



# A Guide to Creating Pollinator Habitats in Orchards

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## Native Pollinators Improve Orchard Resiliency

The decline of both domestic and wild bee populations has serious implications for orchard pollination. Relying on a single source for pollination could effect production. One way to build a diversified pollination strategy is to incorporate native pollinators in farming practices.

Fruit trees alone do not provide season-long habitat for native pollinators. Their diversity and bloom time is insufficient. Planting a variety of species with diverse pollen and nectar that flower throughout three seasons will help keep pollinators in the area and support healthier bees.

Creating native habitats to attract wild pollinators is a low-cost way to support sustainable pollination.

## Benefits to Orchard Operations

There are over 600 native species of bees in Washington pollinating wild lands. Growers who include pollinator habitat in their operation can expect a range of benefits including:

- Lower costs for beekeeping and hive rental.
- Beneficial insects that prey on orchard pests, possibly reducing pesticide use.
- Longer pollination season.
- Improved soil health and less erosion with pollinator plantings.

According to the University of California-Davis, wildflower habitats attract “on average **six times the number of native bees** and three times the diversity compared to unplanted controls, **without attracting pests.**”

*Washington’s native mason bee is an excellent pollinator and has a 95 percent pollination rate compared to the honeybees’ 5 percent pollination rate.*



# Pollinator Planting Process Checklist

**Site preparation methods:** Consider weeds and soil condition on the planting site.

	I can do this	Consideration
Solarization	<input type="checkbox"/>	Chemical free way to eradicate weed growth. Very effective.
Soil inversion	<input type="checkbox"/>	Buries the weed seed bank, reduces competition for moisture.
Smothering cropping	<input type="checkbox"/>	Will grow rapidly and suppress or stop the growth of weeds. Species like alfalfa and buckwheat work well.
Herbicide	<input type="checkbox"/>	Selective or non-selective. Suppress specific weeds or broadly suppress all growth.
Shallow cultivation	<input type="checkbox"/>	Breaks the surface crust and aerates the soil for air, water, and nutrients.
Sod removal	<input type="checkbox"/>	Best ways to remove sod, till, dig, smother, and apply herbicide.
Sheet mulching	<input type="checkbox"/>	Also known as "lasagna composting". Mimics natural soil building process.

**Planting methods:** Consider how to install seed and plants for greatest success and ease of maintenance.

	I can do this	Consideration
Broadcasting	<input type="checkbox"/>	Scatter seed by hand or mechanically, over a relatively large area.
Drop seeding	<input type="checkbox"/>	Uses gravity to drop material (seed) so a regular and efficient drop pattern is attained.
Native seed drill	<input type="checkbox"/>	Mechanically press seed into the ground. Plant seed at a set depth.
Transplants	<input type="checkbox"/>	Helps improve plant survival, because plant is established already.
Planting rows	<input type="checkbox"/>	Shrubs planted in rows allow mowing weeds in a straight line.
Planting clumping	<input type="checkbox"/>	Easier to fence, can mow around clumps if needed

**Site maintenance:** Consider actions to ensure a successful planting site.

	I need this	Consideration
Fencing	<input type="checkbox"/>	Is there wildlife pressure? Deer, cattle, beavers active in the area?
Mowing	<input type="checkbox"/>	Will reduce competition from weeds.
Hand-weeding	<input type="checkbox"/>	Do you have the time to hand pull weeds?
Spot spraying	<input type="checkbox"/>	Around planting site so weeds don't encroach.
Prescribed fire	<input type="checkbox"/>	Can be effective, but permits and specially trained personnel needed.
Grazing	<input type="checkbox"/>	Can be effective, but supervision and fencing needed.

# Native Pollinator Plant Species for Irrigated or Riparian\* Areas



\* Species found in wet areas typically associated with creeks, streams, wetlands, lakes and other moist to wet habitats.

	Species	Bloom Time	Height	Exposure
Trees/Shrubs	Sitka willow ( <i>Salix sitchensis</i> )	Spring	3-24 ft.	Sun/Partial Shade
	Oceanspray ( <i>Holodiscus discolor</i> )	Spring/ Summer	10-36 in.	Sun/Partial Shade
	Blue elderberry ( <i>Sambucus nigra</i> )	Spring/ Summer	12-36 ft.	Sun/Partial Shade
	Sitka alder ( <i>Alnus viridis</i> )	Spring	8-18 ft.	Sun/Partial Shade
	Pacific ninebark ( <i>Physocarpus capitatus</i> )	Spring	6-12 ft.	Sun/Partial Shade
Flowers/Forbs/Grasses	Western aster ( <i>Sympphyotrichum ascendens</i> )	Spring/ Summer	4 in. - 2 ft.	Sun/Partial Shade
	Silky lupine ( <i>Lupinus sericeus</i> )	Summer	36-48 in.	Sun
	Joe Pye weed ( <i>Eutrochium maculatum</i> )	Summer/ Early Fall	4-7 ft.	Sun
	Showy milkweed ( <i>Asclepias speciosa</i> )	Summer	1.5-5 ft.	Sun
	Goatsbeard ( <i>Aruncus dioicus</i> )	Spring/ Summer	3-6 ft.	Shade/ Partial Sun
	Western columbine ( <i>Aquilegia formosa</i> )	Summer	12-30 in.	Partial Shade
	Tufted hairgrass ( <i>Deschampsia cespitosa</i> )	Summer	10-20 in.	Sun/Partial Shade



