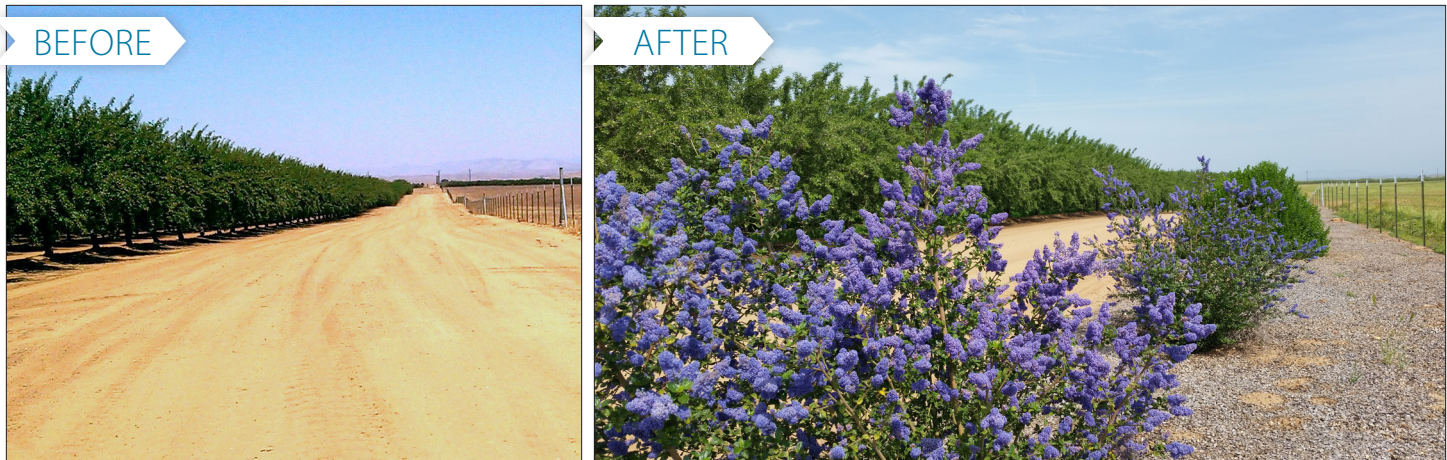


# ESTIMATED COSTS TO ESTABLISH POLLINATOR HEDGEROWS



This pollinator hedgerow—comprised of native flowering shrubs—was installed on a California almond orchard. (Photographs by Jessa Kay Cruz, The Xerces Society.)

## Estimated Cost of Establishing Pollinator Hedgerows:

The table below outlines the estimated costs of establishing hedgerow habitat for pollinators. Pollinator hedgerows are diverse linear plantings of native flowering trees, shrubs, perennial wildflowers and grasses designed to provide foraging and nesting habitat for pollinators. These estimates represent average costs of establishing hedgerows from transplants, and are derived from a series of pollinator hedgerow habitat projects throughout the United States. Actual costs will vary by product and by region.

ACTIVITY	RECOMMENDED METHOD(S)	MATERIALS		LABOR		TOTAL CPU <sup>1</sup>	COMMENTS
		ITEM	CPU <sup>1</sup>	WHPU <sup>2</sup>	CPU <sup>1</sup>		
<b>SITE PREPARATION</b>	Herbicide application, mowing, burning	Non- selective herbicide	\$0.73	1	\$20.00	\$20.73	Cost of equipment or tools not included, as they are usually very low or already in possession of most farmers
<b>PLANTING</b>	Hand labor	Plants	\$83.33	2.5	\$50.00	\$156.43	Cost estimate is for 1 gal. or similar size plants at wholesale price, spacing plants on 6' centers
		Compost	\$7.80				
		Cardboard	\$3.30				
		Mulch	\$12.00				
<b>MAINTENANCE (3 YEARS)</b>	Hand-weeding, string-trimming, spot-herbicide applications			2	\$40.00	\$40.00	
<b>UNIT COST (WITHOUT IRRIGATION)</b>		<b>TOTAL</b>	<b>\$107.16</b>	<b>5.5</b>	<b>\$110.00</b>	<b>\$217.16</b>	
<b>IRRIGATION</b>	Drip irrigation	Polyhose	\$10.00	0.5	\$10.00	\$25.90	Estimate assumes one emitter and ground pin per plant
		Emitters	\$4.30				
		Ground pins	\$1.60				
	<b>PER UNIT SUBTOTAL</b>		<b>\$123.06</b>	<b>6.0</b>	<b>\$120.00</b>	<b>\$243.06</b>	
		<i>Additional irrigation materials<sup>3</sup></i>	<i>\$95.00</i>				One-time cost <sup>5</sup>
<b>COST OF ONE UNIT (WITH IRRIGATION)</b>		<b>TOTAL</b>	<b>\$218.06</b>	<b>6.0</b>	<b>\$120.00</b>	<b>\$338.06</b>	

