Z traps from Spensa Technologies

Re-deployment (1.5 ft above ground): Aug 7, 2017 to present
Near multiple row crops at AU Campus, AL

Major findings:
• Easy to deploy
• Automatic daily update
• Better detection of flying insects
• Large collection jar

Major challenges:
• Expensive as a new product
• Need supervision to maintain traps
• Debris can give block moth collection
• Weather related challenges (rain in collection jar)
Insect Pest Activity in Alabama (May-Sept 2017)

Soybean looper: Total moths captured = 420
Cabbage looper: Total moths captured = 376
Corn earworm: Total moths captured = 336
Tobacco budworm: Total moths captured = 98
Fall armyworm: Total moths captured = 312
Beet armyworm: Total moths captured = 899
Lesser cornstalk borer (peanut pest): Total moths captured = 5670
Squash vine borer (vegetable pest): Total moths captured = 799

Rainfall pattern in a wet year

Blue arrow indicates period of heavy rainfall that slowed moth activity in 2017. Information compiled by Dr. Ayanava Majumdar.
Comparison of moth activity under varying weather conditions (15 locations across AL)

<table>
<thead>
<tr>
<th>Insect</th>
<th>Wet year - 2017</th>
<th>Drought year - 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Peak activity</td>
<td>Total moth numbers (May-Aug)</td>
</tr>
<tr>
<td>Beet armyworm</td>
<td>Mid-July</td>
<td>1,200</td>
</tr>
<tr>
<td>Fall armyworm</td>
<td>Aug-Oct</td>
<td>525</td>
</tr>
<tr>
<td>Cabbage looper</td>
<td>Aug-Sept</td>
<td>714</td>
</tr>
<tr>
<td>Soybean looper</td>
<td>Aug-Sept</td>
<td>755</td>
</tr>
<tr>
<td>Corn earworm</td>
<td>Late-Aug</td>
<td>424</td>
</tr>
<tr>
<td>Tobacco budworm</td>
<td>Early-Aug</td>
<td>130</td>
</tr>
<tr>
<td>Lesser cornstalk borer (major peanut pest)</td>
<td>Aug-Sept</td>
<td>6,790</td>
</tr>
<tr>
<td>Squash vine borer (major vegetable pest)</td>
<td>July-Aug</td>
<td>987</td>
</tr>
<tr>
<td><strong>Total numbers</strong></td>
<td><strong>11,525</strong></td>
<td></td>
</tr>
</tbody>
</table>
Sentinel: First Camera Trap with AI

Automated and connected insect monitoring

The *Spensa Sentinel* is a smart, automated, Internet-enabled insect camera trap that uses deep learning algorithms to count target insects in real time.

Contact us to start your FREE trial

Count and report your target pests

The onboard camera in the Spensa Sentinel detects, counts, and reports target pests in near-real time. The system is able to reliably distinguish between target and non-target pests.

Daily insect counts from the Sentinels lead to more precise biofix and phenology models, which results in better spray timing.
Thrips control
Thrips control in peanuts (Headland, 2017)

Single vs. Twin Rows

Foliar damage rating (0-10 scale)

Planting date: May 9, Variety: Ga-06G

No phytotoxicity observed for any treatments

Thrips Damage Rating: 1 = no damage; 2 = 10% of emerging leaves infected or damaged; 3 = 20% of emerging leaves infected or damaged; 4 = 30% of emerging leaves infected or damaged; 5 = 40% of emerging leaves infected or damaged; 6 = 50% of emerging leaves infected or damaged; 7 = 60% of emerging leaves infected or damaged; 8 = 75% of emerging leaves infected or damaged; 9 = 90% of emerging leaves infected or damaged; 10 = 100% of emerging leaves infected or damaged + dead plants
Velum Total 9 oz twin

Velum Total 18 oz single
Caterpillar control
Caterpillar control in peanuts (Headland, AL, 2017)

