Fig Day 2006

2005 Research: Monitoring, Sanitation, and Insect Pest Management in Figs

Chuck Burks[1], David Brandl[1], Themis Michailides[2], and Mark Doster[2]

[1]USDA-ARS, Parlier, CA

[2]UC Kearney Agricultural Center, Parlier, CA

Background: previous findings

- Two pests collectively responsible for majority of damage:
  - Nitidulid beetles (driedfruit beetle + *C. freemani* + *C. mutilatis*)
  - Navel orangeworm (NOW)
- Nitidulids generally cause greater loss than NOW, but...
- Depends on year and location

Characteristics of NOW and nitidulids

Insect Pest (Order)	NOW (Lepidoptera)	Nitidulids (Coleoptera)
Pheromone biology	Sex pheromone, attractive to males only, no food co-attractant and not outcompeted by food	Aggregation pheromone, attractive to both sexes, but outcompeted by ripe fruit
Feeds as adult	No, adults short-lived	Yes, adults long-lived
Stage entering fig	Neonate larva	Adult

2005 Research

Objectives

- Examine association of trap counts with damage (can we predict damage?) (Madera County)
- Examine association of infestation in breba crop with infestation of fall crop (potential of sanitation for reduction of loss) (Madera County)
- Compare efficacy of current and candidate insecticides against infestation by nitidulids and NOW (UCKAC)

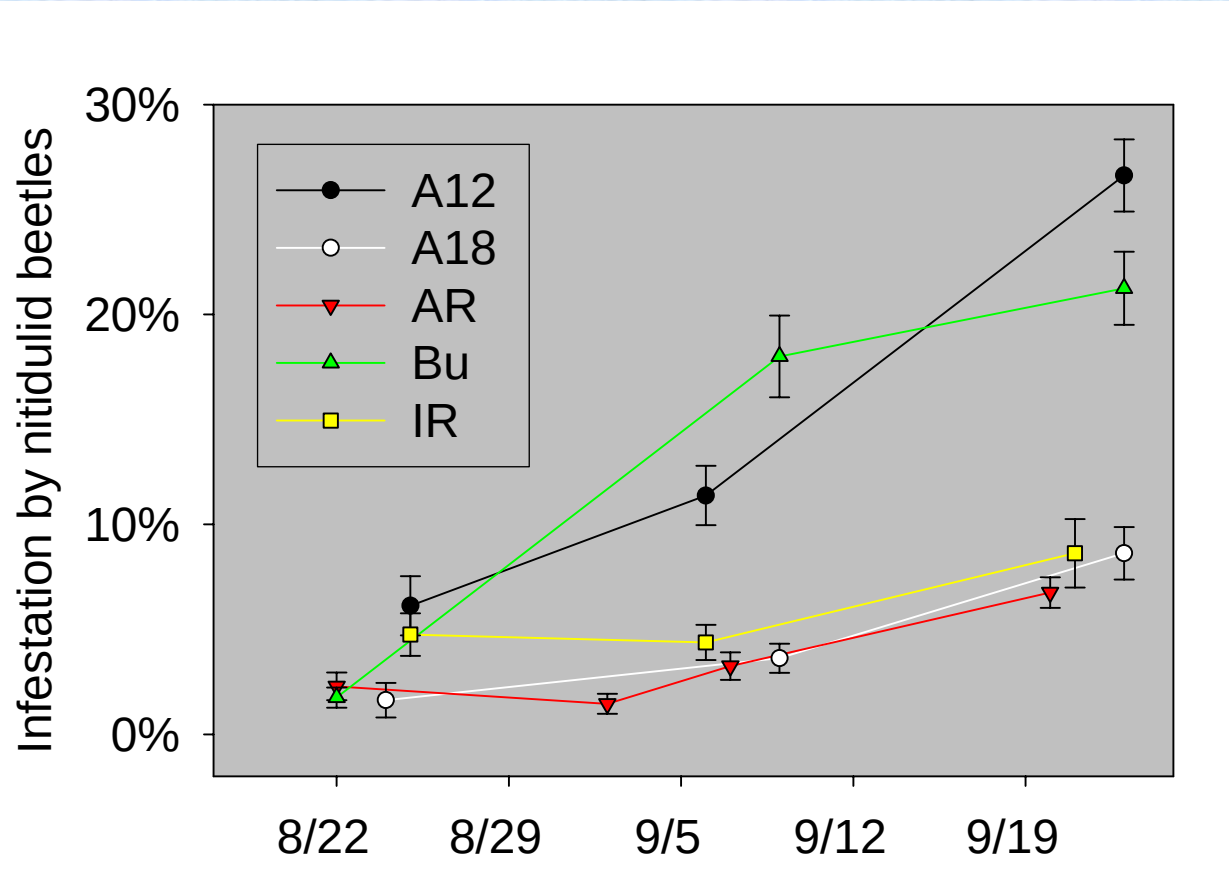
Items to note:

- Dependent on two sampling and evaluation efforts—one in Madera County, and one at Parlier
- First of these recently completed; second in early stages
- Analysis and conclusions presented today are preliminary and tentative

