



Rindworm Damage Research Update

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Entomology

What is "rindworm"?

"Insect larvae that feed on watermelon rinds are generically referred to as rindworms regardless of their specific identities"

- Maynard & Hopkins 1999 - "Watermelon Fruit Disorders" in HortTechnology

What is known about rindworm?

Almost nothing...

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FLORIDA STATE HORTICULTURAL SOCIETY, 1975

NATURAL CONTROL OF THREE RINDWORM SPECIES AND CHEMICAL CONTROL OF THE GRANULATE CUTWORM, FELTIA SUBTERRANEA ON WATERMELON

W. C. ADLERZ

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tobacco budworm and granulate cutworm, and on the chemical control of the granulate cutworm are reported in this paper.

Materials and Methods

Abstract. Egg laying by 3 watermelon rindworm species was sustained at numerically comparable levels from just after plant emergence to first harvest. No parasites were found in tobacco

Seeds of the watermelon cv. 'Smokylee' were planted February 22, 1974. Rindworm populations were studied by counting eggs, larvae, and pupae

Is rindworm a problem in Indiana?



Good question!
Depends on who you ask...

Rindworms: A “Complex” Pest of Melons

by Matt Lollar | Jun 12, 2015 | Cucurbit, Horticulture, Insects, Pest Alert, Pest Management, Watermelon

Which insect(s) cause rindworm?

Vague definition means that the pest culprit(s) will vary across states & regions

In FL, **caterpillars** contribute to rindworm damage in melon; however, we've never found caterpillars on melons in Indiana

An armyworm we found causing minor leaf damage in 2024



beet armyworm



cabbage looper

Other culprits

striped cucumber beetle

We know **adults** cause damage

We know less about **larval** stage



wireworms from a few grower fields in 2024

- long-term life cycle
- rotation & rye use?





damage pattern on
the underside of
melon looks different

How much damage is allowable?



United States
Department of
Agriculture

Agricultural
Marketing
Service

Fruit and
Vegetable
Programs

Fresh
Products
Branch

United States Standards for Grades of Watermelons



Individual melon tolerance thresholds

- **damage** = aggregating >5 sq. in. on a 25-lb. watermelon
- **serious damage** = aggregating >12 sq. in. on a 25-lb. watermelon



Field-scale tolerance thresholds

- **10% to 30%** of melons displaying rind damage

We know from grocery store observations that some make it through



Sampled 32 commercial fields (2 melons/acre) in 2023/24 - photo library of rindworm damage



Hail, Scars, and Rind Worm Injury (Q)

Apply same scoring guide to these defects.

