

Seed Treatment Insecticides for Managing Soil Insect Pests of Sugarbeet

Mark A. Boetel, Ayanava Majumdar*,
Robert J. Dregseth, and Allen J. Schroeder



Department of Entomology, North Dakota State University
Alabama Extension Service, Auburn University

Introduction

- Several soil insect pests damage sugarbeet in N. America
- Conventional granular, liquid insecticides used for decades

Drawbacks:

- 1) broad-spectrum activity (pests & nontargets)
 - 2) many are highly toxic to mammals, including humans
 - 3) require specialized application equipment
 - 4) inconvenient or hazardous to store, transport, load
- Advantages of Insecticidal Seed Treatments
 - 1) accurate delivery of desired rate
 - 2) simple and relatively safe to deploy
 - 3) lower active ingredient needed per acre hectare

Objective

Assess efficacy of seed treatment insecticides for controlling soil insect pests of North American sugarbeet:

- 1) sugarbeet root maggot
- 2) wireworms (*Limonius* spp.)
- 3) subterranean springtails (Collembola)

Materials & Methods

- Plot size:

SBRM: 35 ft long by 7.3 ft wide (4 rows w/ 22-in. spacing)

Others: 35 ft long by 3.6 ft wide (2 “ “ “ “

- Design: Randomized Complete Block

- 4 replications

Insecticide Applications

- Counter 15G (terbufos) applied as a BAND at planting (5-inch swaths ahead of planter's rear press wheels)
- Seed treatments applied by Germain's Technology Group:
 - Cruiser 5FS = thiamethoxam (60 g AI/unit)
 - NipsIT Inside 5FS = clothianidin (60 g AI/unit)
 - Poncho Beta = clothianidin+betacyfluthrin (60:8 g AI/unit)
- 1 unit = 100,000 seeds