Fall Harvest, Madera County

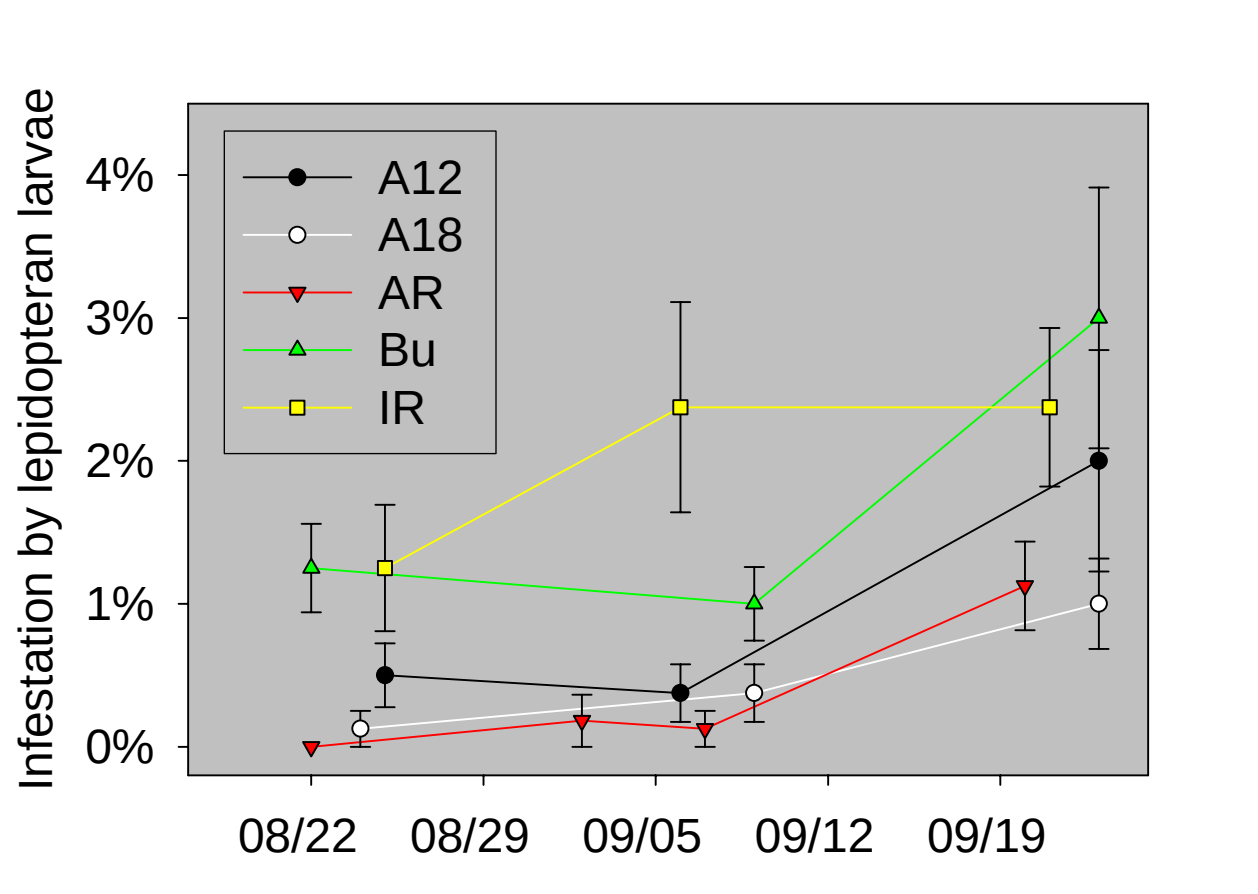
- 50-fig samples taken from windrowed figs at 16 points in a 40-acre plot
- Conadria sampling schedule (BU, AR, IR)
  - Week 1: week of Mon 8/15
  - Week 2: week of Mon 8/22
  - Week 3: week of Mon 9/5
- Calimyrna sampling schedule
  - Arnold Ranch: Weeks of 8/22, 8/29, 9/5, and 9/19
  - Other sites (BU, IR, A12, A18): Weeks of 8/22, 9/5, and 9/19