Hail



Hail



Rind Worm



Scar



Scar

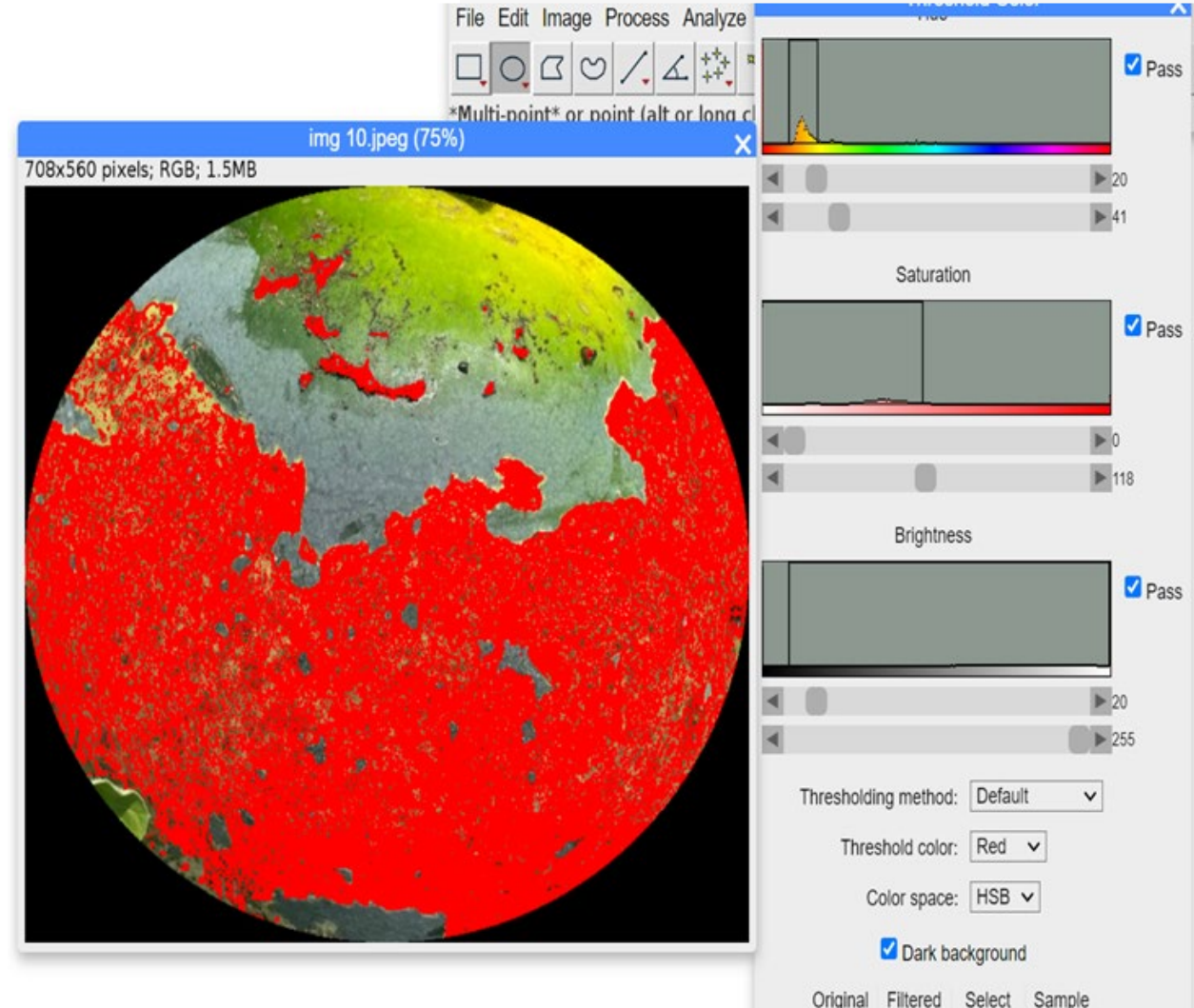


Methodology

Monitoring Process

Rind Damage Assessment

- Pictures taken in the field
- Quantification Using ImageJ software
 - **absolute damage** = quantity of damage (square inches)
 - **relative damage** = % of the total fruit area



Watermelons: Rind Worm Injury on Ground Spot (Q)

