

SPECIES SPOTLIGHT: by Emily Allen¹, ecallen624@gmail.com

Dove weed (*Croton setiger*):

A unique plant with an interesting seed strategy

Dove weed (*Croton setiger*, previously *Eremocarpus setigerus*) is a native annual forb that is ubiquitous along dry roadside edges, gravely disturbed areas, and overgrazed pasture throughout the lower elevations of California and the United States, west of the Rocky Mountains (Baldwin et al. 2012). The two most frequently used common names are dove weed and turkey mullein, which is in reference to the birds that have been observed feeding heavily on its seeds. The scientific name is descriptive of its two most visible features: 1) *Croton* is derived from the Greek word for “a tick”, which is roughly descriptive of the size and look of the seeds, and 2) *setiger* means “bearing bristles” (Smith. 2013). It forms distinctive, light green symmetrical mounds (almost topiary-like) that appear fuzzy because small hairs cover the entire plant.

Dove weed is a member of the spurge family which is a large and diverse family with unique traits. Like other members of this family, dove weed has several well-developed defense strategies to help it establish and persist in the open and harsh areas in which it thrives. Thick leaves and stems are covered in dense stellate hairs which successfully deter most grazing, although livestock will eat it if they have no other food sources, and dove weed hairs can cause a tangled mass that form in the stomach. These hairs can also cause extreme irritation to exposed skin, making seed collection difficult. Dove weed contains toxic

diterpene compounds, including eremone, which were utilized by Native Americans, who broadcasted crushed leaves in waterways to stun fish, making them easier to catch (Burrows and Tyrl 2013).

Dove weed is monoecious; both male and female flowers are small and simplified with no true petals (Baldwin et al. 2012). Individual plants vary in size depending on the level of disturbance (being larger in more disturbed areas) and available nutrients. They can grow into mounds over 1 meter in diameter, sometimes with more than one individual forming a mound, but are typically much smaller. Populations tend to be spread out with several feet or meters between individuals. While seedlings can be numerous, only a small percentage survive the stiff competition between seedlings during establishment (Cook et al. 1971). The flowers are not very attractive to pollinators but bees can still be found foraging on them late in the season when resources are scarce. Some beneficial true bugs have been found on dove weed, including two species of big-eyed bugs, *Geocoris pallens* and *G. atricolor*, and minute pirate bugs in the *Anthocoridae* family (Krimmel 2017, email communication). These true bugs are predators that feed on aphids, small caterpillars, mites, whiteflies, and thrips (UC Regents, 2014), making them helpful in controlling insect pests in the vicinity of planted crops.

The seeds of dove weed are one of the more complex and interesting features of this plant. Dove weed produces several unique polymorphic seed forms. Seed coat coloring changes over the geographic range of dove weed, the time of year produced, and the lifecycle stage. Seeds produced early in the season tend to

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From left: Small clumps of dove weed dot the disturbed landscape in a restoration project in Yolo County. *Photo: John Anderson*
 Seeds with variability in coloring including striped, mottled, and solid grey, from a Central Valley seed source. *Photo: Michael Maccini*
 Two closeups from a disturbed area in restoration project in Yolo County. *Photos: Emily Allen*

Dove weed *continued*

be more colorful and variable in pattern. For example, California coastal populations produce both mottled and striped seeds, while Central Valley populations produce mainly mottled seeds. Mottling on seeds, and to a lesser extent, stripes on seeds, act to camouflage the seeds on and in the soil from large populations of mourning doves (*Zenaida macroura*) that feed on dove weed. Mojave Desert populations produce conspicuous solid dark colored seeds, and it is thought that low mourning dove populations in that area have reduced the necessity for seed camouflage.

In addition to these diversely patterned seeds, all plants also produce some seeds that are light grey in color and are chemically different from other seeds. These light grey seeds are extremely unpalatable to the mourning dove, and tend to be produced later in the season when the plant is senescing (Cook et al. 1971, Cook 1972). Most seeds produced by dove weed do not travel more than 0.5 meters from the parent plant, and because they are often in open and sparsely vegetated areas, the seeds are vulnerable to predation by birds. The chemical protections in the later-produced grey seeds are key to future propagation. While grey seeds are unpalatable to birds, they also have other disadvantages, which includes low seedling vigor, higher susceptibility to fungal diseases, and shorter seed viability (Cook et al. 1971). These disadvantages make the continued production of both seed crops an advantageous strategy for the continued survival of this species.

Because of the high attraction of dove, turkey, and quail to the seeds, dove weed is very popular with hunters. Seeds can be planted in fall or spring to create foraging habitat for these game

birds. If a population is already present onsite, it can be managed by creating soil disturbances and controlling early weeds that come in before it germinates. Dove weed seed can also be added to restoration seed mixes to provide diversity and increase resilience. It may not be seen in the first or second year, but seeds can survive long periods in the soil and take advantage of disturbances when they occur.



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