Infestation by nitidulid beetles in fall ’05 Calimyrna harvest samples

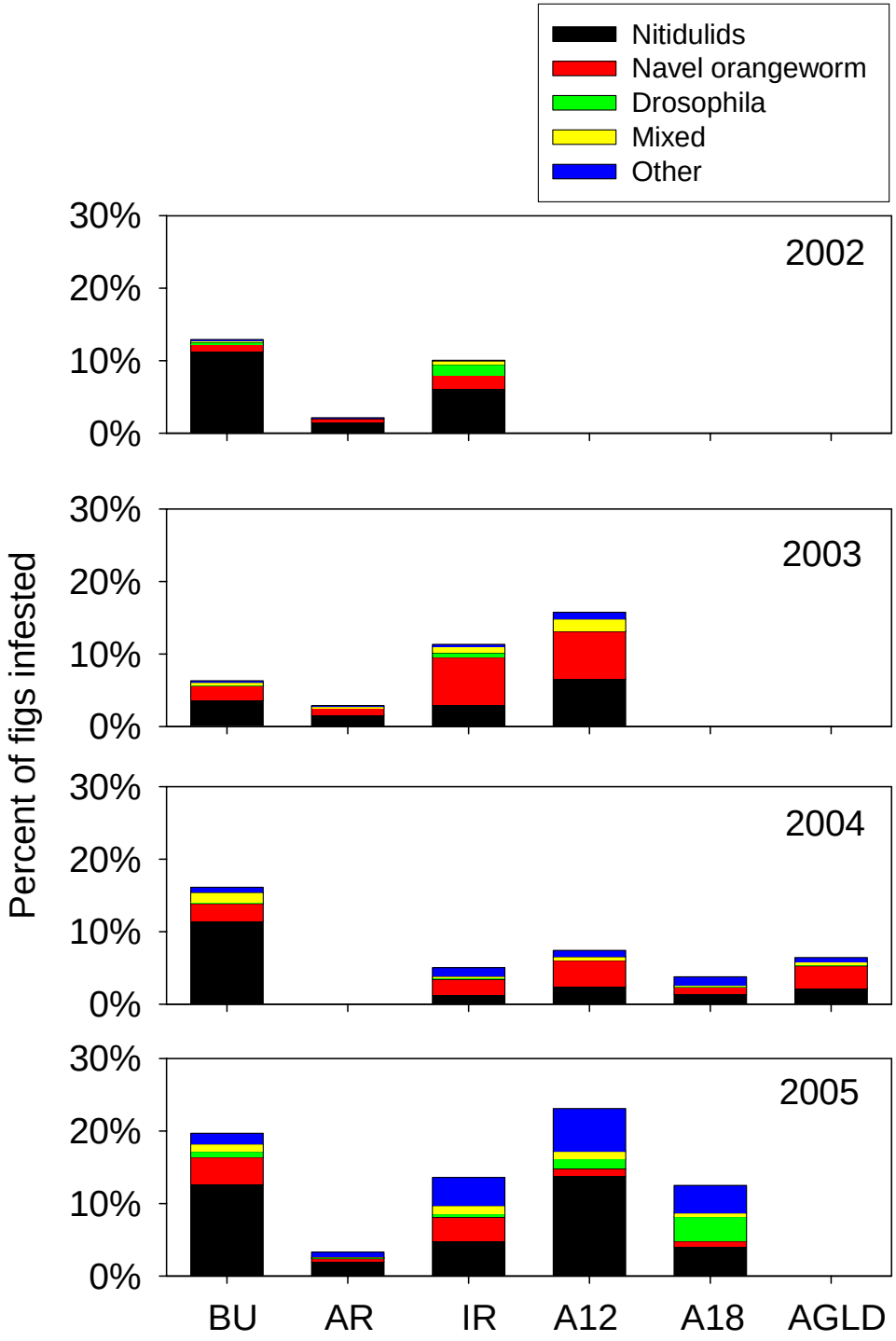


- Nitidulid infestation high compared to previous years
- Greater infestation at two sites

