Agricultural Practices and Environmental Footprint – Dole Latin America

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Agenda

• Company Background
• Environmental Management Approach
• Environmental Indicators
• GAP Examples
• Carbon Program
Dole Fresh Fruit International Ltd.

- Founded in Hawaii in 1851
- Revenues of $6 billion
- World's largest producer and marketer of fresh fruit and vegetables
- Does business in more than 90 countries
- Employs 89,000 permanent employees and 24,000 seasonal or temporary employees.
Dole Latin America employs more than 14,000 employees.
Dole Fresh Fruit International Ltd.

Business Units in Latin America

**Banana**
- Guatemala
- Honduras*
- Costa Rica
- Ecuador*
- Colombia*
- Perú*

**Pineapple**
- Guatemala
- Honduras
- Costa Rica*
- Ecuador

**Box Plants**
- Costa Rica
- Honduras
- Ecuador
- Colombia

**Shared Services**
- Information Tech.
- Accounts Payable
- Payroll
- Purchasing

*Organics
Products and Markets

- **Pines**
  - EU: 42%
  - US: 58%

- **Bananas**
  - EU: 31%
  - OT: 3%
  - US: 66%
BANANAS: 100+ MM Boxes
PINEAPPLE: 20+ MM Boxes
Issues in Agriculture

- Agricultural inputs: fertilizer, water, crop protection products
- Resource Conservation—soil, water, energy
- Biodiversity and habitat protection
- Waste and pollution
- Worker safety
- Food Safety and Security
- Wages, Hours, Working Conditions
- Climate Change

HOW TO MANAGE ALL THESE ISSUES TO EVERYONE’S SATISFACTION??!!
Dole Costa Rica was the first agricultural producer in the world to receive the 14001 Certificate for its environmental management system (1998).

Management systems were implemented in all Dole operating units.
Dole Fresh Fruit International Ltd.

Integrated Management Systems

External Verification

SCOPE:
FARMS
BOX PLANTS
CONTAINERS
GROWERS

Dole Standards
Food Safety
Worker Safety
Agricultural Practices
Environmental Protection
Legal Compliance
Ag. Operation Impact Examples

Then and Now; A few examples illustrating changing perspectives

• Impact On
  • 10 Years Ago
  • None
  • Today
  • Fertilizer GHGs*
  • Soil Health/Erosion
• Air
  • None
  • Soil Health/Erosion
• Soil
  • Solid Waste (Plastic)
  • Contaminants
  • Conservation
• Water
  • Contaminants
  • Soil Health/Erosion
  • Ecosystem Mgt.
• Flora/Fauna
  • Forest Protection
  • Ecosystem Mgt.
• People
  • Pesticides
  • Working Hours

*Greenhouse gas emissions from nitrous oxide coming from applied fertilizers
Dole’s approach

• Develop and implement better management practices
• Meet legal requirements and internationally accepted standards
• Achieve 3rd party certification where necessary and helpful
• Meet customer expectations & requirements
• Participate with stakeholders in defining new areas of improvement
Dole and WWF Collaboration

- Memo of Understanding since 2005.
- Initial work focused on Better Management Practices in Agriculture to reduce potential effects on Mesoamerican Reef (MAR) system from Mexico to Honduras.
- WWF has participated in Dole-organized seminars in Honduras and Costa Rica on soil conservation and erosion control.
- Current discussions include joint work on climate change issues, from WWF participation Carbon Neutral Stakeholder Visit in Costa Rica (June ’08).
- WWF has spearheaded the implementation of an automated weather station network for coastal areas in Belize, Guatemala, and Honduras…. Including installation of stations at Dole facilities.
- On-line weather data will be essential for managing agricultural practices (irrigation, pest control, NDF) to further reduce environmental impact.
- A revised MOU to extend the one expiring in April 2009 and incorporating new areas of collaboration is in the review process.
Main Agricultural Processes

1.1. Processes AG

- 1.1.1. Land Preparation
  - 1.1.2. Planting
    - 1.1.3. Crop Growth
      - 1.1.3.1. Irrigation & Drainage
      - 1.1.3.2. Fertilization
      - 1.1.3.3. Crop Protection
      - 1.1.3.4. Other Cultural Practices
    - 1.1.4. Harvesting
      - 1.1.4.1. Picking
      - 1.1.4.2. Field Transport
  - 1.1.5. Packing
    - 1.1.5.1. Fruit Preparation
    - 1.1.5.2. Packing
    - 1.1.5.3. Storage
    - 1.1.5.4. Loading & Dispatch
    - 1.1.5.5. Waste Management
  - 1.1.6. Lodging
    - 1.1.6.1. Energy Use
    - 1.1.6.2. Domestic Waste Disposal
- 1.1.7. Product Sourcing - Growers
## Environmental Indicators