Data Collection & Analysis

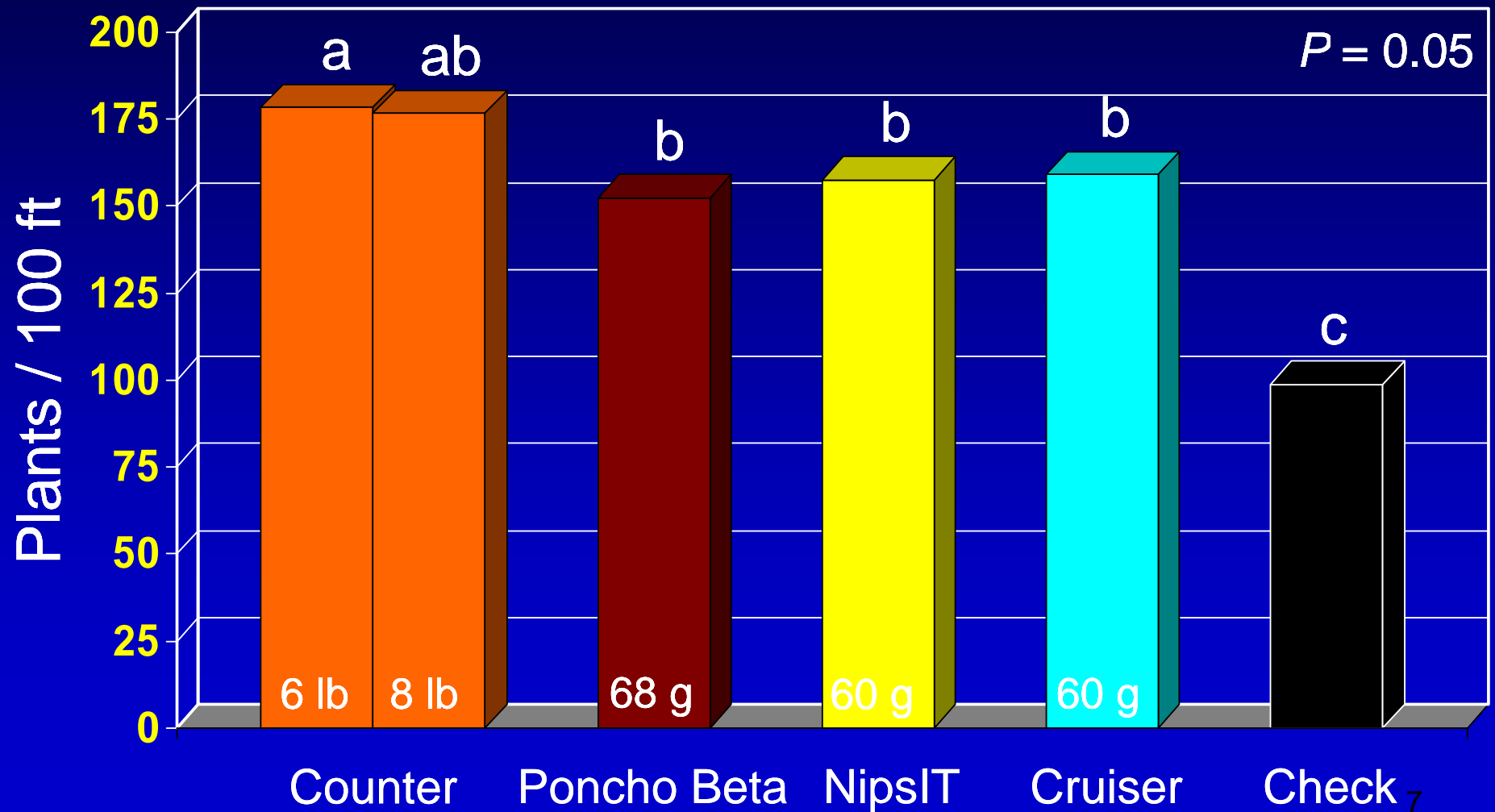
- Efficacy assessments:
 - 1) SBRM feeding injury (0-9 scale)
 - 2) Surviving plant counts (wireworm & springtail)
 - 3) Sucrose yield
- Data analysis:
 - 1) General Linear Models Procedure (SAS)
 - 2) Mean comparisons: Fisher's Protected LSD test
(alpha = 0.05)



