

Plant Assessment Form

For use with the “Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands”
by the California Exotic Pest Plant Council and the Southwest Vegetation Management Association
(Warner et al. 2003)

Printable version, February 28, 2003
(Modified for use in Arizona, 07/02/04)

Table 1. Species and Evaluator Information

Species name (Latin binomial):	<i>Elymus repens</i> (L.) Gould (USDA 2005)
Synonyms:	<i>Agropyron repens</i> (L.) Beauv., <i>Agropyron repens</i> (L.) Beauv. var. <i>subulatum</i> (Schreb.) Roemer & J.A. Schultes, <i>Elytrigia repens</i> (L.) Desv. ex B.D. Jackson, <i>Elytrigia repens</i> (L.) Desv. ex B.D. Jackson var. <i>vaillantiana</i> (Wulfen & Schreb.) Prokudin, <i>Elytrigia vaillantiana</i> (Wulfen & Schreb.) Beetle, <i>Triticum repens</i> L., <i>Triticum vaillantianum</i> Wulfen & Schreb. (USDA 2005)
Common names:	Quackgrass, dog grass, couchgrass, twitch, quickgrass, scutch, quitch.
Evaluation date (mm/dd/yy):	04/13/05
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List committee members:	J. Hall, H. Messing, B. Munda, F. Northam, J. Ward
Committee review date:	04/15/05
List date:	04/15/05
Re-evaluation date(s):	

Table 2. Scores, Designations, and Documentation Levels

Question		Score	Documentation Level	Section Scores	Overall Score & Designations
1.1	Impact on abiotic ecosystem processes	U	Other published material	<p>“Impact”</p> <p>Section 1 Score:</p> <p>C</p>	<p>“Plant Score”</p>
1.2	Impact on plant community	B	Other published material		
1.3	Impact on higher trophic levels	D	Other published material		
1.4	Impact on genetic integrity	U	Other published material		
2.1	Role of anthropogenic and natural disturbance	C	Other published material	<p>“Invasiveness”</p> <p><i>For questions at left, an A gets 3 points, a B gets 2, a C gets 1, and a D or U gets=0. Sum total of all points for Q2.1-2.7:</i></p> <p>8 pts</p> <p>Section 2 Score:</p> <p>C</p>	<p>Overall Score:</p> <p>Low</p> <p>Alert Status:</p> <p>None</p>
2.2	Local rate of spread with no management	U	No information		
2.3	Recent trend in total area infested within state	B	Observational		
2.4	Innate reproductive potential	A	Other published material		
2.5	Potential for human-caused dispersal	C	Other published material		
2.6	Potential for natural long-distance dispersal	U	Observational		
2.7	Other regions invaded	C	Observational		
3.1	Ecological amplitude	B	Other published material	<p>“Distribution”</p> <p>Section 3 Score:</p> <p>C</p>	<p>Something you should know.</p>
3.2	Distribution	D	Other published material		