NOTE: In this estimate one unit is equal to 100' (linear). See ADDITIONAL NOTES on next page for more details.

## I. Site Preparation:

Site preparation, particularly weed abatement, is a critical component of successful habitat establishment. Recommended site preparation methods for hedgerow planting include herbicide treatments, burning (including flame-weeding), or mowing. These methods tend to be effective, efficient, and easily carried out by most landowners. Any of these techniques can be used alone or in combination. Additional methods, such as grazing or hand-weeding, may also be appropriate in some situations. For more information on some of these techniques, *Wildflower Establishment: Organic Site Preparation Methods*, available at [www.xerces.org/organic-farms](http://www.xerces.org/organic-farms).

All treatments should be carefully timed to prevent weeds from setting seed, and to eradicate perennial weeds from the area completely before planting. Treatments should be repeated as necessary to achieve these goals. Site preparation should begin 6–9 months prior to planting, depending on the region, and continue until the hedgerow is ready for planting. For example, in warm climates where weed growth continues year-round, weed management should begin in the winter, while in temperate climates site preparation can begin in the spring. Site preparation methods should involve minimal soil disturbance, and tillage is not recommended since this activity can bring additional weed seeds to the surface.

This cost estimate for site preparation is based on an average of 2–3 treatments, regardless of the method chosen. The time required for each treatment is also similar for the different methods in the table on the previous page. Material cost (herbicides) is based on the use of conventional, non-selective herbicides. Organic herbicides are more expensive and will need to be applied with greater frequency than conventional herbicides.

### ADDITIONAL NOTES: (from previous page)

1. CPU: Cost Per Unit (=100')
2. WHPU: Work Hours Per Unit
3. Additional irrigation materials: These include a remote water timer and drip conversion materials and are generally one-time cost, regardless of project size = \$95.00

### SAMPLE COSTS:

A ½ mile (2,640') hedgerow can cost approximately \$2,829.00–\$3,344.00 for materials and a total of \$5,733.00–\$6,512.00 for both materials and labor combined.

Details for each item included in the table are explained in sections I–V. For more information on wildflower installation and regional recommended pollinator plant lists, please see:

- ⇒ [www.xerces.org/pollinator-habitat-installation-guides](http://www.xerces.org/pollinator-habitat-installation-guides)
- ⇒ [www.xerces.org/providing-wildflowers-for-pollinators](http://www.xerces.org/providing-wildflowers-for-pollinators)
- ⇒ [www.xerces.org/pollinator-conservation/plant-lists](http://www.xerces.org/pollinator-conservation/plant-lists)

Equipment needed for site preparation could include ATV or tractor, spray-rig, mower, back-back sprayer, a string trimmer and a flame-weeder. The cost of equipment use is not included in the cost estimate, as it is generally insignificant, and based on the assumption that the necessary equipment is already in possession of most farmers. Cost-estimates assume that the site is reasonably flat or well graded, accessible to basic farm equipment, and that no major vegetation removal, grading, or excavating is needed. Lack of proper equipment or challenging pre-project site conditions will increase the time and cost needed to complete this step of site preparation.

