USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

Plant Guide

MOUNTAIN GOLDENBANNER

Thermopsis montana Nutt. var. *montana*

Plant Symbol = THMOM3

Contributed by: USDA NRCS Idaho Plant Materials Program

Mountain goldenbanner. Sheri Hagwood @ USDA-NRCS PLANTS Database.

Alternate Names

Common Alternate Names: golden pea, yellow pea, buffalo pea, mountain false lupine

Scientific Alternate Names: *T. rhombifolia* var. *montana* (Nutt.) Isely

Uses

Wildlife/Livestock:
Wildlife and livestock typically avoid mountain goldenbanner. Although reports of palatability vary, it is often considered unpalatable and is left in the stand after all other forage has been consumed (Hermann 1966).

Restoration:
This species is recommended for use in non-grazed areas. It is used for soil and slope stabilization on roadside plantings in Idaho (Robson and Kingery 2006).

Native Plant Gardens:
Mountain goldenbanner is a valuable species for native plant gardens and pollinator plantings. The species is noted for its ease to grow and bright flowers which persist for several weeks. The flowers are especially attractive to bumblebees.

Ethnobotanical:
The Ramah Navajo used a decoction of the plant as cough medicine and created a fumigant of mountain goldenbanner for headaches (Vestal 1952).

Status

Please consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status (e.g., threatened or endangered species, state noxious status, and wetland indicator values).

Weediness

This plant may become weedy or invasive in some regions or habitats and may displace desirable vegetation if not properly managed. Please consult with your local NRCS Field Office, Cooperative Extension Service office, state natural resource, or state agriculture department regarding its status and use. Weed information is also available from the PLANTS Web site at http://plants.usda.gov/. Please consult the Related Web Sites on the Plant Profile for this species for further information.

Description

General: Legume family (Fabaceae). Mountain goldenbanner is a perennial rhizomatous forb from 20 to 75 cm (29 in) tall with erect branching stems. The leaves are palmately trifoliate (3 leaflets) arising from a 1 to 4 cm (0.4 to 1.6 in) long petiole. At the base of the petiole is a pair of leaf-like stipules, 1 to 3 cm (0.4 to 1.2 in) long. The leaflets are 2 to 9 cm (0.8 to 3.5 in) long and 0.5 to 3.6 cm (0.2 to 1.4 in) wide, elliptic to lanceolate or oblanceolate and acute to rounded on the tip. The flowers are born in a 6 to 25 cm (2.4 to 9.8 in) long raceme or loose spike, with 2 to 23 yellow flowers. Each flower is 20 to 26 mm (0.08 to 0.1 in) long and resembles a pea or lupine flower. The fruit is a 4 to 5.5 cm (1.6 to 2.2 in) long pod which dries to a blackish color (Welsh et al. 2003). The pods of mountain goldenbanner are erect. The

seeds are brown and kidney shaped. There are approximately 30,600 seeds per pound (Barner 2009).

Distribution:
Mountain goldenbanner occurs in most western states from New Mexico north to Montana and west to Oregon and Washington. It is not known to occur in California. For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site.

Habitat:
This species is most often found in moist sites in meadows or along streams seeps and springs (Welsh et al. 2003) at elevations of 760 to 3,500 m (2,500 to 11,400 ft) (Robson and Kingery 2006; Welsh et al. 2003).

Adaptation
Mountain goldenbanner is adapted to moist, well-drained sandy to loam soils with a pH of 6.6 to 8.5. The plants will persist in areas within USDA hardiness zones 4a to 9b (Dave's Garden, online).

Establishment
When used for pollinator plantings or native plant gardens, golden mountain banner can be established by seed or with greenhouse propagated plants. This species spreads via rhizomes and should be planted where a colony is desired. The full stand seeding rate for mountain goldenbanner is 35 lbs/acre. Adjust this amount to the percentage of the seed mixture desired. Seed should be planted to a depth of 1/4 to 1/2 inch in late fall to allow for natural stratification.

Management
Due to its low palatability, mountain goldenbanner increases on overgrazed range (USDA 1937). This species is not recommended for planting on range or pasture where grazing occurs.

Pests and Potential Problems
Mountain goldenbanner can be considered weedy on roadsides, pastures and rangelands. It is not palatable to livestock and may compete with more desirable vegetation.

Mountain goldenbanner is known to be toxic. It contains alkaloids which are especially toxic in young plants and in mature flowering plants (Burrows and Tyrl 2001). All parts of the plant are toxic. Ingesting 0.6 to 2.8g of dry foliage per kg of body weight for several days produces severe muscle degeneration in cattle (Keeler et al 1986). Chase and Keeler (1983) indicate that ingesting 300 to 400g of dried plant material for 3 to 4 days will severely intoxicate cattle and slightly more can be lethal.

