ESTIMATED COSTS TO ESTABLISH WILDFLOWER PLANTINGS

Using Chemical Fallow

This native wildflower planting was installed after clearing the site of weeds organically using solarization. (Photographs by Jessa Kay Cruz, The Xerces Society.)

Estimated Cost of Establishing Pollinator Wildflower Plantings Using Chemical Fallow:

The table below outlines the estimated costs of establishing wildflower habitat for pollinators on conventional farms. These cost-estimates are appropriate for any scale project on conventional farms or areas without restrictions on general herbicide use. This method works best for areas with low weed pressure, and timing of treatments is critical for successful wildflower establishment. This estimate represents average cost ranges and are derived from a series of pollinator habitat projects across the United States that involved establishing conservation cover from seed. Specific costs will vary by project and by region.

ACTIVITY	RECOMMENDED METHOD(S)	MATERIALS		LABOR		TOTAL CPU[1]	COMMENTS
		ITEM	CPU[1]	WHPU[2]	CPU[1]		
SITE PREPARATION	Herbicide treatments[3]	Non-selective herbicides (e.g., glyphosate)	$1.40	1.5	$30.00	$31.40	Assumes one year of site preparation (six herbicide applications)[3].
SEEDING	Broadcast or native seed drill	Wildflower seed mix[4] + bulking agent	$6.50–$22.60	0.5	$10.00	$16.50–$32.60	Cost varies significantly by region[4]
MAINTENANCE (3 YEARS)	Hand-weeding, mowing, selective herbicide applications		N/A[5]	10.5	$210.00	$210.00	Cost of tools/equipment not included[5]
UNIT COST (WITHOUT IRRIGATION)		**TOTAL**	**$7.90–$24.00**	**12.5**	**$250.00**	**$257.90–$274.00**	
IRRIGATION	Drip irrigation	In-line drip emitter tubing and pins	$93.00	0.5	$10.00	$103.00	Only necessary in arid climates or drought conditions.
		PER UNIT SUBTOTAL	**$100.90–$117.00**	**13**	**$260.00**	**$360.90–$377.00**	Use **PER UNIT SUBTOTAL** when estimating costs for large plots
		Additional irrigation materials[6]	*$95.00*				One-time cost[6]
COST FOR ONE UNIT (WITH IRRIGATION)		**TOTAL**	**$195.90–$212.00**	**13**	**$260.00**	**$455.90–$472.00**	

NOTE: In this estimate one unit is equal to 1,000 ft². See ADDITIONAL NOTES *on next page for more details.*

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I. Site Preparation

Chemical Fallow

Chemical fallow involves carefully timed, repeated herbicide treatments. This method works best in areas with low weed pressure, or in areas that are too large for solarization to be practical or affordable (see *Wildflower Establishment: Organic Site Preparation Methods* for information on the cost of solarization). The above cost-estimate assumes approximately one year of site-preparation, beginning in the fall with the first flush of cool season weeds, and continuing consistently until planting the following fall. Areas with moderate or high weed pressure may require two or more years of chemical fallow before planting.

In general, herbicides are most effective when weed seedling are 4–6" tall and actively growing. In order to be effective, applications must occur before any weeds growing in the area set seed. This document assumes an average of six herbicide applications to achieve this goal and is based on the use of general non-target herbicides such as glyphosate. However, glyphosate is not effective on all weeds, and a growing number of common weeds are developing resistance to glyphosate. Therefore, other herbicides may be necessary and may affect actual project costs. Avoid the use of herbicides that are bee-toxic (e.g., Paraquat and Gramoxone).

Prior to the first herbicide treatment, the site should be shallowly tilled, leveled, and smoothed. Common farm equipment, such as a tractor or ATV, tiller, rake, harrow or box scraper, are usually sufficient to complete these tasks. The site should NOT be tilled again at any other point of the site preparation, including just prior to planting.

Additional site-preparation techniques may also be appropriate in some situations. These methods include solarization, smother cropping, sheet mulching, mechanical weed management and full soil inversion. For more information on other site preparation techniques, please see *Wildflower Establishment: Organic Site Preparation Methods*, available at www.xerces.org/organic-farms.

II. Wildflower Seed and Planting

The cost of wildflower seed varies widely, between different projects, regions or seasons. The estimated cost provided in the table above is based on a sample native seed mixes sown at the recommended rates for each region. The cost of these mixes generally range from $30.00–$130.00/lbs, and the recommended seeding rates range from about 5–9 lbs/ac. Generally, purchasing an industry-provided seed mix will be less expensive and more effective than attempting to formulate and purchase a custom-mix. For more information on commercially available, recommended seed mixes please visit: www.xerces.org/pollinator-seed.

