

PLANT MATERIALS TECHNICAL NOTE

ROCKY MOUNTAIN BEEPLANT *Cleome serrulata* Pursh

A Native Annual Forb for Conservation Use in Montana and Wyoming

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Rocky Mountain beeplant

General Description

Rocky Mountain beeplant is an annual, tap-rooted, colonizing native wildflower. It grows to a mature height of 2 to 5 feet tall. Rocky Mountain beeplant has many common names including pink bee-plant, bee spiderflower, toothed spider-flower, skunk weed, stink weed, stinking-clover, and Navajo spinach. *Cleome serrulata* [synonym *Peritoma serrulata* (Pursh) DC.], formerly a member of the Caper Family (*Capparaceae*), is presently classified in the Cleome Family (*Cleomaceae*). Genetic studies indicate *Cleomaceae* is closely related to the Mustard Family (*Brassicaceae*). Erect, smooth stems branch from the upper nodes growing into a tall, loosely formed, slightly stinky-smelling plant. Compound leaves are arranged alternately along the stem and consist of three, dark green, narrow leaflets approximately ½- to 3-inches long with minutely-toothed margins. Each of the numerous, small pink flowers have 4 sepals, 4 petals, and 6 long, “spidery” stamens curving backward as the distinctive green anthers open and dehisce pollen. The nectar-rich flowers are formed at the end of the stem in large, round showy clusters which have a fuzzy appearance. The anthesis of new flowers occurs 1 to 3 hours after sunset with no flowers opening in the daylight. Flowering begins at the bottom and proceeds up the inflorescence resulting in an extended bloom period with floral initiation and seed pod development occurring simultaneously. Season of bloom is mid- to -late summer. Rocky Mountain beeplant flowers are self and insect pollinated. The fruit is a slender, drooping, pod-like capsule that is 1 to 3 inches long and resembles legume and mustard seed pods. Mature seeds are large and dark brown to blackish in

color, while non-viable seeds are pale gray and much smaller. The number of chromosomes are $2n=34, 60$.



Rocky Mountain beeplant flower with developing seed pods

Adaptation or Range

Rocky Mountain beeplant is native to the western, central, and northern U.S. as well as the southern prairie provinces of Canada. It was introduced as early as the 1930's in other areas of the country. Rocky Mountain beeplant is found in the moist areas of disturbed sites such as roadsides, ditch banks, coulee edges, barren rangeland, and dormant farm and pasture land. It occurs mostly on sandy sites and can be found on well-drained medium textured soils in low elevation valleys, dry prairies, open woodlands, and mountain foothills. Associated species include western wheatgrass *Pascopyrum smithii*, bluebunch wheatgrass *Pseudoroegneria spicata*, prairie Junegrass *Koeleria macrantha*, Sandberg bluegrass *Poa secunda*, common gaillardia *Gaillardia aristata*, big sagebrush *Artemisia tridentata*, and prairie coneflower *Ratibida columnifera*.

Rocky Mountain beeplant is tolerant to drought, and medium levels of calcium carbonate. It grows in a range of soil pH levels and in full sun or light shade. Rocky Mountain beeplant was collected by Lewis and Clark's Expedition in 1804 near the Vermillion River in South Dakota.

In Montana, Rocky Mountain beeplant is adapted to a wide range of soil types and precipitation zones at elevations of 2,500 feet to 5,200 feet. It is present as an ephemeral annual component on many ecological sites in Major Land Resource Areas (MLRAs) 32, 43B, 44, 46, 52, 53A, 54, 58A, and 60B. Rocky Mountain beeplant is known to inhabit at least 43 of the 56 counties in Montana.

In Wyoming, Rocky Mountain beeplant is adapted to a wide range of soil types and precipitation zones at elevations of 4,000 feet to 7,200 feet. It is present as an ephemeral annual component on many ecological sites in MLRAs 32, 34A, 43B, 58B, and 67A. Rocky Mountain beeplant is known to inhabit 21 of the 23 counties in Wyoming and very likely is found in MLRAs 48, 60A, 60B, 61, 62, and 64.