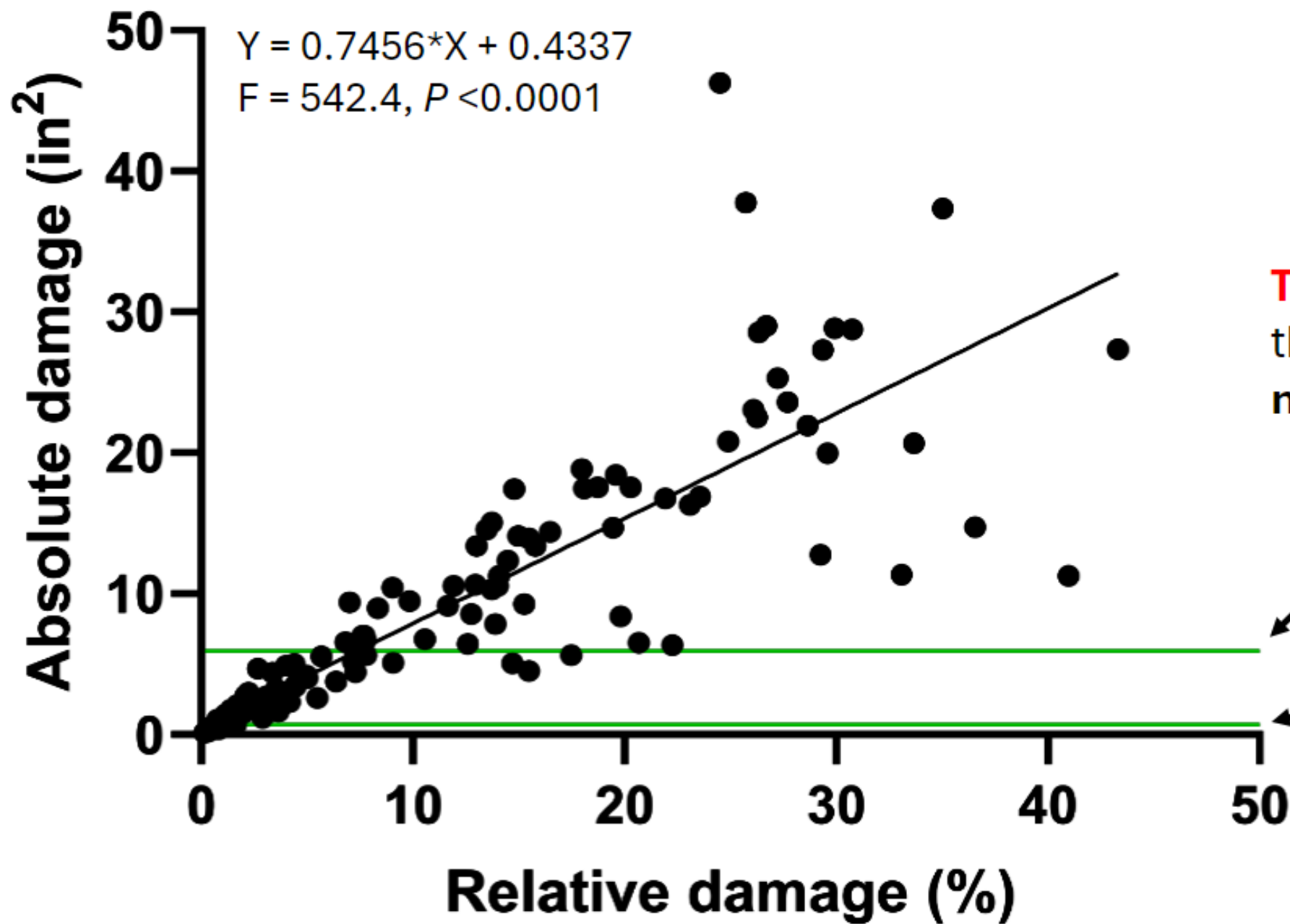
Scoring Guide

Damage: Score when the aggregating rind worm scars exceed 3 square inches on a 15 pound melon. Allow corresponding larger or smaller areas on larger or smaller melons. The portion of rind worm injury occurring on the ground spot is only scorable as damage when seriously detracting from the appearance.

Scorable as damage since affected area on ground spot is greater than 3 square inches and seriously detracts from the appearance.

Maximum allowed. Not scorable as damage since affected area on ground spot **only** materially detracts from the appearance.



