

# 422A Hedgerow Planting, Pollinators: *Central Valley, Central Coast, Southern California*

## Conservation Practice Specification



(Photo: Jessa Kay Cruz, The Xerces Society)

## Specifications

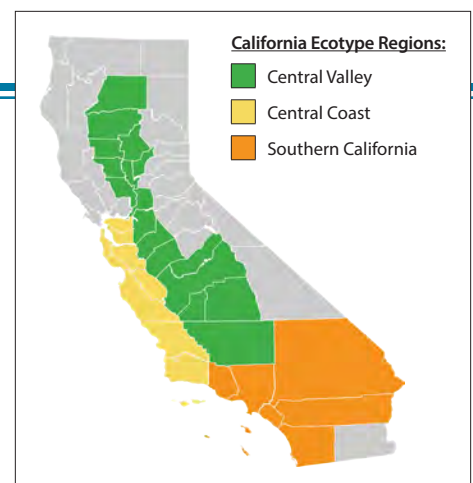
These instructions provide in-depth guidance on how to install hedgerows for pollinators. To plan a specific project, use these *Specifications* to fill out the *Implementation Requirements* form. These requirements and considerations are in addition to those in the *Hedgerow Planting (422) Specification* written for all purposes.

### Definition and Purpose

Establishment of dense vegetation in a linear design to enhance pollen, nectar, and nesting habitat for pollinators.

### Client Conservation Objectives

Depending on landowner objectives and project design, pollinator hedgerow habitat may also provide food, cover, and corridors for other wildlife, provide habitat for predaceous and beneficial invertebrates as a component of an integrated pest management plan, provide food, cover or shade for aquatic organisms in adjacent streams, serve as living fences, delineate boundaries, serve as screens to dust or noise, or increase carbon storage.



# Planning Considerations

## Key Site Characteristics

Site selection for pollinator habitat should take the following into consideration:

- **Pesticide Drift:** Habitat must be protected from pesticides (especially insecticides and bee-toxic fungicides and herbicides). Only sites with no to very low risk for pesticide drift should be established as new habitat. This includes some pesticides approved for use on organic farms.
- **Accessibility:** New habitat should be accessible to equipment for planting and maintenance operations.
- **Sunlight:** Most native shrubs grow best in full sunlight.
- **Slope:** Steep or highly erodible sites should not be disturbed. For re-vegetating such sites, consider Critical Area Planting (342) or other suitable Practice Standards.
- **Weed Pressure:** Areas with high weed pressure will take more time and effort to prepare for planting. It is also important to note the primary weed composition. Knowing the most abundant weed species on site, their reproductive methods, and whether they are grass or broadleaf, perennial or annual, and woody or herbaceous, will help significantly in planning for site preparation and follow up weed management during establishment.
- **Site History:** Factors such as past plant cover (e.g., weeds, crops, grass sod, and/or native plants), use of pre-emergent herbicides or other chemicals, and soil compaction can affect plant establishment. It is also important to know if sites may have poor drainage, or may flood, as such conditions make habitat establishment more difficult and require a plant mix adapted to the site.
- **Soils and Habitat:** Most plants listed in the Appendices of this guide are tolerant of many soil conditions and types, however all plants establish better when matched with appropriate conditions.
- **Irrigation:** To establish plants from plugs, pots, or bare root will require irrigation.
- **Other Functions:** The site may offer opportunities to serve other functions, such as run-off prevention, stream bank stabilization, wildlife habitat, or windbreaks. Those factors can influence plant choice and/or design.

## Plant Selection

Plant species selection should be limited to plants providing pollen- and nectar-rich forage resources for bees. The Appendices provide information on acceptable plants in the California Central Valley region, the Central Coast region, and Southern California.

If you are designing a custom plant list, individual species should be chosen so that there are **consistent and adequate** floral resources throughout the season. In order to achieve this goal, three species from each blooming period (early, mid, and late season), are recommended. Plant composition (i.e., percent of each species) can be designed to complement adjacent crop bloom time or other abundant species in the landscape, with more plants blooming immediately before and after adjacent crops. Wildflowers can be included in hedgerow plantings. For a list of acceptable species and more information on establishing wildflowers, please see *Conservation Cover, Pollinators (327A) Specifications*.

**Alternate Pest or Disease Hosts:** In most cases, native pollinator plants do not serve as alternate hosts for crop pests or diseases, but selected plants should be cross-referenced for specific crop pest or disease associations. University of California research indicates that weedy borders harbor more pests than are found in diverse native plantings.



