Probiotics in Tobacco Farming

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Business Development Manager, SCD Probiotics
Agenda

- Introduction
- Overview of Tobacco Projects
- Colombia, South America Case Study
- Tobacco opportunities globally
- Over 4 million hectares of tobacco grown worldwide

- Unique value proposition for restoring soils to a more healthy state and reducing amount of chemicals used

- Lower input costs per unit while maintaining or increasing yield
Overview of Tobacco Projects

Poland, Europe

- Increase in soil quality (K and Mg)
- 5000+ farms trained on products
- Accelerate breakdown of crop residues
- Pathogen Control including
  - Rhizoctonia
  - Fungal disease
  - Thrips (greenhouse seedling)
Macedonia, Europe

- 25% increase in yield
- Increase in tobacco quality led to an additional $6,846/hectare
- Benefits realized in multiple facets of industry: growers, cigarette company, end users, and the environment

<table>
<thead>
<tr>
<th>The financial effect of probiotic use in Macedonia</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image_url" alt="Table with data" /></td>
</tr>
</tbody>
</table>

- **Koshimo (Untreated)**
  - 1st class: 30% (1440 kg)
  - 2nd class: 30% (1440 kg)
  - 3rd class: 40% (1920 kg)
- **Koshimo (Treated, 2 ha)**
  - 1st class: 40% (2560 kg)
  - 2nd class: 50% (3200 kg)
  - 3rd class: 10% (640 kg)
- **Prilep (Untreated)**
  - 1st class: 30% (900 kg)
  - 2nd class: 40% (1200 kg)
  - 3rd class: 30% (900 kg)
- **Prilep (Treated, 1 ha)**
  - 1st class: 70% (2940 kg)
  - 2nd class: 30% (1260 kg)
  - 3rd class: 0

<table>
<thead>
<tr>
<th>Total US $</th>
<th>$16,360.00</th>
<th>$24,034.00</th>
<th>$10,424.00</th>
<th>$17,270.40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefit</td>
<td>$3,837.00/ ha</td>
<td>Benefit</td>
<td>$6,846.00/ha</td>
<td></td>
</tr>
</tbody>
</table>
Case Study Review – Colombia

Where: Villanueva, Colombia
When: 9/10- present
Type of tobacco: Burley
Variety: Coltabaco 54M LC
Who: Naturallys
Products:
- SCD Bio Ag™
- Bokashi
- Tabacaza
Objectives

- Define your objectives
- Colombian Objectives
  - Reduce amount of synthetic fertilizers
  - Improve quality of soil
Methodology

- Four Treatments
  - T1: SCD Bio Ag: 20 liters/hectare, Bokashi: 30kg/hectare, Tabacaza: 300 kg/hectare
  - T2: same T1 with liquid probiotics “inactivated”
  - T3: SCD Bio Ag: 5 liters/hectare, Bokashi: 7.5kg/hectare, Tabacaza: 75kg/hectare
  - T4: control, standard inputs applied
Parameters measured

- Soil analysis
- Morphoagronomic Evaluation (60 days and 7 days after topping)
- Green weight and dry weight of roots
- Avg price/kg of tobacco
- Cost benefit analysis per treatment
RESULTS - Morphoagronomic Evaluation at 60 days

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Height (cms)</th>
<th>Number of leaves</th>
<th>Leaf 6 Long (cms)</th>
<th>Leaf 6 Wide (cms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>26.1</td>
<td>14.2</td>
<td>45.0</td>
<td>27.8</td>
</tr>
<tr>
<td>2</td>
<td>29.1</td>
<td>16.7</td>
<td>46.0</td>
<td>28.2</td>
</tr>
<tr>
<td>3</td>
<td>37.7</td>
<td>20.1</td>
<td>52.2</td>
<td>32.3</td>
</tr>
<tr>
<td>4</td>
<td>26.6</td>
<td>16.0</td>
<td>48.7</td>
<td>29.8</td>
</tr>
</tbody>
</table>
## RESULTS – Morphoagronomic Evaluation 7 DAYS After Topping

<table>
<thead>
<tr>
<th>TREATMENT</th>
<th>Height cms</th>
<th>N° leaves</th>
<th>Dist between nudes</th>
<th>Leaf Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Large</td>
</tr>
<tr>
<td>1</td>
<td>54.30</td>
<td>18.68</td>
<td>2.90</td>
<td>44.0</td>
</tr>
<tr>
<td>2</td>
<td>58.24</td>
<td>18.62</td>
<td>3.12</td>
<td>42.9</td>
</tr>
<tr>
<td>3</td>
<td>68.47</td>
<td>21.12</td>
<td>3.24</td>
<td>49.7</td>
</tr>
<tr>
<td>4</td>
<td>64.42</td>
<td>20.5</td>
<td>3.14</td>
<td>47.9</td>
</tr>
<tr>
<td>AVERAGE</td>
<td>61.35</td>
<td>19.73</td>
<td>3.1</td>
<td>46.1</td>
</tr>
</tbody>
</table>
RESULTS – Green and Dry Weight of Roots

- T3 was the best for green weight and dry weight of roots
- 75% average increase over control
RESULTS - Costs for Treatment Per Hectare

<table>
<thead>
<tr>
<th>TREATMENT</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Cost/hectare</td>
<td>10,002</td>
<td>10,002</td>
<td>9,016</td>
<td>9,163</td>
</tr>
<tr>
<td>Quality Index (%)</td>
<td>85.04</td>
<td>86.84</td>
<td>88.87</td>
<td>89.84</td>
</tr>
</tbody>
</table>

- There is no statistical difference between T3 and T4 in yield and quality
- $147 additional profit per hectare for T3 with expected further reduction in input costs over next 2 – 5 years
Global Tobacco Opportunities

- Define your objectives
- Cost benefit analysis
- Transferrable knowledge throughout agriculture
Thank You!

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