

Using Mulch for Small-Scale Native Plant Plug Plantings



What is mulch?

Mulch can be any material intentionally placed on the soil surface that aids in weed suppression, erosion control, and moisture retention, and it can be very helpful in establishing small-scale wildflower plantings with plugs for pollinators and beneficial invertebrates. Mulching can be used both before planting to help prepare the site by smothering existing vegetation and after planting to help suppress weed pressure and retain moisture. It also sends the message that this site is cared for, that these small plants will become something significant.



Before You Plant: Site Preparation

Adequately reducing weed pressure is **one of the most important steps** for the successful establishment of native plants. Using mulch to smother weeds can take weeks to months to complete—maybe years for more aggressive species. If weed pressure is high, consider using a non-porous mulch, such as cardboard or plastic (Table 1). For more detailed information, see “solarization” and “sheet mulching” in *Organic Site Preparation for Wildflower Establishment* (xerces.org/publications/guidelines/organic-site-preparation-for-wildflower-establishment), and “smothering” in *Planting for Pollinators: Establishing a Wildflower Meadow from Seed* (extension.unh.edu/resource/planting-pollinators-establishing-wildflower-meadow-seed-fact-sheet).



After You Plant: Maintenance & Communication

Even the hardiest native plants can benefit from the moisture retention, weed suppression, temperature regulation, and other support that mulching can offer. Mulching can also be used to clearly show that a planting is intentional and being cared for, and it can delineate beds and outline pathways. This can help visitors understand where they can walk or where certain plants are located. Mulches can offer a lot of creativity in garden design and aesthetics.

TOP TO BOTTOM—Mulching can help with moisture retention, site preparation, and marking pathways. (Photos [top–bottom]: Therese Bellaimey, Xerces Society / Stefanie Steele, Xerces Society / Stefanie Steele.)

Table 1. Recommended use, characteristics, and notes for common types of mulch .

	TYPE OF MULCH	RECOMMENDED TIMING	ATTRIBUTES	THICKNESS / LAYERS	LIFESPAN	AVAILABILITY	
Natural	Wood chips	Before planting; after planting	  	2–4 inches	1–2 years (aesthetic); 4–7 years (practical)	Generally low cost	
	Straw	Before planting; after planting	  	2–4 inches	3 months–1 year	Generally low cost	
	Leaves	Before planting; after planting	  	2–4 inches	1 year	Generally free	
	Cover crops (temporary)	Before planting	  	NA	3 months–1 year	Varying costs	
	Living mulch, groundcovers (permanent)	After planting	  	NA	5–10+ years	Varying costs	
	Nut hulls	After planting	 	2–4 inches	>5 years	Free – varying costs	
	Pine needles	After planting	 	2–4 inches	6 months–1 year	Free – varying costs	
	Sod (flipped) or existing thatch	Before planting; after planting	 	2–4 inches	6 months–1 year	Free	
	Rocks or seashells	After planting		2–4 inches	10+ years	Free – varying costs	
Manmade	Cardboard	Before planting; after planting	  	2–3 layers	1–2 years	Generally free	
	Newspaper	Before planting; after planting	  	5–10 layers	1–12 months	Generally free	
	Landscape paper rolls	Before planting; after planting	 	>10 mm thick; 2–3 layers	6–12 months	Varying costs	
	Burlap rolls / jute coffee bags	Before planting; after planting	   	1–2 layers	1–2 years	Generally free	
	Woven landscape fabric	Before planting; after planting		1–2 layers	3–15 years	Free (recycled) – expensive (new)	
	Repurposed billboard vinyl	Before planting	 	1–2 layers	10+ years	Generally free	
	Black silage tarp	Before planting		4–6 mil thick; 1–2 layers	2–3 years	Free (recycled) – expensive (new)	
	Clear plastic (solarization)	Before planting		4–6 mil thick; 1–2 layers	2–3 years	Free (recycled) – expensive (new)	

KEY



SOIL ENRICHMENT



ECO-FRIENDLY



BIODEGRADABLE



REUSABLE

Notes:

1. ECO-FRIENDLY MULCHES ARE TYPICALLY BIODEGRADABLE AND HAVE LESS DAMAGING EFFECTS ON THE ENVIRONMENT BY USING NATURALLY OCCURRING MATERIALS AND/OR REUSING EXISTING PRODUCTS.