Hedgerow with California aster, California poppies, western redbud, California phacelia, manzanita, and coyotebrush. (Photo: Jessa Kay Cruz, The Xerces Society)

# Requirements

## Site Preparation

Site preparation is one of the most important and often inadequately addressed components of project success. It is also a process that may require more than one season of effort to reduce competition from invasive, noxious, or undesirable non-native plants prior to planting. Site preparation should focus on the removal of perennial and aggressive annual weeds. More effort and time spent eradicating undesirable plants prior to planting will result in higher success rates in establishing the targeted plant community. Weed removal methods are provided in **Table 1**. For details on how to prepare a seed bed for wildflowers within or adjacent to a hedgerow, see the *Conservation Cover, Pollinators (327A) Specifications*.

Site preparation methods are provided in **Table 1** (page 4).

**Note:** If weed pressure is high, then the weed abatement strategies detailed in **Table 1** should be repeated for an additional growing season. High weed pressure conditions are characterized by:

- Persistent year-round cover of undesirable plants (covering the entire surface of the site);
- Sites where weeds have been actively growing (and producing seed) for multiple years;
- Sites dominated by introduced sod-forming grasses and rhizomatous forbs (e.g. Canada thistle).

If desired, site preparation can also include the creation of a berm to serve as the hedgerow base. Hedgerows with berm-bases are preferred in some regions for greater windbreak and screening benefits (due to the raised base). In areas where drainage is poor, they may support a wider range of plants. Hedgerow berms are often roughly 3' in width and height, and are created using soil excavated from the sides of the berm (creating a parallel ditch on both sides of the planting). Field stones are sometimes added to hedgerow berms as well, adding additional height and structure.

**Figure 1** The first site (top) is not ready for planting. Site preparation should focus on removing existing weedy vegetation. Weedy vegetation has been removed from the next site (bottom); creating a clean planting area where hedgerow plants can become established with less competition for sunlight and water. (Photos: Jessa Kay Cruz, The Xerces Society)



Western tiger swallowtail on showy milkweed. (Photo: Claudia Street, Yuba-Sutter Farm Bureau)

**Table 1. Weed Removal Methods**

METHOD: MOWING OR STRIP TILLAGE	
<p><b>Where to Use</b></p> <ul style="list-style-type: none"> <li>• Where weed pressure is low</li> <li>• Areas with a low risk of erosion</li> <li>• Areas accessible to equipment</li> </ul>	<p><b>Timing</b></p> <ul style="list-style-type: none"> <li>• Total time: 1 + month(s)</li> <li>• Begin: anytime</li> <li>• Plant: fall or early spring</li> </ul>
<p><b>Basic Instructions:</b></p> <ol style="list-style-type: none"> <li>1. Where weed pressure is low, mow or till the existing vegetation as low to the ground as possible for the length of the hedgerow.</li> <li>2. If necessary, rake or lightly harrow the strip to create a clean surface for installing transplants.</li> </ol>	
METHOD: NON-SELECTIVE (NON-PERSISTENT) HERBICIDE	
<p><b>Where to Use</b></p> <ul style="list-style-type: none"> <li>• Where weed pressure is moderate to high</li> <li>• Conventional farms and organic farms*</li> <li>• Areas with a low risk of erosion</li> <li>• Areas accessible to sprayer</li> </ul>	<p><b>Timing</b></p> <ul style="list-style-type: none"> <li>• Total time: 6 + month(s)</li> <li>• Begin: late winter</li> <li>• Plant: fall</li> </ul>
<p><b>Basic Instructions:</b></p> <ol style="list-style-type: none"> <li>1. Clear away existing thatch as needed before beginning herbicide treatments to expose new weed growth to the herbicide spray.</li> <li>2. Apply a non-selective, non-persistent herbicide as per label whenever weeds are actively growing.</li> <li>3. If necessary, repeat herbicide applications at 6 week intervals until the desired level of weed control is achieved.</li> <li>4. Plant the transplants, waiting at least 72 hours after the last herbicide treatment. Refer to the Planting Methods section of this document for specific recommendations.</li> </ol> <p><b>NOTE: Do not till. Avoid any ground disturbance that may bring up additional weed seed. An additional year of site preparation is recommended if weed pressure is particularly high. Avoid use of herbicides that are bee-toxic (e.g. Paraquat and Gramoxone).</b></p> <p><b>*Choice of herbicide must be acceptable to OMRI for organic operations or, if not, used outside of certified ground AND approved by an organic certifier.</b></p>	
METHOD: SOLARIZATION	
<p><b>Where to Use</b></p> <ul style="list-style-type: none"> <li>• Where weed pressure is moderate to high</li> <li>• Organic and conventional farms</li> <li>• Areas with a low risk of erosion</li> <li>• Areas accessible to mowing equipment</li> <li>• Locations with full sun</li> </ul>	<p><b>Timing</b></p> <ul style="list-style-type: none"> <li>• Total time: 6+ months</li> <li>• Begin: spring</li> <li>• Plant: fall</li> </ul>
<p><b>Basic Instructions:</b></p> <ol style="list-style-type: none"> <li>1. Mow, till, or lightly harrow and smooth the site in the spring (raking off debris, if necessary).</li> <li>2. After smoothing the site, irrigate thoroughly and lay UV stabilized plastic (such as high tunnel plastic) burying the edges to prevent airflow between the plastic and the ground. Weigh down the center of the plastic if necessary to prevent the wind from lifting it. Use greenhouse repair tape for any rips that occur during the season.</li> <li>3. Remove the plastic in early-fall before the weather cools and the area beneath the plastic is recolonized by nearby rhizomatous weeds.</li> <li>4. Immediately install transplants. Refer to Planting Methods section of this document for specific bed preparation recommendations.</li> </ol> <p><b>NOTE: Solarization may not be as effective in coastal climates where temperatures are lower and summer sun is limited. After solarization, avoid any ground disturbance that may bring up additional weed seed. An additional year of site preparation is recommended if weed pressure is particularly high.</b></p>	

