

# SILVERLEAF PHACELIA

## *Phacelia hastata* Douglas ex Lehm.

Plant Symbol = PHHA

### Alternative Names

*Common Names:* silverleaf scorpion weed, scorpion weed

### Description

*General:* *Phacelia hastata*, silverleaf phacelia, is a tap-rooted perennial with one to several prostrate to erect stems from 10 to 30 inches tall. Stems and leaves are covered with fine, short, silvery hairs. Leaves are simple with prominent pinnate venation and the margins are usually entire. Basal leaves are numerous, elliptical, and tapering to long petioles. The stem leaves are reduced in size.

Flowers are in dense tightly coiled clusters. The corolla is 0.2 to 0.3 inches long and wide. The filaments are conspicuously longer than the corolla lobes. This species is insect pollinated, most commonly by honey bees and bumble bees. The fruit is a capsule which is 2-chambered, with several seeds per chamber. There are approximately 153,000 seeds per pound.

*Habitat:* Silverleaf phacelia can be found on sandy or gravelly, dry, mineral substrate or disturbed soil from the foothills to above timberline. It is common in rocky gullies or outcrops within valley grasslands.

*Distribution:* Silverleaf phacelia is found primarily in the prairies and southern parklands of the Prairie Provinces of Canada and south to California, east to Nevada, Utah, Colorado, and Nebraska, then North through North and South Dakota, Wyoming, Idaho, and Montana (USDA-NRCS, 2013).

For current distribution, please consult the Plant Profile page for this species on the PLANTS Website.

### Uses

*Wildlife:* Silverleaf phacelia provides pollen and nectar for native bees and other beneficial insects during an extended blooming period (May through September; Ogle et al., 2011).

*Reclamation:* Silverleaf phacelia can be used in mineland and other disturbed land reclamation seed mixes in areas to which it is adapted. Stucky Ridge Germplasm was selected for its tolerance and adaptation to acid soils with a pH of 4 to 6, and soils containing heavy metals such as arsenic, cadmium, copper, lead, and zinc in soils (LeFebvre, 2014).

*Landscaping:* The attractive blossom, long blooming period, and drought tolerance of silverleaf phacelia render it an excellent species to use in Xeriscape<sup>®</sup>, low maintenance, and naturalistic landscapes.

### Ethnobotany

The Thompson tribes of British Columbia used silverleaf phacelia medicinally. Women would drink a decoction as a remedy for difficult menstruation (Steedman, 1928). Silverleaf phacelia is not known to be used as a food, nor used in any ceremonial practices, or for any other purposes.

### Status

*Threatened or Endangered:* Silverleaf phacelia is not threatened or endangered in any part of its range.

*Wetland Indicator:* Obligate Upland

*Weedy or Invasive:* Silverleaf phacelia is not considered a weedy or an invasive species, but can spread into adjoining vegetative communities under favorable climatic and environmental conditions. It coexists with other native species and adds biodiversity to those plant communities. Please consult with your local NRCS Field Office, Cooperative Extension Service office, state natural resource or agriculture departments regarding its status and use, or consult the PLANTS Web site (<http://plants.usda.gov/>) or state agriculture department for this plant's current status (e.g., threatened or endangered species, state noxious status, state species of concern, and wetland indicator values).



Silverleaf phacelia

Photo: NRCS

## Planting Guidelines

*Field Propagation by Seed:* Control competing vegetation by spraying and/or cultivating the planting site well in advance of seeding. Control of existing broadleaved weeds after stand emergence is difficult and consists primarily of spot spraying, mechanical cultivation, and hand-pulling. Seeds should be planted ¼-inch deep into a firm seedbed with a row spacing of 12 to 14 inches. To overcome seed dormancy, sow silverleaf phacelia seeds in the fall, with germination and emergence the following spring. To prevent late season germination, fall sow when soil temperature is lower than 40° F, typically after November 1 in northern temperate climates. The recommended seeding rate for a full stand of silverleaf phacelia is 7 lb. Pure Live Seed (PLS)/acre with a drill on 12-inch row spacing. This results in approximately 24 PLS seeds per linear foot. Increase the seeding rate to 14 PLS lb./acre when broadcasting, and 28 PLS lb./acre when broadcasting on a critical area. Silverleaf phacelia would seldom be seeded to create a solid stand, but rather is used as one of several components in a seed mix. Adjust the seeding rate based on the relative proportion (percentage) of silverleaf phacelia in the mix.



Stucky Ridge Germplasm silverleaf phacelia.

*Container Propagation:* There are several methods for overcoming seed dormancy in silverleaf phacelia for container production purposes.

Moisten seeds and allow to imbibe water overnight. Place imbibed seeds in moistened but drained sand inside a ziplock bag or other container. Provide ventilation by making small holes in the container or by inserting a straw in the container to allow air exchange between the media and atmosphere. Place the bag or container in a refrigerator for 90 to 120 days. Inspect media frequently for signs of molding and desiccation, and to check for germination. After the chilling period, or as germination begins, remove the sand and seed mixture and spread into shallow flats partially filled with media and place in heated greenhouse. Cover with ⅛ -inch of sand or media. Transplant emerging seedlings to 4- to 7-cubic-inch containers once adequate roots develop and maintain in a greenhouse at 65° to 75° F days and 60° to 65° F nights for 16-hour photoperiods (LeFebvre et al., 2015).

Another seed dormancy breaking alternative is to sow seeds ⅛ - to ¼-inch deep directly in 4- to 7-cubic-inch containers in a commercial, peat-based propagation media. The media may be amended with up to 50 percent sand to improve drainage. Water seeds and allow to imbibe water overnight. Place the containers in a walk-in cooler for up to 150 days maintained under high humidity and 33° to 37° F air temperatures (LeFebvre et al., 2015).

