Managing stink bugs through cultural practices

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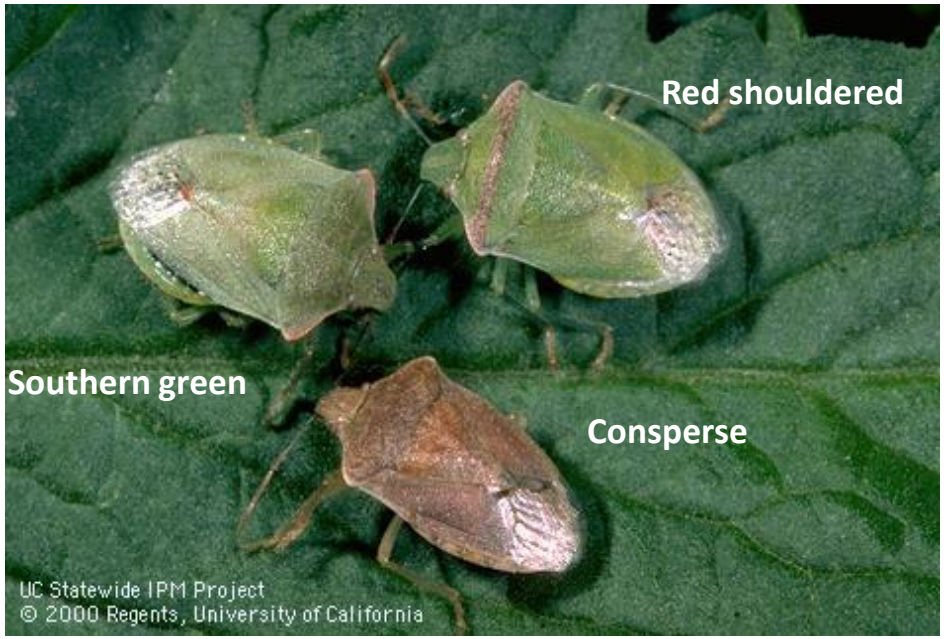
Common stink bugs: Southern green (Africa 1986); Others native