## Planting Methods

Regular shovels are usually adequate for transplanting most woody nursery stock. However, dibble sticks or mechanical transplanters are sometimes helpful for plug-planting. Power augers and mechanical tree spades can be helpful for larger plants.

Depending on weed pressure, hedgerow plants can be installed through planting holes cut into landscape fabric (after which the fabric is typically covered with mulch). While this practice may be highly effective for weed control, it likely reduces nesting opportunities for ground-nesting pollinators and other wildlife. Hedgerows should be installed without landscape fabric when possible.

Plant size at maturity should be considered when planting. Most woody shrubs can be spaced on 6–12' centers (depending upon size at maturity), with most herbaceous plants spaced closer on 3 – 5' centers. It is helpful to measure the planting areas prior to purchasing transplants, and to stage the transplants in the planting area prior to installing them in the ground (e.g., see Figure 2).

Transplanting can occur any time the ground can be worked, but should be timed to avoid prolonged periods of hot, dry, windy or wet weather. Regardless of when planting occurs, however, the transplants should be irrigated thoroughly immediately after planting. Holes for plants can be dug and pre-irrigated prior to planting as well. Follow-up irrigation is dependent upon weather and specific site conditions, but generally even native and drought tolerant plants should be irrigated with at least 1" of water per week (except during natural rain events), for the first two years after planting. Long, deep watering is best to encourage deep root system development and shallow irrigation should be avoided. Drip irrigation is useful, and other methods that allow for deep watering can be successful. It is advisable to irrigate at the base of plants and avoid overhead irrigation that would encourage weed growth. Once plants are established, irrigation should be removed or greatly decreased.

Most of the plants in the Appendices are adapted to a variety of soil conditions and do not need any specific amendments. However, in areas where the soil is compacted, degraded, or depleted, compost should be used during planting. Compost should be free from weed seeds, aged properly, and mixed thoroughly with soil in the holes during planting.

Where rodent damage may occur, underground wire cages around roots are recommended. Plant guards also may be needed to protect plants from above ground browsing or antler damage by deer. Newly planted areas should be clearly marked to protect them from herbicides or other disturbances.

Mulching is recommended to reduce weed competition and to retain moisture during the establishment phase. Recommended materials include wood chips, bark dust, weed-free straw, nut shells, grapeseed pumice, or other regionally appropriate weed-free mulch materials.

**Seeding Wildflowers:** Wildflowers also can be planted from seed within or adjacent to hedgerows to provide additional plant structure and diversity. Seeding requires **excellent** site preparation to reduce weed pressure since weed control options are limited when the wildflowers start to germinate. For more information on establishing wildflowers from seed, see the *Conservation Cover, Pollinators (327A) Specifications*.