Although seed dormancy breaking is best under controlled conditions, good germination percentages can be obtained if containers are direct seeded in the fall, as previously described, and then placed outdoors or in an unheated location where they undergo winter stratification and fluctuating spring temperatures. Move all containers to a heated greenhouse after several seedlings begin to emerge.

## Management

Silverleaf phacelia is rarely planted as a monoculture, and should be used as one component of a multi-species restoration mixture. Once established, silverleaf phacelia is relatively low maintenance. Grazing should be deferred on seeded lands for at least two growing seasons to allow for establishment. The species is not aggressive and unlikely to dominate and become weedy, especially in conservation plantings. To reduce the spread of silverleaf phacelia, glyphosate or 2,4-D, have proven effective in diminishing localized populations. For additional information on herbicides, contact your local Extension office.

## Pests and Potential Problems

There are no known pests or problems associated with silverleaf phacelia in the Northern Rocky Mountains or Intermountain West regions.

Silverleaf phacelia flowers, stems and seed pods are covered in numerous hairs, each containing an oil that may cause rashes, and itching comparable to the effects of poison oak or poison ivy. Scratching the irritation spreads the oil and resultant rash and exacerbates the condition. Rashes caused by silverleaf phacelia can persist for several days to more than a week after initial exposure.

## Environmental Concerns

Silverleaf phacelia establishes and spreads slowly via seed dispersal. It is not a weedy or an invasive species, but may gradually spread into adjoining vegetative communities under appropriate climatic and environmental conditions. It coexists with other native species and adds biodiversity to those plant communities.

## Seeds and Plant Production

**Planting:** Silverleaf phacelia seed production has been successful when planted at the rate of 2.8 PLS lb./acre or approximately 24 PLS seeds per linear foot on a 30-inch row spacing. Seeds are planted with a drill at a depth of a ¼ inch in late fall or early winter in order to obtain the cold stratification period required to overcome seed dormancy. Increasing the seeding rate to 40 PLS seeds per linear foot or 4.5 PLS lb./acre increases stand density. Apply fertilizer based on soil analysis results and local site conditions. For seed production purposes, supplemental irrigation is recommended in areas receiving less than 16 inches of annual precipitation, or during dry periods over the growing season. Supplemental irrigation and fertility increases seedhead height for improved combining, as well as increased seed production.

There are no herbicides labeled for silverleaf phacelia seed production fields. Wider row spacing allows for mechanical cultivation and hand weeding. Hand weeding, herbicide spot treatments, and between-row mechanical tillage are the primary weed management options at this time.

**Harvest:** Silverleaf phacelia seed is generally harvested in mid-July to early August at the Plant Materials Center (PMC) near Bridger, Montana. Seed is mature when the capsules are dry and seeds are hard and dark in color. Flowering is indeterminate, so both mature capsules and flowers may be present at harvest time. Stalks of seed capsules can be hand harvested as they mature, or directly combined if maturity across the field is uniform. Harvested materials should be laid out in a protected shed and allowed to cure before cleaning. Average seed production of Stucky Ridge Germplasm silverleaf phacelia at the Bridger PMC is approximately 56 to 65 pounds of clean seed per acre. A seed crop is not produced until the second growing season, and stands typically remain productive for 3 to 5 years. Stucky Ridge Germplasm silverleaf phacelia averages 153,000 seeds per pound.

**Seed cleaning:** Seed can be separated from plant materials by use of a hammer mill followed by cleaning with an air-screening cleaner. Cleaned seed should be allowed to dry and then stored in a cool dry area. Seeds retain high viability for eight or more years under these conditions.



Photo: NRCS

Silverleaf phacelia seeds (not to scale)

## Cultivars, Improved, and Selected Materials (and area of origin)

Stucky Ridge Germplasm silverleaf phacelia is a selected class release from the USDA-NRCS Bridger Plant Materials Center in Bridger, Montana, in cooperation with the Deer Lodge Valley Conservation District in 2017. It was collected from a wildland collection made on acid and heavy metal contaminated site near Anaconda, Montana. Stucky Ridge Germplasm has been tested in central Montana and has the potential to be adapted to northern Idaho, Montana, Wyoming, and northern Colorado in areas of dry open terrain, loamy to sandy soils, elevations ranging from 2,000 to 8,000 feet, average annual precipitation of 10 to 14 inches, and an average frost-free period of 90 or more days.

## Literature Cited

- LeFebvre, J. 2014. Plant Materials Technical Note No. MT-97. Acid and Heavy Metal Tolerant Plants for Restoring Plant Communities in the Upper Clark Fork River Basin. USDA-NRCS, Bridger Plant Materials Center, Bridger, MT.
- LeFebvre, J., J. Scianna, and J. Jacobs. 2015. Plant Materials Technical Note No. MT-110. Reducing Seed Dormancy in Silverleaf Phacelia (*Phacelia hastata*). USDA-NRCS, Bridger Plant Materials Center, Bridger, MT.
- Ogle, D., L. St. John, M. Stannard, and L. Holzworth. 2011. Plant Materials Technical Note ID-24: Conservation plant species for the Intermountain West. USDA-NRCS, Boise, ID-Salt Lake City, UT-Spokane, WA.
- Steedman, E.V. 1928. The Ethnobotany of the Thompson Indians of British Columbia, SI-BAE Annual Report #45:441-522, page 470.
- USDA-NRCS. 2013. The PLANTS Database (<http://plants.usda.gov>). National Plant Data Team, Greensboro, NC 27401-4901 USA.

## Citation

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