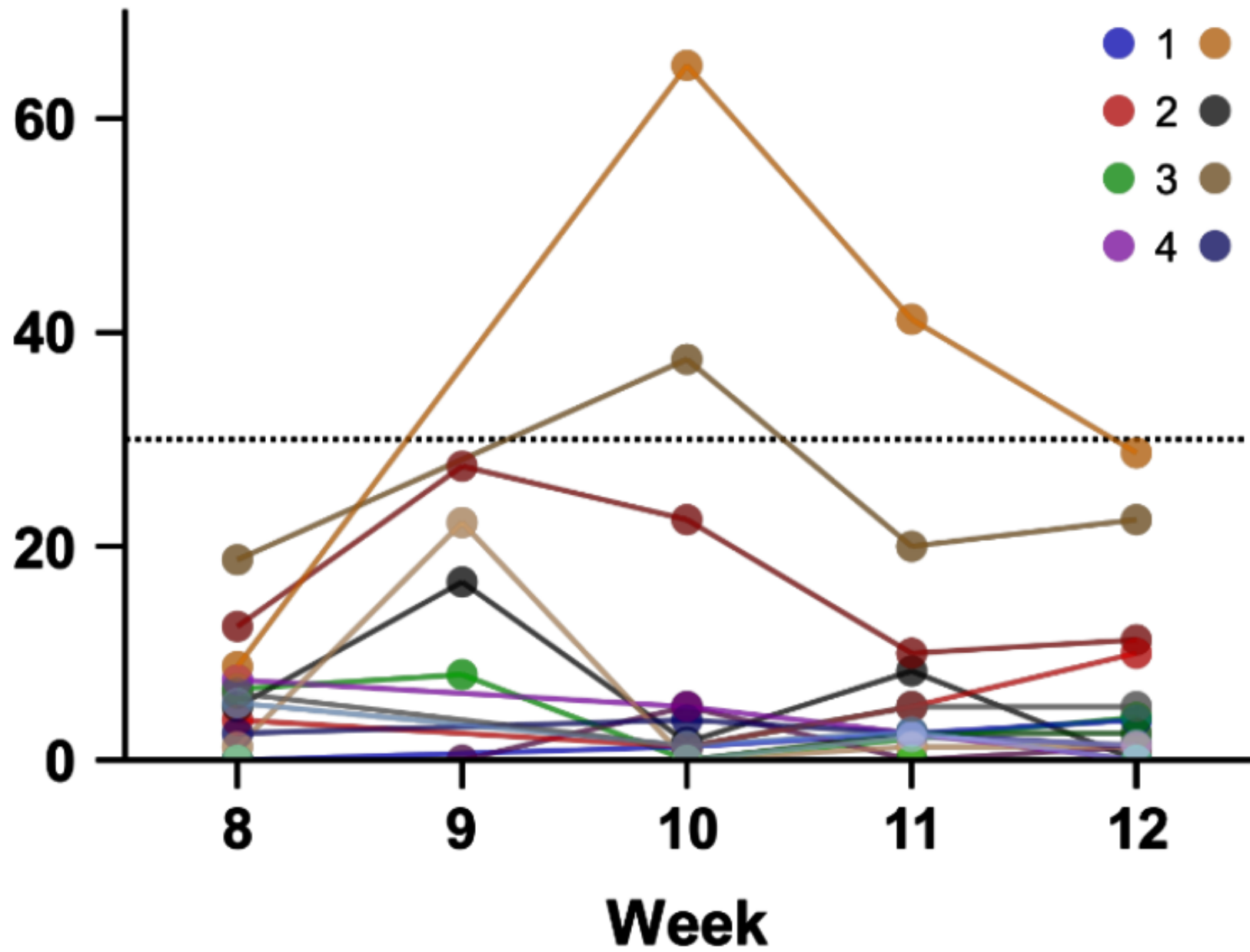


Theoretical tolerance threshold (37.1% of melons exceed)



Actual tolerance threshold (75.3% of melons exceed)