Table 3. Documentation

Question 1.1 Impact on abiotic ecosystem processes	<i>Score: U Doc'n Level: Other pub.</i>
Identify ecosystem processes impacted: Unknown	
Rationale: Reviewed literature did not indicate negative impacts on abiotic ecosystems processes. Because of its rhizomatous nature, quackgrass forms thick dense stands that minimize soil erosion. In cropland quackgrass is an effective competitor for nutrients, water, and light (Tardif and Leroux 1992). The ability to alter nutrient cycling, salinity, and/or light in wildland areas was not presented in the reviewed literature.	
Sources of information: See cited literature; also see Snyder (1992).	
Question 1.2 Impact on plant community composition, structure, and interactions	<i>Score: B Doc'n Level: Other pub.</i>
Identify type of impact or alteration: Quackgrass patches are typically monocultures and can reduce or occlude germination and/or establishment of native plants.	
Rationale: Quackgrass is a strong competitor with existing native plants. Its aggressive root/rhizome system can eliminate less aggressive native plants and impede seedling recruitment of native plants. Rhizomes are known to produce allelopathic substances that suppress surrounding plants and enhance the competitiveness of quackgrass. Quackgrass, depending on the density of the stand, has a negative effect on growth and seed production of cultivated crops such as alfalfa, canola, corn and wheat (Moyer and Schaalje 1993).	
Sources of information: See cited literature. Also considered information from Weber County Weed Abatement-Quackgrass (available online at: http://www.co.weber.ut.us/weeds/types/q_grass.asp ; accessed March 2, 2005) and Yard & Garden Brief: Controlling Quackgrass in Gardens (available online at: http://www.extension.umn.edu/projects/yardandgarden/ygbriefs/h507quackgrass.html ; accessed March 2, 2005) and inference based on the literature.	
Question 1.3 Impact on higher trophic levels	<i>Score: D Doc'n Level: Other pub.</i>
Identify type of impact or alteration: Minor alteration of higher trophic populations, communities or interactions.	
Rationale: Quackgrass is rated good to fair cover for small mammal, nongame birds, upland game birds, and waterfowl. Palatability is rated good for horses and cattle and fair for sheep. Quackgrass is rated fair in energy value and poor in protein value, though some studies have shown quackgrass, at certain periods of growth, can have crude protein values as high as alfalfa. (Snyder 1992)	
Sources of information: See cited literature.	
Question 1.4 Impact on genetic integrity	<i>Score: U Doc'n Level: Other pub.</i>
Identify impacts: Unknown, but no known natural hybridization with native species.	
Rationale: Quackgrass is a cross pollinated species which has been successfully crossed, in the laboratory, with bluebunch wheatgrass (native) as well as with crested wheatgrass (introduced) to form salt tolerant hybrids. 'Newhy' hybrid wheatgrass is an intentional cross between quackgrass and bluebunch wheatgrass. 'RS-Hoffman' is a genetically manipulated variety of quackgrass. Six forms and one variety of quackgrass have been recognized. Native <i>Elymus</i> do occur in Arizona (Kearney and Peebles 1960). Impact was considered Unknown because though intentional hybrids have been made, the reviewed literature did not indicate that natural hybridization has occurred or been found.	
Sources of information: See cited literature; also see Snyder (1992) and Alderson and Sharp (1994).	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	<i>Score: C Doc'n Level: Other pub.</i>
Describe role of disturbance: Quackgrass requires anthropogenic disturbance to establish.	

