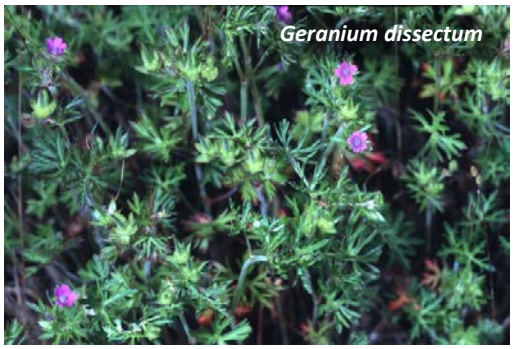
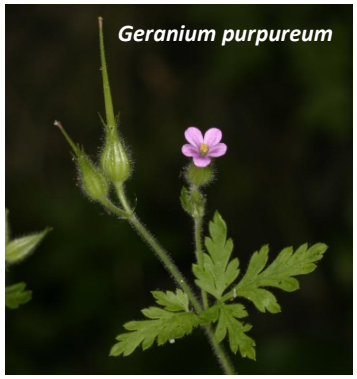
Geranium dissectum L.; cutleaf geranium
Geranium purpureum L.; little robin

Cutleaf geranium and little robin





Family: Geraniaceae
Range: Cutleaf geranium and other common species (Carolina geranium, dovefoot geranium) are found in many western states, as well as in most other northwestern, eastern, and southern states, and in some central states. In the United States, little robin is reported only from California, where it is rapidly expanding its range.
Habitat: Roadsides, fields, pastures, orchards, vineyards, landscaped areas, waste places, turf, disturbed open woodlands, shrublands, and other plant communities, and occasionally crop fields.
Origin: Both species are native to Europe.
Impact: Once established, they may displace native herbaceous species. Little robin appears to be the most significant threat to natural areas, as it can form a carpet under an oak woodland canopy.
California Invasive Plant Council (Cal-IPC) Inventory: *G. dissectum*, Limited Invasiveness

These geraniums are small herbaceous plants, annuals to biennials, growing prostate to erect, with palmate leaves and violet-pink flowers. They are widespread but generally minor weeds of wildlands. The mature plants have forked, hairy stems, hairy foliage, and slender taproots with fibrous lateral roots. Cutleaf geranium grows to about 3 ft tall with rough stem hairs and has highly dissected, round leaves with five to seven deep lobes that are dissected into narrow segments. Cutleaf geranium flowers in spring in warm areas and all the way to October in cooler, wetter areas. Little robin is a small (to 20 inches tall) geranium recently introduced into California. Its leaves appear compound, somewhat resembling a filaree leaf, with three or five pinnate-lobed leaflets.

Flowers have five violet-pink petals and are usually two per cluster. The fruits have a cranes-bill shape like filaree, which is related, but usually are not as long as filaree. Fruits split open and the seed coils on the elongated style. Most seeds land within a short distance of the parent plant, but some disperse to greater distances with animal movement, and as a seed contaminant, especially of clover seed. The seeds of cutleaf geranium can survive in the soil for up to 10 years and it is suspected that other geraniums may have similar seed longevity.

Other widespread non-native geraniums include Carolina geranium (*G. carolinianum* L.), which closely resembles cutleaf geranium, except that the hairs on the flower stalks are not glandular; and dovefoot geranium (*G. molle* L.), which is smaller than cutleaf geranium and has lobed leaves which are not as deeply dissected. There are several other less common non-native geraniums. Herb-robert (*G. robertianum* L.) is a state listed noxious weed in Washington.

NON-CHEMICAL CONTROL

Mechanical (pulling, cutting, disking)	Geraniums can be pulled, dug, or cultivated before they produce flowers and seeds.
Cultural	Grazing is not an effective means of control, though geranium is palatable to grazers. Burning is probably not effective, as it tends to increase the germination of other weeds in this

	family.
Biological	No biocontrol agents have been introduced for any *Geranium* species, due to the importance of the family as ornamentals and to the presence of native species in the genus in the western United States.

CHEMICAL CONTROL

The following specific use information is based on published papers and reports by researchers and land managers. Other trade names may be available, and other compounds also are labeled for this weed. Directions for use may vary between brands; see label before use. Herbicides are listed by mode of action and then alphabetically. The order of herbicide listing is not reflective of the order of efficacy or preference.