ADDITIONAL NOTES: (from previous page)

1. Cost Per Unit (=1,000 ft²)
2. Work Hours Per Unit
3. Additional site preparation cost: flat labor cost of 3 hrs/$60.00 for set up of herbicide applications (e.g., mixing herbicides, setting up equipment, flushing tank sprayer), calculated at ½ hr for each spray event.
4. See www.xerces.org/pollinator-seed for a list of recommended mixes.
5. Cost of tools and equipment use not included, as they are usually insignificant/already in possession of most farmers.
6. Additional irrigation materials: remote water timer and drip conversion materials, generally one-time cost, regardless of project size = $95.00

SAMPLE COSTS:

A ½ acre wildflower field will range in price from approximately $176.00–$2,670.00 for materials and $5,736.00–$8,500.00 for both labor and materials. Please see Wildflower Establishment: Organic Site Preparation Methods (www.xerces.org/organic-farms) for guidance on larger projects.

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
- www.xerces.org/providing-wildflowers-for-pollinators
- www.xerces.org/pollinator-conservation/plant-lists

This site was prepared using repeated applications—shown in July and August—of vinegar burndown herbicide over the growing season to eliminate weeds before seeding wildflowers. (Photographs courtesy of Joe Fahey, Peck & Bushel Fruit Company.)

Because wildflower seeds are often very small and the seeding rates, in terms of lbs/ac, are generally low, equipment calibration and even seed dispersal can be challenging. To facilitate calibration and dispersal, it is helpful to mix in polenta (coarse cornmeal) or another bulking agent with the seed mix at a 1:1 ratio. The cost of polenta is approximately $2.00/lbs, and will add $15.00/ac to the seed mix cost.

III. Maintenance

Thorough site-preparation prior to planting should keep maintenance costs to a minimum; however, some on-going site management will be necessary. Annual flail mowing in the fall is recommended to prevent thatch build-up and promote wildflower seed germination. Some on-going weed management will also likely be needed. This weed management could consist of hand-weeding within the project site, managing weeds on the perimeter of the site through mowing or herbicide use, spot or selective herbicide use in the project area, additional mowing to target specific weed species, or occasional inter-seeding to maintain species diversity and wildflower cover. Inadequate site preparation will increase the cost of on-going maintenance see *Maintaining Diverse Stands of Wildflowers* for more information on managing wildflower plantings.

IV. Irrigation

Although it is recommended that native or locally adapted wildflower species be used in conservation cover projects, installing an irrigation system may still be necessary for project success, particularly in arid climates or areas experiencing drought conditions.

The irrigation estimates in the tables above assume that the system can be hooked into an existing irrigation system on the farm, with a separate irrigation line for the habitat area. As wildflower plantings 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.

The most water-efficient irrigation for conservation cover projects is in-line drip emitter tubing. Tubing can be ordered with in-line emitters on 1' centers, and the driplines can be laid about 2' apart, thus one linear foot of dripline will cover about 2 ft^2 This will generally ensure even soaking of the entire project area. Ground pins can be used to secure the drip line in place, at the rate of one pin approximately every 6'.

This site in Minnesota was mowed before receiving numerous applications of herbicide over the growing season and is now ready for planting. In order to avoid bringing up dormant weeds or weed seed DO NOT TILL a site prior to seeding wildflowers. (Photograph by James Eckberg, The Xerces Society.)

PROVIDING CONTINUOUS BLOOM

It's important for pollinator plantings to provide a continuous source of pollen and nectar throughout the growing season—with a minimum of three species in bloom per season. This site in California, shown in March and April, demonstrates how a mix of wildflower species can prevent gaps in bloom. (Photographs by Jessa Kay Cruz, The Xerces Society.)

V. Cost Comparisons

Chemical Fallow vs. Solarization for Wildflower Establishment

Chemical fallow is generally less effective at eradicating weeds and weed-seeds from a site as compared to the site preparation method referred to as solarization, and thus requires significantly more labor in terms of on-going management to keep the site weed-free. However, chemical fallow methods cost far less in material costs as compared to solarization. The cost of establishing a 1,000 ft^2 wildflower planting using chemical fallow ranges from ~$8.00–$212.00 for materials and $258.00–$472.00 for materials and labor combined. The cost of establishing a 1,000 ft^2 wildflower planting using solarization ranges from ~$47.00–$311.00 for materials, and $147.00–$421.00 for materials and labor combined.

Wildflower Establishment vs. Hedgerow Establishment

Native wildflower plantings and native hedgerows are two of the most common types of planting for providing on-farm pollinator habitat. Hedgerow costs are typically provided in $/linear foot, and wildflower costs are provided in $/$ft^2$. In order to compare costs, assume a 10' width for hedgerows, so that a 100' (linear) hedgerow is approximately equal to a 1,000 ft^2 wildflower planting. A 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 in a given situation. 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 cavity 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[1]		Wildflower planting: CHEMICAL FALLOW	Wildflower planting: SOLARIZATION	POLLINATOR HEDGEROW
SMALL PLANTING[2]	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[3]	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^2 plot or 10' × 100' hedgerow
3. Large planting = ½ ac plot *OR* ½-mile-long hedgerow

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