Uses
Silver leafhopper (Athysanus argentarius), an insect introduced from Europe, is frequently found in fields of smooth brome. Other insects that feed on Bromus spp. include the large headed grasshopper (Phoetaliotes nebrascensis) and the many winged wainscot (Leucania multilinea). Because smooth brome "lacks awns that can injure...mouthparts and gastrointestinal tracts" it is enjoyed by rabbits and hoofed herbivores (Hilty, 2007).

B. inermis is planted to increase forage or to reduce erosion after fire (Grace et al., 2002). Smooth brome is used as hay, pasture, or silage for livestock, as it is high in protein. It works well in a cropping system with alfalfa or other legumes. B. inermis' massive root system makes it a very effective erosion control (USDA, 2007).

Habitat Description
Bromus inermis occurs on roadsides, riverbanks, edges of fields, prairies, woods and pastures. It prefers sandy soils to silty ones (Sather, 1987). B. inermis needs well aerated soils with a pH from 5.5-8. B. inermis is not tolerant of anaerobic, calcareous, or salty conditions, but can tolerate temperatures as low as negative 38 degrees Celsius (ANHP, 2004). It is also very drought tolerant which can be attributed to its deeply penetrating root system (Sather, 1987) B. inermis is not shade tolerant, and seed production, number of shoots and rhizomes, and dry weight of plant decreases when B. inermis does not receive sufficient sunlight (Sather, 1987).

Reproduction
Bromus inermis is a cool season grass. Growth phase begins in early spring and continues into the late fall. Roots develop within 5 days of germination. Seed production is variable, with plants producing between 156 and 10,080 viable seeds (Lowe & Murphy, 1955 in Sather, 1987). Seeds remain viable for 2-10 years (ANHP, 2004). Plants flower in synchrony and pollination can occur between plants up to 50m apart. B. inermis is an open pollinated plants and is self-incompatible. B. inermis can also reproduce through rhizome development which begins three weeks to six months after germination (Sather, 1987; North Dakota Department of Agriculture, Undated).

General Impacts
Bromus inermis is a highly competitive C3 grass that forms a dense sod, resulting in smothering and exclusion of other (native) species and decreasing natural biodiversity (ANHP, 2002; Oftinowski et al., 2007). ANHP (2002) writes that "Smooth brome may inhibit natural succession processes...and [serves as an] alternate host for viral diseases of crops." Anemone patens, a long lived native perennial in North American grasslands, is negatively affected by the presence of B. inermis. The thatch left by previous B. inermis growth creates an issue for survival and germination of A. patens seeds (Williams & Crone, 2006). B. inermis has also shown to alter the population dynamics of the dominant native perennial prairie cordgrass (Spartina pectinata).

When B. inermis grows in conjunction with native S. pectinata is known to reduce patch growth, decrease colonization rates and increase extinction rates of the native species (Dillemuth et al., 2009). B. inermis is also known to significantly impact the population dynamics and movement behaviour of several native arthropod species in North American prairies (Baum et al., 2004; Cronin 2003a, b, 2007; Cronin & Haynes 2004; Cronin et al., 2004; Haynes & Cronin 2003).
Management Info
Management in some areas is aided by *Bromus inermis*’ tendency to grow in nearly pure swaths. Sather (1987) offers a caveat, that "because of its cool season habit [*B. inermis*] is often lumped together with *Poa pratensis,*" another exotic grass that affects tallgrass /mixed prairies. However, differences in the two species biology and their responses to management techniques reveal "that there is a difference in the timing of the most susceptible phenological stages of the two species." (Sather, 1987). Sather (1987) notes that "more effective management of smooth brome might be achieved by first understanding the relative proportions of *B. inermis* to *P. pratensis* and their spatial distributions in the mosaic of vegetation. Treatment schedules could then be adapted to impact smooth brome in the boot stage in areas where it is the rightful target species."

Mechanical: Cutting smooth brome while it is still in boot stage (while the flowering head is still enclosed in sheath) may be the most effective means of mechanical control. Boot stage usually occurs while *B. inermis* is between 18-24 inches. Ideal conditions for cutting *B. inermis* include "hot moist weather at the time of cutting, followed by a dry period." (Sather, 1987). Managers of park areas may have even greater success if they continue mowing throughout the season.

