

This WEED REPORT does not constitute a formal recommendation. When using herbicides always read the label, and when in doubt consult your farm advisor or county agent.

This WEED REPORT is an excerpt from the book *Weed Control in Natural Areas in the Western United States* and is available wholesale through the UC Weed Research & Information Center (wric.ucdavis.edu) or retail through the Western Society of Weed Science (wsweedscience.org) or the California Invasive Species Council (cal-ipc.org).

Mirabilis nyctaginea (Michx.) MacMill.

Wild four-o'clock

Family: Nyctaginaceae

Range: All western states except Arizona and Oregon.

Habitat: Found in a wide range of habitats, including perennial crops such as orchards and alfalfa fields, waste areas and along roadsides, railroad lines, woodlands, pastures, riparian areas, and dry meadows and rangelands. It is often found on sandy or rocky soil, but can also grow on clay soils or along waterways. It rarely establishes in annually cultivated ground.

Origin: Native east of the Rocky Mountains, from Montana to Mexico, and east to Wisconsin and Alabama.

Impacts: Wild four-o'clock can spread from small infestations to hundreds of acres very quickly. It colonizes both perennial agriculture and rangelands. It can outcompete pasture and grassland plants. It can compete in the same habitat as Macfarlane's four-o'clock (*Mirabilis macfarlanei*), a rare species that is considered threatened in Idaho and endangered in Oregon.

Western states listed as Noxious Weed: Washington



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Wild four-o'clock is a taprooted perennial to 4 ft tall. Plants are deeply rooted with thick, black roots, and sometimes producing a semi-woody crown. The leaves are opposite, to 4 inches long and 3 inches wide, and are heart- or egg-shaped. Leaves are smooth and waxy, with lower and middle leaves larger and borne on petioles and upper leaves smaller and more typically sessile. The stems are oppositely branching and usually smooth with a bluish to whitish waxy bloom on their surfaces.

The flowers are borne in clusters of three to five on short hairy stalks near the top of the plant. Flowers are about 10 mm in diameter but have no petals. Instead, flowers consist of five showy pink to red or lavender sepals with a whorl of bracts at the base. The name "four-o'clock" refers to the flowers, which open late in the day and wither early the next morning. Fruits are prominently five-ribbed, warty, somewhat hairy, grayish brown in color and from 3 to 6 mm long. Dispersal is only by seed. Seed spread primarily by falling to the ground below the parent plant; long-distance dispersal can occur when the umbel-like inflorescences catch on and are transported by vehicles and equipment. The seed is a hard, elongated nutlet. Seeds do undergo dormancy, but the longevity in the soil is not well understood. It is expected, however, that the seeds would remain in the soil for a few years.

NON-CHEMICAL CONTROL

Mechanical (pulling, cutting, disking)	Wild four-o'clock spreads primarily by seed, so hand weeding must be employed before flowering and seed set. However, hand pulling is generally not appropriate for this species, as roots rarely can be removed without breaking and subsequent resprouting. Unless applied repeatedly, mowing will not generally control this perennial species. Timely mowing can prevent seed production, however. While some reports indicate that cultivation alone can control wild four-o'clock, this method was not effective in Washington. However, if employed more than once per season, cultivation may be more effective. Hand hoeing following initial cultivation can be effective.
Cultural	Wild four-o'clock was reported to produce a mildly toxic alkaloid, but it is not widely considered to be a toxic species. In addition, pigs are fond of the fleshy roots. Selective grazing has not been shown to be an effective control strategy.

Biological	There are no known biological control agents to aid in the control of wild four-o'clock. This is because the species is native to the eastern United States. It is, however, susceptible to <i>Mirabilis</i> mosaic caulimovirus, which could potentially reduce growth and seed production.
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CHEMICAL CONTROL

Wild four-o'clock is reported as being very tolerant of 2,4-D, but suppressed by dicamba (*Banvel*); it is not known if non-crop sulfonylurea herbicides such as metsulfuron (*Escort*) or chlorsulfuron (*Telar*) also suppress wild four-o'clock.

The following specific use information is based on reports by researchers and land managers. Other trade names may be available, and other compounds may also be labeled for this weed. Directions for use may vary between brands; see label before use.

AROMATIC AMINO ACID INHIBITORS	
Glyphosate <i>Roundup, Accord XRT II, and others</i>	Rate: 1.5 qt product (<i>Roundup ProMax</i>)/acre (1.7 lb a.e./acre) Timing: Postemergence to early bloom. Remarks: Usually one application at low rate is adequate in non-crop areas or glyphosate-resistant crops.

RECOMMENDED CITATION: DiTomaso, J.M., G.B. Kyser et al. 2013. *Weed Control in Natural Areas in the Western United States*. Weed Research and Information Center, University of California. 544 pp.