Conservation Uses

Rocky Mountain beeplant attracts many different insects when in bloom and is a good mid- to late-season flowering species for pollinator habitat improvement plantings. It is a short-lived showy ornamental plant suitable for use in water-efficient (Xeriscape™) gardens and is resistant to wildlife browsing due to the disagreeable taste and odor of its leaves. This native wildflower can be used

as a forb component in reclamation of drastically disturbed lands, range renovation, and numerous conservation practices, such as pollinator habitat, conservation cover, range and critical area plantings, and restoration and management of rare and declining habitat. The seeds are a good food source for birds. It can be included in many seeding mixtures for creating and enhancing habitat for upland game birds. Rocky Mountain beeplant is rated as “poor” forage for livestock and wildlife and may cause nitrate poisoning if consumed in large quantities.

Cultural Uses

Rocky Mountain beeplant has historically been used by humans as a nutritious food source, a medicinal treatment for many ailments, and as a dye for coloring fabric and pottery. All parts of the plant can be eaten raw, cooked, or dried. Drinking an infusion of the plant relieves stomachache and reduces fever. Applied as a compress it soothes sore eyes. A yellow-green dye is made by boiling the leaves and a black dye is made by boiling the woody stems for an extended period of time.



Honey bee foraging on Rocky Mountain beeplant

Ease of Establishment

Rocky Mountain beeplant is easy to establish by direct seeding. Seedling vigor is good with nearly all plants reaching maturity and setting seed the year of establishment.

Planting Rates (all recommended amounts based on pure live seed PLS)

Rocky Mountain beeplant has approximately 64,500 seeds per pound. As a guideline, at a seeding rate of 1 pound per acre, there would be approximately 1.5 seeds per square foot. The full stand drill seeding rate, based on approximately 25 seeds per linear or square foot is 16.8 pounds PLS per acre, but it would seldom be seeded in a pure stand. It is recommended in native seed mixtures at a rate of ¼- to ½-pound PLS per acre. The broadcast seeding rate is double the drill rate and is recommended only when the large seed is adequately covered with soil. The critical area drill seeding rate is double the non-critical area drill rate, while the critical area broadcast rate is double the non-critical broadcast rate, and quadruple the non-critical area drill rate. Wildland collected and field produced seed is commercially available and cost is dependent upon supply and demand.

Stand Establishment

For best results, seed should be planted into a firm, weed-free seedbed in early spring or as a dormant seeding in late fall after the last killing frost. It is recommended seeding be done with a drill to ensure a uniform seeding depth of ¼- to ½-inch. Seeding a forb component in alternate rows, or cross-planting, with the grass component may ensure better forb establishment. After one growing season, Rocky Mountain beeplant is likely to reseed in relatively low numbers.



Rocky Mountain beeplant in test plot near Pinedale, Wyoming

Seed Production

Seed production fields should be established in rows of 25 PLS per linear foot. Between-row spacing is dependent on the type of planting and cultivation equipment used, and ranges from 24 to 36 inches. Allow adequate between-row space for mechanical weed control. At 24-inch row spacing, the recommended seeding rate is 8.4 pounds PLS per acre and at 30- and 36-inch row spacing, the seeding rate is 6.8 and 5.6 pounds PLS per acre respectively. There are presently no herbicides specifically labeled for controlling weeds in seed production fields of Rocky Mountain beeplant. Seed harvest can be accomplished by direct combining when the pod-like fruit capsule is brown in color but before it splits and shatters the seed. A single plant may produce up to 26,000 seeds. Indeterminate ripening requires that harvesting be timed properly in order to optimize seed yield. Seed viability is high and seed longevity is maximized by storage under moderate temperatures and low humidity.

Limitations

A variety of insects can cause substantial damage to foliage, capsules, and seed under favorable environmental conditions, such as increased soil moisture—this is due to lower concentrations of the compound methylglucosinolate (glucocapparin). Rocky Mountain beeplant is not considered a weed but under favorable conditions may re-seed and persist at low densities for years.

Additional Information

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