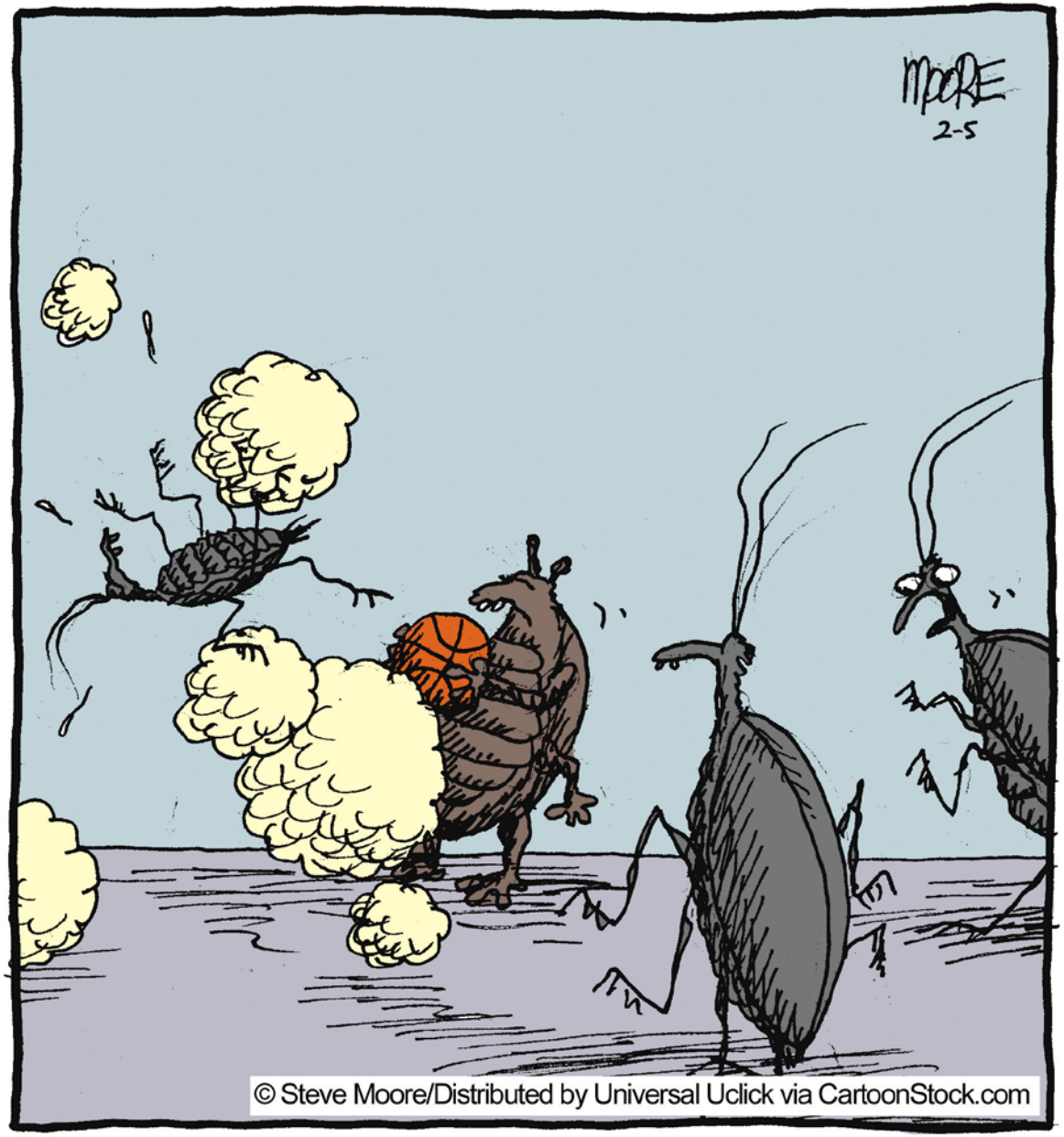
Stink bug Pests in California



Bagrada bug, NEW, 2008

Brown stink bug, NEW
Southern desert area

Brown marmorated stink bug, NEW, 2006



"I *hate* playing stinkbugs! Every time we press them on defense, they just let 'er rip!"

Stink bugs

- Don’t sting or bite, but stink (alarm pheromones).
- Aggregation/attraction pheromones: Lures in traps for possible early detection in fields.
- Adults live for 6-8 months
- 2-3 generations per year
- Cyclical (have outbreak years)
- About size of dime, except bagrada bug

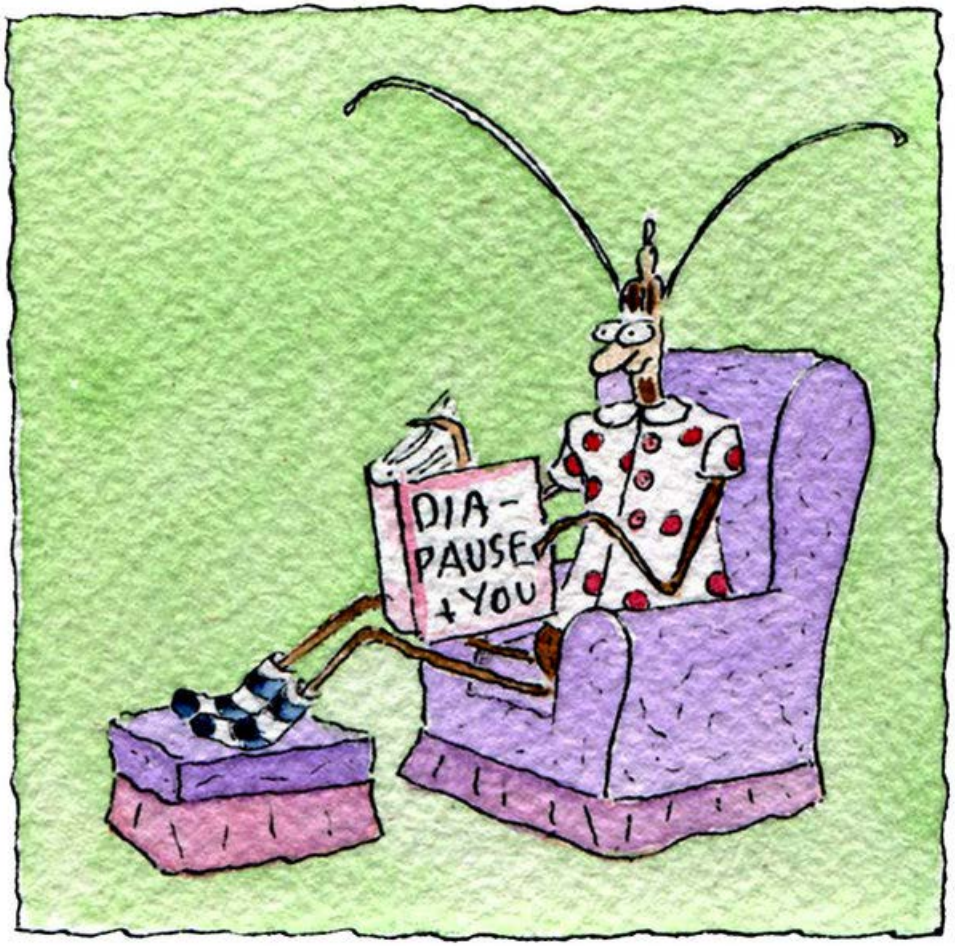
- Needle like mouthparts: inject digestive enzymes
- Most have wide host range

