

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).

Elytrigia repens (L.) Desv. Ex Nevski
(= *Elymus repens* (L.) Gould, *Agropyron repens* (L.) P. Beauv.)

Quackgrass

Family: Poaceae

Range: Throughout the United States and in every western state. Because quackgrass does not tolerate long, hot summers it is not present in desert environments and is more prevalent in northern states.

Habitat: Moist mountain meadows, roadsides, ditches, crop fields and other disturbed moist areas. Common in fine-textured soils with near neutral to slightly alkaline soil pH (6.5 to 8.0), however, it will tolerate sandy, acidic soils as well. Quackgrass prefers moist sites but is fairly drought and salt tolerant. Does not tolerate continuous shade.

Origin: Native to Eurasia.

Impact: Quackgrass is highly competitive and displaces native species. It is more commonly known as a noxious agricultural weed that can significantly reduce crop yield. It is a host for several cereal diseases including leaf rusts, smuts, ergot, and take-all disease. In some settings, particularly arid rangeland, quackgrass is considered desirable forage as few other grasses are able to survive in these areas.

Western states listed as Noxious Weed: Arizona, California, Colorado, Oregon, South Dakota, Utah, Wyoming



Quackgrass is an erect, tufted, long-lived cool-season perennial grass up to 4 ft tall. It often grows in large clumps. The leaves are flat, drooping and range from 4 to 12 inches long. The underside of the leaves has a waxy coating, and the upper leaf surface has either a hairy or waxy coating. A useful identification characteristic of quackgrass is the constriction or crimp in the leaf blade approximately 1 to 2 inches from the tip. The collar has narrow, clasping auricles. The stems often lay horizontal from the base of the plant and then bend upwards. Quackgrass produces an extensive rhizome system that has been reported to grow as fast as an inch per day. The rhizome tips are sharp, enabling them to penetrate hard soil, roots, and tubers (such as potatoes).

The inflorescence of quackgrass is a spike about 2 to 8 inches long with alternate stalkless (sessile) spikelets that are flattened, with the flat side facing the stem. Awns are short (< 2 mm long). Quackgrass is not a prolific seed producer and has been reported to produce as few as 25 viable seeds per plant. Seed production often gives rise to new biotypes, which explains the diversity that exists among quackgrass plants. Seed typically falls from the plant in late summer and can remain viable for 1 to 6 years. Quackgrass reproduces primarily by rhizomes but also by seed. The rhizomes can remain viable through long periods of desiccation, and fragmented rhizomes can give rise to new plants.

NON-CHEMICAL CONTROL

Cultural and mechanical practices such as burning, mowing, grazing and cultivation are more effective when done in combination with the application of an effective herbicide.

Mechanical (pulling, cutting, disking)

The extensive root and rhizome system of quackgrass makes it extremely difficult to control by mechanical or cultural means alone. Its abundant food reserves and ability to regenerate from rhizome fragments make mechanical control problematic. Hand-pulling is usually not a practical control measure, especially for larger infestations.

Mowing has minimal effect on quackgrass.

The effectiveness of tillage is variable and depends on the severity and frequency of the infestation. Tillage can actually stimulate new shoots to form by severing the terminal bud from the rest of the rhizome.

	Moldboard plowing can significantly reduce quackgrass infestations. Chisel plowing is generally not as effective and often helps spread rhizomes throughout a field. A single disking or cultivation alone is usually not very effective and may spread the rhizomes. However, disking or cultivation after plowing can be beneficial. It can help chop roots and rhizomes and bring them to the surface where they can desiccate. Vigorous tillage before or after an effective herbicide treatment can improve control.
Cultural	Grazing has minimal effect on quackgrass. It is difficult to significantly deplete the carbohydrate reserves stored in the extensive rhizome system. Burning is usually not very effective for quackgrass suppression. Late spring fires generally reduce cover, plant biomass and flowering, while early spring fire can have the opposite effect. Quackgrass normally recovers rapidly after a fire due to the amount of stored root reserves.
Biological	There are no biological control agents available for the management of quackgrass.