Infestation by lepidoteran larvae in fall ’05 Calimyrna harvest samples

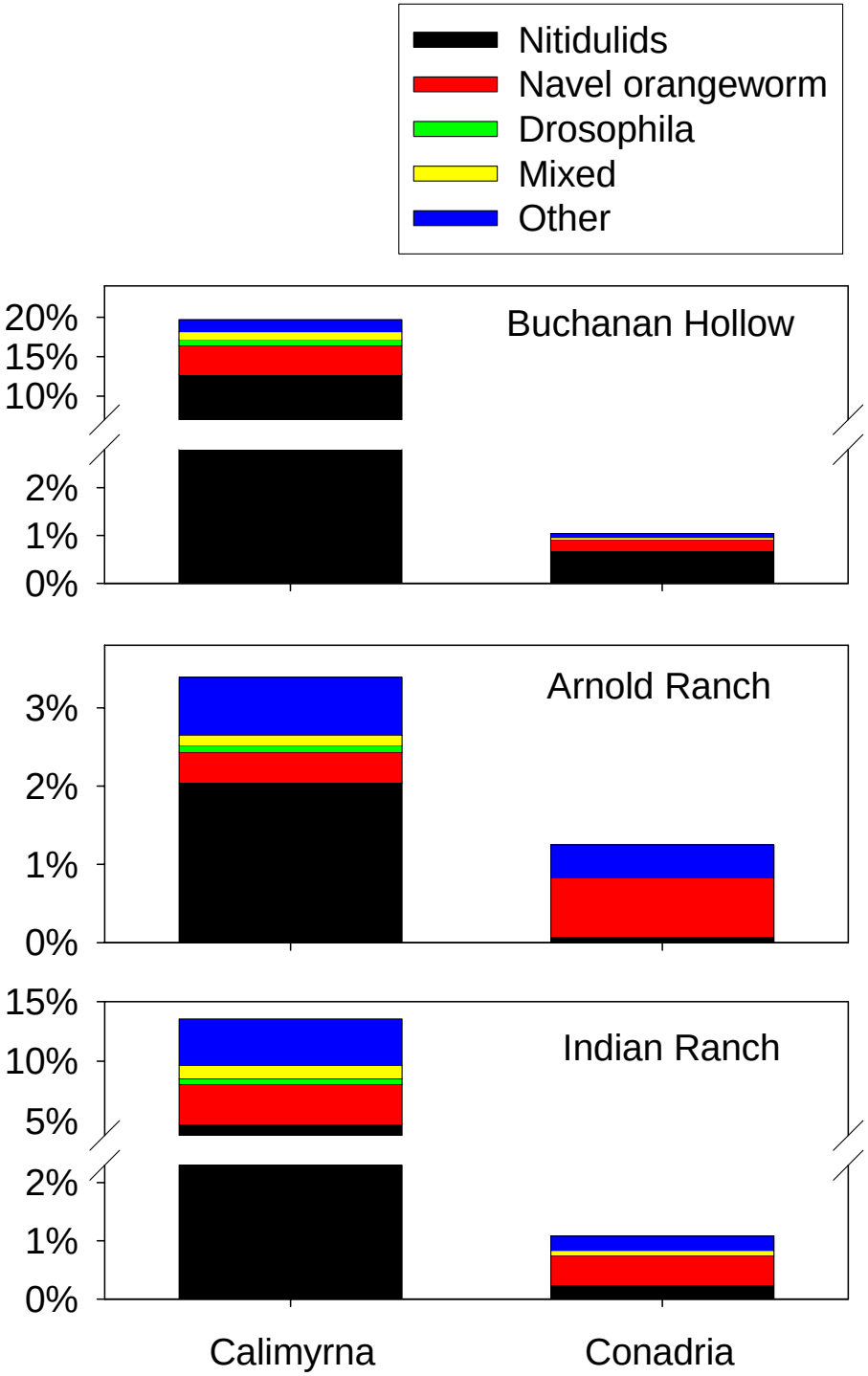


- NOW responsible for a majority of these infestations
- Low compared to nitidulids in ’05 and leps in some previous years
- Increases with later harvest



Damage by pest category: comparison of 2005 and previous years

- Pooled data for all harvests for year
- Nitidulids and navel orangeworm cause most damage
- Considering all years and locations, nitidulids show greater potential for damage (# of defects) compared to navel orangeworm

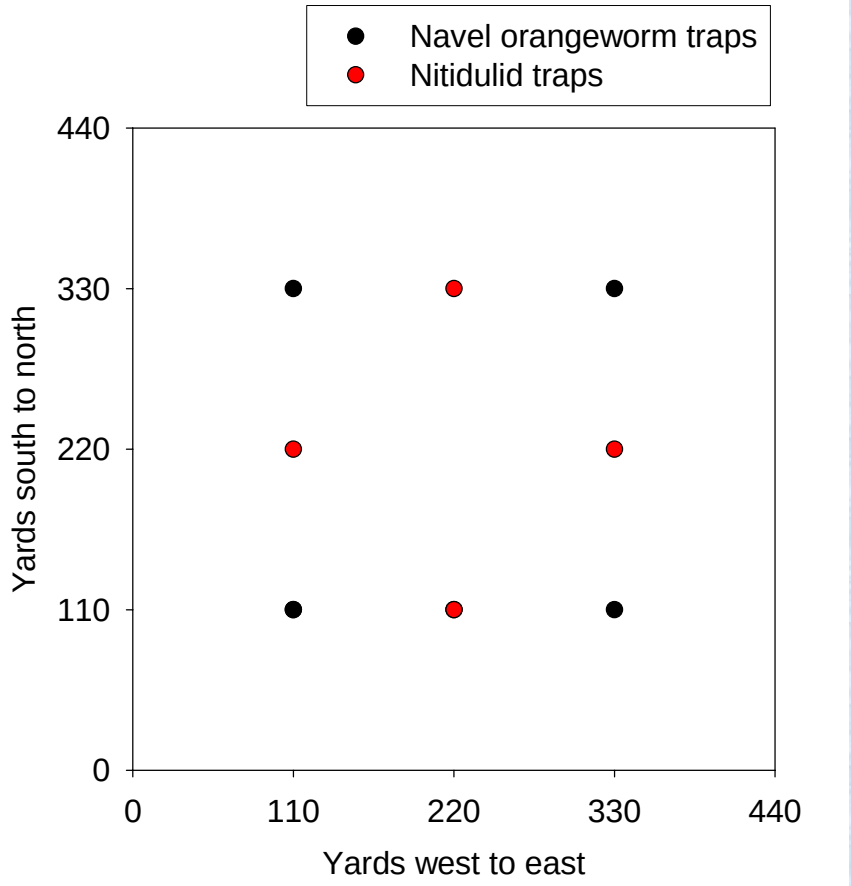


Comparison of insect pest damage, to Calimyrna and Conadria figs

- Generally much greater damage in Calimyrnas
- Greater similarity between amount of Conadria damage at these three sites
- Possibly greater proportion of damage due to navel orangeworm in Conadria compared to Calimyrna

1) Monitoring for DFP and NOW and association of trap counts with damage

- Monitoring occurred in 40-acre plots of Calimyrna and Conadria figs described for the fall harvest
- Four trap for each species place at even intervals and monitored through the growing season