## Planting Method Photos



Figure 2

Hedgerow plants can be staggered in multiple rows, providing a wider habitat feature, with greater secondary benefits, such as screening, wind reduction, and dust control (left). Where weed pressure is particularly severe, the ground below the hedgerow can be covered in weed barrier landscape fabric (right). The use of weed barrier however may reduce the value to ground-nesting wildlife, including many species of bees. (Photos: Jessa Kay Cruz, The Xerces Society)



Figure 3

Grow tubes or trunk protectors (e.g. milk cartons) may help during establishment to reduce browsing by herbivores and trunk damage from mowers or weeding operations (left). Most species will benefit from an inch of water per week during the first two years of establishment, either from natural rainfall, or from irrigation, such as the drip irrigation lines used on this hedgerow (center). Wildflowers can be seeded in linear strips alongside newly planted hedgerows to provide pollen and nectar resources while slower growing shrubs become established (right). Site preparation and weed eradication needs to be very rigorous prior to planting seeds. See *Conservation Cover, Pollinators (327A) Specifications* for details on establishing wildflowers. (Photos: Jessa Kay Cruz, The Xerces Society)

# Post Planting Establishment Requirements

## Maintenance During Establishment (Short Term)

Weed control is critical in the first and second years after planting. If the site is well prepared, then less effort will be required for weeding after project installation. Maintenance practices must be adequate to control noxious and invasive species and may involve tools such as mowing, string trimming, hand hoeing, or spot spraying with herbicides.

Weeds should be prevented from going to seed in, or adjacent to, the hedgerow during the first two (and possibly three) years after planting to help ensure long-term success. Familiarity with the life cycle of weeds will facilitate appropriate timing of management activities.

Common weed-management strategies include:

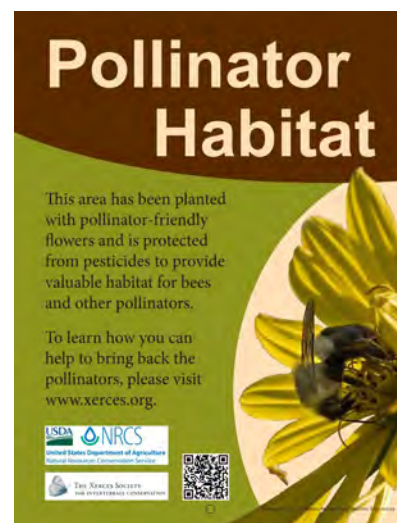
- **Spot Spraying:** Spot spraying with herbicides can be effective, relatively inexpensive, and require minimal labor, even on larger project areas. Care should be taken that herbicides do not drift or drip onto desirable plant species.
- **Selective Herbicides:** Grass-selective herbicides can be used to control weedy grasses in hedgerows. Contact a local crop advisor or Extension specialist for appropriate herbicide selection and timing.
- **Managing Irrigation:** Whenever possible, irrigation should be supplied at the base of the transplant (through drip irrigation, for example) to avoid watering nearby weeds.
- **Mowing / String Trimming:** Mowing or string trimming can be utilized to keep weedy species from going to seed and shading out hedgerow plants.
- **Hand Weeding:** Hand-weeding (including hoeing) can be effective in small areas with moderate weed pressure.

## Operations and Maintenance (Long-Term)

Control herbivores as needed, but remove tree guards or other materials that could impede plant growth as soon as possible after establishment. In most cases, irrigation can be removed from transplants by the end of the second year after planting. Continue to protect habitat from pesticides and herbicides except when necessary to control noxious or invasive plants. On-going herbicide use (spot-treatment) or occasional hand weeding may be necessary to control noxious weeds. Maintain the long-term plant diversity of pollinator habitat by re-planting as necessary.

Hedgerow plantings may need to be managed over time to prevent shrub encroachment into adjacent fields or roadsides or to cut back large trees that shade out other hedgerow species. Depending on management goals (e.g. preferred wildlife structure) larger hedgerow species are sometimes cut back to a stump and allowed to re-sprout (called coppicing) to produce multiple bushy stems. Regardless of management needs, do not prune hedgerow plants during critical wildlife nesting seasons (consult your state wildlife biologist for specific guidance). After establishment, no more than 30% of the habitat area should be disturbed in any one year to ensure sufficient undisturbed areas for pollinators and other wildlife.

















Finally, some common farm-management practices can cause harm to bees and other beneficial insects. Insecticides are especially problematic, including some insecticides approved for organic farms. Therefore, if insecticide spraying is to occur on the farm, it is critical that the pollinator hedgerow is outside of the sprayed area and/or protected from application and drift.



**Figure 6.** Newly planted areas should be clearly marked to protect them from herbicides or other disturbances. Using signs such as the one on the above can be a useful tool to designate protected pollinator habitat.