Bagrada bug

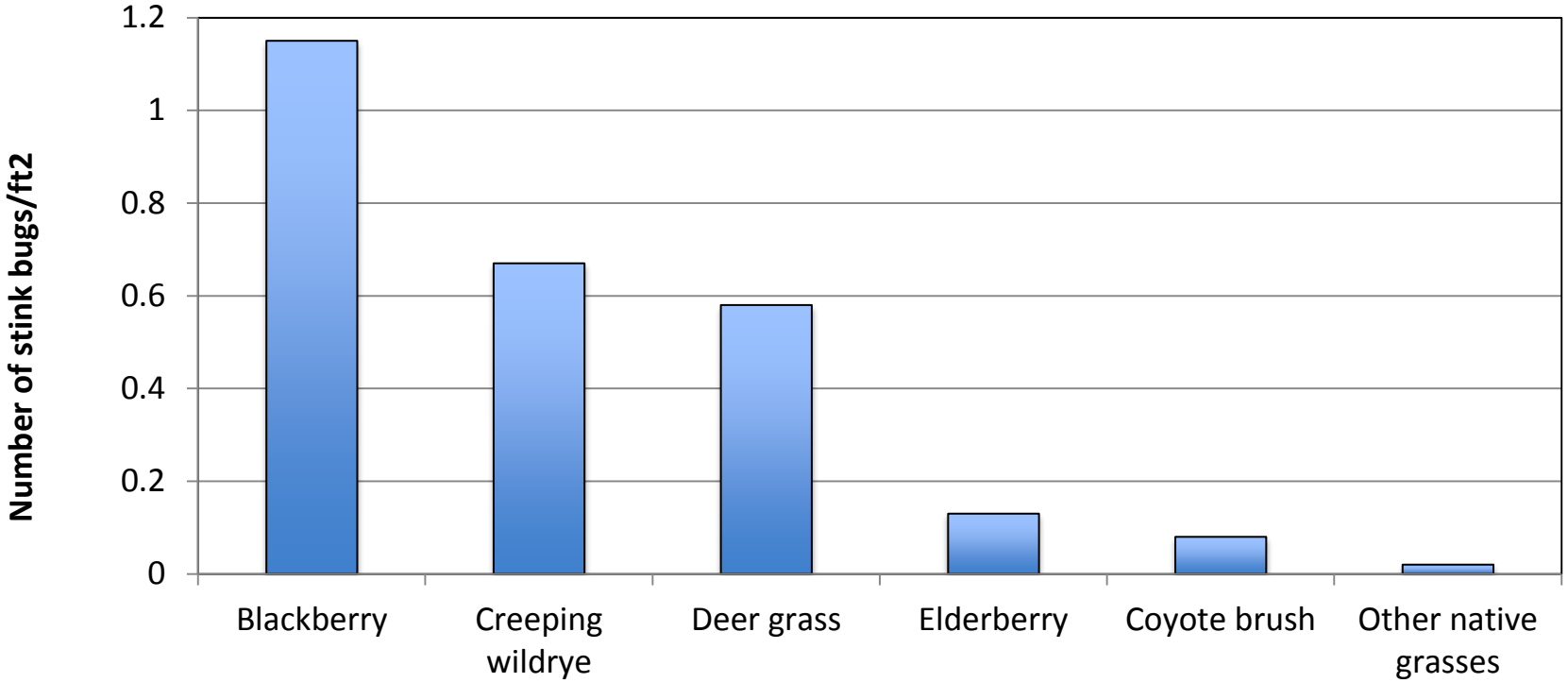
- Primarily brassicas
- Also damage growing point (apical meristem)

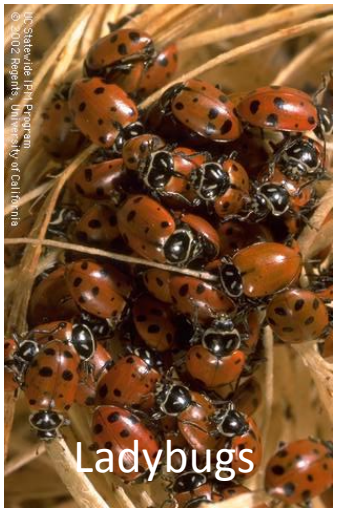
Stink bugs generally overwinter outside fields as adults in a dormant state, singly or in groups, (except bagrada bug)

Diapause=Hibernation



Overwintering sites: Consperse, red shouldered and southern green





Behind tree bark, buildings, boards, and leaf litter

Life cycle:
Consperse, red shouldered, southern green stink bug

Control weeds around fields (blackberries, mustard, radish, *Malva*)

- Herbicides
- Mowing
- Discing
- Replace weedy vegetation with native California plants that are non-hosts.


