

## Case Study: Pollinator Conservation Brings Life Back to California Farm

Driving through the farm fields of Colusa County in California's Central Valley is a good way to dispel any sentimental image of farmland as lush, pastoral, and nature-rich. Massive monoculture acreages push right up against dusty roadsides, with virtually no wild plants in sight. The banks of irrigation ditches and road edges are sprayed constantly with herbicides and disked until the dry soil takes on the consistency of powdered sugar—and pests are suppressed with mammoth boom sprayers and aerial crop dusters. The only nature that takes root in the midst of these farmlands tends to be the toughest weeds like mustard and yellow star thistle, and highly mobile cropland pests like starlings and ground squirrels.

Yet, in the midst of this unlikely backdrop one company is seeking to reverse the trend and bring a little bit of nature back to Colusa County. Working with Xerces staff, Muir Glen Organic Tomatoes has launched one of the largest native plant hedgerow projects in the area. This effort not only provides pollinator habitat adjacent to one of their processing facilities near the town of Williams, but also functions as a living demonstration site and outdoor teaching facility for Muir Glen's local network of organic tomato farmers. Established in 2012, the mile-long hedgerow has restored a formerly barren and compacted dirt roadside to create a vibrant, functional, and beautiful pollinator corridor.

The background behind this success is rooted in the particular value that native bees offer to agriculture. Recognizing how research now demonstrates a strong link between buzz pollination by bumble bees and increased tomato yields, Muir Glen worked with Xerces to design a complex, highly diverse hedgerow made up of dozens of species of native shrubs, bunch grasses, and wildflowers that would attract those and other native bees with both food sources and nesting habitat.

As a first step in this process, the project team worked to immediately stop erosion and soil loss at the site by terracing the roadside slope to establish a level planting area. The slope was further stabilized with straw erosion-control wattles, and the soil was amended with compost to add back organic matter and soil microorganisms.

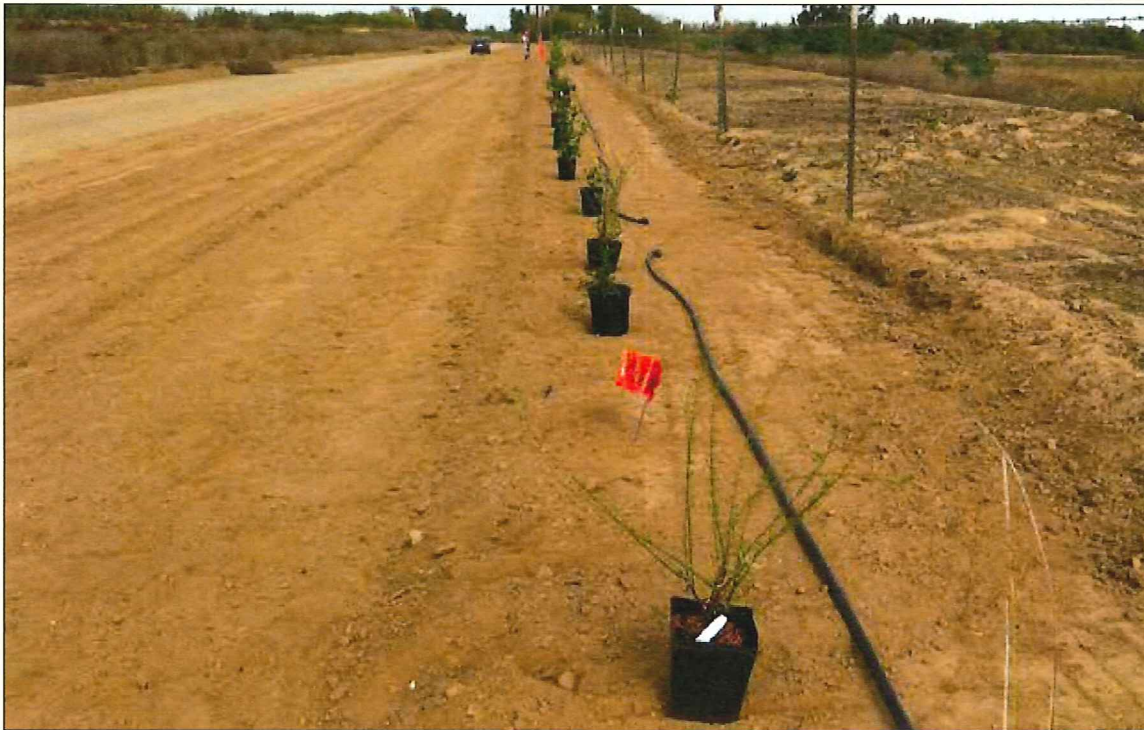
Then, as a second step, the team hand-planted hundreds of the larger plants along the top of the slope, including elderberry, manzanita, deergrass, California lilac, coyotebrush, California buckthorn, showy milkweed, bladderpod, bush lupine, and many others. After planting, these transplants were initially supported with a single drip irrigation line and were heavily mulched with almond shells from local orchards. Because these native plants are highly drought-adapted, irrigation only needs to be maintained for the first two years of establishment before being removed in the third year.

Finally, supplementing the larger plants along the lower part of the slope, a diverse understory of native wildflowers, like California poppy, lacy phacelia, and Bolander's sunflower, was direct-seeded to further stabilize the soil and expand the plant diversity.

To ensure that the hedgerow is functioning as intended, Muir Glen and Xerces partnered with University of California–Davis scientists to monitor the abundance and diversity of bees using the new hedgerow and to compare those findings against the abundance and diversity of bees found in the field edge areas of other farmland nearby (where hedgerows were not present). Amazingly, after only the first year, the findings were dramatic—nearly twice as many bees were found at the Muir Glen hedgerow as were found on the edges of other nearby farm fields.

Supplementing these findings, additional research conducted by scientists at University of California–Berkeley now demonstrates that, in California's Central Valley, farmers can typically expect to see a return on investment within 10 years for the costs involved in planting a hedgerow (this time can be cut in half with USDA financial assistance through Farm Bill conservation programs). That return on investment comes in the form of enhanced crop pollination, and in reduced pest damage due to the increased numbers of beneficial insects that prey upon crop pests.

While financial returns and crop yields are a key part of the equation, Muir Glen's success story runs deeper. A once-dry, desolate landscape now stands as a green, life-filled example of what is possible. This is a significant step in a new farm paradigm that will be necessary for others to follow if wild pollinators are going to have a role in agriculture, both in Colusa County and beyond.



Hundreds of plants were hand-planted as part of this hedgerow project. Irrigation was maintained for the first two years to insure proper establishment while their root systems developed. (Photograph by Eric Lee-Mäder, The Xerces Society.)

One of the benefits of landscaping with native plants is their drought tolerance. In this hedgerow, irrigation was removed after two years of establishment, even though the area was experiencing a prolonged drought. (Photograph by Jessa Kay Cruz, The Xerces Society.)

