

# Biology and Management of the Pacific Flatheaded Borer

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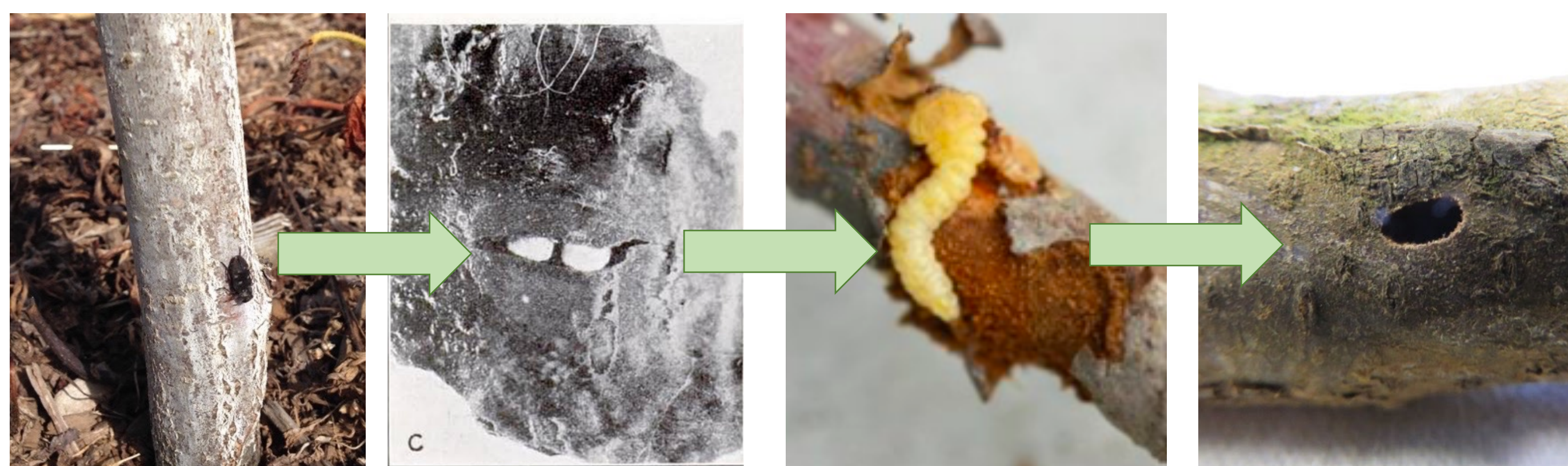


## Introduction

- Pacific Flatheaded Borer *Chrysobothris mali* Horn (PFB) is a native buprestid wood boring beetle
- PFB attacks a wide range of hosts, including hazelnuts
- PFB pose a threat to first-leaf hazelnut orchards, sometimes causing more than 30% mortality
- Borers are attracted to stressed trees