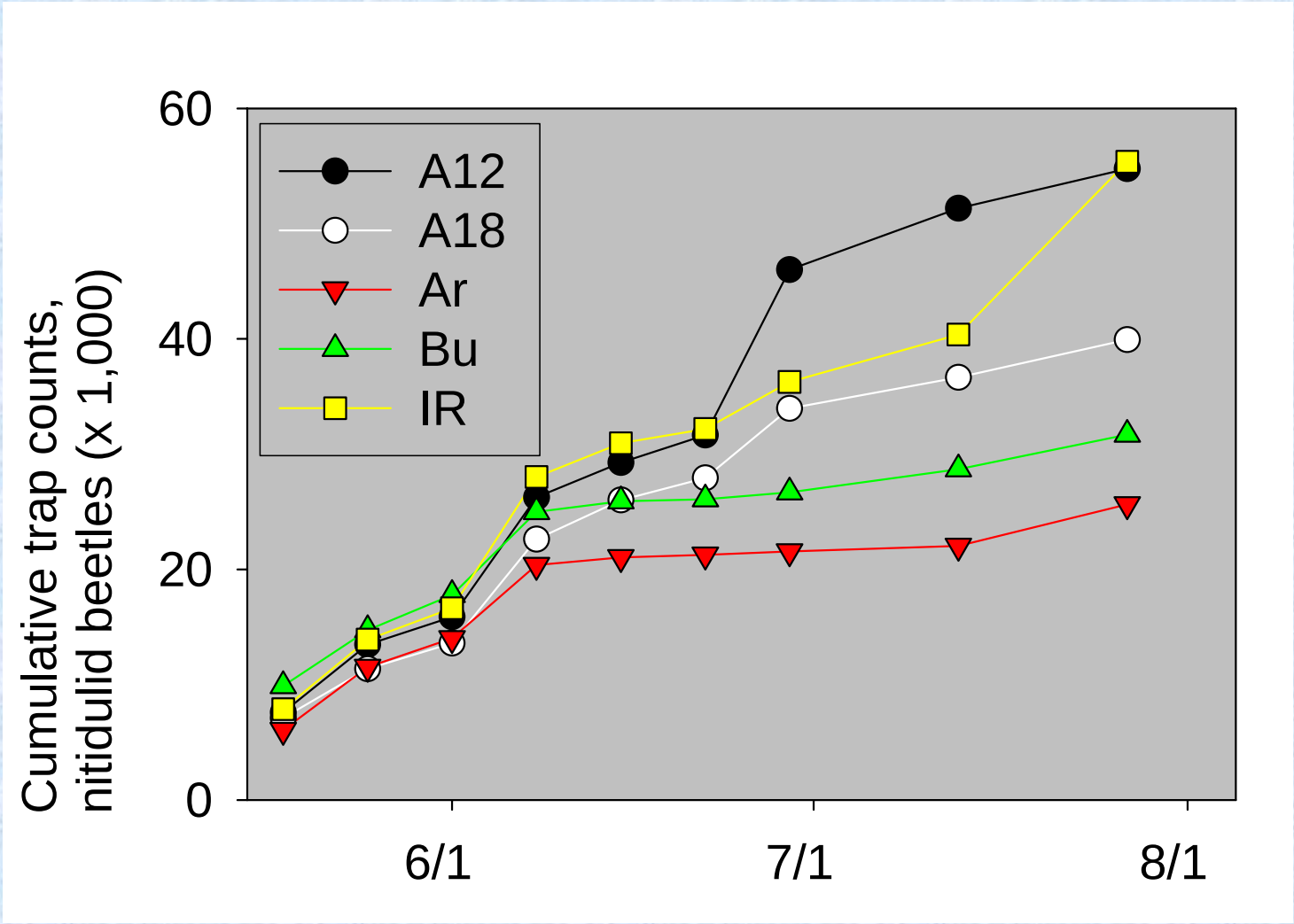


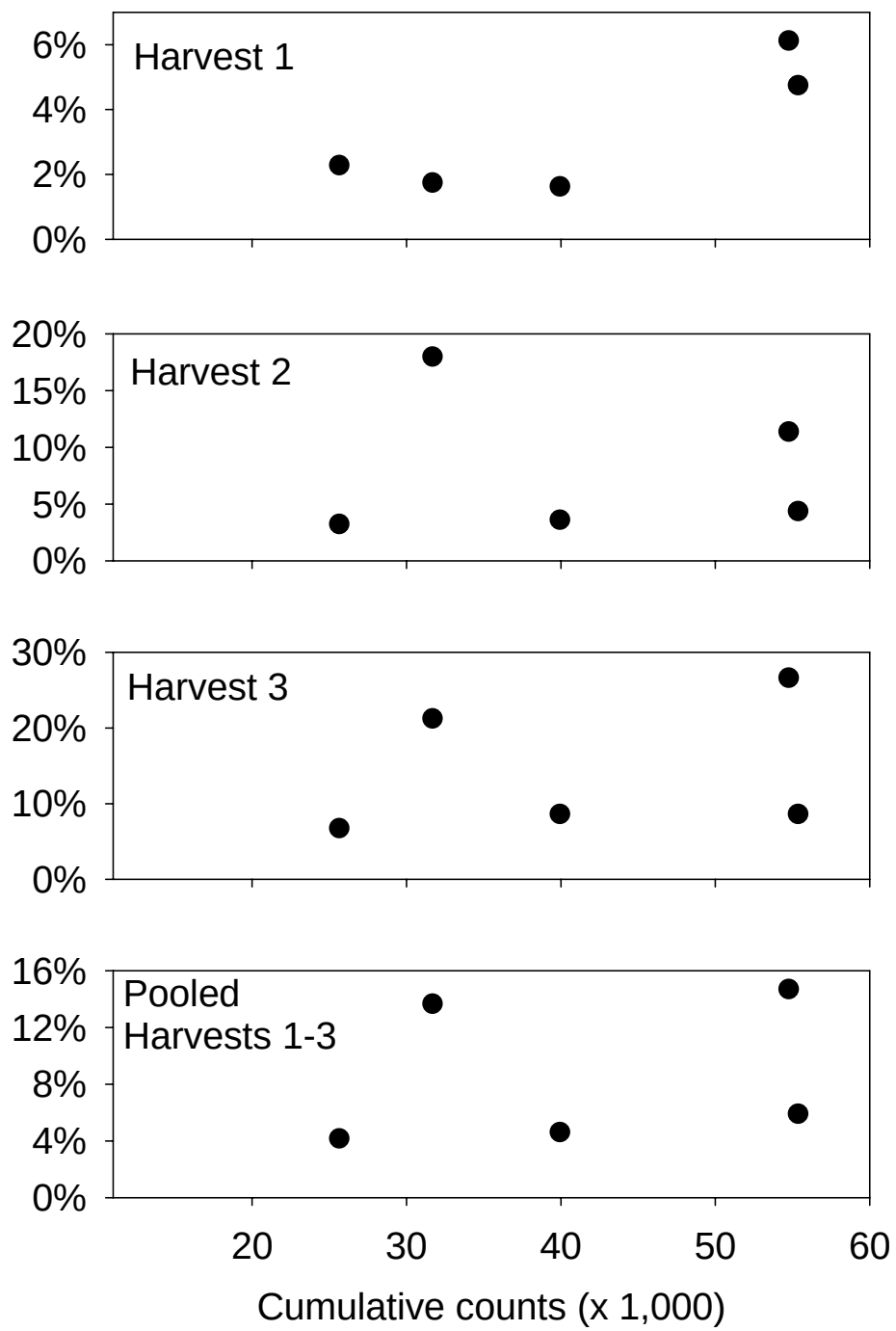
Traps used for monitoring

Navel orangeworm:
Live females as a pheromone source.

Nitidulid beetles:
Rubber septa containing commercial aggregation pheromone, fermenting fruit co-attractant, and a Vapona kill strip.

