

A new tool for managing soybean aphid in Iowa

Erin Hodgson
Extension Entomologist

IOWA STATE UNIVERSITY
University Extension

IPM for insects

- Integrated pest management
 - Use multiple tactics to reduce pests
 - Select high-yielding seed
 - Plan ahead with regular scouting
- Limit pesticide applications
 - Only spray when needed – use thresholds!
 - Follow rates/harvest intervals
 - Alternate chemical classes

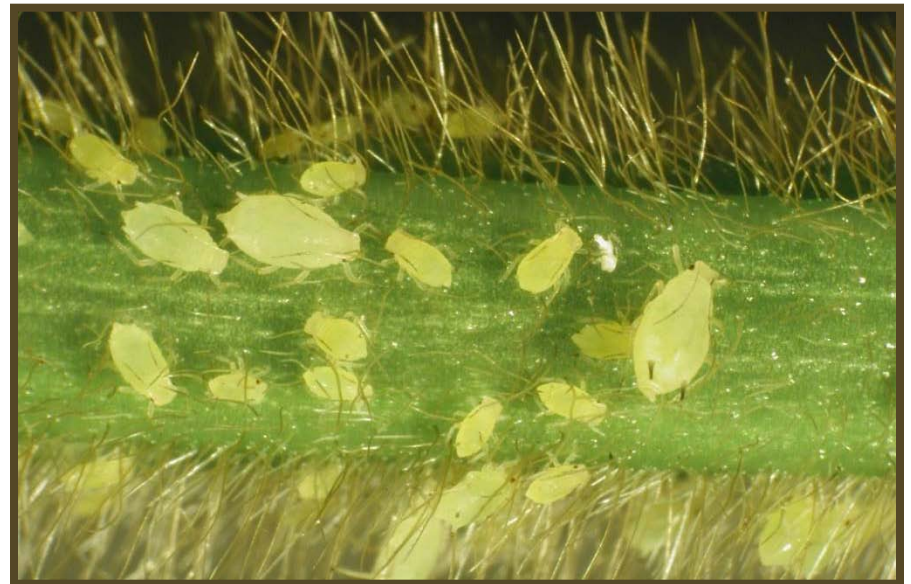
A new tool for soybean aphid

- Host plant resistance (HPR)
 - Insects are repelled, don't survive or do as well
 - Conventional and molecular breeding
 - Ex., Bt corn and glandular-haired alfalfa



HPR for soybean aphid

- **Rag1**, Resistant Aphis glycines
- Single gene expression
- Naturally-occurring germplasm
- Antibiosis, don't do as well as normal



Small plot research

SBA-resistant

SBA-susceptible

**notice sooty mold*



Questions about HPR for SBA

- *Is the Rag1 gene under patent?* **No**
- *When is it commercially available?* **2010**
- *Will it be Roundup Ready?* **Yes, conventional HPR-seed is in development for organic fields.**
- *Do you have to use a refuge?* **No**

Questions about HPR for SBA

- *Will HPR-resistant fields be aphid free?* **No**

The *Rag1* gene has moderate resistance to SBA. Expect there to be aphids in the field, but to reproduce at a slower rate.

Different SBA genetic biotypes exist, and some are more susceptible to *Rag1*.