% insect-damaged fruits

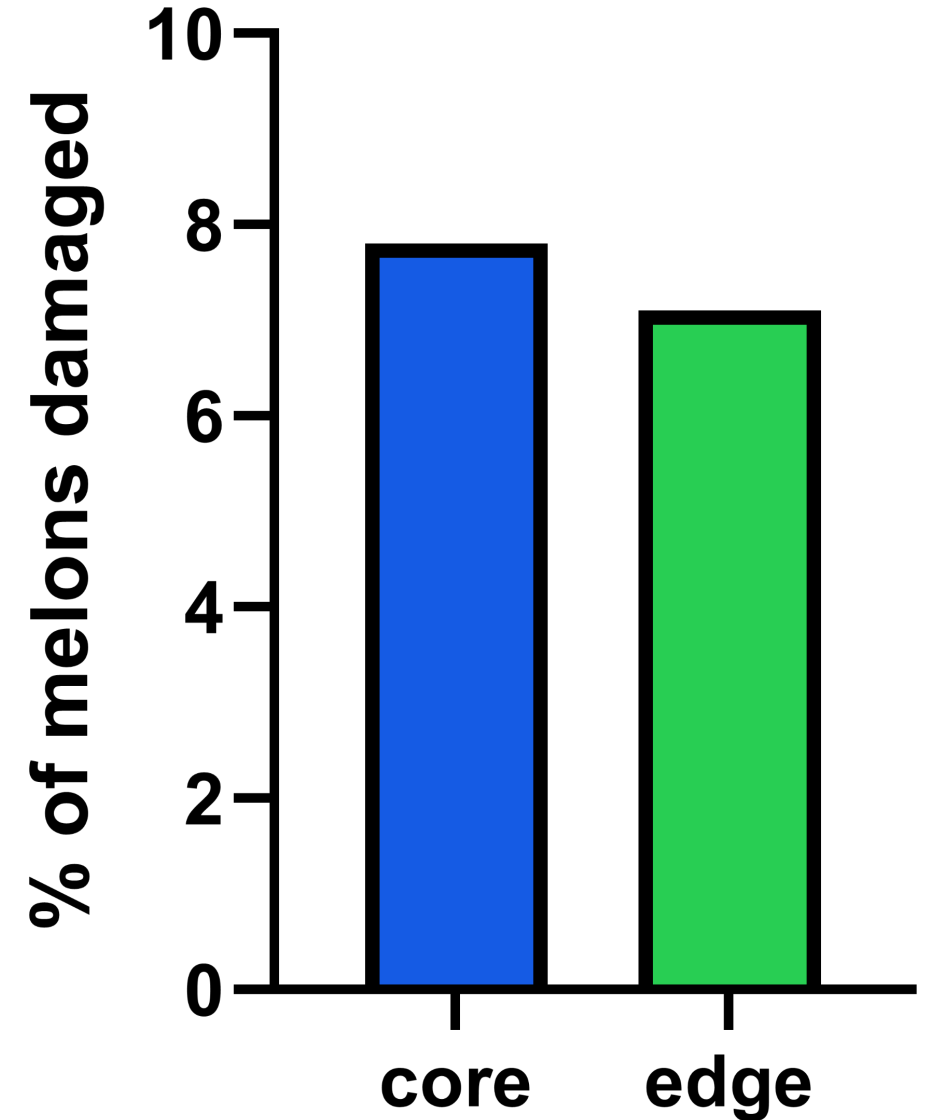


Field

- 1 5 9 13
- 2 6 10 14
- 3 7 11 15
- 4 8 12 16

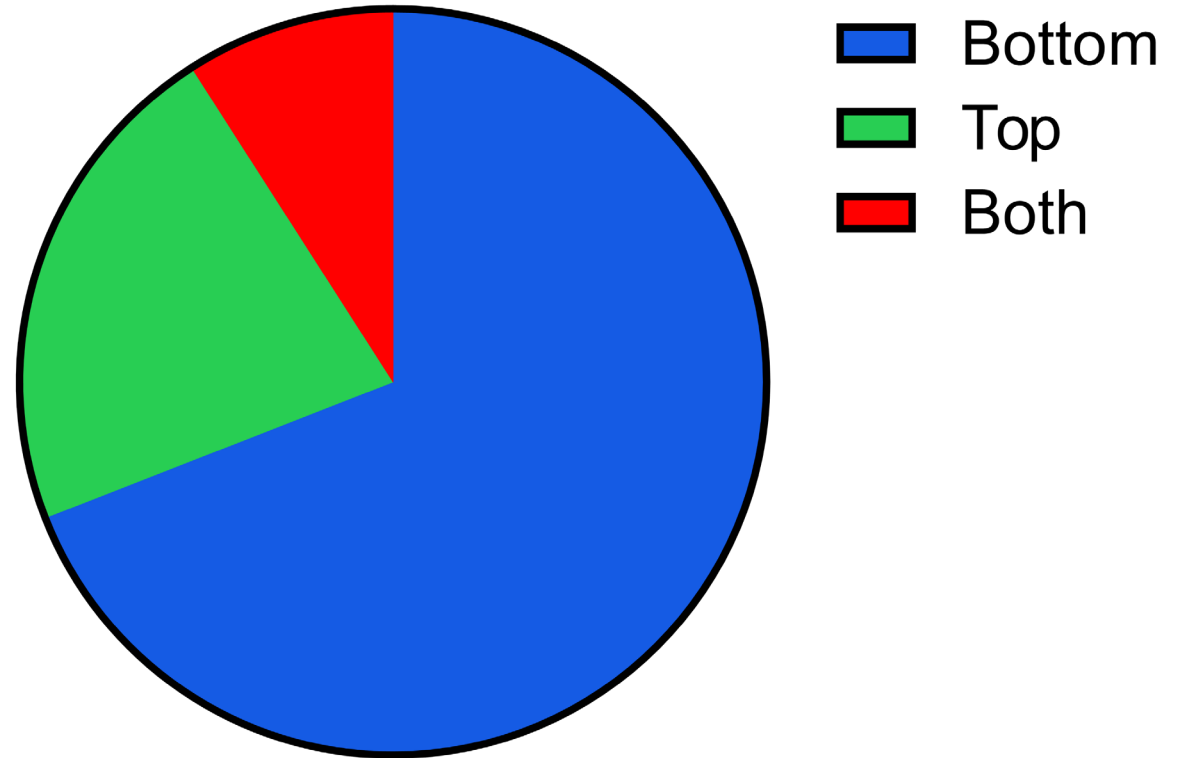


Does rind damage vary across the field?