Springtail Control

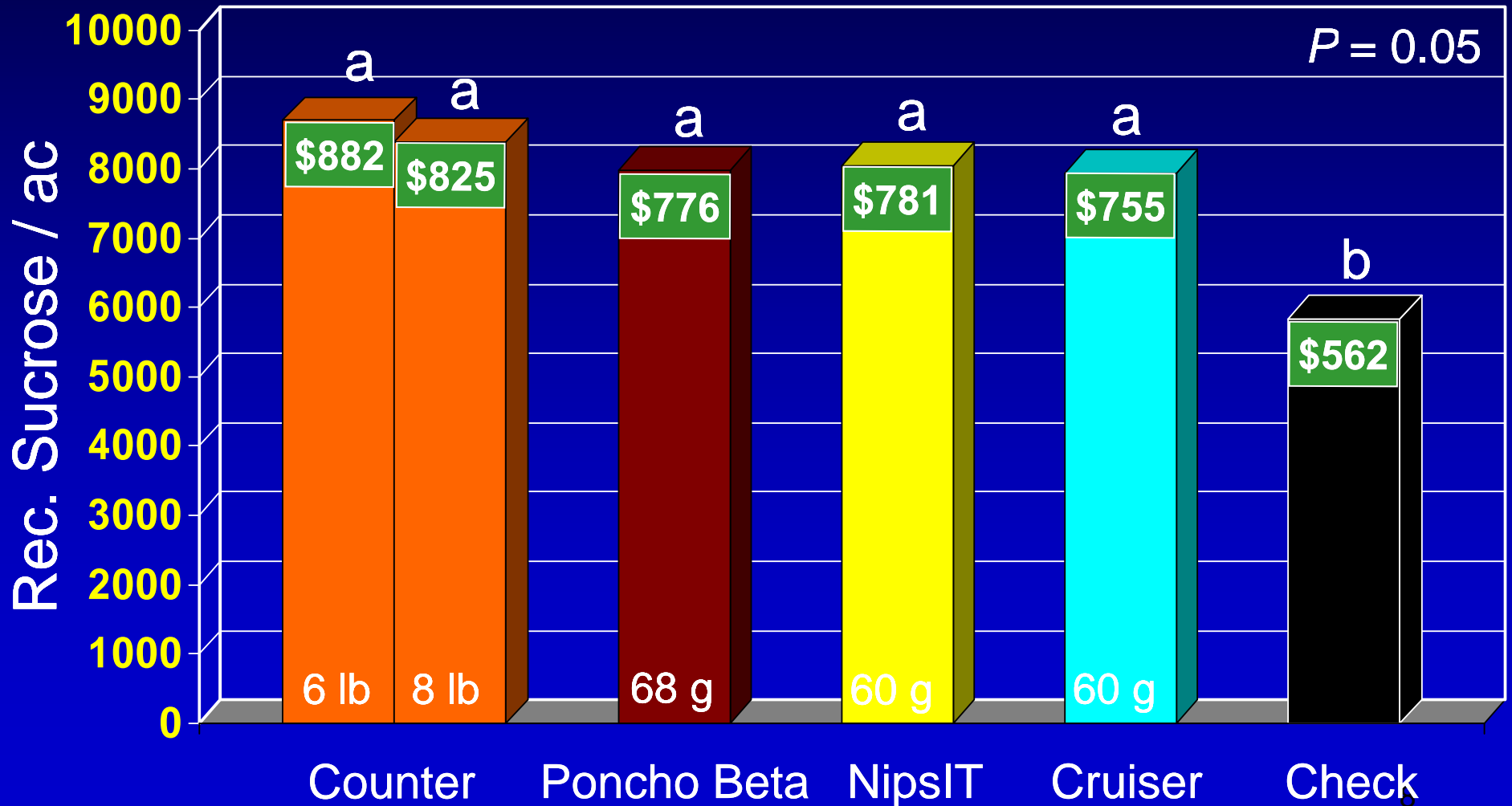
Plant Stand

3-yr Combined Analysis (2006-2008)