2017 had excessive rainfall in June to Aug that delayed moth activity. Having 7 day spray gap in Intrepid Edge treatment (5 oz) enhanced beneficial insect populations. Three-cornered alfalfa hopper (TCAH) numbers were high with noticeable damage in Intrepid Edge only plots. Incorporation of pyrethroid spray reduced TCAH numbers. NO SPIDERmite issues noted.
Terminal leaf damage rating from caterpillar feeding  
(Headland, AL, 2017)

Leaf damage rating scale (1-10):  
1 = no damage; 2 = 10% emerging leaves damaged; 3 = 20% emerging leaves damaged; 4 = 30% emerging leaves damaged; 5 = 40% emerging leaves damaged; 6 = 50% emerging leaves damaged; 7 = 60% emerging leaves damaged; 8 = 75% emerging leaves damaged; 9 = 90% emerging leaves damaged; 10 = 100% emerging leaves damaged

7DAT3 (Sept 14)
Terminal leaf damage rating = 2

Diamond 6 oz/A (2 appl)

Untreated check (VBC + Looper outbreak)

Terminal leaf damage rating = 6+
Terminal leaf damage rating = 3

Dimilin 4 oz/A (2 appl)

Untreated check (VBC + Looper outbreak)

Terminal leaf damage rating = 6+
Intrepid Edge 5 oz (2 appl)

Untreated check (VBC + Looper outbreak)

Terminal leaf damage rating = 2

Terminal leaf damage rating = 6+
Numbers indicate total numbers per 6-ft row.
Heavy rains favored TCAH development in late-Aug and Sept.

Three-cornered alfalfa hopper control in peanuts
(Headland, AL, 2017)

- Untreated check
- Diamond 0.83EC (6 oz) - week 1 and 3 appl
- Dimilin 2L (4 oz) week 1 and 3 appl
- Xentari (Bt 1 lb) - weekly appl
- Tundra 2EC (2 oz) - weekly appl
- Intrepid Edge 3F (5 oz) + COC Surfactant (1%), 7 day gap
- Intrepid Edge 3F (5 oz) + COC Surfactant (1%), Tundra 2EC (2 oz)
- Intrepid Edge 3F (8 oz) + COC Surfactant (1%), 7 d gap
- Intrepid Edge 3F (8 oz) + COC Surfactant (1%), Tundra 2EC (2 oz)
- Radiant 1SC (4 oz)

Heavy rains favored TCAH development in late-Aug and Sept.

14 DAT1 (Aug 24)
- Untreated check: 1
- Diamond 0.83EC (6 oz): 0
- Dimilin 2L (4 oz): 0
- Xentari (Bt 1 lb): 1
- Tundra 2EC (2 oz): 1
- Intrepid Edge 3F (5 oz) + COC Surfactant: 0
- Intrepid Edge 3F (8 oz) + COC Surfactant: 0
- Radiant 1SC (4 oz): 0

7DAT3 (Sept 14)
- Untreated check: 3
- Diamond 0.83EC (6 oz): 3
- Dimilin 2L (4 oz): 2
- Xentari (Bt 1 lb): 1
- Tundra 2EC (2 oz): 1
- Intrepid Edge 3F (5 oz) + COC Surfactant: 3
- Intrepid Edge 3F (8 oz) + COC Surfactant: 3
- Radiant 1SC (4 oz): 0
NOTE: Use selective insecticides when biological control agents (BCA) activity is high.
Excessive use of synthetic pyrethroids mid-season may cause spider mite issues.

Information compiled by Dr. Ayanava Majumdar, ACES
Spider mite control
Two-spotted spider mites
*Tetranychus urticae*

Red spider mites
*Tetranychus tumidellus*
2017 Induction of spider mites

Mustang Max (Zeta-cyper) = Aug 8, Aug 22
Bifenthrin treatment = Sept 5, Sept 12
Spider mites can cause severe crop losses!

Miticide treated rows

Miticide treated row

Pesticide-induced spider mite populations can cause 22% yield loss
Spider mite counts in high tunnel peanuts
(Clanton, 2016 – A drought year!)

