GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Bromus rubens***

Bromus rubens 简体中文 正體中文

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Liliopsida	Cyperales	Poaceae

Common name foxtail chess (English), red brome (English), foxtail brome (English)

Synonym *Anisantha rubens* , (L.) Nevski
Bromus madritensis ssp. rubens , (L.) Husnot

Similar species

Summary *Bromus rubens* is a tufted, cool-season annual bunchgrass commonly found growing on shallow dry soil or poor textured, clayey soil. It becomes extremely competitive with other grasses and displaces native species. Red brome can produce large amount of biomass that increase the amount and continuity of fine fuels. The lack of a soil seed bank provides one avenue of control for this species.

view this species on IUCN Red List

Species Description
Red brome is a tufted, cool-season annual bunchgrass which characteristically reaches a height of 20cm to 50cm. Its annual growth pattern is a dense panicle with a purplish tinge and pubescent culm (Newman, 2001). The culms vary from 10-70cm tall. The inflorescence is a panicle, 3-11cm tall, with long awns (Simonin, 2001).

Notes
The spread pattern of *B. rubens* is similar to that explained by the intermediate disturbance hypothesis: At intermediate levels of disturbances, certain species are able to exist at increased levels. These same species usually have reduced numbers of individuals in areas without disturbances or in areas with intense or frequent disturbances (Camp and Knight, 1998).

Lifecycle Stages
Simonin (2001) states that, \"*B. rubens*'s initiation and establishment is a direct response to fall rains. Initial growth is relatively slow, followed by a rapid increase in vegetative growth coinciding with warming spring temperatures. Flowering and fruiting generally occur in April and May. Seeds are disseminated in summer.\"

Uses
Bromus rubens may provide a source of forage for livestock. Desert cottontails prefer *B. rubens* with the heaviest use occurring in winter (Simonin, 2001).

Habitat Description
Bromus rubens is commonly found growing on shallow dry soil or poor textured, clayey soil. It grows on south facing slopes, and is a common constituent in steppe regions. Newman (2001) states that, \"*B. rubens* occurs at low to medium elevations below 1,524m, in deserts and chaparral hillsides, and various places where competition from established herbaceous plants is minimal. It is common along roadsides, waste places, rangelands, and cultivated fields. It is a dominant species on some rangeland that, previous to the destruction of the vegetation, were abundant in perennial native grasses.

Reproduction
Newman (2001) states that, \"Less than 2% of *B. rubens* seeds maintain their viability over a one year period. Wind carries florets of *B. rubens* a few metres from the parent plant. Rodent excavation may also be a means of disseminating the seeds. Other common mechanisms of seed dispersion, such as flood sediment transport and scattering by animals, most likely aid in the dissemination of *B. rubens* seeds.\" The authors also state that, \"*B. rubens* is a prolific seed producer: an average of 76 seeds per plant in natural populations, 142 seeds per plant in experimental mixed stand plots, or 83,600 seeds per square metre of densely spaced plants.\" Salo (2004) reports that, \"Unlike native annuals, *B. rubens* does not produce dormant seed and does not maintain a soil seed bank\". Red brome exhibits nearly uniform germination under the cool, moist conditions that characterise winters in these regions. These characteristics cause the periodical decimation of populations of red brome and allow red brome to dominate annual communities in some years.

Nutrition
Simonin (2001) states that, \"*B. rubens* prefers disturbed sites in Mediterranean climates. In California, *B. rubens* prefers areas receiving less than 250mm of annual rainfall. It is a dominant species in California valley grasslands receiving less than 190mm of rainfall.\" The authors also state that, \"*B. rubens* commonly occurs in small patches on shallow soils, growing best where there is little competition from other annuals. In southern Nevada, *B. rubens* occupies blackbrush communities with coarse-textured soils, showing best growth under shrubs and peripheries of shrub canopies. Upland clay and sandy loam ranges and rolling sandy hills receiving 203-305mm of precipitation promote good growth in southern Utah.\" The authors note that, *B. rubens* is often found in areas with relatively high levels of sulfur dioxide pollution.\"