Nitidulid Trapping Data

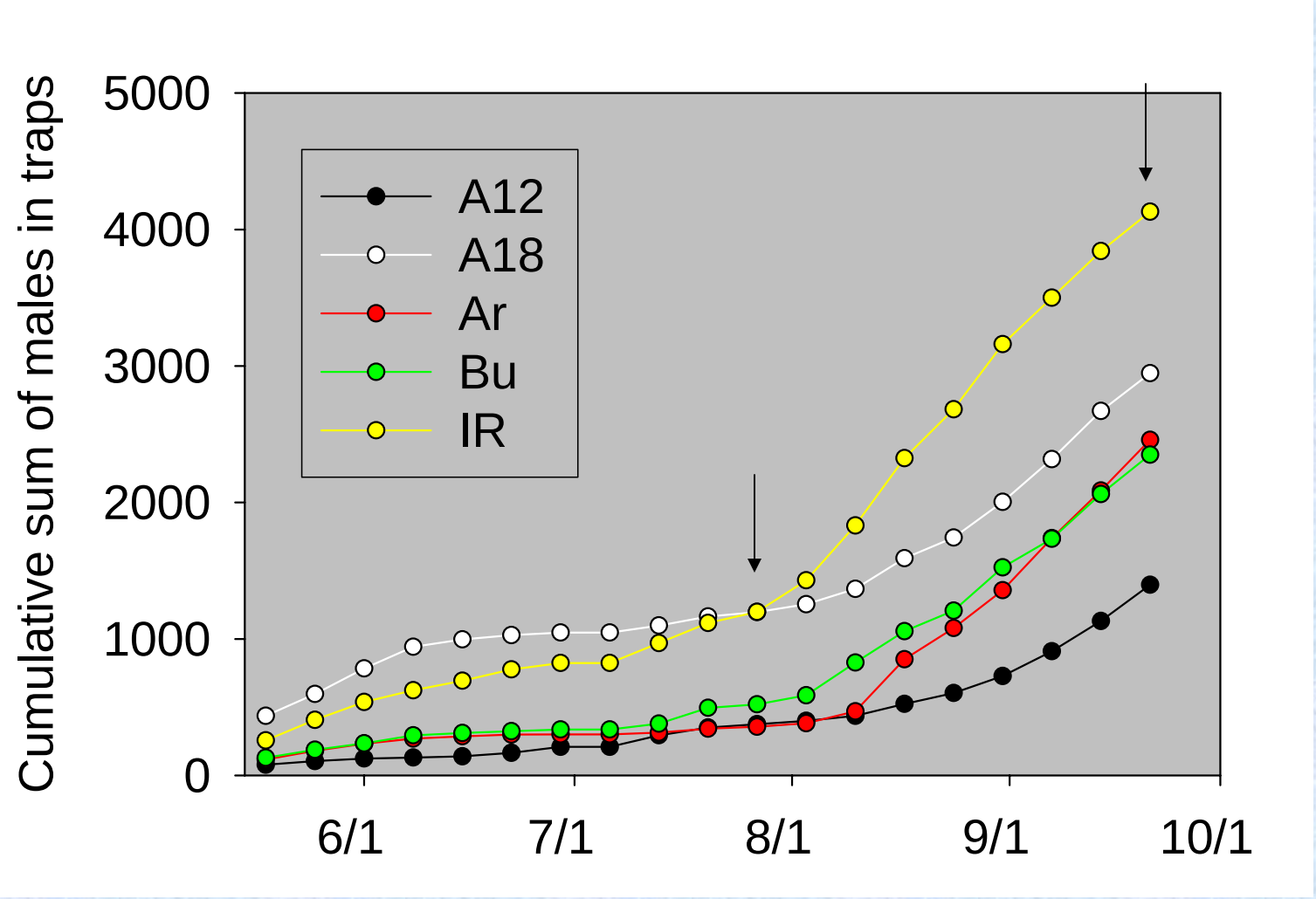




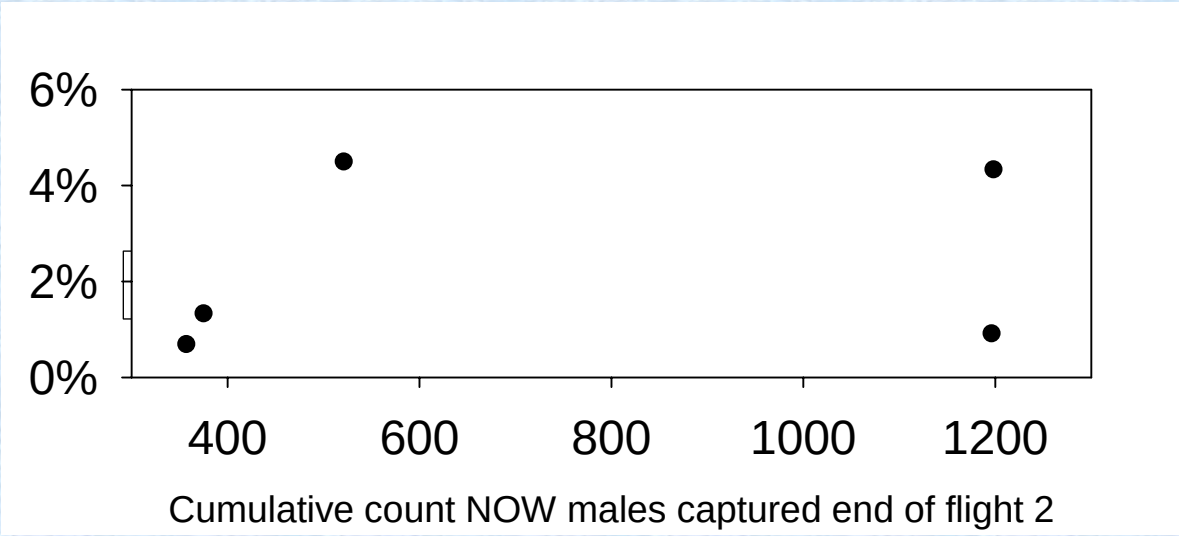
Association of nitidulid trap counts with fig damage