Hedgerow


Control
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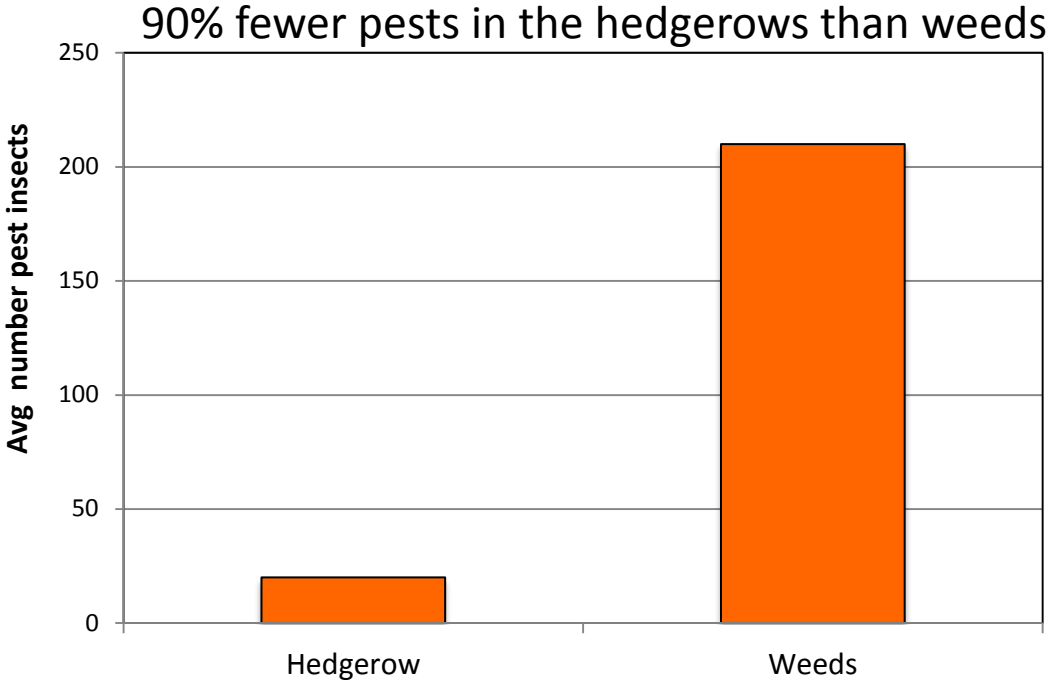
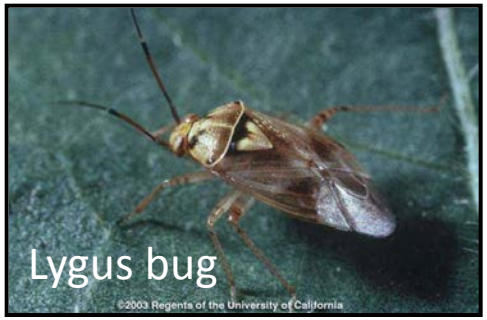

90% fewer pests in the hedgerows than weeds
Avg number pest insects
250
200
150
100
50
0
Hedgerow
Weeds


Lygus bug
©2003 Regents of the University of California


Flea beetle
©2003 Regents of the University of California


Cucumber beetle
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Stink bug

Conserving natural enemies is also important for managing stink bugs

Main types of natural enemies are Predators and Parasitoid wasps (Parasites)

Predators of stink bug nymphs

(Larva)

Lacewing (Adult)

Stink bug nymphs

Collops beetle

Lady beetle

Predatory bugs- feed on stink bug nymphs

(Nymph) Minute pirate bug (Adult)

(Nymph) Big-eyed bug (Adult)

(Nymph) Assassin bug (Adult)