General Impacts
In the North American region red brome is reported to be invasive because it faces low herbaceous competition. Once established, it has the potential to compete with other grasses (Newman, 2001). The accumulation of litter and necromass has the potential to increase fire frequency in the desert south-west (Huxman *et al.* 1999). Red brome-fuelled fires result in the loss of native perennial species in invaded areas, resulting in disturbed areas that are ideal for increased growth of red brome (Esque and Schwalbe, 2002)}. According to Salo (2004), the germination requirements of *B. rubens* seem to be less demanding than those of native Sonoran and Mojave Desert annuals. This grass appears to be able to germinate following a precipitation event of 1cm, whereas native Mohave Desert annuals appear to require twice that amount, suggesting that red brome may be able to germinate before native annuals in years when early precipitation events are relatively small. The fact that they are excellent dispersers and early germinators makes them the first species to colonise distubed sites. Yoder and Nowak (2000) in their study associate the decrease in biodiversity with *B. rubens* establishment. Studies report that nitrogen additions increased Bromus yields and led to competitive suppression of the native bunchgrass *Agropyron spicatum* (Wilson *et al.* 1966). The awns and florets are a direct threat to livestock and native fauna. The vegetation change from perennial grasses to this species and other annual introduced species influences the density of rabbits, grasshoppers, and kangaroo rats.

Management Info
Physical: Annual removal of seed heads will significantly decrease the amount of red brome. Reduction in the number of weed seeds will produce available sites for native seeds to germinate and become established. Encouraging germination of native seeds will decrease the reproductive success of red brome. It is not competitive on vegetated sites and established native plants will out-compete the remaining seedlings. Removal of this annual weed, can be accomplished by hoeing the plants. Plants will not reach maturity if the seedlings are uprooted and thus no seed source for the following year will be produced. This repetitive task is time consuming, especially since seeds of red brome germinate from fall through spring. An alternate approach would be to remove all the red brome plants at one time during the spring before the majority of flowering occurs. Red brome plants are shallow rooted and can be easily removed from the soil by hand or with tools. Fire hazard from red brome biomass can be reduced with spring raking of the dead stems. Although this method disturbs the land, the number of plants and the seed source for the following year can be decreased. Grazing and burning may increase the amount of red brome by clearing vegetation and providing adequate sites for the seeds to germinate. Because seeds of annual species have a short dormancy period, they can utilise optimum conditions to germinate and complete their rapid life-cycle during the same period that disturbed perennials are slowly recovering. While burning can increase the invasiveness of red brome, Newman (2001) states that, \"If burning comes at a time that will prevent seed production and if native perennial plants are encouraged to grow, burning may help in changing the balance of the plant community\", he continues on to state that, \"burning increases the abundance of red brome, especially in areas where the land had previously undergone disturbances. A reduction in the amount of available nitrogen in burned plots may have a greater detrimental effect on the native perennial plants than on the introduced annuals; no deleterious effects of these fires were observed on red brome.
Chemical: Newman (2001) states that, \"due to the annual growth cycle of *B. rubens*, the most effective chemical control would be from pre-emergence herbicides\". Pre-emergent herbicides now available do not kill seeds, but prevent emergence by interfering with root growth at germination or early seedling growth (Cindy Salo, pers.comm., 2004). Impacts of herbicides on native plants may counter the benefits from killing *B. rubens*. The soil-active herbicide atrazine is effective in reducing the amount of competition by annual brome species, as seen by an increased yield of range forage crops and sagebrush in California and Nevada (Kay 1971, Evans and Young 1977).

Pathway

Principal source: *Element Stewardship Abstract for Bromus rubens* (Newman, 2001)
Index of Species: Bromus madritensis (Simonin, 2001)

Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

Review: Lucinda F. Salo, US Geological Survey, Forest and Rangeland Ecosystem Science Center, Snake River Field Station, Boise, ID, USA

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ALIEN RANGE

[1] AUSTRALIA

[19] UNITED STATES

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Spanish:
La lista de especies del Sistema de informaci&#65533;n sobre especies invasoras de m&#65533;xico cuenta actualmente con informaci&#65533;n aceca de nombre cient&#65533;fico, familia, grupo y nombre com&#65533;n, as&#65533; como h&#65533;bitat, estado de la invasi&#65533;n en M&#65533;xico, rutas de introducci&#65533;n y ligas a otros sitios especializados. Algunas de las especies de mayor riesgo ya tienen una liga directa a la p&#65533;gina de alertas. Es importante resaltar que estas listas se encuentran en constante proceso de actualizaci&#65533;n, por favor consulte la portada (http://www.conabio.gob.mx/invasoras/index.php/Portada), en la secci&#65533;n novedades, para conocer los cambios.
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