<table>
<thead>
<tr>
<th>Area</th>
<th>Activity</th>
<th>Operation</th>
<th>Measurement</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water</strong></td>
<td>Irrigation/Packing</td>
<td>Farming</td>
<td>cubic meters/lts</td>
<td>m³/ha.; lts/kg product</td>
</tr>
<tr>
<td><strong>Agricultural Inputs</strong></td>
<td>Agriculture</td>
<td>Crop Protection &amp; Nutrition</td>
<td>kgs. active ingredient</td>
<td>kgs ia./ha</td>
</tr>
<tr>
<td><strong>Machinery Use</strong></td>
<td>Agriculture</td>
<td>Planes/Equipment/Vehicles</td>
<td>liters</td>
<td>lts/hrs. of operation</td>
</tr>
<tr>
<td><strong>Energy Use</strong></td>
<td>Agriculture/Packing</td>
<td>Offices/Packing Plants</td>
<td>KwH</td>
<td>KwH/ha; KwH/ kg product</td>
</tr>
<tr>
<td><strong>Plastic Use</strong></td>
<td>Agriculture/Packing</td>
<td>Farming/Packing</td>
<td>kilograms</td>
<td>kgs/ha.; grs/box</td>
</tr>
<tr>
<td><strong>Waste Management</strong></td>
<td>Agriculture/Packing</td>
<td>Recycling/Reuse/Disposal</td>
<td>kilograms</td>
<td>kgs/ha.</td>
</tr>
<tr>
<td><strong>Environmental Protection</strong></td>
<td>Agriculture</td>
<td>Protected Forest/Reforestation</td>
<td>hectares/no. of trees</td>
<td>forest/total has.</td>
</tr>
<tr>
<td><strong>Transportation Fuel Use</strong></td>
<td>Transport to Port</td>
<td>Road/Rail</td>
<td>kilometers and liters</td>
<td>lts/kg of product; lts/km</td>
</tr>
<tr>
<td><strong>Ocean Transportation</strong></td>
<td>Ocean Transport</td>
<td>Vessel Logistics</td>
<td>metric tons (MT)</td>
<td>n. miles/MT or MT/day</td>
</tr>
<tr>
<td>-vessel fuel</td>
<td>Operations</td>
<td>Terminal</td>
<td>liters; kwh</td>
<td>liters/hr; kwh/container</td>
</tr>
<tr>
<td>-terminal fuel &amp; electricity</td>
<td>Operations/Vessels</td>
<td>Terminal</td>
<td>kgs</td>
<td>kgs/kg product; GWP total</td>
</tr>
<tr>
<td>-refrigerant use</td>
<td>Manufacturing</td>
<td>Fruit Box Plant</td>
<td>kwh/liters</td>
<td>kwh/MT paper; lts/MT</td>
</tr>
<tr>
<td><strong>Box Plants: Energy Use</strong></td>
<td>Production to Distrib.</td>
<td>Supply Chain</td>
<td>tonnes of CO2 equiv.</td>
<td>grs CO2 per kg of product</td>
</tr>
</tbody>
</table>

It’s very difficult to control or improve what is not measured!
Eco-Weeder

- Rationalize herbicide use
- Promote of low-lying native cover crops
- Reduction of active ingredient use of between 40% and 60%
**Fertilizer Reduction Example**

- **Fertilizer Use Optimization**
  - Use of less nitrogen through precision farming techniques and the use of controlled release fertilizers.
  - Reduction of GHGs with this program is 12% versus traditional fertilizer.
  - Decreased volatilization and leaching
  - Applications down from an avg. of 12 to 3 per year.

*approximately 1% of applied N converts to N2O a potent GHG with a global warming potential of 310.*
Water use reduction example

Water reuse systems

Full recirculation system includes treatment which permits reuse of water for several days.

Partial recirculation conserves 30% water.
Dole Fresh Fruit International Ltd.

Water Use Reduction Example

Savings:
23,000 cubic meters/year
80% Water Savings
• **Minimum Tillage** (planting over ratoon crop with no tillage)
Soil Conservation Examples

- Use of plastic mulch (significantly reduces erosion when used following contours; also diminishes use of pesticides)
• Crop Rotation, Cover Crops
  (nitrogen-fixing “green manure”)
• Ditch Stabilization using plant cover in the canals

• Mechanical barriers (bamboo stakes to capture soil and reduce speed of water in ditches)
Soil Erosion Measurement
Composting Program Example
<table>
<thead>
<tr>
<th>Forestry Types</th>
<th>Hectares</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Forest</td>
<td>893</td>
</tr>
<tr>
<td>Reforestation</td>
<td>697</td>
</tr>
<tr>
<td>Buffer Zones: Rivers &amp; Lagoons</td>
<td>305</td>
</tr>
<tr>
<td>Buffer Zones: Roads/Bldgs</td>
<td>425</td>
</tr>
<tr>
<td>Commercial Forest</td>
<td>168</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,488 has.</strong></td>
</tr>
</tbody>
</table>

- **Company Forest Program**
  - CO2 Capture
  - Biodiversity
  - Erosion Control
Live Tree Propping System Example

- *Poró* (*Erythrina poeppigiana*) posts to substitute cable way support arches
- Possibility of eliminating metal arches entirely
- Carbon capture potential
Plastics - Recycling Example

- All farms (Dole and independent) collect field plastic and send for recycling.
- 2200 MT recycled yearly.
- Most converted to pallet corner boards.
Carbon Neutral Effort CR

Agreement with CR Government signed in Aug 2007 to collaborate with country which seeks carbon neutrality by 2021.