# Appendix A: Recommended Plants—California Central Valley Region

## Native Hedgerow Plants for Pollinators

	COMMON NAME	SCIENTIFIC NAME		MAX HEIGHT	NOTES
Early	Bladderpod	<i>Cleome isomeris</i>	L	5'	Tolerates salinity
	California lilac	<i>Ceanothus 'Concha'</i>	L	4'	Tolerates clay soils
	Frosty blue california lilac	<i>Ceanothus 'Frosty Blue'</i>	L	8'	Tolerates clay soils
	McMinn manzanita	<i>Arctostaphylos 'McMinn'</i>	L	5'	Tolerates clay soils
	Narrowleaf willow	<i>Salix exigua</i>	H	10'	Wetland-semi riparian species
	Oregon grape	<i>Mahonia aquifolium</i>	L	5'	Drought-tolerant; also tolerates semi-riparian conditions
	Western redbud	<i>Cercis occidentalis</i>	L	15'	Drought-tolerant; also tolerates semi-riparian conditions
	Red willow	<i>Salix laevigata</i>	H	20'	Wetland-semi riparian species; tolerates clay soils
Early-Mid	Blue elderberry	<i>Sambucus nigra var. cerulea</i>	M	15'	Host plant for the endangered Valley Elderberry Longhorn Beetle; tolerates semi-riparian conditions
	California buckthorn	<i>Frangula californica</i>	L	5'	
	Mule's fat	<i>Baccharis salicifolia</i>	M	8'	Wetland-riparian to semi-riparian species
	Showy penstemon 	<i>Penstemon spectabilis</i>	L	3'	
	Silver bush lupine	<i>Lupinus albilfrons</i>	L	3'	Requires good drainage
	Toyon	<i>Heteromeles arbutifolia</i>	L	12'	Can be an alternate host of fire blight
Mid	California buckwheat 	<i>Eriogonum fasciculatum</i>	L	2.5'	Extremely drought-tolerant
	California wildrose	<i>Rosa californica</i>	M	8'	Tolerates clay soils; drought-tolerant; also tolerates semi-riparian conditions; can be a host for spotted wing drosophila
	Cleveland sage 	<i>Salvia clevelandii</i>	L	3'	Requires good drainage
	Coyote mint 	<i>Monardella villosa</i>	L	2'	Requires good drainage
	Hollyleaf cherry	<i>Prunus ilicifolia</i>	M	15'	
	Showy milkweed   ①	<i>Asclepias speciosa</i>	M	5'	Tolerates clay soils; tolerates wet or dry conditions
Mid-Late	Big saltbush	<i>Atriplex lentiformis</i>	L	20'	Tolerates clay soils; can be extremely drought-tolerant
	California fuchsia 	<i>Epilobium canum</i>	L	3'	
	Common buttonbush	<i>Cephalanthus occidentalis</i>	M	15'	Wetland, riparian, or semi-riparian species; tolerates clay soils
	Gumplant	<i>Grindelia camporum</i>	L	4'	Tolerates wet or dry conditions
	Narrowleaf milkweed  	<i>Asclepias fascicularis</i>	M	1.5'	Tolerates clay soils; tolerates wet or dry conditions
	Nettleleaf giant hyssop 	<i>Agastache urticifolia</i>	M	4'	Tolerates clay soils; tolerates wet conditions
	Woollypod milkweed  	<i>Asclepias eriocarpa</i>	M	2'	Tolerates clay soils; tolerates wet or dry conditions
	California aster 	<i>Symphotrichum chilense</i>	L	5'	Tolerates clay soils; tolerates wet or dry conditions
Late	Canada goldenrod 	<i>Solidago canadensis</i>	M	3'	Tolerates wet or dry conditions
	Coyotebrush ②	<i>Baccharis pilularis</i>	L	10'	Extremely drought-tolerant
	Dwarf coyotebrush ②	<i>Baccharis pilularis 'Pigeon Point'</i>	L	2'	Extremely drought-tolerant

### Central Valley Region Recommended Native Wildflowers—Additional Notes:

- ① Plant ONLY in Sacramento Valley, not in San Joaquin Valley
- ② Dioecious—plant male plants to provide pollen and avoid unwanted seeding

KEY	 Bloom time	 Water needs: low (L), medium (M), high (H)	 Establishes better from transplant than seed	 Monarch butterfly host plant

