Monsanto Commitment to Ag Sustainability: Green Chemistry and Beyond

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The Pesticide Stewardship Alliance
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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 Pledge Report Contains Crop Chemical Eco-Efficiency Metrics

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

Monsanto Crop Chemical Production

Inputs

Product (MT a.i.)

Emissions
Raw Material Consumption

Material Consumption (MT Material / MT Product)

- 2008: 6.2
- 2007: 6.1
- 2006: 6.4
- 2000: 7.4
Energy Consumption

Energy Consumption
(GJ / MT Product)

<table>
<thead>
<tr>
<th>Year</th>
<th>Energy Consumption</th>
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<tbody>
<tr>
<td>2008</td>
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<tr>
<td>2007</td>
<td>39.1</td>
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<tr>
<td>2006</td>
<td>43.2</td>
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<td>2000</td>
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Water Consumption

Water Consumption
(MT H₂O / MT Product)

<table>
<thead>
<tr>
<th>Year</th>
<th>Water Consumption</th>
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</thead>
<tbody>
<tr>
<td>2000</td>
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<tr>
<td>2006</td>
<td>42.4</td>
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<tr>
<td>2007</td>
<td>42.1</td>
</tr>
<tr>
<td>2008</td>
<td>36.9</td>
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</table>
Direct GHG Emissions

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

- 2008: 2.84 MT CO₂-eq
- 2007: 2.91 MT CO₂-eq
- 2006: 3.24 MT CO₂-eq
- 2000: 3.66 MT CO₂-eq
Indirect GHG Emissions

Indirect Greenhouse Gas Emissions
(MT CO\textsubscript{2}-eq / MT Product)

- 2008: 1.73
- 2007: 1.78
- 2006: 2.02
- 2000: 2.49
Pre-Serve: Endangered Species Protection

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

- 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 PRESERVE system must also be followed.
Use of Pre-Serve: Drill Down to Individual Fields
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

Requires new collaborations

Farmers of all sizes become more productive, including >5M people in resource-poor farm families
Field to Market: The Keystone Alliance for Sustainable Agriculture


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

- EXECUTIVE SUMMARY - PDF (169K)
- 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 2008 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

Nitrogen Use Efficiency Trait Reduces N$_2$O Levels and Nitrate Water Quality Impacts

- 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 N$_2$O 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