Evaluating Slow Release N Fertilizer and an Organic Fish/blood Meal Product for Wetland Taro Production

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Objective and Experimental Layout

- Evaluate the effect of slow release N fertilizer and organic fish/blood meal fertilizer on taro yield, nitrogen use efficiency (NUE), and economic feasibility.
Fertilizer Effects on Taro Yield

• No statistically significant effect
• CR fertilizer produced consistent yield
Heavy *phytophthora* incidence
Unusually high rainfall (175”)

Month

Rainfall (inches)

Month

Rainfall (inches)
• NH$_4^+$-N in the 0N and farmer practice plots similar. 0 N plots were not low in NH$_4^+$-N
• Monthly additions of urea did not change soil NH$_4^+$-N
• For FBM and CR fertilizers, NH$_4^+$-N rose rapidly to a maximum at all sites within the 1$^{st}$ 60 days indicating a rapid release fertilizer.
• FBM and CR fertilizers conserve N in the root zone
Leaf N Concentration at 4 Months

- Higher soil NH$_4^+$-N in FBM and SRN plots at 4 months produced significantly higher taro leaf N status compared with 0N and FP.
Fertilizer Effect on Water N

• FBM and CR fertilizers showed effect on water N up to 30 days

• Urea practice showed increase related to fertilizer event mostly at Farm 4

• Urea treatment showed higher tendency for N export from the taro field.
Results of partial cost benefit analysis

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Farm</th>
<th>Yield</th>
<th>Gross Return</th>
<th>Net Return</th>
<th>Mean Net Return</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>lb/acre</td>
<td>$/acre</td>
<td>$/acre</td>
<td>$/acre</td>
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<tr>
<td>Farmer Practice</td>
<td>1</td>
<td>16,607</td>
<td>$11,127</td>
<td>$10,626</td>
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<td></td>
<td>3</td>
<td>23,482</td>
<td>$15,733</td>
<td>$15,232</td>
<td>$14,320 ($±$3,333)</td>
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<td>4</td>
<td>26,272</td>
<td>$17,602</td>
<td>$17,102</td>
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<tr>
<td>FBM</td>
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<td>22,461</td>
<td>$15,049</td>
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<tr>
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<td>28,287</td>
<td>$18,952</td>
<td>$17,152</td>
<td>$11,571 ($±$6,583)</td>
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<tr>
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<td>9,120</td>
<td>$6,110</td>
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<tr>
<td>CR</td>
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<td>$16,371</td>
<td>$15,621</td>
<td>$15,925 ($±$567)</td>
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<td>4</td>
<td>24,366</td>
<td>$16,325</td>
<td>$15,575</td>
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</tbody>
</table>

- Despite higher initial cost (68ȼ/lb for CR vs 48ȼ/lb for urea), CR produced more consistent return to the farmer.
Summary

• Potential benefits of Controlled Release Fertilizer
  – Control release fertilizer produced consistent yield with potential be economical to farmers
  – Conserves N in the root zone
  – Decreases export of N to river system

• Next Steps
  – should consider using lower rates of controlled release and fish/bone meal fertilizer
  – Repeat fish/bone meal experiment
Mahalo Nui!

Research supported by USDA-NRI grant (2008-35107-04526 & USDA HATCH funds)