Exclusion, suppression, and eradication of pink bollworm (*Pectinophora gossypiella* (Saunders)) from the southwestern US and northern Mexico

Eoin Davis, Pink Bollworm Rearing Facility Director
USDA-APHIS PPQ, Phoenix, AZ
Pink Bollworm (PBW) in the USA

- PBW first detected in the USA in Texas in 1917
- Mid-1960s– Established in southern California, western Arizona, northern Mexico
- CA began PBW control & exclusion program in San Joaquin Valley in 1967; sterile insect releases
- Successful exclusion
Pink Bollworm (PBW) in the USA

- Most serious cotton pest in the southwestern USA for 40 years
- More than 72 million acre equivalents of pesticides in AZ & CA alone
- Control costs in excess of $1.3 billion

Source: Arizona Cotton Research & Protection Council
Development & Progress

• 1990s—Significant development work on area-wide population suppression in areas where PBW was well established
Development & Progress

- Broad-ranging, integrated program
  - Cultural controls
  - Mapping
  - Detection
  - Mating disruption
  - SIT, with significant cost reductions
  - BT cotton (once available)
Development & Progress

• Cultural controls
  – Determinate varieties
  – Fall defoliation
  – Spring planting date controls
  – Eliminate hostable material over winter
Development & Progress

- Mapping
  - Field locations
  - Sizes (acreage)
  - Bt vs non-Bt varieties
Development & Progress

• Detection
  – Cotton varieties
    • Bt vs non-BT
  – Desert trap lines in addition to field traps
Development & Progress

- Control & eradication strategy:
  - Cultural controls
  - SIT
    - New rearing facility allows increased output, lower costs
  - Mating disruption
  - Bt cotton (1996)
  - Limited to no insecticide use
New rearing facility (PBWRF)

- Major changes in diet processing and larval rearing containers were implemented in new facility.
- High volume production possible
  - 1995 - 2004 @ 5 million/day
  - 2005 @ 12.5 million/day
  - 2007 - 10 @ 28 million/day
Automated diet production
Rearing unit implant line
PBW released by piloted aircraft

- Refrigerated release machine placed in aircraft.
- Aircraft flies @ 500 feet (150m) and releases moths over cotton fields.
- Moths emerging from aircraft flying at 110 MPH (175kph).
- Released an average of 250/PBW/acre/day during eradication program (620/ha).
United States Department of Agriculture
Animal and Plant Health Inspection Service
Plant Protection and Quarantine

Eradication plan

Phase I
Phase II
Phase III
Phase IV
Containment/Suppression
Is it working?

Some data from the US and Mexico
PROMEDIO DE CAPTURAS DE GUSANO ROSADO POR CICLO REGIÓN NORTE (JUAREZ)

<table>
<thead>
<tr>
<th>CICLO</th>
<th>PALOMILLAS</th>
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<tr>
<td>2005</td>
<td>1108</td>
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Arizona Reduction in Native Captures 2006-2016
Arizona Reduction in Larval Finds
2006-2016
Resultados de capturas de Gusano rosado, San Luis Río Colorado.

Capturas /trampa

Capturas de G. Rosado

Capturas/trampa
PROGRAMA BINACIONAL DE ERRADICACION DEL GUSANO ROSADO Y PICUDO DEL ALGODONERO EN BAJA CALIFORNIA 2016
## EVALUACION DE RESULTADOS
### MUESTREO DE BELLOTAS

<table>
<thead>
<tr>
<th>Año</th>
<th>Muestras</th>
<th>Bellotas</th>
<th>Larvas</th>
<th>% Infestación</th>
<th>Reducción</th>
<th>Reducción Acumulada</th>
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<td>250</td>
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<tr>
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<tr>
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<td>6,000</td>
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<tr>
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## DETECCIÓN DE PALOMILLAS DE GUSANO ROSADO POR TRAMPA POR CICLO

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<tr>
<th>Año</th>
<th>Capturas de palomillas</th>
<th>Promedio C/T/S</th>
<th>Reducción x ciclo</th>
<th>Reducción acumulada</th>
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</tr>
<tr>
<td>2012</td>
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<td>0.0003</td>
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<td>99.99%</td>
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</tr>
<tr>
<td>2016</td>
<td>0</td>
<td>0.000</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>
Eradication progress

- No wild moth captures since May 2012
- No Bt resistance seen in wild or PBWRF moths
- Dramatic reduction in pesticide use
Thank You!