

Dyer's Woad

Isatis tinctoria



FAMILY	Brassicaceae- plantains	ORIGIN	Southeast Russia
LIFE CYCLE	Biennial or Annual	OTHER NAMES	Marlahan mustard, Asp-of-Jerusalem, Glastum, Devil's weed

QUICK FACTS

- Valued as a crop and tolerated as a useful weed from Europe to the Eastern U.S., dyer's woad is woefully suited to become ecologically invasive in New Mexico. **Highly adaptable**, it has no issue growing in harsh conditions such as clay-heavy, alkaline, and rocky soils, which are so common in our arid landscape.
- Under these conditions, it thrives openly without cultivation (especially in neglected or open areas), out-competing native or other desired plants easily, often forming **large monocultures** that spread quickly and exhaust soil resources. The result is vast ecological and economic damage, as stands of these plants not only reduce the available forage for wildlife but also may **leach toxic compounds** into the soil.

Dyer's woad: the unassuming plant that once turned medieval wardrobes blue, adorned the tombs of Egypt, made warriors fearful, and eventually turned traitor in the American Southwest.

Valued as a dye crop by ancient empires, dyer's woad persisted through the centuries until it was purposefully brought to the United States and quickly displaced native plant communities in the West. Dyer's woad thrives on neglect; it is happy to move into overlooked areas that haven't even been disturbed. If not caught early, it will quickly take over a field and render pastures economically useless.

What does it look like?

Dyer's woad grows as a winter annual, short-lived perennial, or biennial, which appears blue-green with stems topped with large umbels (shaped like an upside-down umbrella) of small, bright-yellow flowers (see Gallery below). Typical of mustards, dyer's woad has four petals in a cross shape. Look out for reddish stems often seen at the plant's midsection – this is a distinguishing feature of dyer's woad.



anetteffm, inaturalist.org



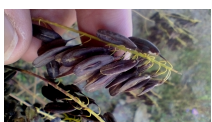
youngpedalucz, inaturalist.org



Cesar Garcia, inaturalist.org



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Jordi López-Pujol, inaturalist.org

Plant: Young plants germinate as a rosette; at this stage, the basal leaves may have some hairs known as trichomes. Multiple stems arising from a central stalk; almost 20 from its basal (first germination) stage, but usually seven at maturity. The stems mature to a length of about 1–5 ft. Although in higher elevations, 6,300 feet and above, the plant may be on the shorter side, averaging 1–2 feet. The plant branches into an umbrella shape at the top.

Roots: The plant has a thick taproot that can be fleshy or woody. This taproot can grow up to five feet in depth, giving the plant an advantage in rocky or sandy soils. Its lateral roots grow primarily in the top 12 inches of soil.

Leaves: Oval to lance-shaped and blue-green, arranged alternately on the stem, with irregularly toothed margins. The adult leaves clasp the stem and have a white to cream-colored midvein from the base of the leaf to the tip. The leaves at the base of the stem are usually largest at the base (1–4 inches long) and get smaller as you go up the stem.

Flowers: are small and yellow, each with four petals arranged in a cross shape, and sepals that are just over 1/8 inch long. The inflorescences cluster, forming compound raceme panicles (umbrella shapes) at the top of the stems

Seeds: Flat, teardrop-shaped, and suspended from the stems from which the flowers used to grow. The seed pods begin green and, when they finish maturing, are dark purplish-brown to black.

Impact and Management

Native Ecosystems and Biodiversity

As the basis of food chains, plants provide the backbone to the rest of the ecosystem. From pollinating insects and migrating birds to our distinctive wildlife, they have all evolved to rely on the plants native to the land, and thus rely on those communities for their complete nutrient supply. Dyer's woad displaces native plants from their ancestral landscapes, resulting in a loss of species biodiversity that has branching effects throughout the ecosystem, including reduced forage availability for game and other wildlife.

Agriculture & Economy

Working landscapes such as farms and pastures are heavily affected by dyer's woad infestations across the West. Dyer's woad is known to reduce available forage for domestic livestock, leading to decreased agricultural economic health. In 1981, the presence of dyer's woad cost Utah ranches an estimated \$2 million collectively. Rangelands suffer more greatly than active croplands, as the frequent disturbance and accessibility of food crops provide less-than-ideal conditions for the plant. While a chemical composition has not been established, the plant is believed to have allelopathic properties, not from the roots but from decomposing seed pods that fall to the ground near the parent plant and poison the soil. This adds to the difficulty of managing infestations by overwhelming dyer's woad with more desirable plant communities.

Because this plant can quickly displace existing vegetation, identifying the plant early is key. Once established, dyer's woad relies primarily on the chemical properties and sheer abundance of its seeds to assert dominance over the landscape. Management thus focuses on preventing seed formation and germination. Removing the crowns before seeds become viable is essential to the plant's eradication. Early detection and removal of plants before flowering can also significantly reduce seed production.

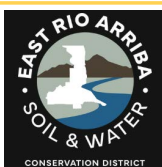
Mechanical methods, such as hand-pulling or digging, can be effective as long as the taproot is fully removed to prevent regrowth. Mowing can limit seed production in the short term, but may be counterproductive.

DO's

- Uproot plants early in their lifecycle, ideally before they flower. This prevents seeds from forming and spreading. Ensure the entire taproot is removed to prevent regrowth.
- Clean equipment, vehicles, and tools after working in infested areas. Seeds can cling to machinery and travel to new sites.
- Frequently check fields, rangelands, and open areas for early signs of infestation. Early detection is crucial for effective management and minimizing the spread.

DON'Ts

- Let the plant flower and set seeds, as a single plant can produce thousands of seeds. Immediate action is essential to control spread.
- Ignore infestations in remote areas. Even in inaccessible or less-visited regions, unmanaged infestations can rapidly spread.
- Underestimate its resilience. Dyer's woad can survive in harsh conditions with poor soil. Assuming it won't thrive in a specific area can lead to unchecked growth and invasion.



For more information on managing dyer's woad, please visit www.nmweeds.org