<p>Rationale: Quackgrass is a pest of cultivated lands, road sides, and water conveyance ditches in cool, moist zones throughout the United States except the south eastern states. Literature indicates that an initial act of disturbance with the introduction of seed or rhizomes is needed for the plant to become established.</p>	
<p>Sources of information: See Synder (1992). Also considered information regarding <i>E. repens</i> available online through U.S. Geological Survey's, Southwest Exotic Plant Information Clearinghouse at: http://www.usgs.nau.edu/swepic/asp/swemp/question.asp?Location=GRCA&Symbol=ELRE4; accessed April 15, 2005.</p>	
<p>Question 2.2 Local rate of spread with no management</p>	<p>Score: U Doc'n Level: No info.</p>
<p>Describe rate of spread: Unknown.</p>	
<p>Rationale: No information</p>	
<p>Sources of information: None.</p>	
<p>Question 2.3 Recent trend in total area infested within state</p>	
<p>Score: B Doc'n Level: Obs.</p>	
<p>Describe trend: Increasing but far less than doubling every 10 years.</p>	
<p>Rationale: Herbarium specimens in Arizona herbaria indicate a presence of quackgrass in Arizona wildlands since the 1940s (SEINet 2005). However, during that 60-year time frame only 10 records were collected and only four of those were in wildlands. Likewise, field observations by F. Northam (personal communication, 2005) did not uncover any evidence that quackgrass populations have substantially increased during the past decade in wildlands.</p>	
<p>Sources of information: SEINet (Southwest Environmental Information Network), Arizona herbaria specimen database (available online at: http://seinet.asu.edu/collections; accessed June 7, 2005). Also considered personal communication with F. Northam (2005, discussion of observations while serving as Arizona Department of Agriculture's Noxious Weed Program Coordinator 2000 to 2003).</p>	
<p>Question 2.4 Innate reproductive potential</p>	
<p>Score: A Doc'n Level: Other pub.</p>	
<p>Describe key reproductive characteristics: Quackgrass has a high reproductive potential.</p>	
<p>Rationale: Quackgrass reproduces by seed and rhizomes. One plant can produce 300 feet of rhizomes each year. Each rhizome bud can develop into a plant. Species is cross-pollinated and can produce over 1000 seeds per year but seed viability appears to be low with up to 25 viable seeds produced per shoot in a season. Dense patches can have over 900 shoots per square meter.</p>	
<p>Sources of information: See Snyder (1992). Also considered information regarding <i>E. repens</i> available online through U.S. Geological Survey's, Southwest Exotic Plant Information Clearinghouse at: http://www.usgs.nau.edu/swepic/asp/swemp/question.asp?Location=GRCA&Symbol=ELRE4; accessed April 15, 2005, Weber County Weed Abatement-Quackgrass (available online at: http://www.co.weber.ut.us/weeds/types/q_grass.asp; accessed March 2, 2005), Yard & Garden Brief: Controlling Quackgrass in Gardens (available online at: http://www.extension.umn.edu/projects/yardandgarden/ygbriefs/h507quackgrass.html; accessed March 2, 2005), and Quackgrass Description (available online at: http://www.turf.uiuc.edu/weed_web/descriptions/quackgrass.htm, accessed March 2, 2005).</p>	
<p>Question 2.5 Potential for human-caused dispersal</p>	
<p>Score: C Doc'n Level: Other pub.</p>	
<p>Identify dispersal mechanisms: Human dispersal is infrequent.</p>	
<p>Rationale: Quackgrass was introduced into the U.S. over 200 years ago and is a listed Prohibited and Restricted noxious weed in Arizona (USDA 2005). Possible contaminant in seed, hay, or straw mulch used for erosion control and revegetation practices.</p>	
<p>Sources of information: See cited literature. Also considered information from Yard & Garden Brief: Controlling Quackgrass in Gardens (available online at: http://www.extension.umn.edu/projects/yardandgarden/ygbriefs/h507quackgrass.html); accessed March 2, 2005).</p>	

<http://www.extension.umn.edu/projects/yardandgarden/ygbriefs/h507quackgrass.html>; accessed March 2, 2005).

Question 2.6 Potential for natural long-distance dispersal	<i>Score: U Doc'n Level: Obs.</i>
Identify dispersal mechanisms: Quackgrass potential for long distance dispersal mechanisms is unknown.	
Rationale: Southwest Exotic Plant Information Clearinghouse data sheet for <i>E. repens</i> indicated little potential for long-distance dispersal. However, rhizome/root masses could be dislodged from an existing stream-side population and carried down-stream during flood events. Seeds are large and probably not subject to wind dispersal but may have some ability to float. Because of the plant's usefulness to waterfowl, other birds, and small mammals, it is suspected to have potential for natural dispersal but this was not documented in the reviewed literature.	
Sources of information: Information from U.S. Geological Survey's, Southwest Exotic Plant Information Clearinghouse regarding <i>E. repens</i> is available online at: http://www.usgs.nau.edu/swepic/asp/swemp/question.asp?Location=GRCA&Symbol=ELRE4 ; accessed April 15, 2005. Score based on inference.	

Question 2.7 Other regions invaded	<i>Score: C Doc'n Level: Obs.</i>
Identify other regions: Occurs in all states except the Gulf Coast States (occurs in northern Texas), Alaska, and Canada.	
Rationale: Reviewed literature and observations indicate it occurs in the montane wetlands and southwestern interior riparian ecological types in Arizona. Because of <i>E. repens</i> requirements for moist soils at elevations above 6,500 feet, it is inferred that it has potential to invade only in ecological types it has already invaded in the state.	
Sources of information: See Synder (1992). Also considered personal communication with B. Phillips (Zone Botanist, U.S. Department of Agriculture, Forest Service, Coconino, Kaibab, and Prescott National Forests, 2005).	

