Economics of BMP’s

Luis Girado
Environmental Compliance Manager
Florida Crystals Corporation
The Best Cotton in the World
Early Agriculture Civilizations

* 6,000 BC Mesopotamia: Euphrates and Tigris (Sumarians)

* 3,500 BC Pakistan: Indus River (Mohenjo-Daro)

* 4,000 BC China: Yellow River (Fu-Hsi, Shen-Nung, Yellow Emperor: Huang-Ti)

* 3,000 BC Egypt: Nile
The Best Cotton in the World
Early Agriculture Civilizations

* 2,400 BC Mesopotamia: Salinization
* 1,800 BC Pakistan: Salinization Flooding
* Ongoing China: Yellow River Flooding
* Egypt: Nile Uninterrupted
The Best Cotton in the World
Early Agriculture Civilizations

* Egypt: Nile
* The annual flood of the Nile

Sediment Management
How does the BMP Program work?

Water moves South through the Peninsula, enriching the Everglades.

The SFWMD requires Producers in the EAA to monitor their Water Quality and follow BMP’s.

Producers must achieve 25% reduction in P loads Since the beginning of the program.

Producers have achieved Over 50% reduction in P loads Since the beginning of the program.
**The BMP Point System**

### Table 3 – Best Management Practices Summary and "BMP Equivalent" Points

<table>
<thead>
<tr>
<th>BMP</th>
<th>PTS</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WATER DETENTION</strong></td>
<td></td>
<td>• water table management by controlling levels in canals, field ditches, soil profiling, fallow fields, aquatic cover crop fields, prolonged crop flood; measured on a per event basis — rainfall vs. runoff</td>
</tr>
<tr>
<td>½ Inch Detained</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>1 Inch Detained</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td><strong>FERTILIZER APPLICATION CONTROL</strong></td>
<td></td>
<td>uniform and controlled boundary fertilizer application (e.g. direct application to plant roots by barding or side-dressing; pneumatic controlled-edge application such as AIRMAX)</td>
</tr>
<tr>
<td><strong>FERTILIZER CONTENT CONTROLS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertilizer Spill Prevention</td>
<td>2 ½</td>
<td>• formal spill prevention protocols (handling and transfer) • side-throw broadcast spreading near ditch banks</td>
</tr>
<tr>
<td>Soil Testing</td>
<td>5</td>
<td>avoid excess application by determining P levels needed</td>
</tr>
<tr>
<td>Plant Tissue Analysis</td>
<td>2 ½</td>
<td>avoid excess application by determining P levels needed</td>
</tr>
<tr>
<td>Split P Application</td>
<td>5</td>
<td>apply small P portions at various times during the growing season vs. entire application at beginning to prevent excess P from washing into canals (rarely used on cane in EAA)</td>
</tr>
<tr>
<td>Slow Release P Fertilizer</td>
<td>5</td>
<td>avoid flushing excess P from soil by using specially treated fertilizer which breaks down slowly thus releasing P to the plant over time (rarely used in EAA)</td>
</tr>
<tr>
<td><strong>SEDIMENT CONTROLS</strong></td>
<td></td>
<td>EACH SEDIMENT CONTROL MUST BE CONSISTENTLY IMPLEMENTED OVER THE ENTIRE ACREAGE</td>
</tr>
<tr>
<td>Any 2</td>
<td>2 ½</td>
<td>• leveling fields • cover crops • ditch bank berms • raised culvert bottoms • sediment sump in canal • veg. on ditch banks • strong canal cleaning program • other BMP</td>
</tr>
<tr>
<td>Any 4</td>
<td>5</td>
<td>• field ditch drainage sump • slow field ditch drainage near pumps • sump upstream of drainage pump intake</td>
</tr>
<tr>
<td>Any 6</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td><strong>OTHER</strong></td>
<td></td>
<td>reduce cattle waste nutrients in surface water runoff by &quot;hot spot&quot; fencing, provide watering holes, low cattle density, shade, pasture rotation, feed &amp; supplement rotation, etc.</td>
</tr>
<tr>
<td>Pasture Management</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Improved Infrastructure</td>
<td>5</td>
<td>uniform drainage by increased on-farm control structures</td>
</tr>
<tr>
<td>Urban Xeriscape</td>
<td>5</td>
<td>lower runoff &amp; P by using plants that require less of each</td>
</tr>
<tr>
<td>Det. Pond Littoral Zone</td>
<td>5</td>
<td>vegetative filtering area for property stormwater runoff</td>
</tr>
<tr>
<td>Other BMP Proposed</td>
<td>TBD</td>
<td>proposed by permittee and accepted by SFVMD</td>
</tr>
</tbody>
</table>
What is a BMP?

BMP’s are essentially Soil Conservation Practices.
How much have we Achieved so far?

Total Load Reduction: 2,999 Mt of Phosphorus
**Economics of BMP’s**

**Total Load Reduction:**
2,999 Mt of Phosphorus

* **Fertilizer**
  * 2,999 tons of P Equals to
  * 14,310 tons of MAP Fertilizer*
  * At an average rate of 60 lbs/acre/year, we have saved the fertilizer of
  * 252,323 acres
  * $7.4 Million

* Reference: Dr. R. Mikkelsen, IPNI, Fertilizer Calculations, 2011

* **Soil**
  * We need an average of 644 MT of soil to obtain 1 MT of P*.
  * At an average density of 0.4 Tons/M3, we have saved
  * 42,143 acres of 1 foot deep soil.
  * At an average price of 8,000/acre
  * $337.1 Million

* Muck Soils Average: for Dania, Luderhill and Pahokee soils.
* Sandy Soils, Mucky Sand and Sandy Muck have different ratios that need investigation.
Economics of BMP’s
As of 2015, the program has yielded

* Fertilizer
  * Enough to fertilize 252,323 acres $7.4 M.

* Soil
  * We have saved 42,143 acres of 1 foot deep soil $337.1 M.

Thank you

Questions?

Luis Girado, Sept 2015
Epilog

At 87, She is learning to remember

* Learn how to Learn

Innovate