Dole CR hosted stakeholder visit in June 2008 to obtain feedback on carbon reduction efforts.
Carbon Neutral Program

• Reduce and mitigate effect of GHGs (greenhouse gases) produced by Dole’s operations
  - Develop an inventory (measure)
  - Identify mitigation programs (reduce)
  - Evaluate carbon offset alternatives - internal and external (compensate)

• Work with stakeholders within and outside the fresh fruit value chain on climate change issues
  - Develop ideas to mitigate emissions
  - Communicate efforts and ideas
  - Strengthen business relationships and opportunities.
Process Analysis and high-level LCA to determine measurement areas
**Measurement Example. Fruit Transportation**

<table>
<thead>
<tr>
<th>Concepto</th>
<th>Cajas</th>
<th>Viajes</th>
<th>Kms</th>
<th>Litros de Diesel</th>
<th>de CO2e (Tm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bananos</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carretera</td>
<td>11105862</td>
<td>11568</td>
<td>2558220</td>
<td>1075840</td>
<td>3207</td>
</tr>
<tr>
<td>Tren</td>
<td>5708419</td>
<td>-</td>
<td>-</td>
<td>362112</td>
<td>1079</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>16814281</td>
<td>11568</td>
<td>2558220</td>
<td>1437952</td>
<td>4287</td>
</tr>
<tr>
<td><strong>Piñas</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carretera</td>
<td>5037167</td>
<td>3598</td>
<td>1157423</td>
<td>547606</td>
<td>1632</td>
</tr>
<tr>
<td>Total</td>
<td>21851448</td>
<td>15166</td>
<td>3715644</td>
<td>1985558</td>
<td>5919</td>
</tr>
</tbody>
</table>
Mitigation Example. Train Use.

- Use of railroad to transport fruit:
  - Dole is only CR exporter using this mode.
  - 35% of bananas produced by Dole are transported by rail.
  - Rail is 30 to 40% more efficient than road*
  - Additional packing plant added to the rail network in Nov. 08, increasing to 40% the volume of bananas transported by this means.

*Note: This is the situation in Costa Rica. Train would be much more efficient if it were to be powered by electricity.
Mitigation Example. Training

Eco-energía Training Program.

- > 400 employees trained on driving and equipment operation techniques to improve efficiency and reduce fuel use.
- Expected reduction from 8% to 15%.
- Extension to all Dole operating divisions during 2009.
Mitigation Example. Terminal Fuel Use.

- Efficient fuel use:
  - Quota system by equipment
  - Vortex valve implementation
  - Automatic shut off valves

• 22% reduction in fuel use
• Emission reduction: 1,000 tCO2e per year.
Mitigation Example: Container Refrigerants

Refrigerant Consumption:
- Effective Preventive Maintenance Practices
- Refrigeration unit substitution to more modern technology
- Reduction in the use of refrigerants with a high global warming potential

*Green house gas emissions from refrigerants down 75%!"
Dole Standard Fruit
Firma acuerdo pionero para compensar emisión de carbono

Es la primera empresa agroexportadora con acciones concretas en el proceso de clima neutral en Costa Rica.

Los productos Dole se encuentran a la certificación de carbono neutral.

Compensation Example: CR Forestry Fund Certificates

Agreement to compensate emissions from fruit transport to the port of export signed with the Minister of the Environment on Earth Day 2008.

Dole Standard Fruit pagó por las CSAs el Fondo Nacional de Fomento Forestal (FONAFIFO) una cantidad equivalente a las emisiones de dióxido de carbono generadas por el transporte terrestre de la fruta, por carretera y ferrocarril, en nuestro país. Esta es un acuerdo pionero, porque es la primera vez que una empresa privada se compromete a compensar las emisiones producidas por el transporte de sus productos.

El proyecto se inició con un acuerdo marco firmado en agosto último con el Ministro de Ambiente y Energía de Costa Rica y la Estrategia Nacional de Cambio Climático, para lograr una cadena de valor carbono neutra para nuestra banana y piña. Costa Rica busca convertirse en el primer país con carbono neutro para el año 2021.
We are pushing ourselves today so that future generations will inherit a better world.