# Appendix B: Recommended Plants—California Central Coast Region

## Native Hedgerow Plants for Pollinators

	COMMON NAME	SCIENTIFIC NAME		MAX HEIGHT	NOTES
Early	Bigberry manzanita	<i>Arctostaphylos glauca</i>	L	10'	
	California lilac	<i>Ceanothus 'Julia Phelps'</i>	L	6'	
	McMinn manzanita	<i>Arctostaphylos 'McMinn'</i>	L	5'	Tolerates clay soils
	Oregon grape	<i>Mahonia aquifolium</i>	L	5'	Drought-tolerant, but also tolerates semi-riparian conditions
Early-Mid	California bee plant	<i>Scrophularia californica</i>	M	4'	Tolerates clay soils; seed can spread
	Foothill penstemon 🌿	<i>Penstemon heterophyllus</i>	L	3'	
	Golden bush lupine	<i>Lupinus arboreus</i>	L	5'	
	Hollyleaf cherry	<i>Prunus ilicifolia</i>	M	15'	
Mid	Sticky monkey flower 🌿	<i>Mimulus aurantiacus</i>	M	2'	
	Black sage 🌿	<i>Salvia mellifera</i>	L	2'	
	Blue elderberry	<i>Sambucus nigra var. cerulea</i>	M	15'	Host plant for the endangered Valley Elderberry Longhorn Beetle; drought-tolerant, but also tolerates semi-riparian conditions
	California buckthorn	<i>Frangula californica</i>	L	5'	
	California wildrose	<i>Rosa californica</i>	M	8'	Tolerates clay soils; can be a host for spotted wing drosophila
	Common deerweed	<i>Lotus scoparius</i>	L	3'	Long-blooming; tolerates wet or dry conditions
	Coyote mint 🌿	<i>Monardella villosa</i>	L	2'	Requires good drainage
	Narrowleaf milkweed 🌿🦋	<i>Asclepias fascicularis</i>	M	1.5'	Tolerates clay soils; tolerates wet or dry conditions
	Nettleleaf giant hyssop 🌿	<i>Agastache urticifolia</i>	M	4'	Tolerates clay soils; tolerates wet conditions
	Purple sage 🌿	<i>Salvia leucophylla</i>	L	2'	
Mid-Late	Toyon	<i>Heteromeles arbutifolia</i>	L	12'	Can be an alternate host for fire blight
	California fuchsia 🌿	<i>Epilobium canum</i>	L	3'	
	Golden-yarrow	<i>Eriophyllum confertiflorum</i>	M	3'	
	Gumplant	<i>Grindelia camporum</i>	L	4'	Tolerates clay soils; can re-seed aggressively; tolerates wet or dry conditions
Late	Seaside woolly sunflower	<i>Eriophyllum stoechadifolium</i>	M	3'	
	California aster 🌿	<i>Symphotrichum chilense</i>	L	5'	Tolerates clay soils; tolerates wet or dry conditions
	California buckwheat 🌿	<i>Eriogonum fasciculatum</i>	L	2.5'	Can be extremely drought-tolerant
	Canada goldenrod 🌿	<i>Solidago canadensis</i>	M	3'	Tolerates wet or dry conditions
	Coyotebrush ①	<i>Baccharis pilularis</i>	L	10'	Extremely drought-tolerant <sup>3</sup>
	Dwarf coyotebrush ①	<i>Baccharis pilularis 'Pigeon Point'</i>	L	2'	Extremely drought-tolerant <sup>3</sup>



Above: seaside woolly sunflower (Photograph courtesy of Phil Hogan, Yolo County RCD.)

Opposite (left to right): butterflies, lady beetles, syrphid flies, and honey bees on coyotebrush. (Photographs by Mace Vaughan, The Xerces Society.)