Question 3.1 Ecological amplitude	<i>Score: B Doc'n Level: Other pub.</i>
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: Two major types (Non-Riparian Wetlands and Riparian) known to be invaded.	
Rationale: <i>Elymus repens</i> is a cool season perennial grass that is typically found at elevations above 6,500 feet growing on moist soils. It does not tolerate long, hot summers. Flowering typically occurs from June through August. Optimum temperatures for growth are between 68°F and 77°F. Growth ceases when temperatures fall below 35°F or go above 95°F. Rhizome growth occurs in late May or early June and then again in September and October when temperatures near 50°F and day length is long, approximately 18 hours. Herbarium records (SEINet 2005) indicate the earliest collection as August 1941 at Haystack Cienega, Navajo County, Fort Apache Indian Reservation.	
Sources of information: See Snyder (1992). Also considered information from Yard & Garden Brief: Controlling Quackgrass in Gardens (available online at http://www.extension.umn.edu/projects/yardandgarden/ygbriefs/h507quackgrass.html ; accessed March 2, 2005) and SEINet (Southwest Environmental Information Network), Arizona herbaria specimen database (available online at: http://seinet.asu.edu/collections ; accessed April 15, 2005).	

Question 3.2 Distribution	<i>Score: D Doc'n Level: Other pub.</i>
Describe distribution: Known locations occur in higher elevation sites above 6,500 feet in cienegas and areas where soils are moist and cool.	
Rationale: Fort Apache Reservation: Pachito Ranch (2 collections), Fort Apache-Haystack Cienega-	

Navajo County (2 collections), Flagstaff-Coconino County, Fort Valley Station-Coconino County, Window Rock-Apache County, West of Happy Jack-Coconino County, Sierra Ancha Wilderness Area-Gila County, Grand Canyon National Park (specific location not shown).
Sources of information: SEINet (Southwest Environmental Information Network), Arizona herbaria specimen database (available online at: http://seinet.asu.edu/collections ; accessed April 15, 2005) and information from U.S. Geological Survey's, Southwest Exotic Plant Information Clearinghouse regarding <i>E. repens</i> that is available online at: http://www.usgs.nau.edu/swepic/asp/swemp/question.asp?Location=GRCA&Symbol=ELRE4 ; accessed April 15, 2005.

Worksheet A. Reproductive Characteristics

Complete this worksheet to answer Question 2.4.

Reaches reproductive maturity in 2 years or less	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	1 pt.
Dense infestations produce >1,000 viable seed per square meter	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	2 pt.
Populations of this species produce seeds every year.	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	1 pt.
Seed production sustained for 3 or more months within a population annually	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	1 pt.
Seeds remain viable in soil for three or more years	<input type="checkbox"/> Yes	<input type="checkbox"/> No	2 pt.
Viable seed produced with <i>both</i> self-pollination and cross-pollination	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	1 pt.
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	1 pt.
Fragments easily and fragments can become established elsewhere	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	2 pt.
Resprouts readily when cut, grazed, or burned	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	1 pt.
Total pts: 9 Total unknowns: 1			
Score : A			

Note any related traits:

Worksheet B. Arizona Ecological Types

(sensu Brown 1994 and Brown et al. 1998)

Major Ecological Types	Minor Ecological Types	Code*
Dunes	dunes	
Scrublands	Great Basin montane scrub	
	southwestern interior chaparral scrub	
Desertlands	Great Basin desertscrub	
	Mohave desertscrub	
	Chihuahuan desertscrub	
	Sonoran desertscrub	
Grasslands	alpine and subalpine grassland	U
	plains and Great Basin shrub-grassland	
	semi-desert grassland	
Freshwater Systems	lakes, ponds, reservoirs	
	rivers, streams	
Non-Riparian Wetlands	Sonoran wetlands	
	southwestern interior wetlands	U
	montane wetlands	D
	playas	
Riparian	Sonoran riparian	
	southwestern interior riparian	D
	montane riparian	U
Woodlands	Great Basin conifer woodland	
	Madrean evergreen woodland	
Forests	Rocky Mountain and Great Basin subalpine conifer forest	
	montane conifer forest	
Tundra (alpine)	tundra (alpine)	

*A means >50% of type occurrences are invaded; B means >20% to 50%; C means >5% to 20%; D means present but ≤5%; U means unknown (unable to estimate percentage of occurrences invaded).

Literature Cited

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