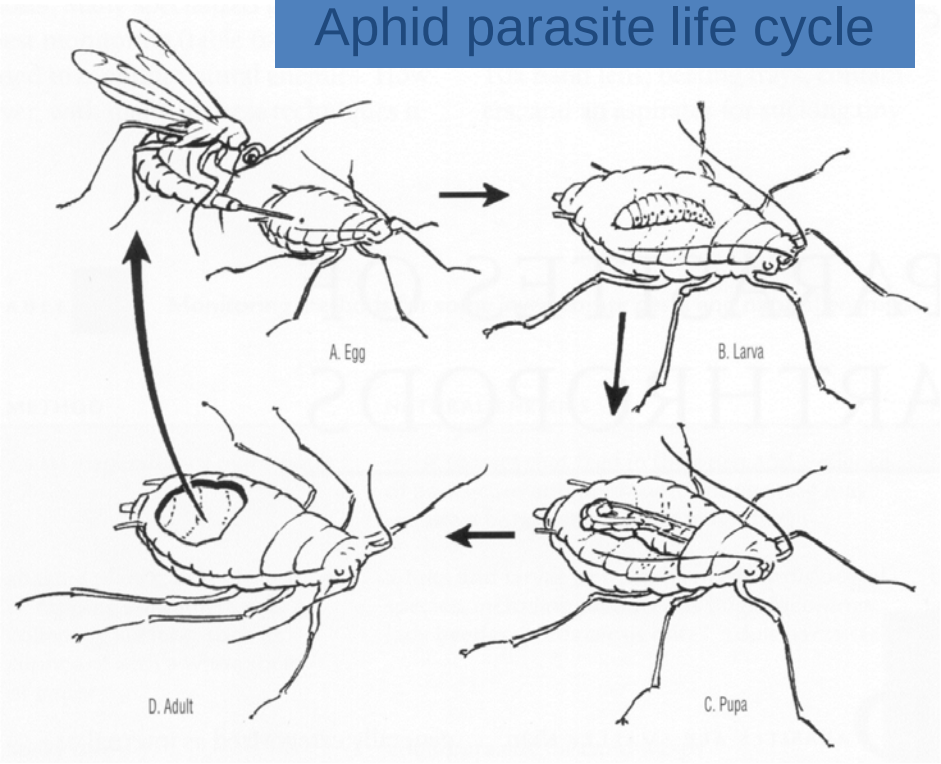
Parasitoid wasps (parasites) that prey on stink bugs

