

## MEADOW BROME

*Bromus biebersteinii*

Roemer & J.A. Schultes

plant symbol = BRBI2

Contributed by: USDA, NRCS, Idaho State Office



University of Wyoming

### Alternate Names

*Bromus erectus*, *Bromus riparius*

### Uses

**Grazing/Hayland:** The primary use of meadow brome is for forage production. It is used for pasture, hay and haylage. It is highly palatable to all classes of livestock and wildlife. Meadow brome is one of the best forage grasses for use in the Northwestern states under intensive rotational grazing systems.

**Erosion control:** Because of its dense network of roots, meadow brome provides good erosion control on those soils to which it is adapted. Rhizomes of meadow brome are much shorter than those of

smooth brome. Because of this, smooth brome is commonly a better choice for erosion control plantings.

**Wildlife:** Meadow brome is used in grass-legume mixes for nesting, brood rearing, escape and winter cover in upland wildlife and conservation plantings. It is excellent forage for big game animals and waterfowl, particularly geese.

### Status

Consult the PLANTS Web site and your State Department of Natural Resources for status (e.g. threatened or endangered species, state noxious status, and wetland indicator values).

### Description

*Bromus biebersteinii*, meadow brome, is native to southwestern Asia near Turkey. It is a long-lived, rapid developing, leafy, introduced, cool season grass that spreads by short rhizomes. The numerous long, light-green leaves are dominantly basal, lax, and mildly pubescent. The numerous erect stems appear earlier in the growing season than smooth brome. The awned florets are produced in large, terminal panicles. The presence of awns, hairy leaves and stems, and lack of aggressive rhizomes can distinguish meadow brome from smooth brome. When grown under irrigation, it can reach 2-6 feet in height. It is very productive in close spaced, one-foot rows. Meadow brome is not invasive. Meadow brome has 93,000 seeds per pound.

### Adaptation

Meadow brome can be grown under dryland conditions in 14+ annual precipitation regions of the foothills, mountains and irrigated areas throughout the West. Areas of greatest adaptability in the West are the sagebrush-grass, pinyon-juniper, ponderosa pine, aspen and Douglas fir communities. Meadow brome is one of the earliest species to initiate growth in the spring and makes tremendous growth during cool conditions. Due to deep roots and tiller base, it is capable of strong summer growth and regrowth following grazing or haying. It makes rapid recovery following mowing or grazing even during the hot periods of the year.

Unlike meadow brome, smooth brome regrowth initiates from its crown and thus never achieves rapid recovery or regrowth following grazing or haying. Smooth brome does not grow well under hot summer temperatures.

Rhizomes of meadow brome are much shorter than smooth brome resulting in fewer problems with stands becoming sodbound, which is common in smooth brome.

Meadow brome is very winter hardy. It produces well in areas with spring frost such as high mountain valleys. In areas with significant spring frost and little snow cover, meadow brome is a much better species selection than orchardgrass.

Meadow brome performs well on soil textures ranging from shallow to deep, coarse gravelly to medium textured, well to moderately well drained, and moderately acidic to weakly saline to alkali. It performs best on fertile, moderately deep to deep, well-drained soils. It does not grow well in saline soils and wet areas with high water tables. It is also sensitive to flooding and commonly dies if inundated for more than 10 days. It has the ability to establish and persist in areas that receive as little as 14 inches of annual precipitation, but performs best with 16 inches or more rainfall or irrigation. It prefers full sun, but will tolerate semi-shady areas or areas with reduced light.

In an Alberta, Canada yield trial meadow brome had impressive pasture-hay yield performance:

Species	Cultivar	Yield (lbs/ac.)
Meadow brome	Regar	10810 (5.4 ton)
	Fleet	10684 (5.3 ton)
	Paddock	10442 (5.2 ton)
Smooth brome	Manchar	8665 (4.3 ton)
Orchardgrass	-----	8709 (4.4 ton)
Meadow foxtail	Garrison	9177 (4.6 ton)

\* Fertilized after each cutting for an annual average of 220 lb/ac N and 55 lb/ac P

The forage yields of the meadow brome releases in this study are not significantly different. These yields may be an indicator of production under irrigated conditions. Average yields under dryland conditions are estimated to be about 50 percent of those listed above.

### Establishment

A clean, firm, weed-free seedbed is recommended. Dry land and erosion control seedings should be made in the late fall or very early spring when soil moisture is not limited. Irrigated seedings should be made in early to mid spring. On dryland, do not seed later than May 15th or a failure may occur because of drought and hot summer conditions before the grass is well established. A deep furrow or double disc

drill with press wheels may be used. Meadow brome does not flow uniformly through a drill unless it is diluted with rice hulls or other diluent. For dryland and irrigated land a seeding rate of 10 pounds Pure Live Seed (PLS) per acre is recommended (20 seeds per square foot). If broadcast or planted for critical area treatment, double the seeding rate to 20 pounds PLS per acre or 40 seeds PLS per square foot. Meadow brome is very compatible with legumes such as alfalfa, cicer milkvetch, birdsfoot trefoil, sainfoin, and clover species. When planting with legumes, alternate row planting is recommended due to differences in seedling vigor. Use 6 to 8 pounds PLS of meadow brome seed per acre when planting in alternate rows with a legume. Adjustments in seeding rate should be made when seeding in mixtures. Seeding depth should be 1/4 to 1/2 inch.

