Influence of Floating Aquatic Vegetation on Environmental Parameters Affecting Phosphorus Removal in the Everglades Agricultural Area

Jennifer Cooper, Anne Sexton, Timothy Lang and Samira Daroub

University of Florida – Everglades Research and Education Center
Belle Glade, FL
Study Area
Success of the BMP Program

Baseline Period (WY1980-1988)
- Rainfall Adjusted Predicted Load: 185 mt
- Average Annual Concentration: 173 µg/L

WY2015 Runoff
- TP Load Reduction: 79%
- TP Load: 38.7 mt
- FWM TP Conc.: 47 µg/L

25% TP Load Reduction Requirement (Target)

First Compliance Year (WY1996)

Pre-BMP Implementation
Partial BMP Implementation
Full BMP Implementation

Annual % TP Load Reduction
5-year TP Load Reduction
Current BMP Research: Suppression of Floating Aquatic Vegetation (FAV)

FAV control by farmer

Suppression of FAV
Justification: Denser sediments formed with FAV Suppression

Light weight/labile P-sediments

Denser/recalcitrant P-precipitates
Methods

- Eight experimental farms
- Four with FAV suppression <25\% cover, four with FAV cover controlled by farmers
- Two sample types:
  - Ambient canal conditions
  - Drainage water
Results: Threshold of FAV effect on Phosphorus

Ambient canal water

Discharge water
- Total P(TP) correlated to TSS, Ca and pH
- Particulate P(PP) correlated to TSS and temp
- Soluble Reactive P(SRP) correlated to FAV and pH
## Correlations: Discharge Water

<table>
<thead>
<tr>
<th></th>
<th>FAV</th>
<th>TSS</th>
<th>Ca</th>
<th>Temp</th>
<th>pH</th>
<th>ORP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TP</strong></td>
<td>0.489</td>
<td>0.701</td>
<td>-0.047</td>
<td>0.006</td>
<td>-0.263</td>
<td>-0.071</td>
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<tr>
<td></td>
<td>0.002</td>
<td>&lt;0.001</td>
<td>0.773</td>
<td>0.971</td>
<td>0.101</td>
<td>0.665</td>
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<tr>
<td><strong>PP</strong></td>
<td>0.515</td>
<td>0.790</td>
<td>-0.036</td>
<td>0.121</td>
<td><strong>-0.440</strong></td>
<td>-0.286</td>
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<tr>
<td></td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>0.825</td>
<td>0.459</td>
<td><strong>0.005</strong></td>
<td>0.073</td>
</tr>
<tr>
<td><strong>SRP</strong></td>
<td>0.346</td>
<td>0.519</td>
<td>-0.034</td>
<td>-0.105</td>
<td>-0.067</td>
<td>0.064</td>
</tr>
<tr>
<td></td>
<td>0.031</td>
<td>&lt;0.001</td>
<td>0.833</td>
<td>0.518</td>
<td>0.684</td>
<td>0.696</td>
</tr>
</tbody>
</table>

- Total P(TP) correlated to FAV and TSS
- Particulate P(PP) correlated to FAV TSS and pH
- Soluble Reactive P(SRP) correlated to FAV and TSS
Conclusions

• Preliminary results suggest management of FAV coverage may be an effective new BMP for reduction of P
• Suppression of FAV cover to less than 20% will significantly reduce both ambient and discharge total P
• Ambient canal P significantly correlated to Ca and pH
• Discharge water P significantly correlated to FAV coverage and TSS
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