NOTES	
	Avoid noxious or invasive species, seeds, flammable species, or those that inhibit plant growth. Moisture can lead to fungal growth.
	Attractive to rodents. Fire hazard when dry. Ensure that straw is labeled as weed and seed free.
	Not all leaves are the same—some decompose more quickly (maple), some last longer (oak). Walnut debris can contain juglone, which can inhibit germination and plant growth.
	Avoid noxious or invasive species. Can improve soil and provide resources for pollinators before habitat installation.
	Avoid noxious or invasive species. Common species include non-native clovers (Dutch white, red) and native species (such as strawberries, violets, cinquefoils, blue-eyed grass, ginger, ferns, sedges, sedums, and selfheal). Some may be competitive with native plug species. Can improve soil and provide resources for pollinators before habitat installation.
	Options vary by region: almond, walnut, hazelnut, coconut, and cocoa are common. Rough and pointy shells can deter pests like snails and slugs.
	Common in the southeastern U.S. Despite common misconception, doesn't acidify soil more than any other mulch
	Best for small areas. Grass may regrow.
	Rocks are common in the desert southwest. Seashells are common near coasts. May grow weeds with insufficient ground cover. Can cause hotspots and alter pH levels (depending on type).
	Can be attractive to pests (rodents, snails, slugs). Often used as base layer with natural mulches (2–4 inches).
	Non-glossy black-and-white newspaper recommended. Often used as base layer with natural mulches (2–4 inches).
	100% recycled paper recommended. Often used as base layer with natural mulches (2–4 inches).
	Some weeds may grow through. Easy to cut holes for planting plugs. Sometimes resuble but tends to breakdown after a year. Often used as base layer with natural mulches (2–4 inches).
	Weeds may grow on top. Easy to cut holes for planting plugs. Generally less heavy than the other plastic mulches. Often used as base layer with natural mulches (2–4 inches).
	UV-resistant and resistant to tears.
	Non-UV-resistant tarps can shred and leave plastic fragments in soil.
	Consistent high temperatures and sun recommended. Often prone to tearing.

Photo: Xerces Society / Stefanie Steele.



Mulching Tip for Pollinators!

70% of bees are ground-nesting, laying their eggs in burrows just beneath the surface (see left). Mulching can interfere with this. Once plants are established, additional mulch is typically unnecessary. Reducing dense mulch can encourage ground-nesting bees to nest. Autumn leaves can be a great temporary mulch that still encourages bee nesting.

Picking a Mulch

Every kind of mulch supports weed suppression, erosion control, and moisture retention. There are many types of mulch, all with unique attributes. For guidance on which mulch is most suitable for your project, see Table 1 above.

Natural mulches, such as wood chips, straw, and leaves, are often cheaper and more readily available; however, they pose a higher risk of containing weed seeds, diseases, and pesticides. Some natural mulches may introduce excess carbon, raising the carbon-to-nitrogen ratio (C:N) and reducing available soil nutrients near the surface; this will affect young seedlings more than transplanted plugs. Contact your local Cooperative Extension (extension.org/find-cooperative-extension-in-your-state/) to learn more about your soil and to arrange for soil testing.

Man-made mulches, such as cardboard, landscape fabric, and UV-stable plastic tarp, are often more expensive and may pose a risk of synthetic contamination, such as plastic fragments, dyes, and chemicals. These mulches work best on non-sloped areas. Heavy and non-porous layers of mulch, such as black plastic tarp, can be more difficult for an individual to manage, and mosquitoes may breed in standing puddles. It's essential to secure edges and patch any holes caused by animals or stiff plant stems.

In some cases, mulching may not be the best tool.

- **Overly wet conditions** may cause porous mulches to store excess water, often leading to fungal growth; non-porous mulches may collect stagnant water in depressed areas, leading to an increase in algal growth and mosquito reproduction.
- **Heightened pest pressure** (e.g., snails or slugs) may occur if using a mulch that creates hiding spaces.
- **If mulching around trees**, avoid creating “volcanoes.” Putting too much mulch against the tree trunk may smother and kill it.

Additional support

- Visit your local USDA Natural Resources Conservation Service (NRCS) Service Center! Several urban centers across the U.S. now have Field Offices right in the city. Ask about relevant practices, including mulching, trails and walkways, cover cropping, and planting wildflower plugs, shrubs, or trees.
 - Find your local Service Center at nrcs.usda.gov/contact/find-a-service-center
- Xerces Society for Invertebrate Conservation: Pollinator Conservation Resource Center (xerces.org/pollinator-resource-center)
- National Food and Agriculture Institute (NIFA): Find Your Local University Extension Office (nifa.usda.gov/grants/land-grant-university-website-directory)
- Environmental Protection Agency (EPA): Green Infrastructure (spcwater.org/topics/stormwater-management/stormwater-best-management-practices-2/green-infrastructure/)

Acknowledgments

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This material is based upon work supported by a U.S. Department of Agriculture (USDA), Natural Resources Conservation Service grant under agreement number NR233A750005C045. 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 U.S. Department of Agriculture. –

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