## Borer Life Cycle

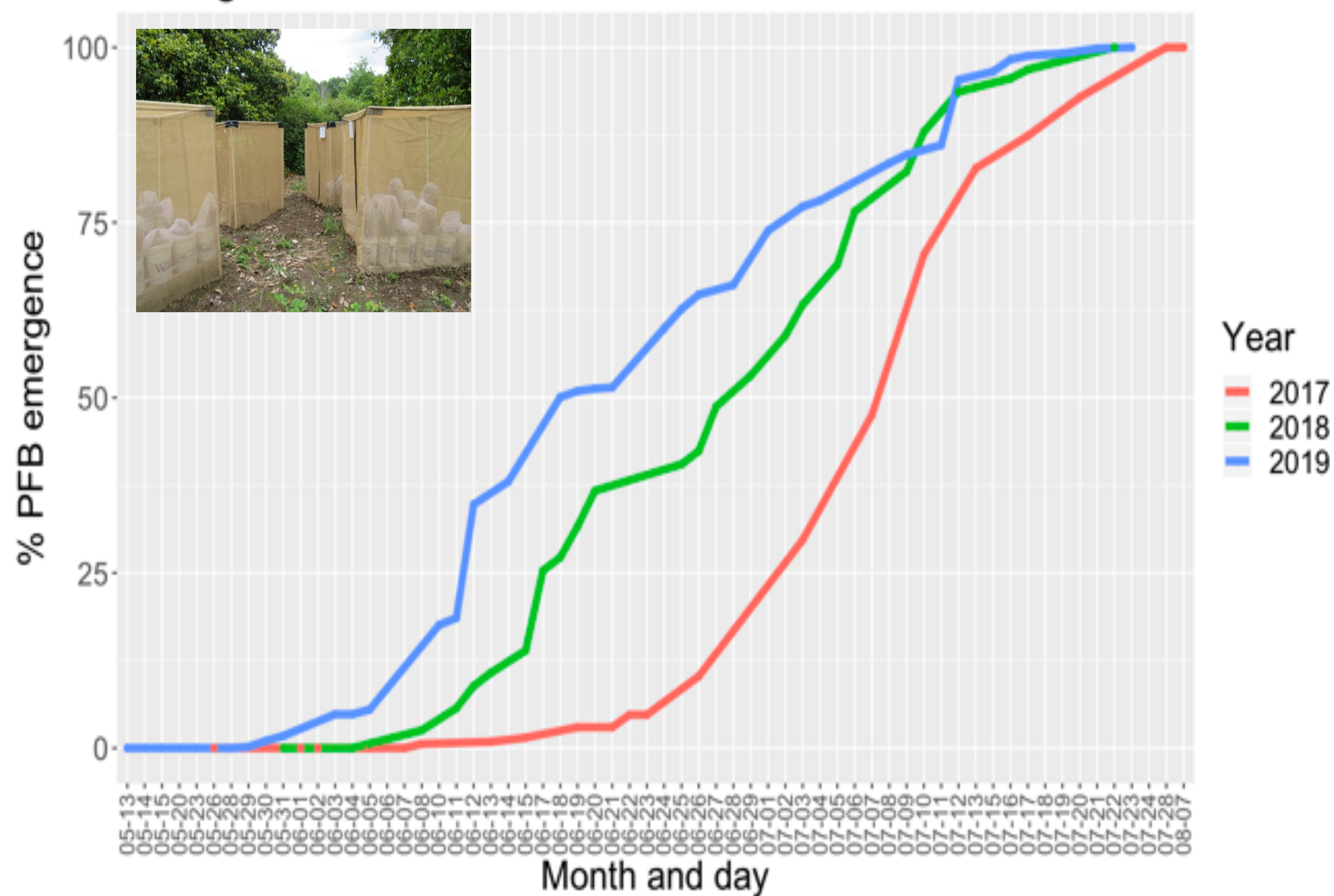
1. Adult PFB females lay their eggs on bark of young trees
2. Larvae feed underneath bark, girdling the tree before burrowing into the center to overwinter in the pupal cell (sometimes far)
3. Adults emerge late spring, mate and then begin laying eggs



## Adult Borer Emergence

- In the Willamette Valley adult PFB begin emerging at the end of May or early June, depending on weather
- Adult emergence is prolonged, lasting ~50 days
- Emergence peak may change due to shifting climates