Treatment 1: Sept 6
Treatment 2: Sept 20
20 ft plots, single rows
Sampled 10 terminal leaves per plot, washed in alcohol
Bifenthrin applications (6 oz) to flare up mites: Aug 1 and Aug 15, 2016

Ga 06G peanut variety

<table>
<thead>
<tr>
<th>Treatment</th>
<th>7DAT1 (Sept. 13)</th>
<th>14DAT2 (Sept 26)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated check</td>
<td>106</td>
<td>181</td>
</tr>
<tr>
<td>Portal 1 pt/A, 2 apl</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Portal 2 pt/A, 1 apl</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>Agri-Mek 1.75 oz/A, 2 apl</td>
<td>12</td>
<td>25</td>
</tr>
<tr>
<td>Agri-Mek 3.5 oz/A, 1 appl</td>
<td>8</td>
<td>26</td>
</tr>
<tr>
<td>Comite 2.2 pt/A, 1 appl</td>
<td>19</td>
<td>69</td>
</tr>
</tbody>
</table>

F = 9.75, Sig = .000***
F = 9.1, Sig = .000***
Spider mite counts in high tunnel peanuts
(Clanton, 2017 – A very wet year!)

Treatment 1: Sept 26 (leaf sampled on Oct 3)
Treatment 2: Oct 4 (leaf sampled on Oct 16)
20 ft plots, single rows
10 terminal leaves per plot, washed in alcohol

Mustang Max (Zeta-cyper) = Aug 8, Aug 22
Bifenthrin treatments = Sept 5, Sept 12

Virginia peanuts

<table>
<thead>
<tr>
<th></th>
<th>7DAT1 (Oct 3)</th>
<th>12DAT2 (Oct 11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated check</td>
<td>197</td>
<td>240</td>
</tr>
<tr>
<td>Portal 2 pt/A, 1 appl</td>
<td>4</td>
<td>23</td>
</tr>
<tr>
<td>Agri-Mek 3.5 oz/A, 1 appl</td>
<td>2</td>
<td>31</td>
</tr>
<tr>
<td>Aramite 32 oz/A + Bemix 18 oz/A, 2 appl</td>
<td>14</td>
<td>50</td>
</tr>
<tr>
<td>Comite 2.2 pt/A, 1 appl</td>
<td>282</td>
<td>258</td>
</tr>
</tbody>
</table>

F = 10.2, Sig = .000***
F = 35.4, Sig = .000***
Peanut Insecticide Special Notes

- **Imidacloprid** *(Admire Pro, Imidashot, Velum Total)* are good early season products to protect against small insects like thrips and leafhoppers. Waiting period = 21 d for systemic action, 7 d for foliar appl.

- **Beseige** *(Karate + Prevathon)* has a new chemistry in it. Prevathon disbalances nervous system and rapidly stops insect feeding killing them in 1-3 days. This is primarily a stomach poison with long residual action (7-11 d).

- **Xentari**, a Bt insecticide *(biorational)*, has better efficacy against armyworms than DiPel. Bt is ideal for low pest pressure situation as a preventive spray and can be tank-mixed with other materials.

- **Intrepid Edge** *(methoxyfenozoide + spinetoram premix)*, **Intrepid**, **Diamond**, **Dimilin** – Insect growth regulators for caterpillar control.
Peanut Insecticide Special Notes

• Radiant is good thrips-control material for pre-bloom period; it will not control thrips inside flowers. Provides quick knockdown in 1-3 days. 10-14 day residual. Min. rate of appl. for thrips = 5 oz.
• Beseige and Radiant have translaminar activity – product moves from upper leaf surface to the lower surface. This provides ease of application in thick canopy.
• Bifenthrin and other synthetic pyrethroids can cause increase in two spotted spider mites when applied weekly during drought.
• Use premixes when you really need them against multiple pests.
• For any of the insecticides, do not overuse the product to avoid resistance and spider mite resurgence.