

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).

Pennisetum ciliare (L.) Link
(= *Cenchrus ciliaris* L.)

Buffelgrass



Family: Poaceae

Range: While it is found in California, the most significant infestations are in Arizona and New Mexico.

Habitat: Mostly disturbed sites and fields; has greatly expanded its range into the Sonoran Desert.

Origin: Native to Africa, India and western Asia. It was introduced into Texas in the 1940s to stabilize overgrazed rangelands and provide livestock forage. It was introduced into Arizona in the 1930s and 1940s to control erosion.

Impacts: Buffelgrass is becoming especially problematic in southwestern desert regions that receive summer rain, where it and other exotic grasses are contributing to the type conversion of desert shrubland to grassland by making the fire-intolerant shrubland more susceptible to periodic burning. It is also problematic in Hawaii and Australia. Buffelgrass is highly palatable and nutritious to livestock.

Western states listed as Noxious Weed: Arizona

Buffelgrass is a tufted, or sometimes rhizomatous or stoloniferous, perennial to 4 ft tall. The ligules are hairy and the leaf blades contain small stiff hairs along the blade from the stem to the tip of the leaf. Plants can survive with only a one- or two-month rainy season.

The inflorescence of buffelgrass is a bristly spike 1 to 5 inches long, with each spikelet consisting of about 30 to 50 plumose bristles that are typically purplish. The spikes somewhat resemble those of crimson fountaingrass (*Pennisetum setaceum*). Unlike crimson fountaingrass, buffelgrass spikes are erect, dense, and mostly 0.5 to 1 inch wide, and the bristles are stiff, wavy, and mostly less than 0.5 inch long. Plants reproduce primarily by seed, although rhizome fragments can also spread the plant. Plants are apomictic. Seeds are dispersed long distances on animal skin and fur, but wind can also blow seed moderate distances away from parent plants. There is no information on the longevity of the seed in the soil seedbank. Germination of new seedlings is episodic and occurs only in high rainfall years.

NON-CHEMICAL CONTROL

Mechanical (pulling, cutting, disking)	Hand tools such as shovels, digging bars, rock picks, Caliche bars, and Pulaskis are commonly used to uproot plants. However, all roots must be removed to prevent resprouting. While the technique can be used year-round on most sites, the optimal time for manual removal is at least 4 days after 0.5 to 1 inch of precipitation. At this time, the soil is moist and removal is much easier. Two years are required to successfully remove mature buffelgrass from a site. Seedlings will need to be monitored and removed thereafter. Hand removal can be time consuming and labor-intensive and is best used for small infestations. Mowing or cutting are not effective methods for buffelgrass control and can even increase growth rates. However, cutting or mowing can be used to decrease standing biomass before herbicide applications. In this way, less herbicide can be used and the herbicide may be more effective. Mowing or cutting work best in large, relatively flat, dry areas. Repeated cultivation (tilling) can also eventually eliminate a buffelgrass infestation, but the applicability of such measures is limited in natural areas. In addition, if all vegetative reproductive parts are not removed, it can spread the infestation. Disking can also stimulate germination of the seedbank.
Cultural	Grazing is not a practical option for the management of buffelgrass, as it has been shown, on some

	occasions, to withstand continuous grazing. In other situations, continual heavy grazing was shown to reduce deeper root development. Buffelgrass can tolerate burning better than most long-lived perennials in the Sonoran Desert. Frequent fires allow buffelgrass to persist and spread to the detriment of native species, and thus, prescribed burning is not a good control option. Burning is particularly ineffective when soil water availability is high, as is often the case during winter burns. However, research indicates that when burned at the peak of live biomass production, buffelgrass production was reduced by almost 50%, even 4 years post-treatment.
Biological	There are no biological control agents available for buffelgrass. In Mexico, spittlebugs (<i>Aeneolamia albofasciata</i>) killed more than 50% of buffelgrass aboveground biomass. Leaf blight (also called rice blast or buffelgrass blight), caused by the fungus <i>Pyricularia grisea</i> , causes lesions in leaves and can damage up to 90% of individual plants, but some buffelgrass cultivars are resistant to this fungus. Since there is concern that this fungus may affect agricultural crops and because buffelgrass is considered a valuable pasture grass in Texas, the fungus is not being developed as a potential biocontrol agent. In the United States, buffelgrass is largely free of insect pests.

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.

LIPID SYNTHESIS INHIBITORS

Fluazifop <i>Fusilade</i>	Rate: 1 to 1.5 pt product/acre (4 to 6 oz a.e./acre) Timing: Postemergence to rapidly growing plants before boot stage. Remarks: Treatments may need to be repeated during a single season. Fluazifop is only effective on grass species. It is possible that fluazifop and other grass-selective herbicide, including clethodim and sethoxydim, will be effective for the control of buffelgrass, but no information is available. Fluazifop does not currently have a rangeland label.
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AROMATIC AMINO ACID INHIBITORS

Glyphosate <i>Roundup, Accord XRT II, and others</i>	Rate: Broadcast foliar treatment: 1 to 4 qt product (<i>Roundup ProMax</i>)/acre (1.1 to 4.5 lb a.e./acre). Spot treatment: 2% v/v solution, thoroughly wetting leaves. Timing: Postemergence to rapidly growing plants from mid-summer to fall. Plants should be at least 50% green when applications are made. This usually occurs during the monsoon rains, but can also occur in winter if climatic conditions are right. Remarks: Glyphosate is the standard herbicide option for control of buffelgrass. It is a nonselective herbicide. In many cases, it is best to add a dye to the chemical solution to avoid spraying non-target species. Adding ammonium sulfate to spray solution will enhance control. This application may need to be repeated several times to kill all the underground portions of buffelgrass. Glyphosate can be tank mixed with 1 to 2 oz a.e./acre imazapic (<i>Plateau</i>). However, this treatment is more expensive compared to glyphosate alone.
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BRANCHED-CHAIN AMINO ACID INHIBITORS

Imazapyr <i>Arsenal, Habitat, Stalker, Chopper, Polaris</i>	Rate: 4 to 6 pt product/acre (1 to 1.5 lb a.e./acre) Timing: Preemergence or postemergence to rapidly growing plants. Remarks: Imazapyr is a broad-spectrum herbicide with fairly long soil residual activity. It is expected to be effective on buffelgrass, though no direct evidence is available. The higher rates should be used in heavy or well-established infestations.
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PHOTOSYNTHETIC INHIBITORS

Hexazinone <i>Velpar L</i>	Rate: 1.25 to 2.5 gal <i>Velpar L</i> /acre (2.5 to 5 lb a.i./acre). Rates will vary depending on formulation used. Timing: Preemergence or postemergence to rapidly growing plants. Remarks: Hexazinone is a broad-spectrum herbicide that is mobile in the soil and has long soil residual activity. At high rates it may damage most vegetation. It should not be used in areas with a shallow water table. Hexazinone was effective in reducing growth of older buffelgrass plants (older than 45 days) and also controlled seedlings. High rates of hexazinone can create bare ground, so only use high rates in spot
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	treatments.
Tebuthiuron <i>Spike 80DF</i>	Rate: 5 lb product/acre (4 lb a.i./acre) Timing: Preemergence in fall before rains. Remarks: At this high rate, tebuthiuron is not very selective and has long soil residual activity. It has been shown to provide some control of buffelgrass when applied preemergence. Tebuthiuron was effective in decreasing growth of older buffelgrass individuals (older than 45 days) and also controlled seedlings.

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.