### Emergence of Pacific flatheaded borer



**Figure 1:** Emergence of adult borers in 2017-2019 over time. Peak adult emergence occurred early July.

## Borer Damage



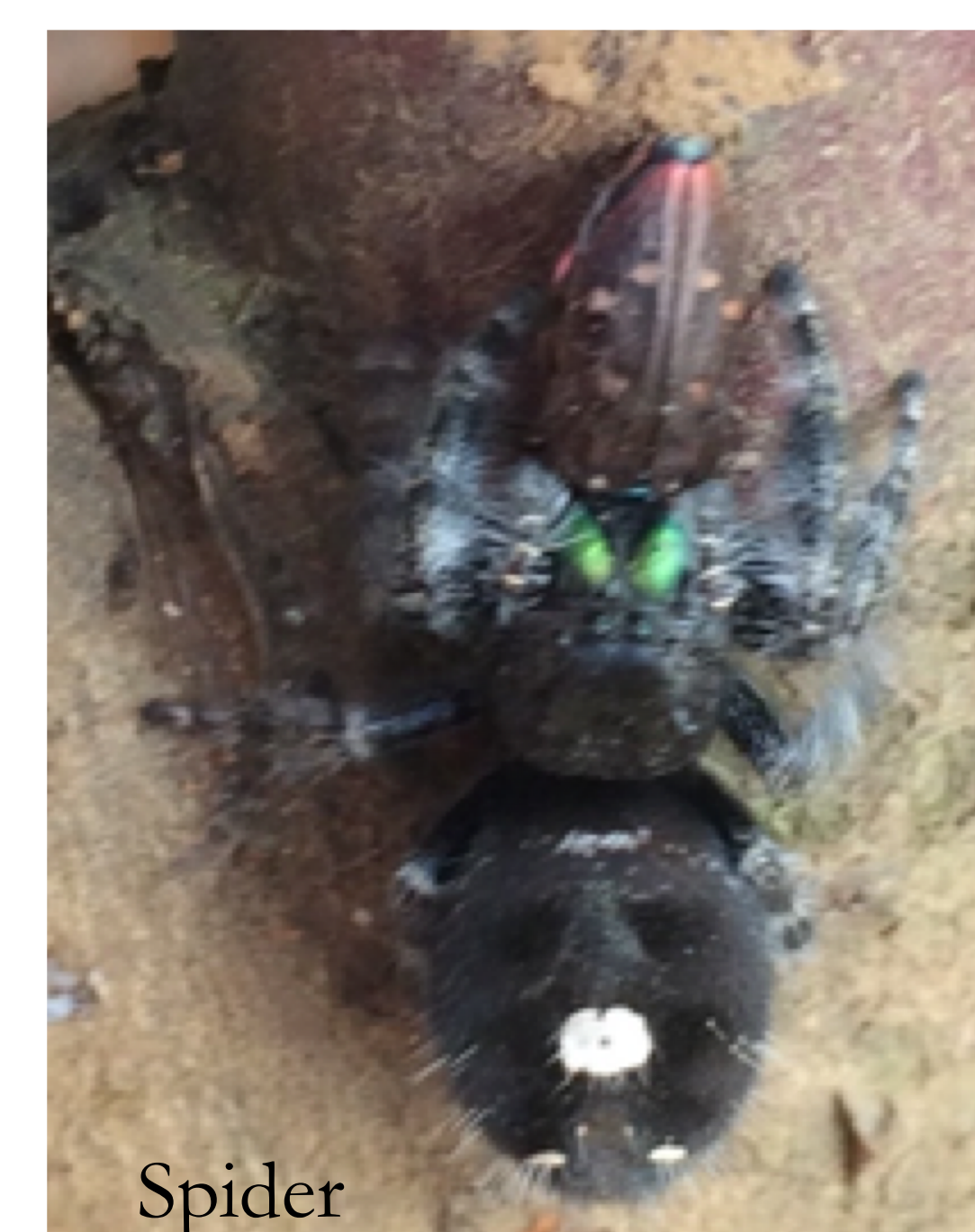
**Figure 2:** Examples of PFB damage.

## Cultural Control Tactics

- Adequate irrigation and nutrient management
- Protect trees from sunburn using trunk guards or white latex paint
- Avoid mechanical and chemical damage to trunks

