

## JAPANESE BROME

(*Bromus japonicus*)

Japanese brome

**Description:** Japanese brome is a member of the Poaceae or grass family.

Japanese brome is a cool season, annual grass that can range in height from 14 to 40 inches. Leaf blades are flat, covered with soft, distinct, thin hair, approximately 1 to 8 inches in length, and 1/32 to 1/16 of an inch wide. Sheaths are covered with dense, soft hairs. Ligules are 1/64 to 1/16 of an inch long and auricles are absent. Inflorescence is an open panicle, 2 to 7 inches long with spreading, usually drooping branches. Spikelets are 6 to 10 flowered, 1/2 to 1 inch in length, and 1/8 to 1/4 of an inch wide. First glumes are usually 3- to 5- nerved,

1/8 to 1/4 of an inch long. Second glumes are 5- to 9-nerved and 1/4 to 1/2 of an inch in length.

Lemmas are broader at the upper-half, tapering to the bottom, with margins not strongly enrolled in the fruit. Awns are 1/4 inch to 3/4 inch long, somewhat twisted and widely spread at maturity.



Japanese brome

### Plant Images:



Spikelets

**Distribution and Habitat:** Japanese brome is native to Europe and is now considered naturalized throughout the United States. The plant occurs on a wide variety of soils that include sand, silt, and clay, but thrives on fine-textured soils. Waste areas, disturbed sites, roadsides, pastures, rangelands, and wheat fields are areas where Japanese brome can establish. The plant is a common component of many mixed prairie communities.

**Life History/Ecology:** Japanese brome is an annual or winter annual that reproduces solely through seed production. Seedlings generally germinate in the fall, with a minority of seeds germinating in the spring. Following germination, each plant overwinters as a “rosette” of leaves. Flower buds emerge in

early April, at which time the plants begin to bolt. Flowering occurs in early May and seeds ripen by late June or early July. Japanese brome senesces as the seeds mature and no living plants are observed in the summer. Seeds are retained on dead erect plants and are dispersed from October until March. Seeds may remain viable for several years.

**History of Introduction:** Japanese brome is native to Europe and was introduced into North America as a forage species. The plant is now widespread throughout the United States except for a few states in the southeast. Japanese brome populations have steadily increased in the northern Great Plains region over the past 30 years. In North Dakota, Japanese brome is widely distributed in the western part of the state, the Prairie Coteau, and occasionally in the eastern part of the state. Japanese brome has been reported in Divide, Burke, Williams, Mountrail, McKenzie, Golden Valley, Billings, Slope, Bowman, Stark, Hettinger, Mercer, Oliver, Morton, Grant, Sioux, McLean, Sheridan, Wells, Kidder, Logan, McIntosh, Emmons, Pembina, Nelson, Cass, Richland, and Sargent counties.

**Effects of Invasion:** Japanese brome is an aggressive species that out-competes desirable vegetation for water and soil nutrients, thus reducing plant biodiversity. Forage production of perennial grasses and grazing performance is also reduced in Japanese brome infested areas.

**Control:**

Management objectives for Japanese brome control should involve prevention, early detection and reducing or preventing seed production. Seeds of Japanese brome can remain viable in the soil for several years, therefore infestations should be monitored for several consecutive growing seasons to prevent germination of new plants. Control methods should be combined into an integrated management system for the best long-term control of the plant. Management techniques selected are dependent upon a specific site and will be determined by land use objectives, extent of Japanese brome infestations, desired plant community, and effectiveness and limitations of available control measures.

*Mechanical* - Prescribed burns can be effective for control of Japanese brome but may be dependent on the growing season and precipitation. In South Dakota, prescribed burns conducted in April initially reduced plant populations for one growing season. However, populations were able to recover the following year and recovery may have been dependent upon litter accumulations and precipitation. This study suggests that Japanese brome will be reduced in areas with less surface litter accumulations and below average precipitation in the fall. Prescribed burning should be repeated sometime within 5 years after the first burn to continue to reduce litter accumulations, potentially reducing Japanese brome populations, especially when precipitation is low in the fall. Another study in South Dakota, reported that spring, summer, or fall burning all reduced Japanese brome populations two years following the burns. The prescribed burns were also followed by a two year drought. Cutting or mowing may also be effective if conducted while the flowering head is still enclosed within the sheath of the plant. However, Japanese brome populations may increase after implementing these mechanical control methods. The disturbance associated with mechanical control methods may also favor Japanese brome growth.

*Chemical* - Several herbicides are available to control Japanese brome. Picloram, dicamba, glyphosate, and imazapic have all been successful. However, most herbicides are not specific to Japanese brome.

Contact your local county extension agent for recommended use rates, locations, and timing.

*Biological* - No insect biological control agents are currently available for the control of Japanese brome. The plant is palatable and can provide fair to good forage for livestock during the fall and in the early spring prior to emergence of inflorescence. Grazing as a control measure has had variable results.

Some authors suggest that Japanese brome may increase with moderate to heavy grazing. However, in South Dakota, Badlands National Park was lightly grazed and populations of Japanese brome appeared to be much higher than infestations that were more heavily grazed on adjacent rangeland. Litter accumulation that had been lightly grazed or not at all may have created a favorable environment for Japanese brome germination and establishment.

## References:

- Baskin, J. M. and C. C. Baskin. 1981. Ecology of germination and flowering in the weedy winter annual grass *Bromus japonicus*. *J. Range Manage.* 34(5):369-372.
- Haferkamp, M. R., R. K. Heitschmidt, M. G. Karl. 1998. Clipping and Japanese brome reduce western wheatgrass standing crop. *J. Range Manage.* 51:692-698.
- Haferkamp, M. R., R. K. Heitschmidt, and M. G. Karl. 1997. Influence of Japanese brome on western wheatgrass yield. *J. Range Manage.* 50:44-50.
- Haferkamp, M. R., M. G. Karl, and M. D. Macneil. 1994. Influence of storage, temperature, and light on germination of Japanese brome seed. *J. Range Manage.* 47:140-144.
- Sedivec, K. T. and W. T. Barker. 1998. Selected North Dakota and Minnesota range plants. NDSU Ext. Ser. North Dakota State Univ., Fargo, ND. 270 pp.
- Whisenant, S. G. 1990. Postfire population dynamics of *Bromus japonicus*. *Am. Mid. Nat.* 123(2):301-308.
- Whisenant, S. G. and D. W. Uresk. 1990. Spring burning Japanese brome in a western wheatgrass community. *J. of Range Manage.* 43(3):205-208.
- Whitson, T. D., editor. 2000. *Weeds of the West* 9<sup>th</sup> Ed. Western Society of Weed Science, Newark, CA 94560. 630pp.
- Zouhar, K. 2004. *Bromus japonicus*. In: Fire Effects Information System. U. S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). [Online.] Available: <http://www.fs.fed.us/database/feis> (October 2004).
- Japanese brome photograph courtesy of Robert H. Mohlenbrock @ USDA-NRCS PLANTS Database/ USDA NRCS. 1995. Northeast wetland flora: Field office guide to plant species. Northeast National Technical Center, Chester, PA.
- Spikelets photograph courtesy of W. L. Wagner @ USDA-NRCS Database.