Questions about HPR for SBA

- *Do you still need to scout? YES*

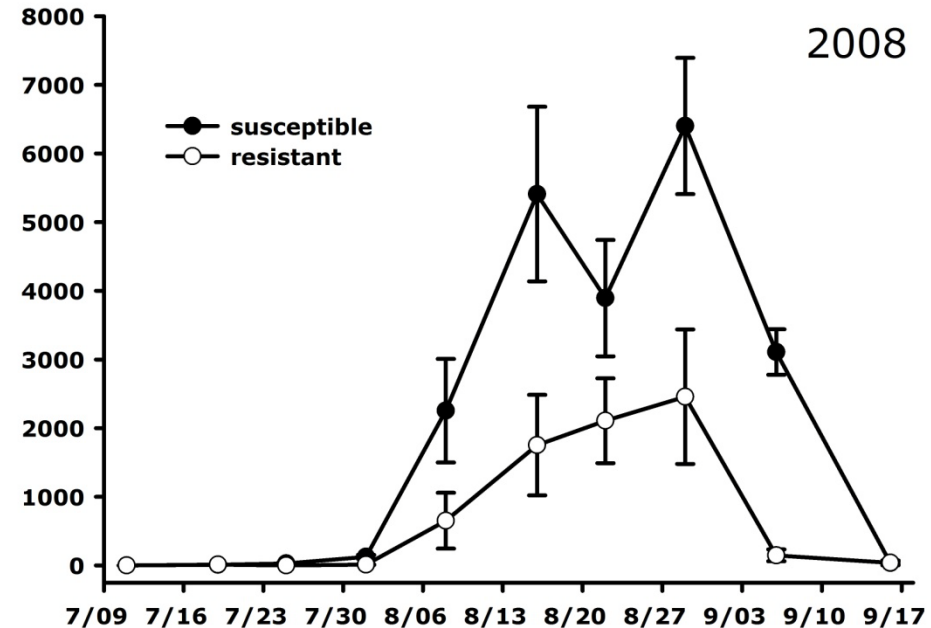
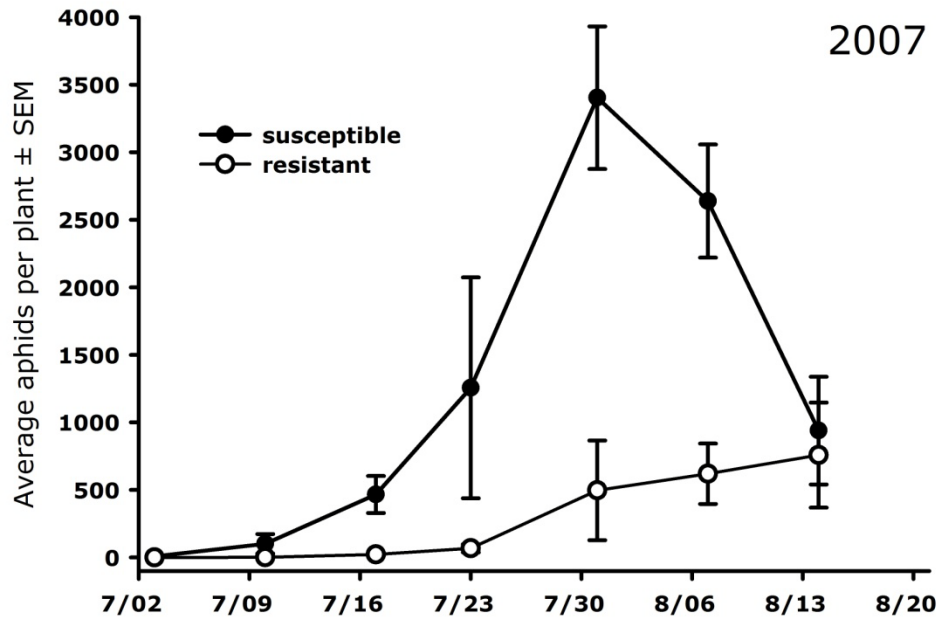
Even if you use a seed treatment with HPR-seed, you will still need to watch for aphids.

Use whole-plant counts or *Speed Scouting* every 7-10 days through seed set in every field.

Questions about HPR for SBA

- *What is the economic threshold for HPR-seed? The ET is the same: 250 aphids per plant in 80% of the field with increasing numbers through seed set.*
- *Will I need to spray? Yes, if aphids exceed the ET, treatments are recommended to protect yield.*
- *Is there noticeable yield “drag”? No*