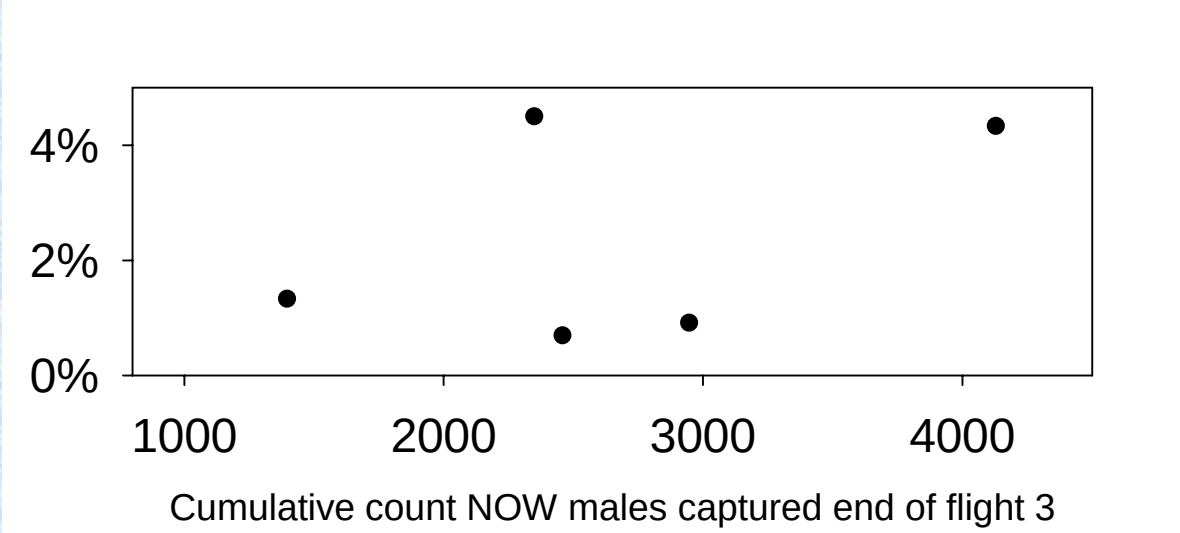
- Significant correlation with first harvest, but not w subsequent harvests
- Orchard history and manager experience a more useful guide

