Xanthium strumarium L.; common cocklebur
Xanthium spinosum L.; spiny cocklebur

Common and spiny cocklebur

Family: Asteraceae
Range: Common cocklebur occurs throughout the west and in all contiguous states. Spiny cocklebur is found throughout much of the western United States, except Wyoming, North and South Dakota.
Habitat: Woodlands, pastures, fields, forest margins, coastal habitats and disturbed sites such as roadsides, ornamental landscapes, agricultural fields, and urban waste areas; also common along riparian areas. The cockleburs can grow in most environments and can tolerate many soil types.
Origin: Both species are native to North America.
Impacts: Cocklebur is a widespread weed in temperate to subtropical regions nearly worldwide. Ingestion of seedlings and seeds at 1% of body weight or more can be fatally toxic to livestock, especially pigs and calves. Seed and sprouts contain a high concentration of a diterpene glycoside that causes an acute metabolic disorder characterized by a sudden drop in blood glucose and an increase of certain liver enzymes. In humans, handling cocklebur can cause contact dermatitis in sensitive individuals. Spiny cocklebur has sharp, stout spines which can cause injury, and the burs of both species may stick to fur or clothing.
Western states listed as Noxious Weed: *Xanthium spinosum*, Oregon, Washington

Common and spiny cocklebur are native plants that produce large burs covered with hook-tipped prickles. Both species occur as weeds in many areas throughout the world.

Common cocklebur is a summer annual to 4.5 ft tall, with green leaves and stems without spines. The stems are thick, branched, often slightly fleshy, reddish or black-spotted, or tinged dull red. The leaves have a distinctive scent, are broadly triangular, 1 to 6 inches long and wide, often weakly three-lobed, with three main veins from the base. Upper and lower surfaces are green and rough to the touch. Plants are highly variable within and between populations.

Spiny cocklebur is a summer annual to 3 ft tall, with leaves up to 3 inches long divided into three irregular lobes. The upper surface of the leaf is shiny dark green with short appressed hairs that are denser on the veins. The lower surface is pale green and downy. Leaves are arranged alternately on the stem. The stems are erect and slightly curved with many branches. The stems have yellow/green 3-pronged spines at the base of each leaf or branch.

Both species reproduce by seed. Male flowers are produced in terminal spikes at the ends of branches or in the upper leaf axils. They are small, green to rusty red and inconspicuous. Female flowers form lower on the stem at the leaf axils and at the nodes; they become hard prickly burs at maturity. Spiny cocklebur has yellowish-green, nearly cylindrical burs, mostly 0.5 inch long and 0.2 to 0.4 inches wide. Common cocklebur has ellipsoid burs, 0.5 to 1.3 inches long, green to yellowish brown, with two conspicuous thick straight or curved beaks at the apex. The burs contain two seeds that can survive up to 3 years under field conditions. Burs disperse primarily with water – they can float for up to 1 month – and by clinging to animals and other objects.

NON-CHEMICAL CONTROL

Mechanical	Hand pulling is effective on small incipient populations. Pulling is most effective before bur development

(pulling, cutting, disking)	and seed dispersal. Cocklebur can cause dermatitis in sensitive individuals. Individuals handling cocklebur should wear protective clothing to prevent contact. Mowing or disking at flowering stage will control cockleburs. Resprouts may occur after mowing and a secondary treatment may be required. Cut-off plants with immature burs can still develop viable seed.
Cultural	Neither grazing nor burning is considered an effective control option. Seeds and foliage contain a glycoside that can be fatally toxic to livestock.
Biological	In the western U.S., there are no efforts to use biological control agents, as both species are native and considered desirable in most natural communities. Worldwide, 60 different species have been identified that attack cocklebur. Several species of insects have been introduced to Australia to control *Xanthium strumarium*, but results have generally been disappointing. The most promising control species appears to be *Nupserha antennata*, a beetle native to India and Pakistan. Another potential biocontrol agent for *Xanthium strumarium* is *Oedopa*, which feeds exclusively on *Xanthium*. Fourteen species of fungi infect *Xanthium* in the U.S. and Canada. The rust *Puccinia xanthii*, which occurs throughout the U.S., southern Canada, parts of Europe, and India, is an obligate parasite on species of *Xanthium* and *Ambrosia*. It attacks all aerial parts of the plant except the flowers. Fungal and bacterial pathogens have had some success in controlling *Xanthium strumarium* in India. *Cuscuta pentagona* (dodder), a higher plant parasite, has been found on cocklebur. *Orobanche ramosa* (broomrape) is another parasitic plant found on a variety of cultivated and weedy plants, including *Xanthium*.