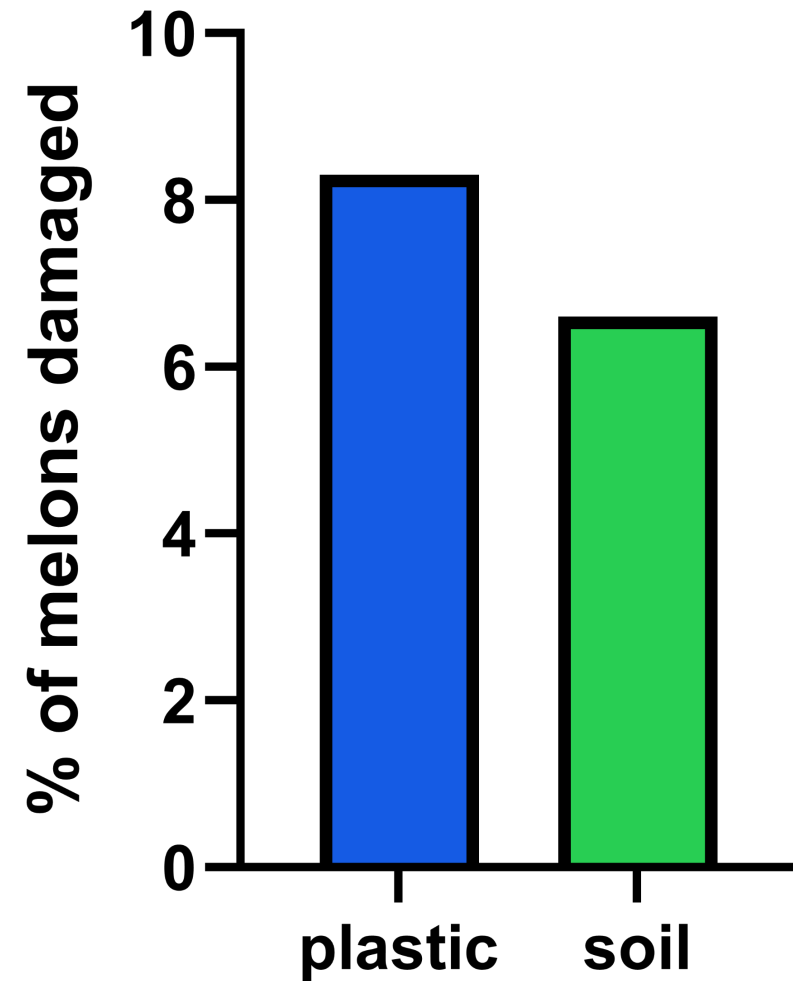


Where does damage occur on the melon?