Springtail Control

*Yield and Gross Economic Return
3-yr Combined Analysis (2006-2008)*



Springtail Plots – Prosper, ND, 2006



CHECK



Counter
8 lb BAND

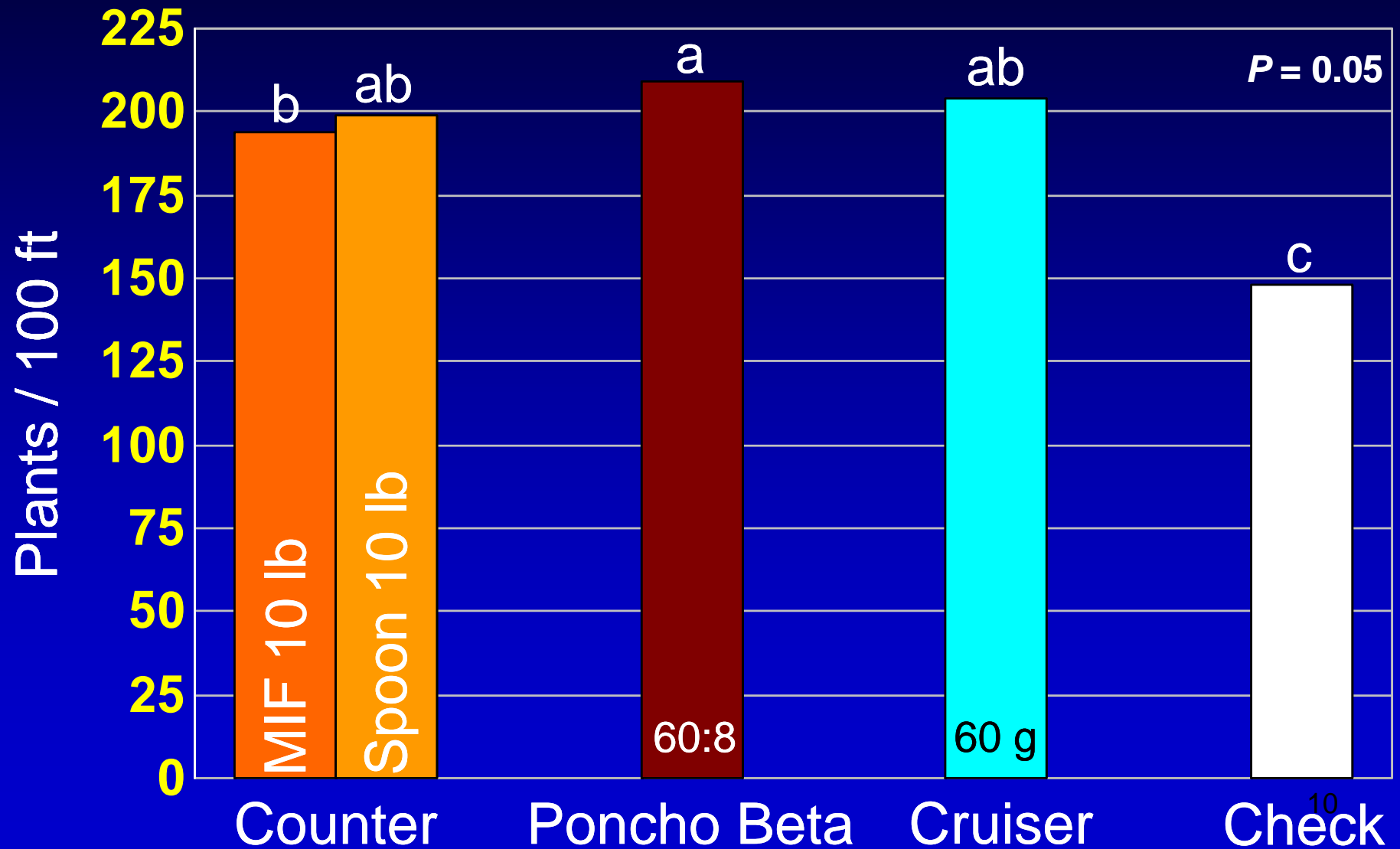


Poncho Beta
68 g



Wireworm Control

Stand Counts – St. Thomas, ND (2006)