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:** Broadcast treatment: 2 to 4 pt product/acre (0.95 to 1.9 lb a.e./acre). **Timing:** Postemergence when plants are growing rapidly. Applications in spring provide best control. **Remarks:** 2,4-D is selective for broadleaf species and will not damage desirable grasses growing nearby. Good coverage is necessary. 2,4-D can be tank-mixed with dicamba, and is available in a premix with triclopyr (*Crossbow*).
Aminopyralid *Milestone*	**Rate:** Broadcast treatment: 3 to 5 oz product/acre (0.75 to 1.25 oz a.e./acre) plus 0.25 to 0.5% v/v surfactant. **Timing:** Early postemergence when plants are small and rapidly growing. **Remarks:** Aminopyralid is a selective herbicide for broadleaf species and will not damage desirable grasses growing nearby. Other options include aminopyralid in a premix with 2,4-D (*Forefront HL*, 1.5 to 2.1 pt product/acre) or metsulfuron (*Opensight*, 1.5 to 2 oz product/acre). The formulation with metsulfuron is not registered for use in California.
Clopyralid *Transline*	**Rate:** Broadcast treatment: 4 to 10 oz product/acre (1.5 to 3.75 oz a.e./acre) plus 0.25 to 0.5% v/v surfactant, applied to thoroughly wet all leaves. **Timing:** Early postemergence when plants are small and rapidly growing. **Remarks:** Clopyralid is a selective herbicide for broadleaf species and will not damage desirable grasses growing nearby. Clopyralid can be tank mixed with triclopyr (*Garlon 4 Ultra*) for control of cockleburs.
Dicamba *Banvel, Clarity*	**Rate:** Broadcast treatment: 0.5 to 1.5 pt product/acre (0.25 to 0.75 lb a.e./acre) plus 0.25 to 0.5% v/v surfactant. **Timing:** Early postemergence when plants are small and rapidly growing. **Remarks:** Dicamba is a selective herbicide for broadleaf species and will not damage desirable grasses growing nearby. Dicamba can be tank mixed with 2,4-D. *Overdrive,* a premix of dicamba with diflufenzopyr, has been reported to be effective on common cocklebur. Diflufenzopyr is an auxin transport inhibitor which causes dicamba to accumulate in shoot and root meristems, increasing its activity. *Overdrive* is applied postemergence at 4 to 8 oz product/acre. Higher rates should be used on large annuals. Add non-ionic surfactant to the

	treatment solution at 0.25% v/v, or methylated seed oil at 1% v/v solution.
Fluroxypyr *Vista XRT*	**Rate:** Broadcast treatment: 11 oz product/acre (3.4 oz a.e./acre) plus 0.25 to 0.5% v/v surfactant. To optimize control use 0.25 to 0.5% v/v seed oil surfactant. **Timing:** Postemergence, when plants are growing rapidly. **Remarks:** Fluroxypyr is a selective herbicide for broadleaf species and will not damage desirable grasses growing nearby.
Picloram *Tordon 22K*	**Rate:** Broadcast treatment: 1 to 2 pt product/acre (4 to 8 oz a.e./acre) plus 0.25 to 0.5% v/v surfactant. **Timing:** Postemergence, when plants are growing rapidly. **Remarks:** High levels of picloram can give long-term soil activity for broadleaves. Also available in premixes with 2,4-D (*Grazon P+D*) or fluroxypyr (*Surmount*). Picloram is a restricted use herbicide. Picloram and all formulations including picloram are not registered for use in California.
Triclopyr *Garlon 4 Ultra, Remedy Ultra*	**Rate:** 2 pt product/acre (1 lb a.e./acre) **Timing:** Early postemergence, when plants are small and rapidly growing. **Remarks:** Triclopyr is a selective herbicide for broadleaf species and will not damage desirable grasses growing nearby. *Remedy Ultra* is the formulation used in rangelands.
AROMATIC AMINO ACID INHIBITORS	
Glyphosate *Roundup, Accord XRT II*, and others	**Rate:** Broadcast treatment: 1 to 2 qt product (*Roundup ProMax*)/acre (1.1 to 2.25 lb a.e./acre). Spot treatment: 1.5 to 2% v/v solution *Roundup* (or other trade name) and water. **Timing:** Postemergence when plants are growing rapidly. Applications in early spring provide best control. **Remarks:** Glyphosate is a nonselective systemic herbicide.
BRANCHED-CHAIN AMINO ACID INHIBITORS	
Imazapic *Plateau*	**Rate:** Broadcast treatment: 4 to 6 oz product/acre (1 to 1.5 oz a.i./acre) plus 0.25 to 0.5% v/v surfactant. **Timing:** Preemergence or early postemergence. **Remarks:** Imazapic is a selective postemergence herbicide effective for controlling broadleaf weeds and some grasses. It is not registered for use in California.
Imazapyr *Arsenal, Habitat, Stalker, Chopper, Polaris*	**Rate:** Broadcast treatment: 3 to 4 pt product/acre (0.75 to 1 lb a.e./acre) plus 0.25 to 0.5% v/v surfactant. **Timing:** Preemergence or postemergence. **Remarks:** Imazapyr is effective for controlling several broadleaf and grass weeds. It is not very selective and may produce bare ground at rates above 1 pt product/acre.
Metsulfuron *Escort*	**Rate:** Broadcast treatment: 0.33 to 0.5 oz product/acre (0.2 to 0.3 oz a.i./acre) plus 0.25 to 0.5% v/v surfactant. **Timing:** Early postemergence. **Remarks:** Metsulfuron is a selective herbicide for broadleaf species and will not damage desirable grasses growing nearby. Metsulfuron is also available in a premix with 2,4-D + dicamba (*Cimarron Max*). Metsulfuron and its formulations are not registered for use in California.
Propoxycarbazone-sodium *Canter R+P*	**Rate:** 0.9 to 1.2 oz product/acre (0.63 to 0.84 oz a.i./acre) **Timing:** Postemergence, to small, rapidly growing plants. **Remarks:** Propoxycarbazone is a broad-spectrum herbicide that will control many species. It will provide only partial control of common cocklebur. Perennial grass species vary in tolerance. A non-ionic surfactant should be added at 0.25 to 0.5% v/v solution.
Sulfosulfuron *Outrider*	**Rate:** Broadcast treatment: 0.75 to 1.33 oz product/acre (0.56 to 1 oz a.i./acre) plus 0.25 to 0.5% v/v surfactant. **Timing:** Preemergence or postemergence. **Remarks:** Sulfosulfuron is a selective, systemic herbicide for many annual and perennial weeds.

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.