NOW Trapping Data



Association of NOW trap counts with fig damage





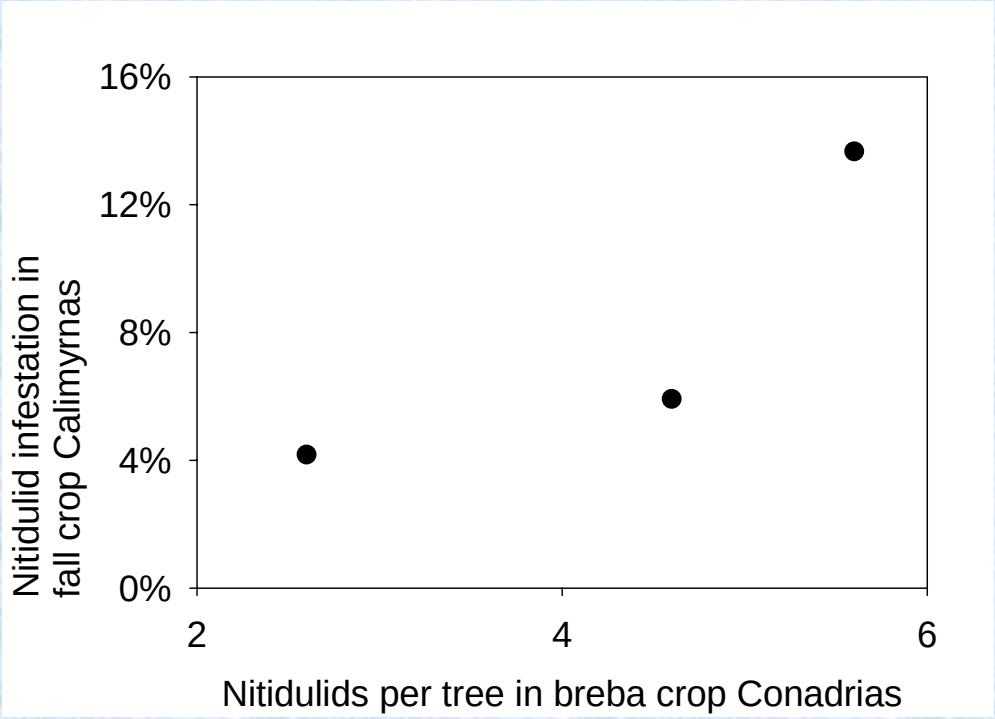
2) Examine association of infestation in breba crop with infestation of fall crop

- Fifteen trees chosen at random from within 40-acre plots of Conadrias at Buchanan Hollow, Arnold Ranch, and Indian Ranch
- Samples of 15 breba figs each taken from top of canopy, bottom of canopy, and orchard floor on four sampling dates: 6/20, 6/28, 7/11, and 7/25
- All figs transported back to our laboratory for analysis of stage of development/decay and for insect infestation
- Full counts taken on 6/28

Density of breba figs at selected locations

Location	Brebas in tree	Brebas on ground
Arnold Ranch	56±9.4a	121±20.4a
Buchanan Hollow	39±5.6ab	95±29.1ab
Indian Ranch	25±4.4b	41±12.4b

Nitidulids—breba infestation and infestation of nearby Calimyrnas in fall crop



- Based on breba count multiplied by infestation...
- 2.6, 5.6, and 4.6 infested brebas per tree for AR, BU, and IR, respectively
- These data suggest association of nitidulid load in Conadria brebas and subsequent damage in nearby Calimyrnas (not surprising), but...
- They do not support hypothesis that low breba load means less damage to fall crop Calimyrnas

3) Compare efficacy of current and candidate insecticides against infestation by nitidulids and NOW

- Treatments: Water only, Malathion, Success, Diazonon, and Intrepid (highest label rate)
- Applied to 20 single-tree plots on 7/26 and 8/9
- Harvested figs weeks of 8/15, 8/22, and 8/29
- All assessment in our laboratory
- Currently have assessed 352 of 4,637 figs (all from first week

Nitidulid data, UCKAC figs

Treatment	n	% Infest
Control	108	55%a
Malathion	57	54%a
Success	85	54%a
Diazinon	35	20%b
Intrepid	67	16%b

Based on evaluation of only 8% of sample, all from week 1

Thank you!