Humans can also be affected by consuming mountain goldenbanner. Children suffered digestive tract problems, weakness and neurological effects after eating a few seeds or flowers (Spoerke et al. 1988).

Environmental Concerns
Mountain goldenbanner is native to western North America and poses no known environmental concerns.

Control
Mountain golden banner can be controlled in range and hay land using broadleaf herbicides, specifically 2,4-D, Dicamba, Picloram, Triclopyr, or combinations thereof (Plumlee 2004).

Please contact your local agricultural extension specialist or county weed specialist to learn what works best in your area and how to use it safely. Always read label and safety instructions for each control method. Trade names and control measures appear in this document only to provide specific information. USDA NRCS does not guarantee or warranty the products and control methods named, and other products may be equally effective.

Seeds and Plant Production
Seed is mature in July and August when pods begin to split open. Seed is large and easily cleaned with screens or an air column. Barner (2009) recommends processing the seed using a brush machine with a #20 mantel followed by air-screening size 10 top screen and a 1/20 bottom screen.

Germination is improved with scarification. Skinner (2005) reported 93% germination from seed scarified in hot water at 180° F compared to 39% germination from untreated seed. Seed that had been mechanically scarified with sandpaper or scratched with a needle had 56 and 84% germination respectively (Skinner 2005).

For optimum growth, goldenbanner seed should be inoculated with the proper Rhizobium species prior to planting.

Cultivars, Improved, and Selected Materials (and area of origin)
Seed of mountain goldenbanner is available in limited quantities on the commercial market. Larger quantities of seed can be grown on a contract basis.

References

Barner, Jim 2009. Propagation protocol for production of *Thermopsis montana* Nutt. *montana* seeds; USDA FS - R6 Bend Seed Extractory, Bend, Oregon. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 8 November 2012). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.

Burrows, G.E. and R.J. Tyrl. 2001. Toxic Plants of North America. Iowa State University Press. Ames, Iowa. 1342p.

Chase, R.L. and R.F. Keeler. 1983. Mountain *Thermopsis* toxicity in cattle. Utah Science. 44: 28-31.

Dave's Garden. 2012. Available online at: http://davesgarden.com/guides/pf/go/1973/. Accessed November 8, 2012.
Hermann, F.J. 1966. Notes on Western Range Forbs: Cruciferae through Compositae. USDA Forest Service Agriculture Handbook No. 293. Washington D.C. 365p.
Isley, D. 1981. Leguminosae of the United States. III. Subfamily Papilionoideae: Tribes Sophoreae, Podalyrieae, Loteae. Mem. New York Bo. Gard. 25(3): 1-264.
Keeler, R.F, Johnson, A.E. and R.L. Chase. 1986. Toxicity of *Thermopsis montana* in cattle. Cornell Vet. 76: 115-127.
Plumlee, K. 2004. Clinical Veterinary Toxicology. Mosby Publishing. St. Louis, MO. 504p.
Robson, S. and J. Kingery. 2006. Idaho Native Plants for Roadside Restoration and Revegetation Programs. Idaho Transportation Department.
Skinner, David M. 2005. Propagation protocol for production of container *Thermopsis montana* Nutt. plants; USDA NRCS - Pullman Plant Materials Center, Pullman, Washington. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 8 November 2012). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.
Spoerke, D.G., Murphy, M.M, Wruk, K.M. and B.H. Rumack. 1988. Five cases of *Thermopsis* poisoning. Clinical Toxicology. 26: 397-406.
U.S. Department of Agriculture, Forest Service. 1937. Range Plant Handbook. Washington DC: U.S. Department of Agriculture, Forest Service, Variously paginated.
Vestal, P.A. 1952. The Ethnobotany of the Ramah Navaho. Papers of the Peabody Museum of American Archaeology and Ethnology. 40(4):1-94.

Prepared By:
Derek Tilley, USDA NRCS Plant Materials Center, Aberdeen, ID

Citation
Tilley, D. 2012. Plant Guide for mountain goldenbanner (*Thermopsis montana*). USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center. Aberdeen, Idaho 83210.

Published January 2013

Edited: 7November2012djt; 10dec2012ls; 10dec2012gm; 9jan2013jb

For more information about this and other plants, please contact your local NRCS field office or Conservation District at http://www.nrcs.usda.gov/ and visit the PLANTS Web site at http://plants.usda.gov/ or the Plant Materials Program Web site http://plant-materials.nrcs.usda.gov.

PLANTS is not responsible for the content or availability of other Web sites.