Insect dynamics in hedgerows

Rachael Long, Farm Advisor, Yolo Co., CA
Hedgerow research sites, Yolo County, 1992-2011

**Crops:**
- Processing tomatoes
- Alfalfa
- Wheat
- Seed crops (sunflower)
- Almonds

**Collaborators**
- UC Davis
- UC Berkeley
- Yolo RCD
- Hedgerow farms
Hedgerows: Rows of trees, shrubs, grasses, forbs that surround farm fields. In existence for thousands of years. Relic of cleared lands, natural dispersal, or direct plantings.
Hedgerow Benefits

- Enhance biodiversity
- Weed suppression
- Filter traps (air and water quality protection)
- Erosion control
- Windbreaks
- Beneficial insect and pollinator habitat

Insectary Hedgerow
Many beneficial insects need nectar and pollen to survive and reproduce.
Syrphid flies: Water 50 eggs; Pollen: 500 eggs

Wasps: Longevity
Water: 2 days
Nectar: 9 days
% Rubidium marked beneficial insects in crops adjacent to hedgerows.

Lacewings 20-450 ft; parasitic wasps, lady beetles 250 ft.

Percent Rubidium marked beneficial insects in trees 100 ft from insectary cover crop

- Wasps: 7% labeled
- Lacewings: 23% labeled
- Syrphid flies: 69% labeled
Grape leafhopper

Anagrus parasitoid

Grape leafhopper egg parasitized by Anagrus

Anagrus overwinters outside vineyards
Up to 34% of Anagrus in grape vineyards came from prune hedgerows in rubidium marking studies.
Native California shrubs and grasses

- Buckwheat
- Coffeeberry
- Coyotebrush
- Elderberry
- Toyon
- Ceanothus
- Purple needlegrass
- Creeping wildrye
Beneficial and pest insects per 10 sweeps in weeds vs. native perennial grasses, Yolo Co., CA 1999-2000.
Average number of pest and beneficial insects per sample site

Overwintering Data

Very few pests overwintering in hedgerows (~1% of samples had stinkbugs). Lady beetle aggregations in deergrass.
Impact of hedgerows on pest management: 20% higher parasitism in fields that have hedgerows compared to fields with weedy edges.
Mean proportion of stinkbug egg parasitism between distances from the field edge by treatment, Yolo County, CA 2009.
Currently working on models to show economic benefits of hedgerows and ecosystem services they provide in terms of both pollination and pest control.
In 74% of cases studied, landscapes with high proportions of non-crop habitat had enhanced natural enemy populations in crop fields.
Establishing hedgerows on farm in California, ANR 8390, 2010.
A WORKSHOP ON:
INSECTARY HEDGEROWS
Hedgerows for pollinators and beneficial insects

Thursday, September 8, 2011
7:45am-Noon
Esparto, California

TOPICS WILL INCLUDE:
- Incorporating hedgerows into a farming operation
- Funding incentives for hedgerow installation
- Benefits of native pollinators on crop production
- Attracting beneficial insects to farm edges
- Selecting plants to maximize insectary habitat
- Incorporating forbs into hedgerows
- Achieving a successful installation

To register and for directions, please contact Sheila Pratt at pratt@yolocd.org or (530) 662-2037 ext. 117

WORKSHOP AGENDA

7:45-8:00am  Arrival and Sign-in
8:00-8:05am  Welcome: Yolo County Resource Conservation District (RCD)
8:05-8:20am  Farming with Hedgerows: John Stephens of Oakdale Ranch
8:20-8:30am  Cost-Share Opportunities and Technical Support: Natural Resource Conservation Service (NRCS)
8:30-9:00am  Benefits of Hedgerows in Hedgerows: Rachael Long of UC Cooperative Extension
9:00-9:30am  Hedgerows for Native Bees: Contributions to Crop Pollination: Jess Guise of Xerces Society
9:30-10:15am  (Break) Walking Tour of a Mature Hedgerow
10:15-10:45am Site Preparation, Installation, and Maintenance: Jeanette Wysinski and Heather Crowell of Yolo RCD
10:45-11:15am Shrub and Trees for Insectary Hedgerows: Taylor Lewis of Cornflower Farms
11:15-11:45pm Wildflowers for Pollinators: John Anderson of Hedgerow Farms
11:45-12:00  Installing and Maintaining Forb Strips: Jess Guise
12:00-12:30pm  (Optional) Informal Discussion and Networking

NRCS  Yolo County CD  UC Cooperative Extension  UC CE
High abundance of vinca (periwinkle) in riparian areas correlated with high Pierce’s incidence. Himalayan blackberry is also an important host for Pierce’s disease that’s vectored by sharpshooters.