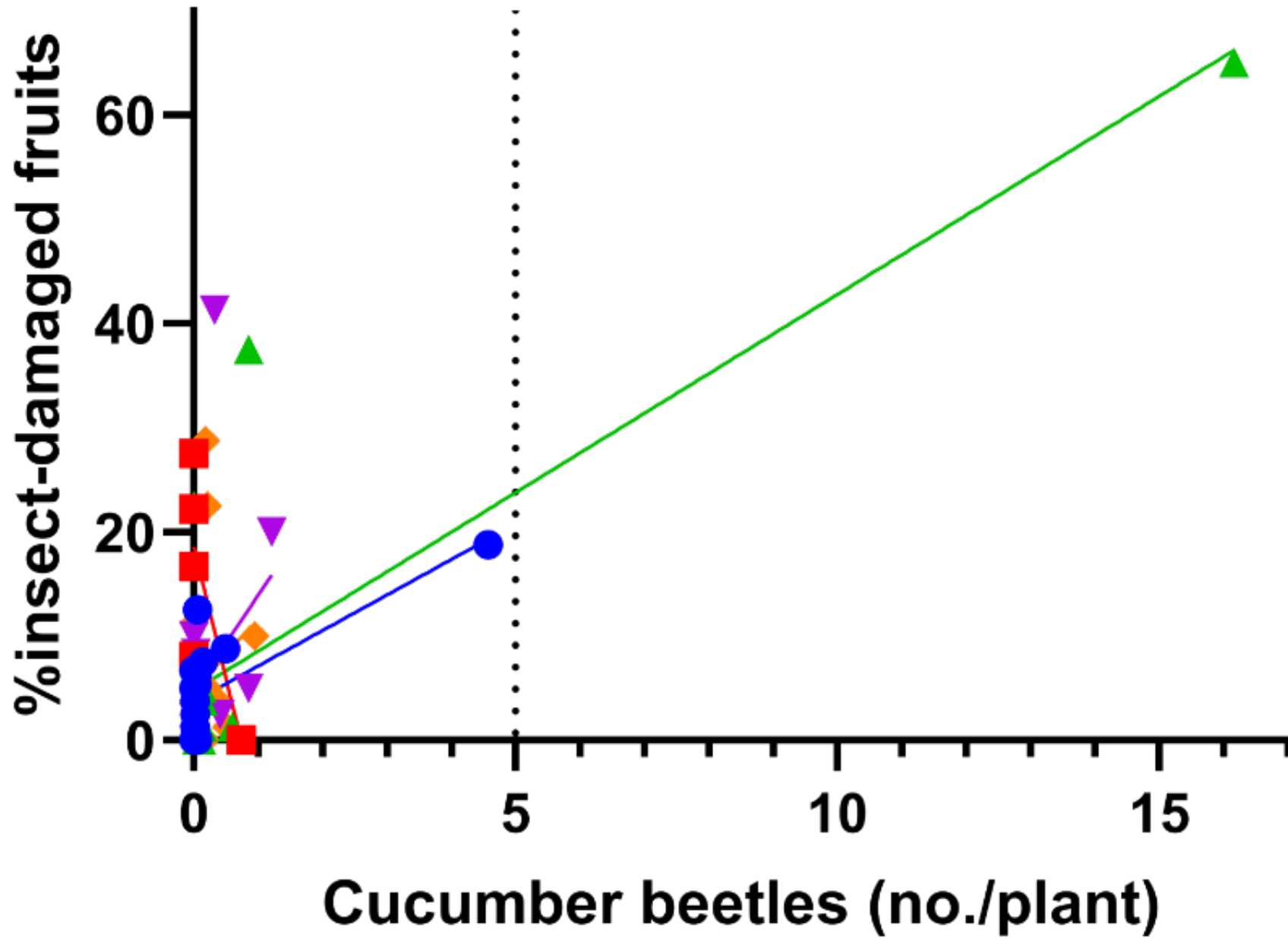
Prevalence of bottom-feeding makes insecticide sprays less effective

Does damage differ on soil vs. plastic?