*Pacific ninebark*



*Red columbine*



*Goatsbeard*

# Native Pollinator Plant Species for Drylands

	Species	Bloom Time	Height	Exposure
Trees/Shrubs	Rubber rabbitbrush ( <i>Ericameria nauseosa</i> )	Summer/Fall	1-8 ft.	Sun/6-9"
	Big sagebrush ( <i>Artemisia tridentata</i> )	Summer	2-13 ft.	Sun/12-16"
	Antelope bitterbrush ( <i>Purshia tridentata</i> )	Spring	2-6 ft.	Sun/12/24"
	Smooth sumac ( <i>Rhus glabra</i> )	Spring/ Summer	6-12 ft.	Sun/Part Shade/9-12"
Flowers/Forbs	Arrowleaf balsamroot ( <i>Balsamorhiza sagittata</i> )	Spring	1-3 ft.	Sun/12-24"
	Blue flax ( <i>Linum perenne</i> )	Spring/ Summer	1-3 ft.	Sun/9-12"
	Silky lupine ( <i>Lupinus sericeus</i> )	Summer	2-4.5 ft.	Sun/10-18"
	Snow buckwheat ( <i>Eriogonum niveum</i> )	Summer	4 in. - 2 ft.	Sun/9-12"
	Oregon sunshine ( <i>Eriophyllum lanatum</i> )	Spring/ Summer	4 in. - 2 ft.	Sun/10"
	Blanketflower ( <i>Gaillardia aristata</i> )	Summer	10 in. - 2 ft.	Sun/10-30"
	Western yarrow ( <i>Achillea millefolium</i> )	Spring/ Summer	10-36 in.	Sun/6-26"
	Purple cushion flebane ( <i>Erigeron poliospermus</i> )	Summer/Fall	1-3 ft.	Sun/10-18"
Grasses	Bluebunch wheatgrass ( <i>Pseudoroegneria spicata</i> )	Multi seasonal	1.5-4 ft.	Sun/8-20"
	Sandberg bluegrass ( <i>Poa secunda</i> )	Multi seasonal	2-4 ft.	Sun/15-20 "
	Idaho fescue ( <i>Festuca idahoensis</i> )	Multi seasonal	1-2 ft.	Sun/14-20"
	Snake river wheatgrass ( <i>Elymus wawawaiensis</i> )	Multi seasonal	1-1.5 ft.	Sun/10-20"

# Case Study: Before & After

## Half Acre of Orchard Developed for Pollinator Habitat

In 2021, a half-acre of native pollinator plant species was planted in a decommissioned ditch along the outside edges of an orchard in the Methow Valley.

The agricultural land manager worked with conservation staff to pick the planting location and helped choose the plant species with the best success rate to attract pollinators and beneficial insects. Bloom time is key in choosing the flowering pollinator plant species. Plants must be blooming throughout spring, summer, and fall to ensure pollinators stay at the site. Nearly 300 plants and 30 pounds of seed were used to develop the site.

Bunchgrasses, alongside flowering plants, provide home sites for pollinators and beneficial insects. The planting site sits away from the orchard and the land manager planted trees along the lower fence edge to provide protection to the beneficial insects from the orchard's daily operations.

The land manager also added brush piles and rock piles to provide additional cover and nesting sites for pollinators. An irrigation system consisting of 500 feet of pipe and 20 sprinkler heads was installed in the planting site to help establish the native plants for the first three-to-five years. Once the flowering plants, shrubs, and grasses are established, the need for irrigation should be minimal.

The land manager installed a temporary fence to discourage foraging by deer during the plants' early growth in order to increase plant survivability. Additionally, white clover seeds were planted in the drive rows of the orchard to attract beneficial insects and fix nitrogen in the soil.

Installed: April 2021

Project Cost: \$8,370

Cost-Share: 50% or \$4,185 of expenses were covered by the Okanogan Conservation District



**Right:** Before and after photos of the orchard under development for native pollinator habitat. The weedy area now hosts a range of native plants and other features that support pollinators and beneficial insects.



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The Okanogan Conservation District provides technical and financial assistance to fruit growers interested in establishing native pollinator habitats. Services are free-of-charge.

## Things to Consider: Creating a Pollinator Habitat

When planning your native pollinator habitat, selecting the right location and plants will ensure its success. Select up to three species to bloom each season in spring, summer and fall to provide a continuous source of food for native pollinators. A variety of native plant species, including bunchgrasses, protects pollinator nesting and egg laying. Bee nesting boxes, rock piles, and brush piles also provide shelter. Consider the following for native plants to thrive:

- **Soil** with limited saline and sodic content that drains.
- **Plants** adapted to the local climate, suitable for sun or shade, and species that do not host orchard pests.
- **Water** access as new plantings require biweekly watering for two-to-three years. Once established, plants require less frequent watering but for a longer duration to drive moisture deeper into the soil to ensure plant roots develop more fully.
- **Weed** control means starting with a weed-free area or creating one using appropriate herbicides or tillage equipment. Keep the area relatively weed-free for the first two-to-three years by mowing and adding mulch to suppress weed competition, and help retain soil moisture.
- **Protect** young plants with fencing that keeps deer and livestock out. New plants need to flower to provide nectar, and pollen.

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### References used to create this document:

[www.xerces.org/pollinator-conservation/habitat-installation-guides](http://www.xerces.org/pollinator-conservation/habitat-installation-guides)  
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