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	
Clethodim <i>Select, Envoy</i>	Rate: 9 to 18 oz product (<i>Envoy</i>)/acre (1.1 to 2.2 oz a.i./acre) Timing: Postemergence to rapidly growing plants before boot stage, preferably when quackgrass is 4 to 12 inches tall. Remarks: Clethodim is only effective on grass species and may require multiple applications. It is not sufficiently effective on sodded quackgrass. Before tank-mixing with broadleaf herbicides, read the herbicide label to avoid reduced grass control. Note that <i>Envoy</i> formulation is 1 lb a.i./gallon, <i>Select</i> is 2 lb a.i./gallon.
Fluazifop <i>Fusilade</i>	Rate: 1 to 1.5 pt product/acre (4 to 6 oz a.e./acre) Timing: Postemergence in late spring to rapidly growing quackgrass 6 to 10 inches tall. Remarks: Fluazifop is only effective on grass species. Repeat treatments during a single season are necessary to control established quackgrass, and additional treatments may be needed in subsequent years for complete control. Do not apply to stressed grasses.
Sethoxydim <i>Poast</i>	Rate: 1.5 to 2.25 pt product/acre (4.5 to 6.75 oz a.e./acre) Timing: Postemergence when quackgrass is 6 to 8 inches tall and rapidly growing. Remarks: Sethoxydim is only effective on grass species. Multiple applications may be required for improved control. Sethoxydim will not control well established sodded quackgrass. Tillage 1 to 2 weeks after application improves control but is not practical on most range sites. Some results show that sethoxydim is less effective than fluazifop to control quackgrass and is therefore not generally recommended.
AROMATIC AMINO ACID INHIBITORS	
Glyphosate <i>Roundup, Accord XRT II,</i> and others	Rate: Broadcast foliar treatment (non-sodded quackgrass): 1 to 2 qt product (<i>Roundup ProMax</i>)/acre (1.1 to 2.25 lb a.e./acre). Broadcast foliar treatment (sodded quackgrass): 2 to 4 qt product (<i>Roundup ProMax</i>)/acre (2.25 to 4.5 lb a.e./acre). Spot treatment: 1 to 2% v/v solution Timing: Postemergence to rapidly growing plants from mid-summer to fall after the target plants have reached the reproductive stage (boot stage to early flowering is best). Remarks: Glyphosate is the most commonly used herbicide option for control of quackgrass. It is nonselective and has no soil activity. Repeat applications are most likely necessary.
BRANCHED-CHAIN AMINO ACID INHIBITORS	
Imazapyr <i>Arsenal, Habitat,</i> <i>Stalker, Chopper,</i> <i>Polaris</i>	Rate: Broadcast treatment: 1 to 4 pt product/acre (4 to 16 oz a.e./acre). Spot treatment: 1% v/v solution Timing: Postemergence to rapidly growing plants. Use higher rates for larger plants or late-season applications. Remarks: Imazapyr has a fairly long soil residual and is nonselective. Rates are based on those

	reported for reed canarygrass.
Propoxycarbazone-sodium <i>Canter R+P</i>	<p>Rate: 0.9 to 1.2 oz product/acre (0.63 to 0.84 oz a.i./acre)</p> <p>Timing: Postemergence from the 2-leaf to 2-tiller stage when plants are growing rapidly.</p> <p>Remarks: Propoxycarbazone is a broad-spectrum herbicide that will control many species. It will provide only partial control of quackgrass. Perennial grass species vary in tolerance. A non-ionic surfactant should be added at 0.25 to 0.5% v/v solution.</p>
Rimsulfuron <i>Matrix</i>	<p>Rate: 4 oz product/acre (1 oz a.i./acre)</p> <p>Timing: Preemergence in fall.</p> <p>Remarks: Rimsulfuron controls several annual grasses and broadleaves. It is only effective on seedling quackgrass. It has not been shown to be effective on established quackgrass. Perennial grasses are tolerant to fall applications when established and grown under dryland conditions. Application to rapidly growing or irrigated perennial grasses may result in their injury or death. It provides soil residual control in cool climates but degrades rapidly under warm conditions. Add a surfactant when applying postemergence.</p>
Sulfosulfuron <i>Outrider</i>	<p>Rate: 1.33 to 2 oz product/acre (1 to 1.5 oz a.i./acre)</p> <p>Timing: Postemergence in spring when the target plants are growing rapidly and in an early vegetative stage. Results are best when weeds are not disturbed by mowing or other factors for 12 days before or after application.</p> <p>Remarks: Sulfosulfuron has mixed selectivity, but is fairly safe on native perennial grasses, especially wheatgrasses. Follow-up applications should be made after suitable quackgrass regrowth and no sooner than 30 days after the previous application. Do not make applications to newly seeded perennial native grasses before the 3-leaf growth stage. Sulfosulfuron has fairly long soil residual activity. Treatments should include a non-ionic surfactant.</p>
PHOTOSYNTHETIC INHIBITORS	
Hexazinone <i>Velpar DF</i>	<p>Rate: 2.67 to 6.67 lb product/acre (2 to 5 lb a.i./acre)</p> <p>Timing: Preemergence in spring to control seedlings or postemergence when the target plants are germinating and actively growing.</p> <p>Remarks: Hexazinone is typically recommended in combination with glyphosate. Glyphosate is used in mid-summer to fall to control existing plants, and hexazinone is used the following spring to control new germinants. Requires adequate moisture for activation. Because hexazinone is costly and requires high rates to control quackgrass, it is not typically used in natural areas. High rates of hexazinone can create bare ground, so only use high rates in spot treatments.</p>

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.