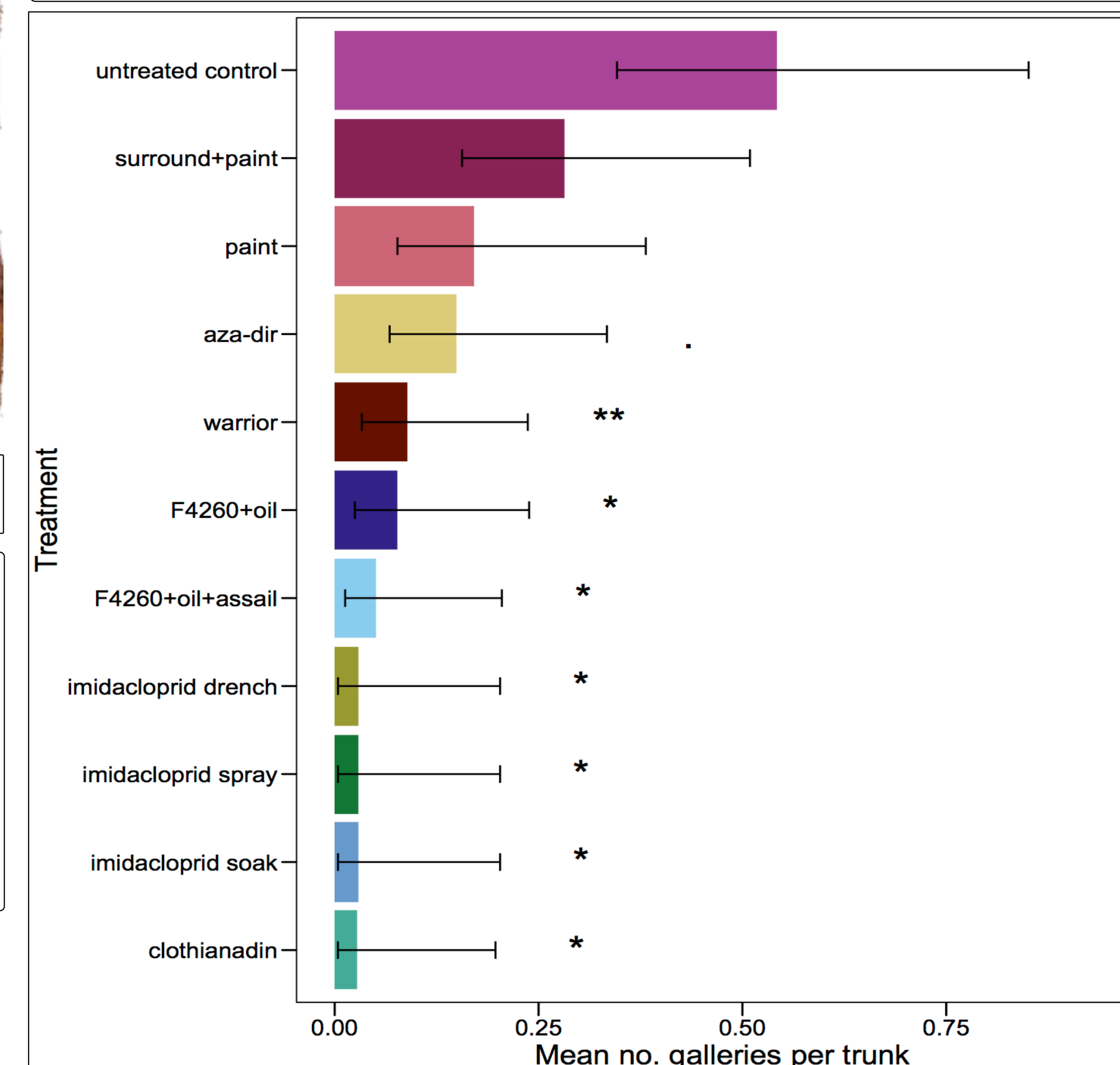
## Natural Enemies

- Several beneficial arthropods will feed on PFB
  - Spiders
  - Harvest mites
  - Parasitoid wasps