GROWTH REGULATORS	
2,4-D Several names	**Rate:** 0.5 to 2 pt product/acre (0.24 to 0.95 lb a.e./acre) **Timing:** Postemergence to rapidly growing plants up to flowering, the smaller the better. **Remarks:** 2,4-D is broadleaf-selective and has no soil activity. It may require repeat application. 2,4-D is not the most effective treatment, but is widely used because of low cost. Do not apply ester formulations when outside temperatures exceed 80°F. 2,4-D can also be used in a premix with picloram (*Grazon P+D*), but this formulation is not registered for use in California.
Aminocyclopyrachlor + chlorsulfuron *Perspective*	**Rate:** 3 to 4.5 oz product/acre **Timing:** Postemergence in spring up to flowering. **Remarks:** *Perspective* provides broad-spectrum control of many broadleaf species. Although generally safe to grasses, it may suppress or injure certain annual and perennial grass species. Do not treat in the root zone of desirable trees and shrubs. Do not apply more than 11 oz product/acre per year. At this high rate, cool-season grasses will be damaged, including bluebunch wheatgrass. Not yet labeled for grazing lands. Add an adjuvant to the spray solution. This product is not approved for use in California and some counties of Colorado (San Luis Valley).
Aminopyralid *Milestone*	**Rate:** 4 to 7 oz product/acre (1 to 1.75 oz a.e./acre) **Timing:** Postemergence in spring from rosette to flowering stages, or in fall to seedlings and rosettes. **Remarks:** Aminopyralid is a broadleaf-selective herbicide with soil residual activity. It can also be used in a premix with 2,4-D (*Forefront HL*), though geranium is not included on the *Forefront HL* label.
Aminopyralid + metsulfuron *Opensight*	**Rate:** 1.5 to 2 oz product/acre **Timing:** Postemergence in spring from rosette to flowering stages, or in fall to seedlings and rosettes. **Remarks:** See label for information on use of hay. Not registered for use in California.
Dicamba *Banvel*, *Clarity*	**Rate:** 8 to 32 oz product/acre (0.25 to 1 lb a.e./acre); 8 to 16 oz for rosettes, up to 32 oz product/acre for bolting plants **Timing:** Postemergence to rapidly growing plants up to flowering. Smaller plants are more effectively controlled. **Remarks:** Dicamba is a broadleaf-selective herbicide often combined with other active ingredients. It is effective earlier in the season than 2,4-D. It is also effective when tank-mixed with 2,4-D (0.75 lb a.e./acre dicamba + 0.25 lb a.e./acre 2,4-D). Dicamba has very limited soil residual. Avoid drift to sensitive crops. Do not apply when outside temperatures exceed 80°F. Dicamba is available mixed with diflufenzopyr in a formulation called *Overdrive*. The combination is broadleaf-selective and safe on most grasses. This has been reported to be effective on Carolina geranium, and would be expected to have similar results on other geranium species. Diflufenzopyr is an auxin transport inhibitor which causes dicamba to accumulate in shoot and root meristems, increasing its activity. *Overdrive* is applied postemergence to rapidly growing plants at 4 to 8 oz product/acre. Higher rates should be used on large annuals and biennials or when treating perennial weeds. Add a non-ionic surfactant to the treatment solution at 0.25% v/v or a methylated seed oil at 1% v/v solution.
Fluroxypyr	**Rate:** 22 oz product/acre (7.7 oz a.e./acre)

Vista XRT	**Timing:** Postemergence to rapidly growing plants. **Remarks:** Fluroxypyr provides only suppression of geranium. It is broadleaf-selective and safe on most grasses.
AROMATIC AMINO ACID INHIBITORS	
Glyphosate *Roundup*, *Accord XRT II*, and others	**Rate:** 2 to 3 pt product (*Roundup ProMax*)/acre (1.1 to 1.7 lb a.e./acre) **Timing:** Postemergence to rapidly growing plants. **Remarks:** Glyphosate has no soil activity and is a nonselective herbicide. Repeat applications may be necessary. Effectiveness is increased by addition of ammonium sulfate.
BRANCHED-CHAIN AMINO ACID INHIBITORS	
Imazapic *Plateau*	**Rate:** 8 to 12 oz product/acre (2 to 3 oz a.e./acre) **Timing:** Most effective postemergence. **Remarks:** Not registered for use in California.
Imazapyr *Arsenal*, *Habitat*, *Stalker*, *Chopper*, *Polaris*	**Rate:** 1.5 to 2 pt product/acre (0.375 to 0.5 lb a.e./acre) **Timing:** Preemergence or postemergence **Remarks:** Imazapyr is a nonselective herbicide. It has a relatively long soil residual activity.
Metsulfuron *Escort*	**Rate:** 0.33 to 0.5 oz product/acre (0.2 to 0.3 oz a.i./acre) **Timing:** Postemergence to young, rapidly growing plants in spring before flowering, or in fall to new rosettes **Remarks:** Metsulfuron has mixed selectivity and is generally safe on grasses. Use a surfactant. It can be tank-mixed with 2,4-D and/or dicamba and has some soil residual activity. Not registered for use in California.
Metsulfuron + chlorsulfuron *Cimarron X-tra*	**Rate:** 0.5 oz product/acre **Timing:** Postemergence to rapidly growing plants before flowering. **Remarks:** Safe on established grasses. Not registered for use in California.
Sulfometuron *Oust* and others	**Rate:** 1.33 to 2 oz or 3 to 5 oz product/acre (1 to 1.5 oz or 2.25 to 3.75 oz a.i./acre). Rate depends on environmental conditions. **Timing:** Preemergence or early postemergence, during the rainy season when weeds are germinating or rapidly growing. Use the lower rate range for areas receiving less than 20 inches precipitation annually and the higher rate range for those receiving greater than 20 inches annual precipitation. **Remarks:** Sulfometuron has mixed selectivity, but is fairly safe on native perennial grasses, especially wheatgrass. Other desirable grasses may be stunted, stressed, or injured. Good for revegetation use. It has fairly long soil residual activity. Do not let spray drift onto sensitive crops. Use lower rates in arid areas.
Sulfometuron + chlorsulfuron *Landmark XP*	**Rate:** 1.5 oz product/acre **Timing:** Preemergence or early postemergence. **Remarks:** See sulfometuron. Rates are based on rates reported for Carolina geranium.

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.