

Resources

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California lilac, *Ceanothus* 'Ray Hartman'



A hedgerow, comprised of plants native to California, in Salinas, CA.

Check with your local Native Plant Society or Conservation District for lists of plants adapted to your region!

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Hedgerows: Enhancing Agroecological Services



Hedgerows are linear assemblages of trees, shrubs, herbs and grasses densely planted along the borders of fields. Hedgerows provide multiple services including windbreak, erosion control, restoration of biodiversity, pollination, and biological control.

Multiple Services

Windbreak



Tall dense hedgerows, planted perpendicular to prevailing winds, effectively protects crops from damage associated with wind. Wind can carry soil particles and agricultural chemicals, which can reduce crop quality and marketability. Strong winds can also stunt crop growth and hamper fruit production resulting in lower yields.

Erosion Control & Water Conservation

Many of the perennial plants used in hedgerows have deep fibrous root systems that can retain soil along sloped terrain and capture sub-surface nutrients that might otherwise leach into groundwater.

Biodiversity

Hedgerows restore the diversity of native plants in agroecosystems and in so doing, provide habitat for a diversity of animals that use those plants for food and shelter. The presence of birds, reptiles, small mammals, butterflies and ground beetles has been well documented in European hedgerows. Hedgerows have also been used to provide habitat for game species like pheasant. When connected to riparian habitat or forest fragments, hedgerows can act as corridors for animal movement.

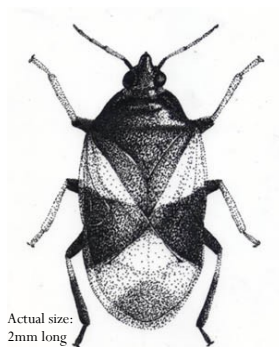
Pollination

Hedgerows provide nesting sites (wood branches and exposed soil) and nectar to wild bees, which contribute to the pollination of fruit, nuts, melons, tomatoes and other important crops. Domestic bee colonies can also be supported by hedgerows when crop flowers are not available.

Biological Control

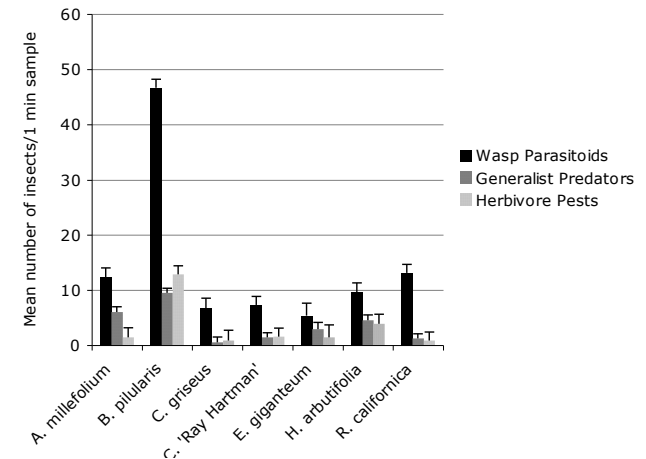
Many insect natural enemies require pollen and nectar in order to survive and reproduce. By planting flowering species in hedgerows, populations of naturally occurring predators and parasitoids can be conserved, thereby increasing the potential of biological control services. Lacewings, minute pirate bugs, ladybird beetles, syrphid flies and parasitic wasps were commonly found on hedgerow plants in California.

The minute pirate bug (*Orius* spp.), which controls thrips, aphids and other small soft-bodied insects, was the most abundant predator found in hedgerows. Chalcidoidea, a super family of minute wasps that attack the egg stage of many crop pests, was the most abundant group of parasitoids.



Actual size:
2mm long

The minute pirate bug (*Orius* spp.) is commonly found on flowering plants.
Illustration by Lauren Benson.



Average abundance of insect parasitoids, predators, and pests collected on California native plants established in hedgerows. Data collected by Tara P. Gareau in 2006.

When designing hedgerows for biological control services it is important to choose plants that are particularly attractive to insect predators and parasitoids. For example it was found that coyote brush (*Baccharis pilularis*) harbored a far greater amount of wasp parasitoids than other hedgerow plants. However, syrphid flies tended to be found in greater numbers on *Ceanothus* plants.

A general rule of thumb is to plant a diversity of “insectary” plants, preferably with overlapping bloom periods, to conserve a diversity of natural enemies.

Tara Pisani Gareau is a post doctoral researcher in the Department of Entomology at the Pennsylvania State University. Tara’s doctoral research at the University of California, Santa Cruz examined the effect of California hedgerows on biological control services.