## II. Planting:

One-gallon (gal) transplants are generally the most readily available and cost effective size for hedgerow transplants. Smaller transplants can be used, but survival rates are often lower. Regular shovels are usually adequate for transplanting most woody or herbaceous nursery stock, and are generally the most efficient method for installing one-gallon containers. However, dibble sticks or mechanical transplanters are sometimes helpful for plug-planting. Power augers and mechanical tree spades can be helpful for larger plants or large projects. Note however that augers are not recommended in heavy, clay, or wet soils, as they can cause compaction.



Working with Xerces Society staff, Muir Glen Organic Tomatoes installed one of the largest native plant hedgerows in their area—over ½ of a mile long. Comprised of drought-tolerant species, the planting supports a diversity of pollinators and beneficial insects. (Photographs by Jessa Kay Cruz, The Xerces Society (top), and courtesy of Muir Glen Organics (bottom).)



Plant size at maturity should be considered when planting. This cost estimate is based on alternating larger (woody shrubs) and smaller (herbaceous) plants, and on installing shrubs 6' apart, which results in approximately 17 plants/100' (linear). It is helpful to measure the planting areas prior to purchasing transplants, and to stage the transplants or flag specific plant locations in the planting area prior to installing them in the ground.

- ♦ **Compost:** Although native plants adapt readily to most soils, adding a small amount of compost will improve plant establishment success in most situations. Several shovelfuls of compost can be used for each transplant, and should be mixed thoroughly with the existing soil. One yd<sup>3</sup> of compost is generally enough for approximately 75 one-gal transplants. For a 10' wide hedgerow with shrubs spaced 6' apart, this is equivalent to about 0.22 yards for 100'.
- ♦ **Cardboard:** Layer cardboard or a similar material directly around the base of each plant for weed suppression and moisture retention. Preventing weeds from germinating in proximity to transplants will aid transplant establishment by reducing competition. This cost estimate includes a layer of cardboard mulch 12" wide around the base of each plant, which amounts to approximately three' (linear) cardboard per plant. Corrugated cardboard can be purchased by the roll for approximately \$0.068/linear foot for a 12-inch-wide roll.
- ♦ **Top Mulch:** The use of top mulch will greatly reduce weed pressure throughout the area, and significantly decrease the amount of time required for follow-up maintenance. Recommended top-mulch includes weed-free hay, rice straw, walnut or almond shells, and wood chips. Add top mulch 3–4" thick for best results. For a 10-foot-wide hedgerow, approximately two bales of straw, or 10 yd<sup>3</sup> of shells or wood chips, are needed to cover 100' at the recommended thickness.

### III. Maintenance:

Adequate site-preparation prior to planting should keep maintenance costs to a minimum; however, some on-going site management will be necessary, especially during the establishment phase which is typically for the first 2–3 years. Annual checking and repairing of the drip irrigation system is recommended. Some on-going weed management will also likely be needed. This weed management could consist of hand-weeding, spot or selective herbicide use, or weed whacking (string-trimming) within the project area. Additionally, managing weeds on the perimeter of the site through mowing or herbicide use may be necessary to keep weeds from encroaching into the project area. Inadequate site-preparation will increase the cost of on-going maintenance.



This Minnesota hedgerow is comprised of native fruiting shrubs that attract both pollinators and wildlife. (Photographs by Sarah Foltz Jordan, The Xerces Society.)

### IV. Irrigation:

In arid regions, transplants will need some supplemental irrigation during the establishment phase, generally for 2–3 years after planting. Drip irrigation is recommended for hedgerow projects in these regions, as it is inexpensive, easy to install, and efficient. The estimated costs of the materials include ½" polyhose, one emitter per plant, and one ground pin per plant, to keep the hose anchored in place. This estimate assumes a linear hedgerow lay-out; non-linear plantings may increase the cost in materials and labor for irrigation installation.