When seeding for seed increase, seed should be treated with a fungicide (most seed company's can treat seed) to reduce potential head smut problems common in bromes. Irrigated seed production plantings should be in at least 24-inch rows and preferably 36-inch rows. Seed at 4.5 to 5 pounds per acre. Dryland seed yields are commonly 150 to 200 pounds Pure Live Seed per acre and irrigated seed yields are commonly 450 to 600 pounds Pure Live Seed per acre. Seed matures fairly evenly and is ready for harvest in mid-July to early August. The preferred method of harvest is to windrow crop in the firm dough stage and then combine in about 7 days once seed has matured in windrow. Direct combining is also acceptable, but the seed crop must be monitored closely and harvested when seed is mature and before seed shatter occurs. The seed should be dried to 12 percent moisture in bins and 15 percent moisture in sacks before storing.

Regar meadow brome seed production fields are only productive for about two to three seed crops and seed production beyond 2 to three years are normally not economical. Proper row culture (tillage) and ripping may help to extend the stands productive life. Fleet, Paddock, Montana and MacBeth releases were selected for a longer seed production life and higher seed production the third production year compared to Regar.

### Management

Under dryland conditions the new planting should not be grazed until late summer or fall of the second growing season. The plants may be severely damaged or pulled out by overgrazing especially in the seedling year due to poorly rooted seedlings. Under irrigated conditions the new planting should not be grazed until late summer or fall of the first growing

season. Meadow brome establishes roots very slowly and plants may be severely damaged by grazing too soon. Harvesting for hay during the establishment year will be most beneficial to eliminate grazing damage.

Do not graze in the spring until forage is 8 to 12 inches high and remove animals from pasture when 3 to 4 inch stubble height remains. A 3 to 4 week rest period between grazing is recommended. Use no more than 60% of the annual growth during the winter season or 50% during the growing season. This plant responds well to rotation-deferred grazing systems. To maintain long-lived stands, the grass should be allowed to periodically mature and produce seed for continuation of the stand.

Meadow brome responds very well to good fertility management. One strategy to even out the forage production is to fertilize the stand after the first and second cutting or grazing periods to boost late spring and summer production. Apply fertilizer based on soil tests. Fertilizer nutrient rates need to be balanced rates of nitrogen and phosphorus to maintain optimum stands of grasses and legumes. Nitrogen will favor the grass while phosphorus will favor the legume.

Forage production can be restored and stands may benefit from ripping if sodbound conditions occur. Care should be taken to avoid excessive tillage because stands may be damaged.

### **Pests and Potential Problems**

Silvertop and head smut are the most common problems in brome grass seed production. Meadow brome seed should be treated with a labeled fungicide if planting is intended for seed production to avoid head smut problems.

Seed shatter is also a common seed production problem that can be avoided by windrowing the field, curing seed in the swath for 5-7 days, and then combining the seed.

Although hybridization with smooth brome can be obtained under controlled greenhouse crosses, hybrids appear not to occur under field conditions due to an earlier (6-10 days) flowering period for meadow brome.

### **Cultivars, Improved, and Selected Materials**

Foundation and Registered seed is available through the appropriate state Crop Improvement Association or commercial sources to grow certified seed.

**Fleet** meadow brome was developed by the Agriculture Canada Research Station, Saskatoon, Saskatchewan, and it was released in 1987. Fleet was formed as a synthetic of plants from Eurasian sources including Regar. Fleet is similar to Regar in having a restricted creeping root habit and abundant basal leaves. Fleet also has varying degrees of pubescence similar to Regar. Regrowth following clipping or grazing and fall greenness are also similar to Regar. Forage yields are also similar to Regar, but Fleet may produce higher seed yields

**MacBeth PVP (pending)** meadow brome was developed at Montana State University and released as a public cultivar under PVP, Title V option in 2001. MacBeth has similar forage yields to Regar, Fleet and Paddock, with a slight yield advantage in Montana dryland trials. A major advantage for MacBeth is its excellent seed yield potential. At three test locations, MacBeth averaged 135 percent higher seed yields than Regar in the third year of production.

**Montana PVP (pending)** meadow brome was developed at Montana State University and licensed exclusively to a private seed company. It is a protected cultivar under PVP, Title V option and was released in 2001. Montana has similar forage yields to Regar, Fleet and Paddock. The major attribute for Montana is its improved seed yield potential over Regar and Paddock. At three test locations, Montana averaged 35 percent high seed yields than Paddock and 167 percent higher seed yields than Regar in the third year of production.

**Paddock** meadow brome was selected by the Agriculture Canada Research Station, Saskatoon, Saskatchewan, Canada and released in 1987. It was developed from and introduction from Krasnodar, USSR in 1969. Paddock has a similar habit of growth to Regar and Fleet. Leaves are slightly wider than Regar and forage yields are similar to Fleet and Regar. Paddock seed yields are greater than Regar seed yields.

**Regar** meadow brome was selected from a collection made near Zek, in Kars Province in Turkey in 1949 and made available to the Aberdeen Plant Materials Center in 1957 by the USDA Regional Plant Introduction Station. It was released in 1966 by the Aberdeen, Idaho Plant Materials Center and the Idaho Agricultural Experiment Station. Regar seed germinates readily, seedling vigor is good and seedlings establish rapidly. Leaves are numerous, dominantly basal, mildly pubescent, and light green. Seed stalks are erect and extend above the leaf mass in an open panicle. Regar heads and matures 7 to 10

days earlier than smooth brome. Regar greens up early in the spring and remains green late into the fall.

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