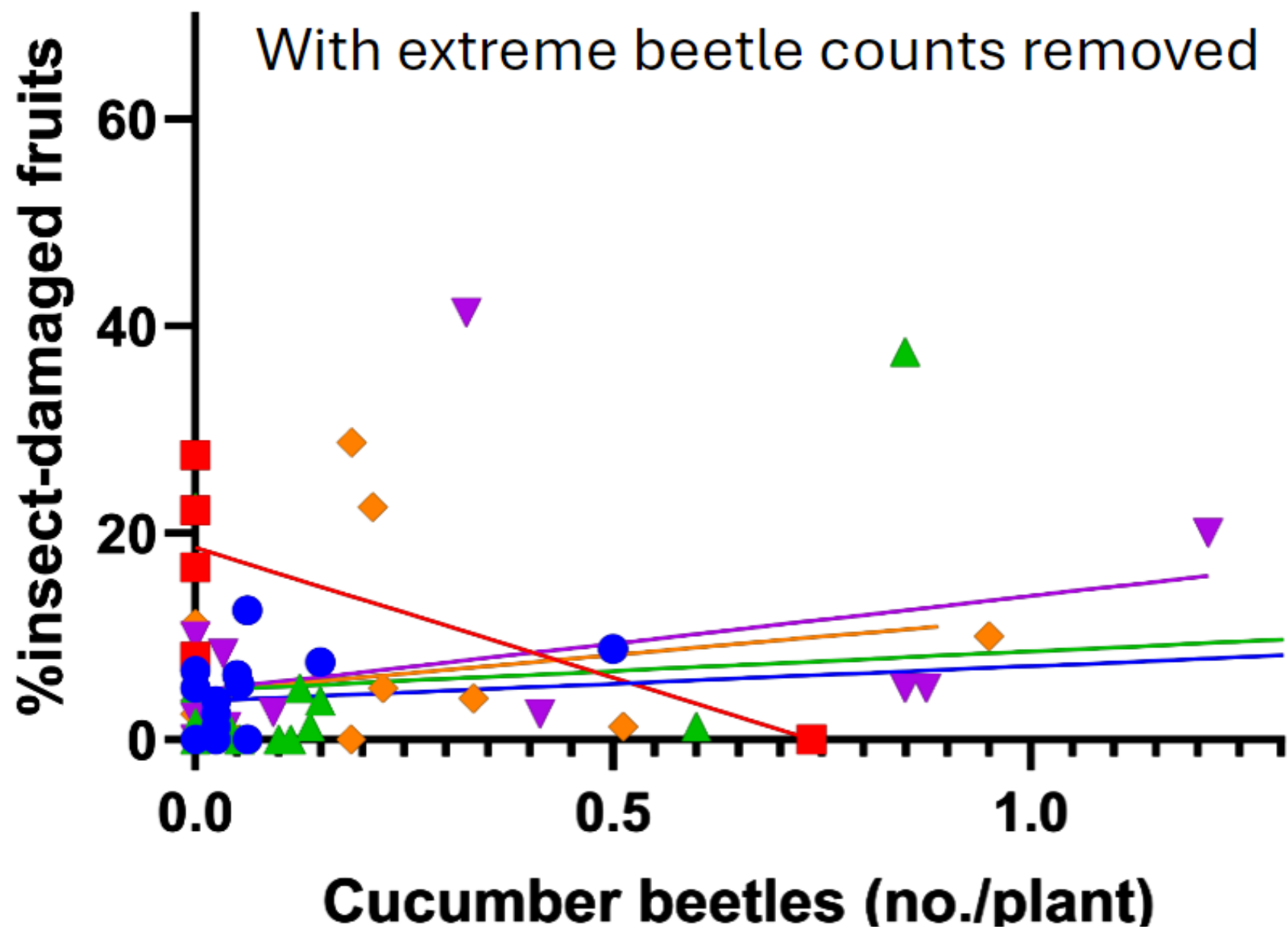


Do beetle counts explain rind damage?



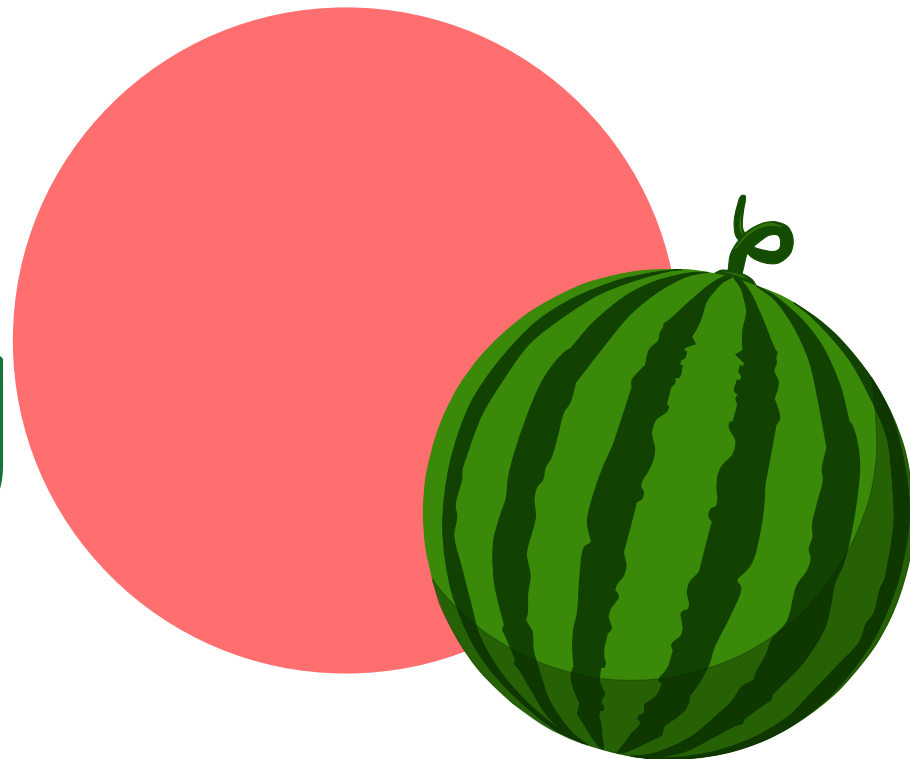


- Week 8
- Week 9
- ▲ Week 10
- ▼ Week 11
- ◆ Week 12






THANK YOU



● **Questions?**

Acknowledgment of Funding Sources

National Watermelon Association 

EPA (PESP: Pesticide Environmental Stewardship Program)