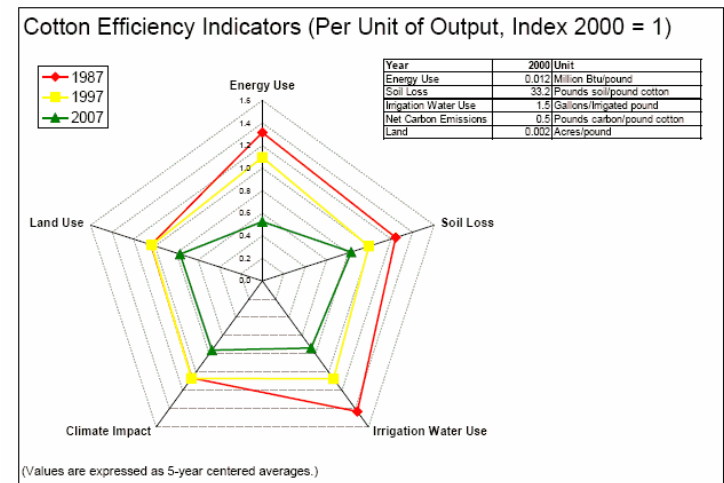


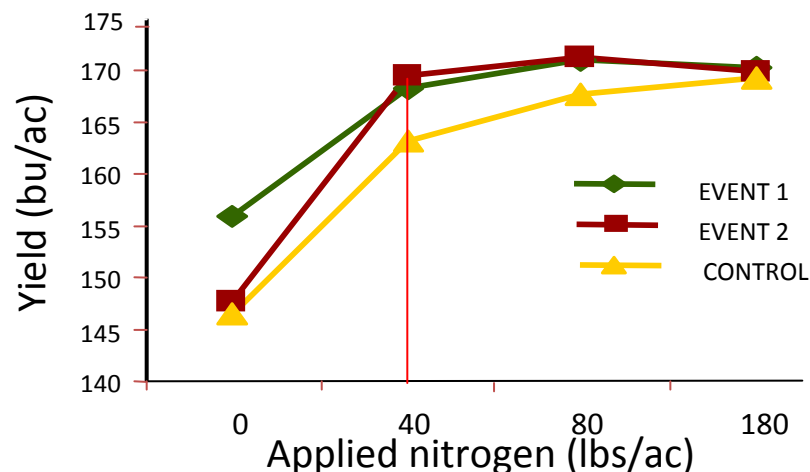
Figure I.II. Summary of Cotton Efficiency Indicators

American Farm Bureau Federation, American Soybean Association, Bayer CropScience, Bunge, Cargill, ConAgra Foods, Conservation International, Cotton Incorporated, DuPont, Fleishman-Hillard, General Mills, Grocery Manufacturers of America, John Deere, Kellogg Company, Manomet Center for Conservation Sciences, Mars Inc., Monsanto, National Association of Conservation Districts, National Association of Wheat Growers, National Corn Growers Association, National Cotton Council of America, National Potato Council, The Coca-Cola Company, The Fertilizer Institute, The Nature Conservancy, Syngenta, United Soybean Board, World Wildlife Fund – US



Nitrogen Use Efficiency Trait Reduces N₂O Levels and Nitrate Water Quality Impacts

Yield response to applied nitrogen



Variable N field trial



- NUE trait maintains high grain yield at lower nitrogen levels
- 50 lb/A reduction in applied ammonia results in a ~ 0.5 lb/A reduction in N₂O emissions
- Potential to result in major reduction of total Ag GHG emissions

Drought Tolerance Traits in Development to Address Climate Change Challenge



Drought tolerance traits:

- Pursued in Corn, Soy and Cotton
- Expected to reduce irrigation by 10% (corn) to 20% (cotton)
- Would reduce diesel usage, thus decreasing CO₂ emissions

Added benefit:

- With our drought tolerance focus, we are increasing the quantity of performance tests conducted in stressed environments

Efficient use of resources, enhanced adaptive ability

Water Efficient Maize for Africa (WEMA)

THE PARTNERS

- African Agricultural Technology Foundation (AATF) is leading the project
- Funding: Bill & Melinda Gates Foundation, Howard Buffet Foundation
- CIMMYT and Monsanto will bring best in global maize germplasm, testing and breeding methods, and biotechnology
- National Ag. Research System (NARS) participation is a crucial part of testing products and bringing WEMA to Sub-Saharan African farmers
- Countries: Kenya, Uganda, Tanzania, Mozambique, and South Africa

THE TECHNOLOGY

- Best global germplasm to combine new sources of drought tolerance and African adaptation
- More rapid gains in conventional drought tolerance through molecular breeding
- Additional drought tolerance obtained through state-of-the-art biotechnology

Recorded droughts between 1971 and 2000, and the number of people affected