Physical: Land managers report some success in reducing the establishment, spread and abundance of smooth brome with the use of prescribed burns (Willson & Stubbendieck, 2000). Willson and Stubbendieck (2000) recommend burning in early spring at the four or five leaf stage of smooth brome. This tactic is thought to work because smooth brome is a cool season grass that begins its growth cycle and sets seeds before native warm season grasses (i.e., C4). Therefore, a properly timed prescribed fire may reduce smooth brome abundance before it set seeds, while freeing up space and resources for native warm season grasses to flourish. According to Willson and Stubbendieck (2000), warm season grasses needed to respond and achieve a minimum of 20% coverage before the next year’s growth cycle begins for this practice to effectively reduce smooth brome populations. Rigorous field testing of this management tactic has yet to be attempted.

However, most research indicates that fire has not demonstrated an ability to effectively control *B. inermis*. Grilz and Romo (1994) note that tiller density, standing crop, and leaf area indices reveal that not only is *B. inermis* resistant to fire, but it may actually increase incidence of *B. inermis* as fire will restrict or kill its competitors.

Chemical: April or May applications of glyphosate at 2kg/ha has shown some ability to control spread. Paraquat is generally less effective that glyphosate (Sather, 1987).

Pathway
*B. inermis* is widely planted as a forage crop. *B. inermis* has been introduced to some areas for use in wildlife and conservation cover mixes for nesting cover and food.

Principal source:


Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)
Review: Forrest P. Dillemuth, Louisiana State University

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ALIEN RANGE

[8] Canada
[41] United States

Red List assessed species 2: EN = 1; VU = 1;
Anthus spragueii VU
Platanthera praeclara EN

BIBLIOGRAPHY

34 references found for Bromus inermis

Management information
Summary: This article discusses the use of fire as a management tool for invasive grasslands species. Available from: http://jfsp.nifc.gov/invasive%20publications/ttrs_22pr_04_40_65_c.pdf [Accessed 20 July 2007]
Summary: This resource provides detailed information about Bromus inermis ranging from habitat and reproductive strategies to in depth discussions of management techniques. Available from: http://www.imapinvasives.org/GIST/ESA/esapages/documnts/bromine.pdf [Accessed 14 May, 2010]

General information
Alaska Natural Heritage Program, 2010. Weed Ranking Project
Summary: Available from: http://akweeds.uaa.alaska.edu/akweeds_ranking_page.htm
Summary: Provides a detailed overview of Bromus inermis biology and effect on local environments. Also discusses management techniques. Available from: http://akweeds.uaa.alaska.edu/pdfs/species_bios_pdf/Species_bios_BRIN.pdf [Accessed 20 July 2007]


**Summary:** Available from: http://www.rbg.ca/cbcn/en/projects/invasives/i_list.html


**Summary:** English: The species list sheet for the Mexican information system on invasive species currently provides information related to Scientific names, family, group and common names, as well as habitat, status of invasion in Mexico, pathways of introduction and links to other specialised websites. Some of the higher risk species already have a direct link to the alert page. It is important to notice that these lists are constantly being updated, please refer to the main page (http://www.conabio.gob.mx/invasoras/index.php/Portada), under the section Novedades for information on updates.

**Invasive species - Plants is available from:** http://www.conabio.gob.mx/invasoras/index.php/Especies_invasoras_-_Plantas [Accessed 30 July 2008]

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

**Summary:** Available from: http://www.conabio.gob.mx/invasoras/index.php/Especies_invasoras_-_Plantas [Accessed 30 July 2008]


**Summary:** Provides information on Bromus inermis habitat and biology, as well as its role in the food web. Available from: http://www.illinoiswildflowers.info/grasses/grass_index.htm#sm_brome [Accessed 20 July 2007]


**Summary:** An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.


**Kentucky Exotic Pest Plant Council.** 2008.

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**Summary:** Available from: http://www.dnr.state.mn.us/invasives/terrestrial/plants/grasses/smoothbromegrass.html

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**Summary:** Available from: http://www.agdepartment.com/noxiousweeds/pdf/smoothbrome.pdf

Porcher Michel H. et al. 1995 - 2002 Sorting Bromus Names. Multilingual Multiscript Plant Name Database - A Work in Progress. Faculty of Land & Food Resources. The University of Melbourne. Australia. Summary: This website provides alternate taxonomies and common names in a variety of languages.


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