# Appendix C: Recommended Plants—Southern California

## Native Hedgerow Plants for Pollinators

	COMMON NAME	SCIENTIFIC NAME		MAX HEIGHT	NOTES
Early	Bigberry manzanita	<i>Arctostaphylos glauca</i>	L	10'	
	Bladderpod	<i>Cleome isomeris</i>	L	5'	Tolerates salinity
	California buckthorn	<i>Frangula californica</i>	L	5'	
	California lilac	<i>Ceanothus 'Julia Phelps'</i>	L	6'	
	Oregon grape	<i>Mahonia aquifolium</i>	L	5'	
Early-Mid	California brittlebush 🌱	<i>Encelia californica</i>	L-M	4'	Tolerates clay soils
	California wildrose	<i>Rosa californica</i>	M	8'	Tolerates clay soils; can be a host for spotted wing drosophila
	Foothill penstemon 🌱	<i>Penstemon heterophyllus</i>	L	3'	
	Purple sage 🌱	<i>Salvia leucophylla</i>	L	2'	
	Showy penstemon 🌱	<i>Penstemon spectabilis</i>	L	3'	
Mid	Toyon	<i>Heteromeles arbutifolia</i>	L	12'	Can be an alternate host for fire blight
	California buckwheat 🌱	<i>Eriogonum fasciculatum</i>	L	2.5'	Can be extremely drought-tolerant
	Common deerweed	<i>Lotus scoparius</i>	L	3'	Drought-tolerant, but also tolerates wetter conditions
	Island buckwheat 🌱	<i>Eriogonum arborescens</i>	L	2'	
	Narrowleaf milkweed 🌱🦋	<i>Asclepias fascicularis</i>	M	1.5'	Tolerates clay soils; tolerates wet or dry conditions
Mid-Late	Black sage 🌱	<i>Salvia mellifera</i>	L	2'	
	California goldenrod	<i>Solidago californica</i>	M	3'	
	Cleveland sage 🌱	<i>Salvia clevelandii</i>	L	3'	
	Golden-yarrow	<i>Eriophyllum confertiflorum</i>	M	3'	
	Gumplant	<i>Grindelia camporum</i>	L	4'	Tolerates clay soils; can re-seed aggressively; tolerates wet or dry conditions
	St. Catherine's lace	<i>Eriogonum giganteum</i>	L	5'	Very long-blooming
	Woollypod milkweed 🌱🦋	<i>Asclepias eriocarpa</i>	M	2'	Tolerates clay soils; tolerates wet or dry conditions
Late	Blue curls	<i>Trichostema lanatum</i>	L	5'	Requires good drainage
	California fuchsia 🌱	<i>Epilobium canum</i>	L	3'	
	Coyotebrush ❶	<i>Baccharis pilularis</i>	L	10'	Extremely drought-tolerant
	Dwarf coyotebrush ❶	<i>Baccharis pilularis 'Pigeon Point'</i>	L	2'	Extremely drought-tolerant
	Seaside woolly sunflower	<i>Eriophyllum stoechadifolium</i>	M	3'	

### Central Coast Region & Southern California Recommended Hedgerow Plants—Additional Notes:

- ❶ Dioecious—plant male plants to provide pollen and avoid unwanted seeding

KEY	🌱 Bloom time	💧 Water needs: low (L), medium (M), high (H)	🌱 Establishes better from transplant than seed	🦋 Monarch butterfly host plant



# Appendix D: Native Seed Vendors and Native Plant Nurseries

Inclusion on this list does not constitute an endorsement or a recommendation. Other vendors not listed below may also have suitable plant materials. If you know of another source or if you are a vendor and would like to be included on this list, please contact Tom Moore, NRCS State Biologist ([Tom.Moore@ca.usda.gov](mailto:Tom.Moore@ca.usda.gov), 530-792-5652). For more information on sourcing recommended seed mixes, please visit [www.xerces.org/pollinator-seed/](http://www.xerces.org/pollinator-seed/).

⚠ Before ordering, ensure that all plants or seeds purchased for pollinator habitat have NOT been treated with systemic insecticides. ⚠

NATIVE SEED VENDORS & NATIVE PLANT NURSERIES				STOCK		REGION(S)		
VENDOR/ NURSERY	LOCATION(S)	PHONE	WEBSITE/ EMAIL	SEEDS	TRANSPLANTS	CENTRAL VALLEY	CENTRAL COAST	SOUTHERN CA
California Flora Nursery	Fulton	707-528-8813	<a href="http://www.calfloranursery.com">www.calfloranursery.com</a>	✗	✓	✗	✓	✗
Central Coast Wilds	Santa Cruz	831-459-0656	<a href="http://www.centralcoastwilds.com">www.centralcoastwilds.com</a>	✗	✓	✗	✓	✗
Cornflower Farms	Elk Grove	916-689-1015	<a href="http://www.cornflowerfarms.com">www.cornflowerfarms.com</a>	✗	✓	✓	✗	✗
Elkhorn Slough Native Nursery	Moss Landing	831-763-1207	<a href="http://www.elkhornnursery.com">www.elkhornnursery.com</a>	✓	✓	✗	✓	✗
Floral Native Nursery	Chico	530-892-2511	<a href="http://www.floralnativenursery.com">www.floralnativenursery.com</a>	✗	✓	✓	✓	✗
Growing Solutions	Santa Barbara	805-452-7561	<a href="http://www.growingsolutions.org">www.growingsolutions.org</a>	✓	✓	✗	✓	✓
Hedgerow Farms	Winters	530-662-6847	<a href="http://www.hedgerowfarms.com">www.hedgerowfarms.com</a>	✓	✓	✓	✗	✗
Intermountain Nursery	Prather	559-855-3113	<a href="http://www.intermountainnursery.com">www.intermountainnursery.com</a>	✗	✓	✓	✗	✗
Las Pilitas Nursery	Escondido, Santa Margarita	760-749-5930	<a href="http://www.laspilitas.com">www.laspilitas.com</a>	✗	✓	✗	✓	✓
Native Here Nursery	Berkeley	501-549-0211	<a href="http://www.nativeherenursery.org">www.nativeherenursery.org</a>	✓	✓	✗	✓	✗
Native Revival Nursery	Aptos	831-684-1811	<a href="http://www.nativerivival.com">www.nativerivival.com</a>	✗	✓	✗	✗	✗
Tree of Life Nursery	San Juan Capistrano	949-728-0685	<a href="http://www.californianativeplants.com">www.californianativeplants.com</a>	✗	✓	✗	✗	✓