Egg parasitoid wasps, 15%-25% parasitism per egg mass in tomatoes

Parasitoid wasps in tomatoes

Caterpillar parasitoid

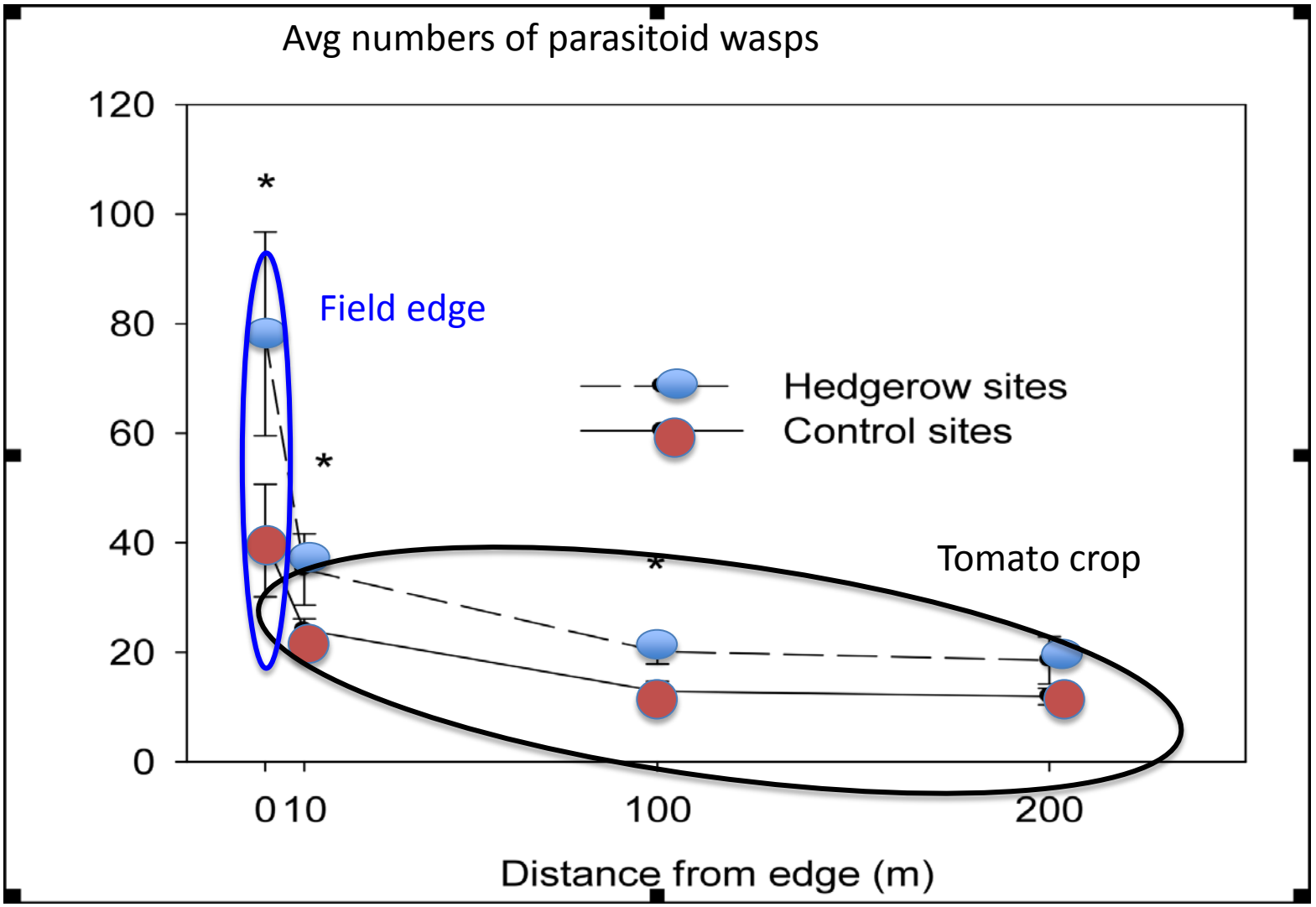
Aphid parasite life cycle

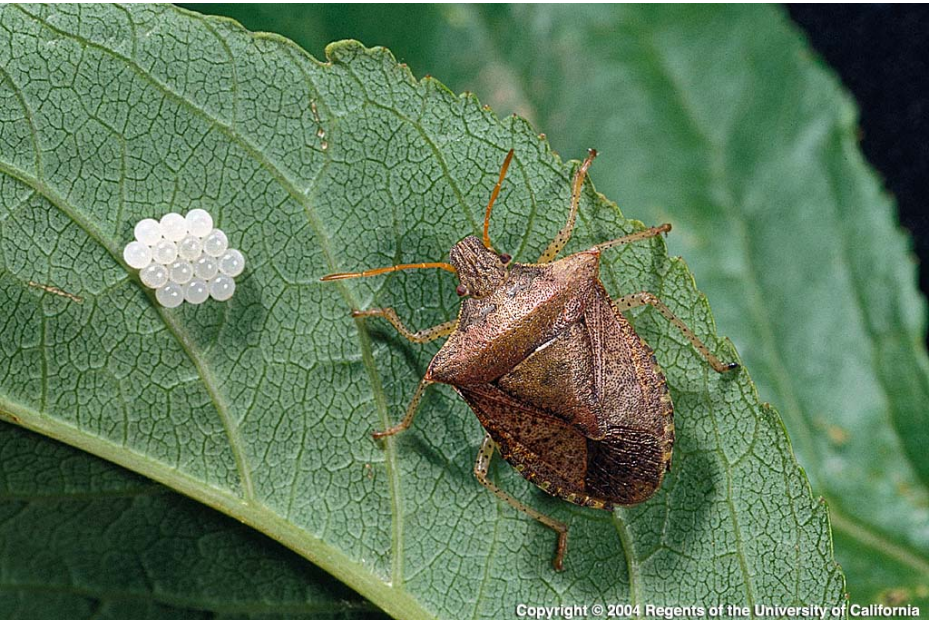


Hedgerows of flowering plants enhance natural enemies on farms

- Adult parasitoid wasps rely on nectar from flowers.
- Natural enemies live longer and lay more eggs with floral resources.

Hedgerows had 50% more parasitoid wasps and exported 10% more parasitoid wasps into adjacent crops than weedy control field edges.