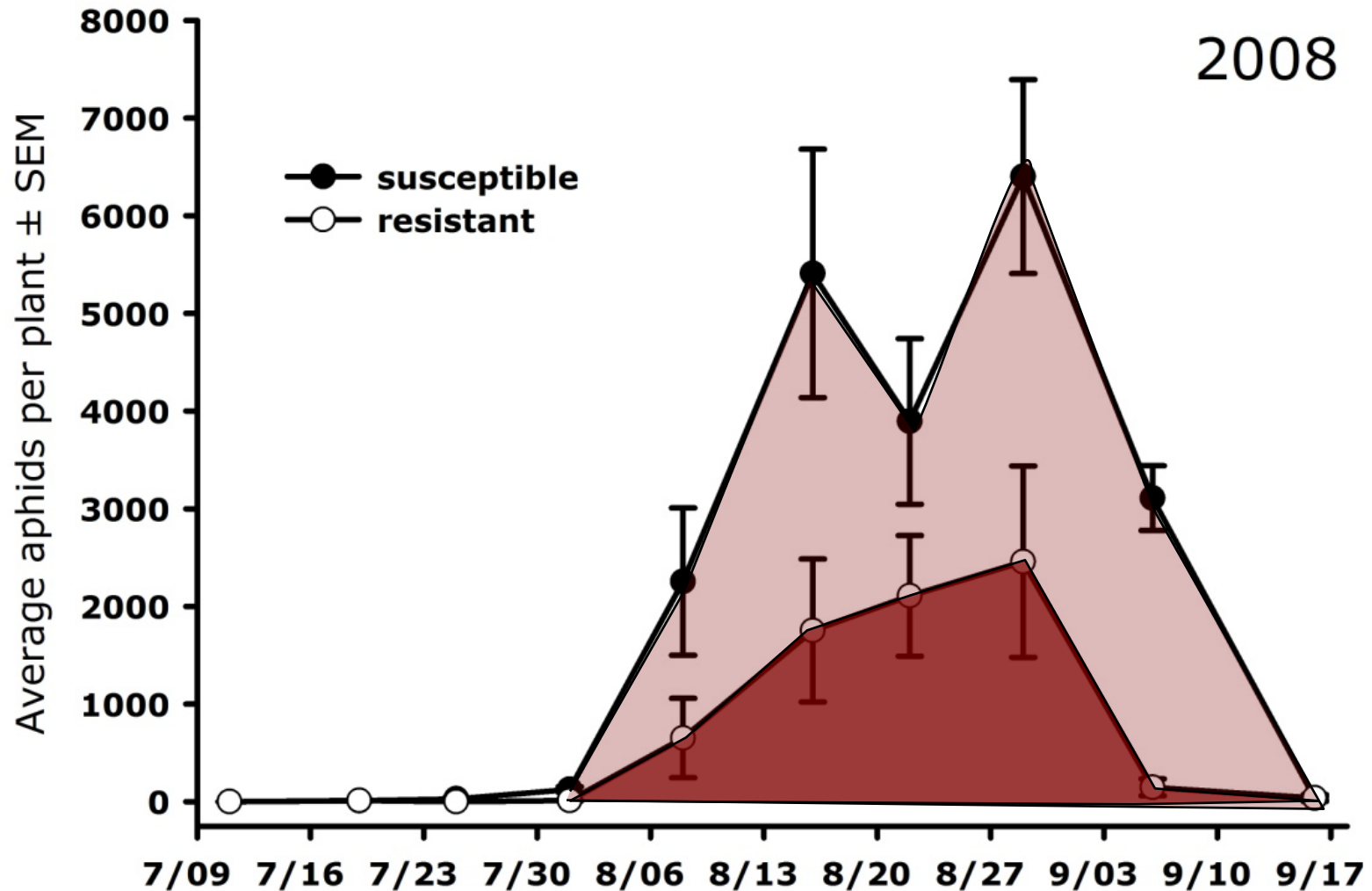
Research from Iowa



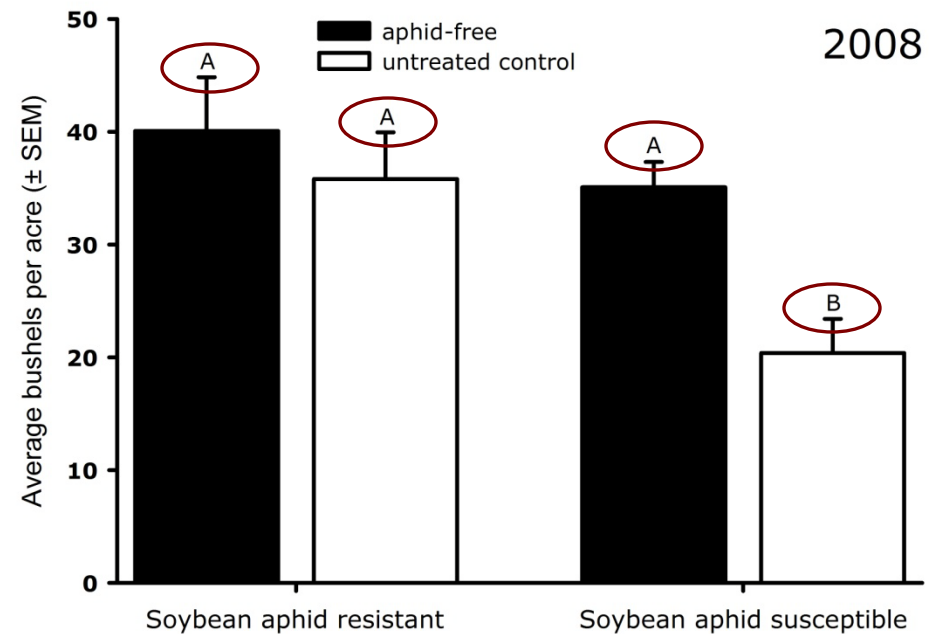
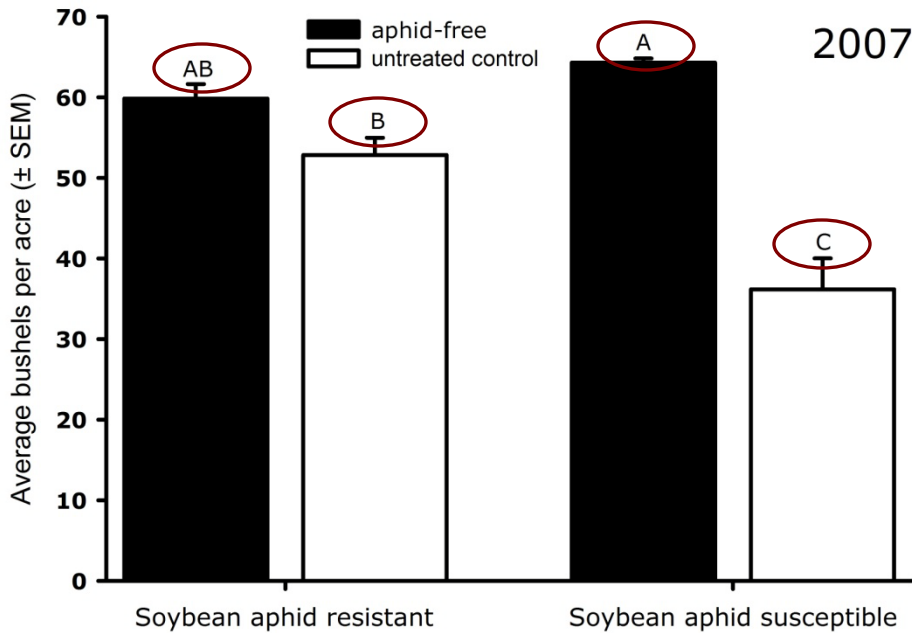
- In both years, aphids exceeded threshold
- Resistant plots had slower aphid growth and less aphid pressure

Is there a difference?

The colored area is seasonal aphid pressure, or CAD



Research from Iowa



- Even under heavy aphid pressure, resistant plots still performed well
- No significant difference in yield in aphid-free
- Significantly better yield when untreated

Questions about HPR for SBA

- *Are there other HPR genes for SBA? Yes*

At least 3 other genes are in development and will be released in 3-5 years.

Expect stronger forms of SBA-resistance and stacking of multiple genes.

Items to consider before using

- Insect pressure
- HPR effectiveness
- Market value of crop
- Seed availability
- Additional management costs

Summary

- HPR to soybean aphid is a new tool
 - Single gene with moderate resistance
 - Continue to scout
 - May exceed thresholds
 - Still need to protect yield
- Go to *www.soybeanaphid.info*