Bolander's sunflowers bloom in a hedgerow adjacent to crop fields. (Photograph by Jessa Kay Cruz, The Xerces Society.)

## References

### *Seedling Identification Guide for Pollinator Hedgerow Forbs of California's Central Valley*

Many of the plant species recommended for Conservation Cover Practice 327A are also featured in this California NRCS Plant Materials Technical Note (no. 82, 2011), a downloadable resource with seedling photos.

[www.plant-materials.nrcs.usda.gov/pubs/capmctn10340.pdf](http://www.plant-materials.nrcs.usda.gov/pubs/capmctn10340.pdf)

### *Pollinator Biology and Habitat in California*

This California NRCS Biology Technical Note (no. 19, 2009) describes the biology and habitat needs of native bees.

[http://efotg.sc.egov.usda.gov/references/public/CA/TN/Biology\\_19\\_wAppendices\\_20090520.pdf](http://efotg.sc.egov.usda.gov/references/public/CA/TN/Biology_19_wAppendices_20090520.pdf)

### *Conservation Buffers: Design Guidelines for Buffers, Corridors, and Greenways*

The Conservation Buffers website offers resources for planning and designing buffers in rural and urban landscapes, including extensive information on hedgerows and windbreaks. A downloadable guide is available in multiple languages.

<http://nac.unl.edu/buffers/index.html>

### *Windbreaks Designed with Pollinators in Mind (Inside Agroforestry, Vol. 20, Issue 1)*

An overview of multi-purpose windbreaks designed with pollinator-friendly trees and shrubs.

<http://nac.unl.edu/documents/insideagroforestry/vol20issue1.pdf>

### *Weed Identification and Management*

California Invasive Plant Council

[www.cal-ipc.org](http://www.cal-ipc.org)

### *Soil Solarization: A Nonpesticidal Method for Controlling Diseases, Nematodes, and Weeds*

This fact sheet, produced by the University of California Cooperative Extension discusses the solarization process, including plastic selection, installation, removal, and underlying principles.

[www.vric.ucdavis.edu/pdf/soil\\_solarization.pdf](http://www.vric.ucdavis.edu/pdf/soil_solarization.pdf)

### *Hedgerows for California Agriculture: A Resource Guide*

Guidance on creating hedgerows in California developed by the Community Alliance with Family Farmers.

[http://caff.org/wp-content/uploads/2010/07/Hedgerow\\_manual.pdf](http://caff.org/wp-content/uploads/2010/07/Hedgerow_manual.pdf)

### *Attracting Native Pollinators: Protecting North America's Bees and Butterflies*

This comprehensive book on pollinator conservation includes information about pollinator ecology, guides for identifying common bees, and habitat designs for multiple landscapes.

[www.xerces.org/announcing-the-publication-of-attracting-native-pollinators](http://www.xerces.org/announcing-the-publication-of-attracting-native-pollinators)

### *Xerces Society Seed Mix Calculator*

Develop your own pollinator conservation seed mix using this seed rate calculator.

[www.xerces.org/xerces-seed-mix-calculator](http://www.xerces.org/xerces-seed-mix-calculator)

### *Pollinator Conservation Resource Center*

For additional information on pollinator plant lists, conservation guides, pesticide protection and more.

[www.xerces.org/pollinator-resource-center](http://www.xerces.org/pollinator-resource-center)



On the left, installing a hedgerow from transplants. On the right, blooming Cleveland sage transplants are protected by a layer of straw. (Photographs courtesy of the Mission RCD.)

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(Photo: Jessa Kay Cruz, The Xerces Society)

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