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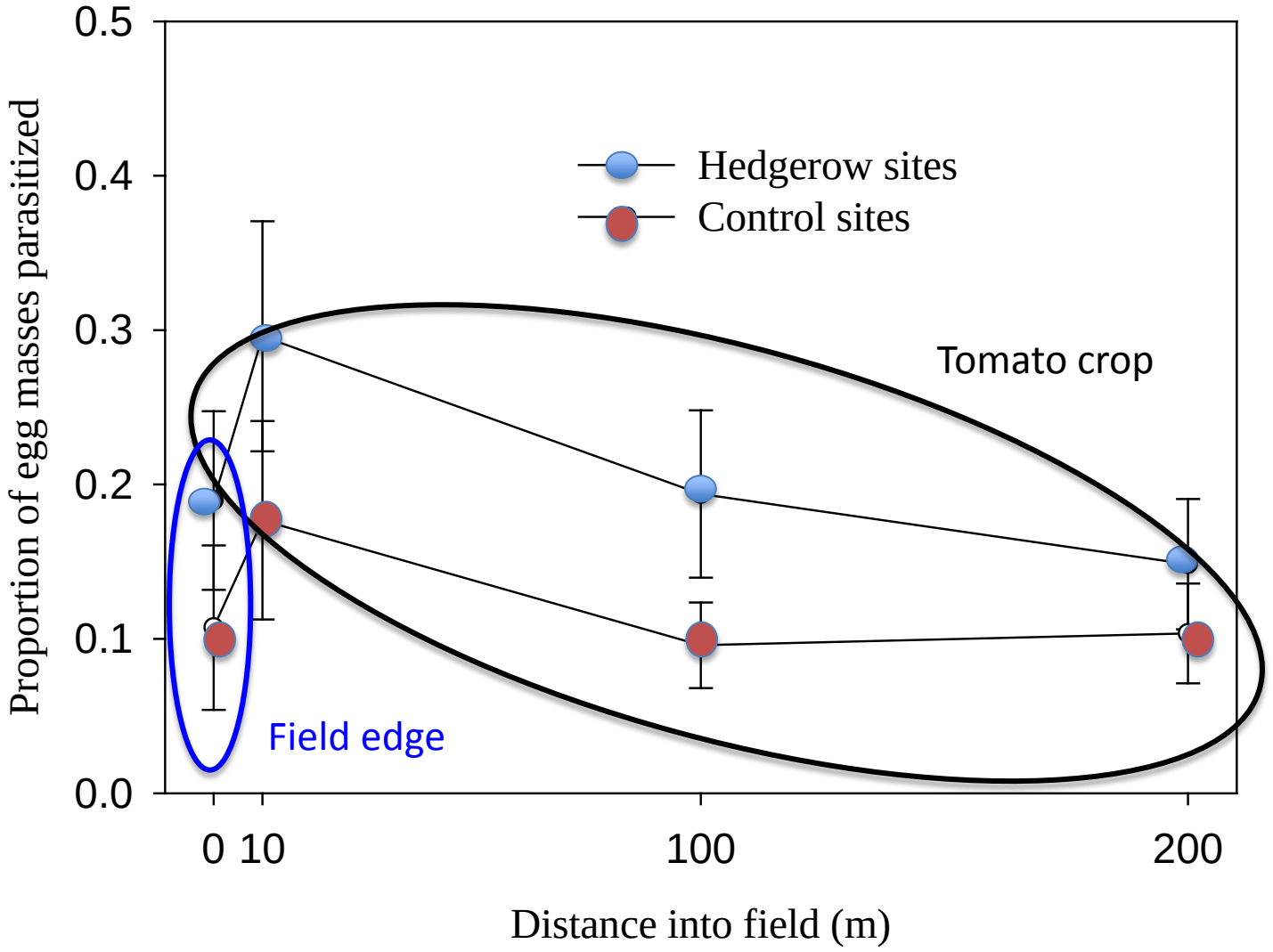
Stink bug parasitism in tomato fields 10% higher with hedgerows.



Monitor Crops: Record the numbers of pests and beneficial insects to determine economic threshold levels for treatment timing.

UC IPM
www.ipm.ucdavis.edu

Tomato—Potato(Aphid(Monitoring

Supplement(to(UC(IPM(Pest(Management(Guidelines:(Tomato

Grower/Orchard_____**-Date**_____

Field-location_____

How-to-monitor

1.# Pick#the#leaf#below#the#highest#open#flower#on#30#plants#selected#at#random#throughout#the#field.
2.# Record#presence#or#absence#of#potato#aphid#on#each#leaf.##Also#note#natural#enemies,#including#lady#beetles,#syrphid#fly#larvae, and#aphid#mummies.

Information#collected#over#a#period#of#years#tells#you#how#weed#populations#are#changing#and#how#effective#your#management operations#have#been.