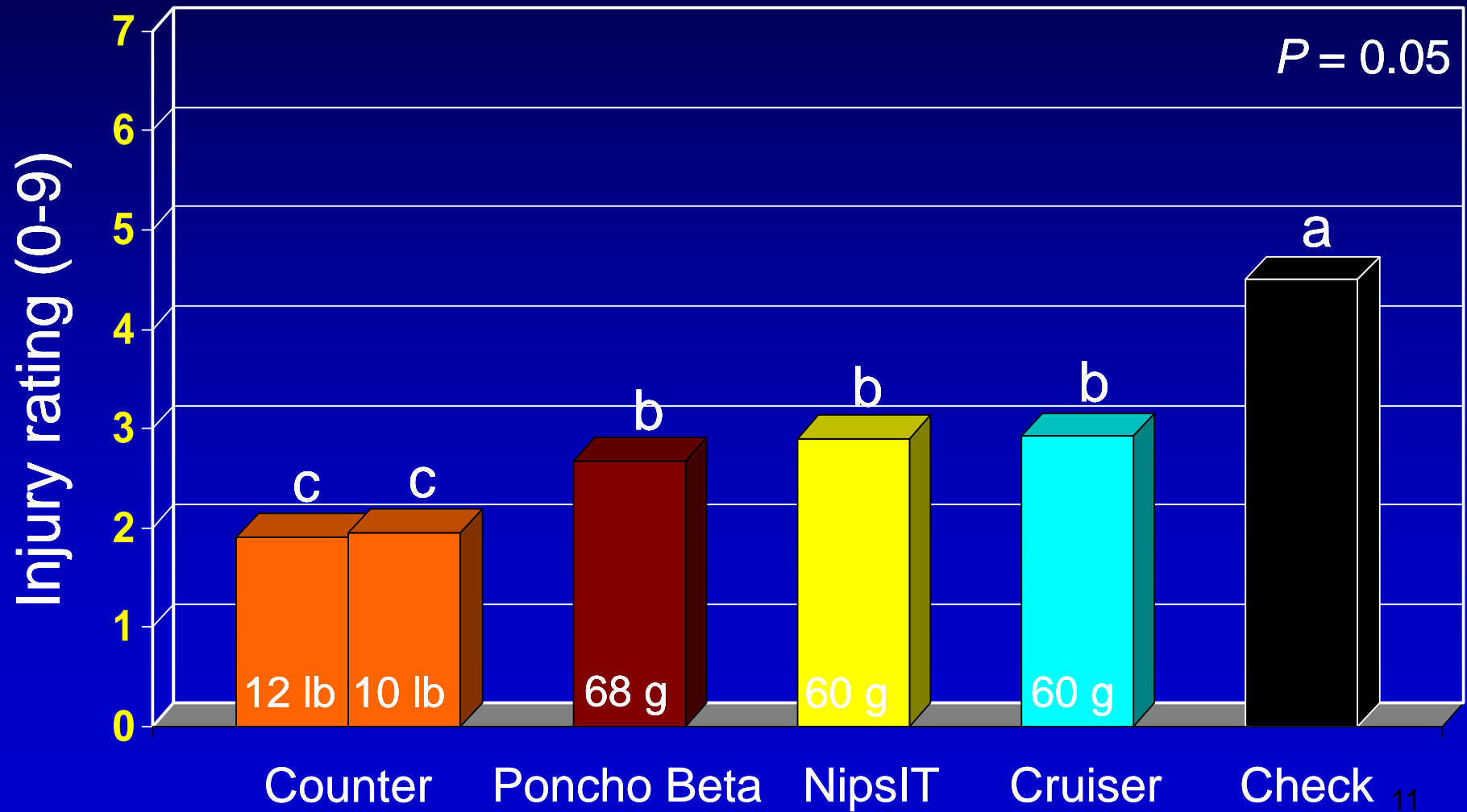




Root Maggot Control

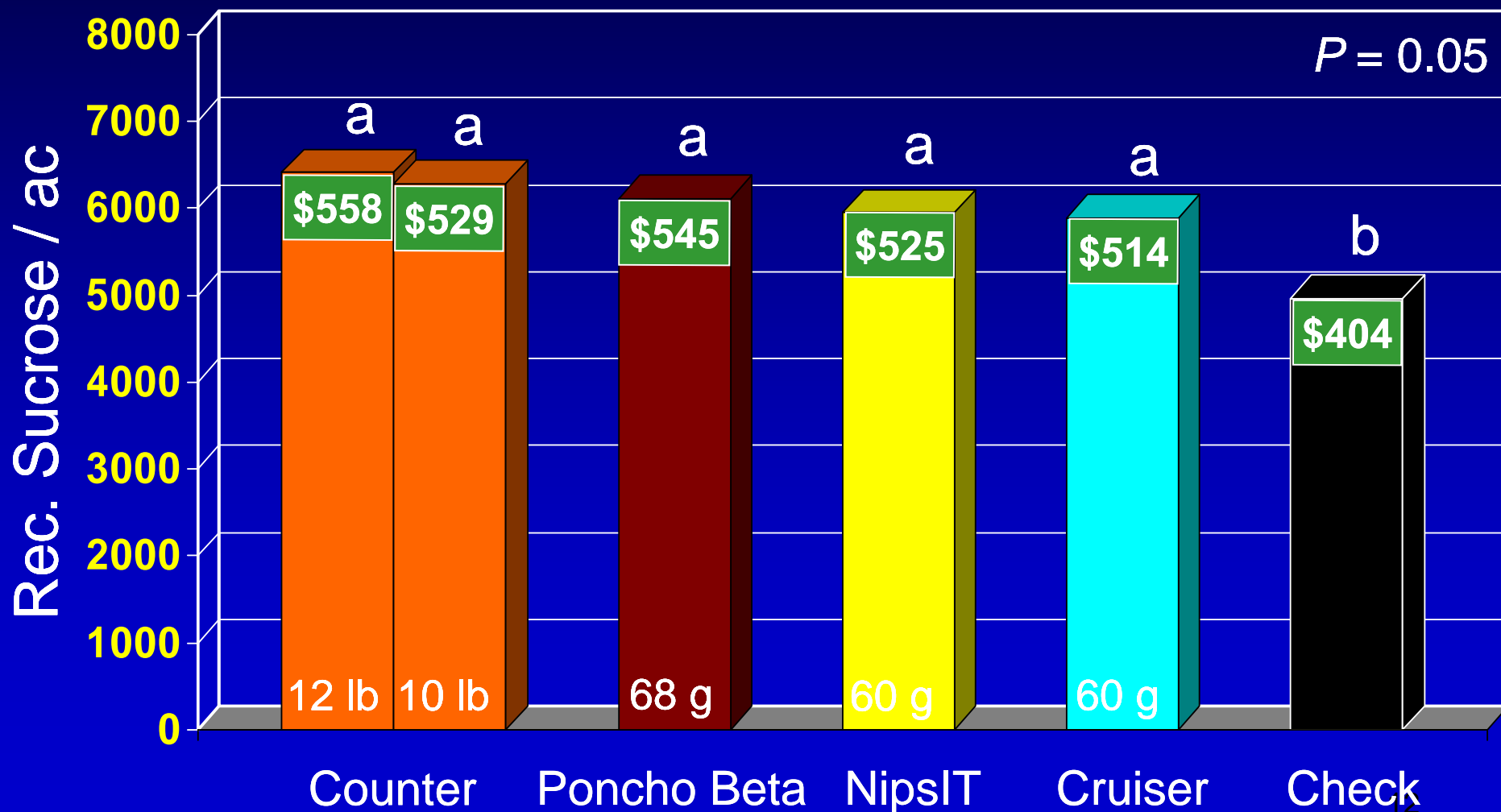
Feeding Injury

2-yr Combined Analysis (2007-2008)



Root Maggot Control

*Yield and Gross Economic Return
2-yr Combined Analysis (2007-2008)*



SUMMARY

- **Springtails:**

- Best stand protection by Counter 15G (6 lb prod/ac)
- Significant stand protection by all seed trts (vs. check)
- No yield differences between any seed trt and Counter 15G

- **Wireworms:**

- Seed trts: equivalent stand protection to Counter 15G
- Further study needed to determine yield impacts

- **Root Maggot:**

- Counter 15G provided better root protection than seed trts
- Seed treatments resulted in equivalent yields to Counter

Conclusions

- Poncho Beta, NipsIT Inside, and Cruiser provide comparable soil insect control and yield benefits to those of Counter 15G.
- Seed treatment insecticides appear to have a good fit for managing soil insect pests of sugarbeet in North America.
- Benefits of seed treatment technology:
 - simple and accurate deployment
 - reduced risk of exposure to applicator
 - major (up to 95%) reductions in active ingredient per acre
- Note: Cruiser is not yet registered for use in sugarbeet.

Thank you!