The irrigation estimates in the table above assumes that the system can be hooked into an existing irrigation system on the farm, with a separate irrigation line for the habitat area. As hedgerows need significantly less water than most crops, a separate line and shut-off for the habitat areas is recommended. The one-time cost for hooking into an existing system includes the purchase of a remote water timer that can be programmed for the habitat area, and dripline conversion materials such as pressure compensators and couplings. If new valves or pumps must be installed, the cost of irrigation will increase significantly.

In Eastern, Southern, and Midwestern regions of the United States, most native plants are well-adapted to ambient rainfall and are unlikely to need regular supplemental irrigation beyond the first season following establishment. Occasional irrigation may be needed in cases of severe drought, but it is unlikely that a drip system will need to be installed in these regions.

## V. Cost Comparison:

### Wildflower Establishment vs. Hedgerow Establishment

Native wildflower plantings and native hedgerows are two of the most common types of plantings for providing on-farm pollinator habitat. Hedgerow costs are typically provided in \$/linear foot, and wildflower costs are provided in \$/ft<sup>2</sup>. In order to compare costs, assume a 10' width for hedgerows, so that a 100' hedgerow is approximately equal to a 1,000 ft<sup>2</sup> wildflower planting.

The total cost for establishing a typical 1,000 ft<sup>2</sup> native wildflower planting using chemical fallow ranges from \$8.00–\$212.00 for materials, and \$258.00–\$472.00 for materials and labor combined. The total cost for establishing a typical 1,000 ft<sup>2</sup> native wildflower planting using solarization ranges from \$47.00–\$311.00 for materials and \$147.00–\$421.00 for material and labor combined. See *Estimated Cost to Establish: Wildflower Plantings Using Chemical Fallow* and *Estimated Cost to Establish: Wildflower Plantings Using Solarization* for different site methods and cost estimates for establishing wildflower plantings.

A comparable 100' hedgerow costs approximately \$107.00–\$218.00 for materials, and \$217.00–\$338.00 for materials and labor combined. Overall, the total cost of wildflower and hedgerow establishment is not that different. However, because the cost of native wildflower seed mixes varies greatly by region, as does irrigation requirements, a site-specific evaluation may be necessary to determine which type of planting is more economical. It is also important to consider other factors beyond cost that affect the relative benefits of one type of planting over another. For example, it is generally easier to establish hedgerows in sites with high weed pressure than wildflowers.

Hedgerows can also provide nesting sites for wood-nesting bees. On the other hand, wildflower plantings can be established in very narrow areas, or in areas that need to be mowed down at certain times of year. It is important to consider all establishment and resource concerns, in addition to cost, when comparing these two practices.

SIZE OF HABITAT & COST BREAKDOWN <sup>1</sup>		Wildflower planting: CHEMICAL FALLOW	Wildflower planting: SOLARIZATION	POLLINATOR HEDGEROW
SMALL PLANTING <sup>2</sup>	MATERIALS ONLY	\$8.00–\$212.00	\$47.00–\$311.00	\$107.00–\$218.00
	MATERIALS + LABOR	\$258.00–\$472.00	\$147.00–\$421.00	\$217.00–\$338.00
LARGE PLANTING <sup>3</sup>	MATERIALS ONLY	\$172.00–\$2,613.00	\$1,013.00–\$4,791.00	\$2,829.00–\$3,344.00
	MATERIALS + LABOR	\$5,617.00–\$8,306.00	\$3,191.00–\$7,187.00	\$5,733.00–\$6,512.00

#### NOTES:

1. All cost estimates are approximate and will vary from region to region
2. Small planting = 1,000 ft<sup>2</sup> plot or 10' × 100' hedgerow
3. Large planting = ½ ac plot OR ½-mile-long hedgerow

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#### Acknowledgements

This material is based upon work supported by the Natural Resources Conservation Service, U.S. Department of Agriculture (USDA), under number 69-3A75-12-253. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the USDA.

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