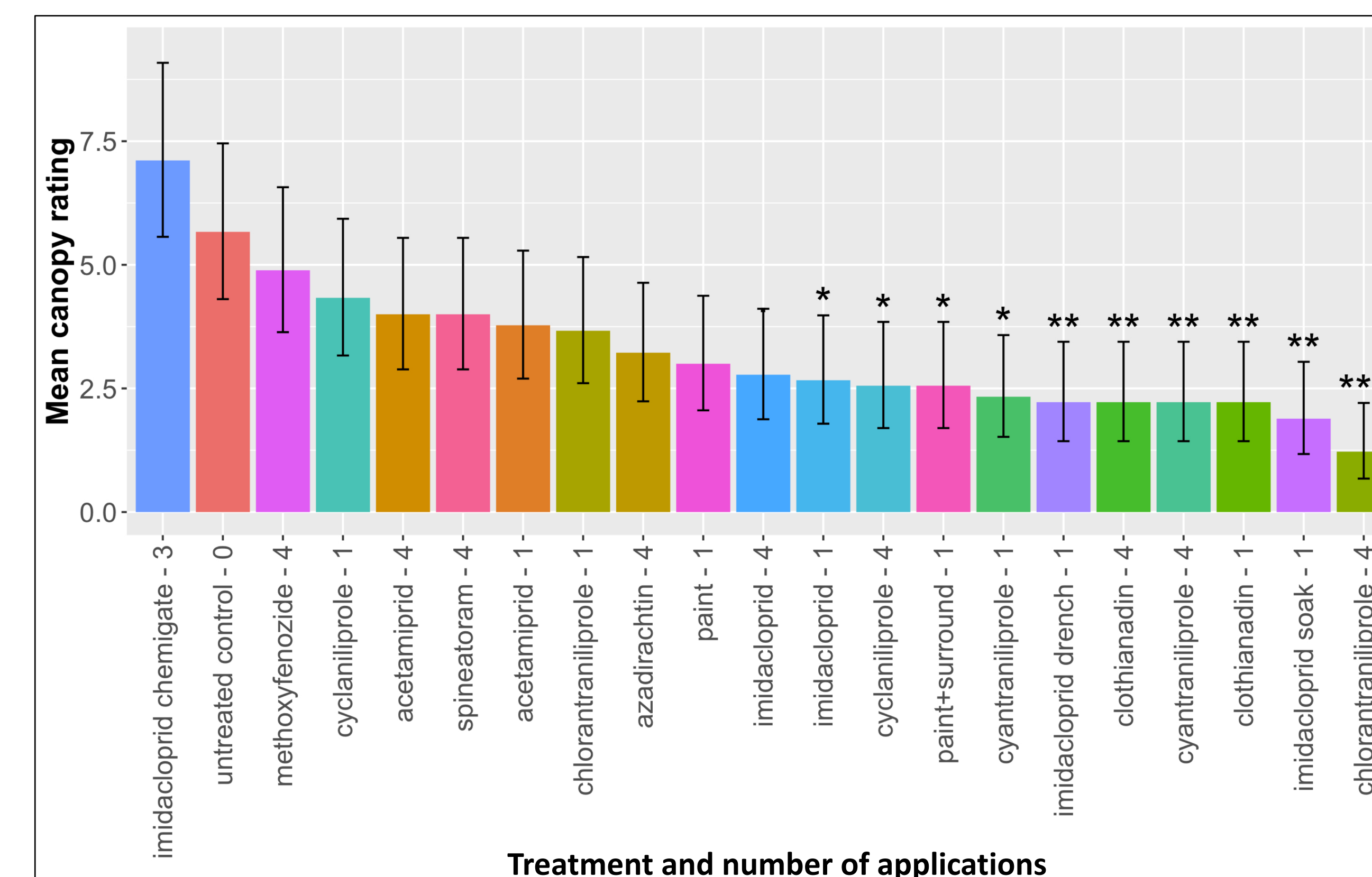


## Chemical Control Tactics

- Cultural control is the first line of defense, but under high pressure, chemical controls can prevent damage if properly timed
- Note: clothianidin is registered for use against PFB, Treating for aphids with imidacloprid at the proper time can control PFB. Always check the label before applying any pesticide to a crop
- Diamides are a promising alternative to neonicotinoids



**Figure 3:** Mean number of PFB galleries per tree from trees treated in 2018. Asterisks indicate statistical differences from the untreated control ( $P < 0.10 = .$ ,  $P < 0.05 = *$ ,  $P < 0.01 = **$ ,  $P < 0.001 = ***$ ).



**Figure 4:** Mean canopy rating of trees treated in 2019. Note: higher rating indicates more chlorosis/necrosis. Common insecticide names: clothianadin= Belay, cyantraniliprole= Exirel, chlorantraniliprole= Altacor.