Leaf	Potato-aphid (+/-)	Natural-enemies
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
Total leaves infested		
Treatment threshold	Treatment#is warranted#if#50–60% of#leaves#are#infested.	High#rates#of parasitization#or predators#may#reduce aphid#numbers#before they#reach#these thresholds.

http://ipm.ucdavis.edu

Pesticide Toxicity to Natural Enemies
http://ipm.ucdavis.edu

Toxicity of insecticides used in tomatoes to natural enemies

Insecticide	Toxicity
microbials, **XenTari, Agree, Grandevo**	Low
chlorantraniliprole, **Coragen**	Low
flubendiamide, **Synapse, Belt**	Low
methoxyfenozide, **Intrepid**	Low
indoxacarb, **Avaunt**	Low
flonicamid, **Beleaf**	Low
spinosad, **Success, Entrust**	Low/Moderate
spinetoram, **Radiant**	Low/Moderate
neonicotinids, **Assail, Admire, Venom, Belay**	Low/Moderate
Endosulfan, **Thionex**	Moderate
sulfur	Low/High*
organophosphates, **Malathion, Dimethoate**	High
carbamates, **Lannate, Sevin**	High
pyrethroids, **Warrior, Baythroid, Capture, Asana**	High

Worms

Lygus, aphids

Thrips/worms

Stink bugs

*High toxicity to parasitoids

Online resources: http://ipm.ucdavis.edu

Identification: Natural Enemies Gallery

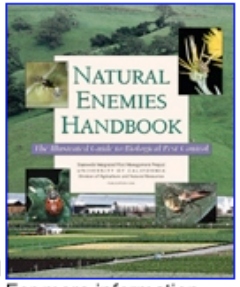
List enemies: | By order and family name | By scientific name | By pest |

Predators
Insect parasites (parasitoids)

The UC IPM Natural Enemies Gallery includes natural enemy species commonly found on California farms and in landscapes. Additional species will be added over time. Acknowledgments

Natural enemies are organisms that kill, decrease the reproductive potential or otherwise reduce the numbers of another organism. Natural enemies that limit pests are key components of integrated pest management programs. Important natural enemies of insect and mite pests include predators, parasites, and pathogens.

See also: Biological Control and Natural Enemies Pest Note.



For more information about natural enemies, purchase this UC IPM book.

Predators: A predator is an organism that attacks, kills, and feeds on several to many other individuals (its prey) in its lifetime.

Common name	Scientific name
Assassin bugs	Reduviidae family
Bigeyed bugs	*Geocoris* spp.
Brown lacewings	*Hemerobius* spp.
Convergent lady beetle	*Hippodamia convergens*
Damsel bugs	*Nabis* spp.
Decollate snail	*Rumina decollata*

Order: Hemiptera
Family: Anthocoridae

Common prey: Predaceous on a wide variety of small insects. Used in greenhouses for controlling thrips.

Commercially available: Yes (*Orius* spp.)

UC IPM STATEWIDE INTEGRATED PEST MANAGEMENT PROGRAM
UNIVERSITY OF CALIFORNIA AGRICULTURE & NATURAL RESOURCES

Agricultural pests

Information about managing pests, including University of California's official guidelines for monitoring pests and using pesticides and nonpesticide alternatives for managing insect, mite, nematode, weed, and disease pests.

Index by crop

A – C (#cropsA) · D – O (#cropsD) · P – Z (#cropsP)

Includes ***Year-Round IPM Program*** *(http://www.ipm.ucanr.edu/IPMPROJECT/yrp_training.html)*, *with annual checklist.*

- **Alfalfa** (http://www.ipm.ucanr.edu/PMG/selectnewpest.alfalfa-hay.html)
- **Almond** (http://www.ipm.ucanr.edu/PMG/selectnewpest.almonds.html)
- **Apple** (http://www.ipm.ucanr.edu/PMG/selectnewpest.apples.html)
- **Apricot** (http://www.ipm.ucanr.edu/PMG/selectnewpest.apricots.html)
- **Artichoke** (http://www.ipm.ucanr.edu/PMG/selectnewpest.artichoke.html)
- **Asparagus** (http://www.ipm.ucanr.edu/PMG/selectnewpest.asparagus.html)
- **Avocado** (http://www.ipm.ucanr.edu/PMG/selectnewpest.avocado.html)
- Barley (see **Small Grains** (http://www.ipm.ucanr.edu/PMG/selectnewpest.small-grains.html))
- Beans (see **Dry Bean** (http://www.ipm.ucanr.edu/PMG/selectnewpest.beans.html))

Cultural practices for stink bug management

- Control weedy vegetation around fields that are hosts to stink bug: mustard, radish, *Malva*, blackberry
- Remove overwintering sites where possible (lumber, wood piles)
- Conserve and enhance beneficial insects:
  - Monitor and use of economic thresholds for pests
  - Use selective pesticides with minimal impacts to beneficials
  - Hedgerow plantings of native California plants for floral resources for natural enemies

Brown marmorated stink bug, BMSB

Possible release of egg parasitoid from China for BMSB in 2016