Development, evaluation and popularization of maize varieties resistant to Gray Leaf Spot

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Gray leaf spot

(*Cercospora zeae-maydis*)
Introduction

- GLS result into yield losses of up to 30%
- Observed in Western Kenya (Kitale) in 1995
- First observed in seed production farms with incidences of more than 60%
Objectives

The project started in 2004 with the following objectives

- To screen germplasm for resistance to GLS.

- To transfer identified/reported resistance to common inbred lines through crossing and pedigree breeding, back cross breeding and sister line development.
Objectives Cont’d

• To develop new, improved varieties of maize with resistance to Grey Leaf Spot (GLS).

• Maintain and produce breeder’s seed of maize varieties with high yield potential and stable performance with resistance to Grey Leaf Spot (GLS).

• To establish baseline for assisting adoption rates of the developed maize technologies through *ex-ante* on-farm surveys.
Expected outputs

- Maize varieties with GLS resistance
- Adoption of improved maize varieties
- Breeder seed availed to interested seed merchants
Outputs

• 15 inbred lines with resistance to GLS identified
• 45 inbred lines with resistance to GLS developed through pedigree breeding
• Maize varieties with substantial levels of resistance developed and released.
KARI Kitale recently released hybrids with GLS resistance

<table>
<thead>
<tr>
<th>Variety</th>
<th>Yield</th>
<th>Type</th>
<th>Seed co</th>
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</thead>
<tbody>
<tr>
<td>KH600-15A</td>
<td>7.43</td>
<td>Top Cross hybrid</td>
<td>E.A</td>
</tr>
<tr>
<td>KH600-16A</td>
<td>7.80</td>
<td>Top Cross hybrid</td>
<td>Freshco</td>
</tr>
<tr>
<td>KH600-14E</td>
<td>8.19</td>
<td>Top Cross hybrid</td>
<td>Freshco</td>
</tr>
<tr>
<td>KH600-20A</td>
<td>8.60</td>
<td>Top Cross hybrid</td>
<td>Agri Seed</td>
</tr>
<tr>
<td>KH600-22A</td>
<td>8.68</td>
<td>Top Cross hybrid</td>
<td>Monsanto</td>
</tr>
<tr>
<td>KH600-23A</td>
<td>9.5</td>
<td>Top Cross hybrid</td>
<td>ADC</td>
</tr>
<tr>
<td>KH600-24A</td>
<td>10.5</td>
<td>Top Cross hybrid</td>
<td>NASECO</td>
</tr>
</tbody>
</table>
Outputs Cont’d

• 6 varieties in NPT, 25 in AYT, 1 Recommended for release
Ex-ante survey

• An ex-ante survey on incidence and severity of GLS was carried out in 8 districts

• Based on the key informants responses, most of the farms (over 75%) were infected with GLS disease across all AEZ’s

• Most respondents (over 60%) indicated that GLS disease occurred in almost all the years
ORGANOLEPTIC TASTE APPRECIATION
Monitoring visit by USAID team at one of the advanced yield trial sites at Naitiri in Bungoma District.
• Developed varieties popularized
Assistant Minister of Agriculture, Hon. Gideon Ndambuki observing KARI maize varieties at Kenya Maize Development Fair at Chepkoilel Campus
Output Cont’d

• Breeder seed availed to interested seed merchants (ADC, NASECO, AGRI SEED, E.A SEED, FAIDA, MONSANTO)
Seed treatment in progress at KARI-Kitale in January 2011.
Packing of breeder seed of parental materials of KH600-20A at KARI Kitale
Collaborators

- CIMMYT, KMDP, ACDI/VOCA, East Africa Grain Council, Ministry of Agriculture, FIPS, CGA, Seed Companies and Several NGO’s in Agriculture.
CHALLENGES

- Emergence of new diseases
- Seed companies rarely declare the amount of seed they have sold
- Once an agreement is signed it is the seed companies who decide the amount of seed to produce
S07 Work plan January to March 2013

- Pollination of the materials in the off season irrigation nursery - February/March
- Seed counting and packaging - March
- Ploughing - February
- Re-ploughing - early March
- Harrowing - Mid - March
- Harvesting of the materials in the irrigation nursery - Late March
SO7 Work plan January to March 2013
Cont’d

• Submission of 2 varieties for DUS and 3 varieties to KEPHIS- Mid February
• Cutting pegs- February
• Field marking- End of March
• Data analysis- January/February
• Site selection- Early February
• Promotion of developed KARI maize technologies- February to March
## Proposed BUDGET for February and March 2013

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>February</th>
<th>March</th>
<th>Total</th>
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<tbody>
<tr>
<td>2110202</td>
<td>Casual Labour</td>
<td>107,720</td>
<td>104,904</td>
<td>212,624</td>
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<td>2210303</td>
<td>Daily subsistence allowance</td>
<td>90,250</td>
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<td>2211004</td>
<td>Fungicides, Insecticides and Sprays</td>
<td>830</td>
<td>830</td>
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<td>2211023</td>
<td>Supplies for production</td>
<td>73,320</td>
<td>44,900</td>
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<td>2211101</td>
<td>General Office Supplies</td>
<td>0</td>
<td>12,200</td>
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<td>2211201</td>
<td>Refined Fuels and lubricants for transport</td>
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<td>2211203</td>
<td>Refined fuels and lubricants (Ploughing) (lts)</td>
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<td>2211311</td>
<td>Contracted Technical Services</td>
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<td>2220101</td>
<td>Maintenance Expenses-Motor Vehicles</td>
<td>20,400</td>
<td>34,400</td>
<td>54,800</td>
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<tr>
<td><strong>TOTAL BUDGET</strong></td>
<td></td>
<td><strong>841,021</strong></td>
<td><strong>311,984</strong></td>
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</tr>
</tbody>
</table>
Acknowledgement

- USAID SO7 for sponsoring this project and director KARI for financial logistical support.