Slender white prairieclover
Dalea candida Michx. ex Willd.
plant symbol = Daca7

***Contributed By*: USDA, NRCS, Bridger Plant Materials Center**

Alternate Names: white prairieclover

Description
Slender white prairieclover, *Dalea candida* Michx. ex Willd., formerly *Petalostemon candidum* (Willd.) Michx., syn. *Petalostemon oligophyllum* (Torr.) Rydb. (*Fabaceae* family), is a perennial forb with slender leafy stems 45-60 cm (18-24 in) tall. The multiple stems rise from a woody base with a strong, deep, poorly branched taproot. The branching stems are usually upright and spreading, but occasionally prostrate. The leaves are alternate, odd-pinnate, the 5-9 leaflets glandular-dotted. The leaflets of slender white prairieclover are larger than those of purple prairieclover *Dalea purpurea* Vent. The flowers are in terminal spikes that are compact and cylindrical. The white flowers develop in July and August, with seed maturing in late August or September. The plants die back to the crown each year. This native legume is found on dry to mesic sites, usually on gravelly, rocky, shallow soils. Plant abundance ranges from a minor forb component in short and mid-prairies to nearly pure stands on steep rocky slopes.

Area of Adaptation
Its natural range extends from the southern portions of the Canadian Prairie Provinces, south to Mexico, Texas, and Louisiana. The prairieclovers are considered to be one of the most important groups of legumes of the Great Plains. The primary areas that slender white prairieclover would be planted are in the southern portion of the Canadian Prairie Provinces (Alberta, Saskatchewan, and Manitoba) and the northern portion of the Great Plains (Montana, Wyoming, North Dakota, South Dakota, Nebraska, and Colorado) (Hitchcock and Cronquist 1973).

Uses
Slender white prairieclover can be included in seed mixtures for range sites, drastically disturbed sites, wildlife habitat, Farm Program conservation plantings, and native landscaping. It is one of the few native forbs grown on a large scale and available through the commercial market. Early spring growth is relished by all classes of livestock and wildlife. It is nutritious throughout the growing season, but decreases with grazing pressure. Sharptail grouse and pheasants make use of plants in the fall (Johnson and Larson 1999).

Establishment
Natural establishment: Slender white prairieclover produces a fair amount of high viability seed and perpetuates itself well on natural range sites from yearly seed set and shattering. This species readily colonizes on disturbed sandy and gravelly sites.

Planting: Slender white prairieclover has approximately 613,000 seeds per kilogram (278,000 seeds per pound). The recommended seeding rate in native seed mixtures would be from 5% to 20% of the mixture 125 to 500 grams/ha (1/4 to 1 pound per acre). Early spring planting is the most desirable, but if a grass-forb-shrub mixture needs to be dormant planted in the fall, slender white prairieclover seed will overwinter and germinate the following spring.

Drill planting has produced better results than broadcast seeding, primarily because of the uniform seed placement of 5 to 10 mm (1/4 to 1/2 inch) below the soil surface. To better ensure the establishment and survival of the forb and shrub components of a native seed mixture, it is advised to plant the grass and forb/shrubs in alternate or perpendicular rows. Thus, the forb seedling will not be out-competed by the grasses. As the grasses and forbs establish they are not directly competing against each other for space, light, nutrients, and moisture.

Asexual propagation: Early spring or summer soft-wood tip cuttings can be rooted in sand or vermiculite under intermittent mist in 21 to 28 days (Currah et al).

Management
All native seedings should be deferred from livestock grazing the establishment year. Wildlife grazing, particularly antelope and rabbits, often can not be

controlled. Slender white prairieclover seedlings are also susceptible to grasshopper damage. In most cases slender white prairieclover will be a minor component in a native seed mixture, therefore management will likely be based on other key species.

Seed Production

Commercial seed production fields of slender white prairieclover usually yield no seed the first (establishment) year. However, once established, stands will remain productive for at least 5 years or longer. Stands should be established in rows spaced at 60 cm (24 in) under irrigation and at 75-90 cm (30 to 36 in) under dryland conditions. The recommended seeding rate with 60 cm row spacing is 1.75 kg PLS/ha (2.0 lbs PLS/acre). Seed production should not be attempted in areas receiving less that 380 mm (15 in) of annual precipitation. A frost-free growing season of at least 120 days is required for economical seed maturity. Seeding in rows facilitates weed control and allows for more extensive plant development. Seeding should be done into a firm, weed-free soil in April to early May. If annual broadleaf weeds such as kochia *Kochia scoparia*, wild buckwheat *Polygonum convolvulus,* and lambsquarters *Chenopodium berlandieri* are potential problems, the planting can be deferred until the first flush of weeds are controlled with a contact herbicide such a glyphosate. There are no proven pre-emergent or post-emergent chemicals for use during the establishment year. Periodic mowing to prevent seed set on the weeds is advisable. Once established there are chemicals that can be used for both broadleaf and grassy weed control. On established stands, a tank mix of Imasethapyr (Pursuit™) at 0.2 liter/ha (3 oz./A) and Bromoxynil (Buctril™) at 1.8 liter/ha (1.5 pt/A) provided excellent control of both annual broadleaf and grassy weeds (Majerus 2001). Applications can be made in late May. For late season annual grassy weed control Select™ or Poast Plus™ can be used. **Caution:** No chemicals are specifically labeled for slender white prairieclover, but the aforementioned chemicals are labeled for most legumes grown for forage, hay and seed production.

In preparing the planting site, up to 200 kg/ha of phosphorus can be incorporated. It is not advisable to add nitrogen until the second year of the stand. Slender white prairieclover is a nitrogen-fixing native legume. To assist in nodule development, the seed should be inoculated prior to seeding. The specific rhizobia has not been developed for this species, but Type 'B' inoculant for clovers can be utilized.

Slender white prairieclover is insect pollinated, often by native bees, wasps and beetles. Field sweeps at the Bridger PMC yielded 14 different species of bees and wasps, other than honey bees and bumblebees. Both leaf cutter bees and honeybees are effective pollinators. Flowers at the base of the spike bloom first, and flowering proceeds upward resulting in a narrow wreath of white on the green cylindrical seedhead (Ladd 1995). Pollinating flowers are classified as 'brush blossom', with flowers nearly regular, short tubular, and with anthers and stigma protruding well beyond the tube having the appearance of a bottlebrush. The columnar seedheads are pollinated by the "mess and soil" method whereby pollen collecting and crawling insects collect pollen on their body parts and randomly distribute pollen on the stigmas (Faegri and van der Pijl 1979).

Seed harvest dates in south central Montana have ranged from September 7 to September 30 depending on climate and age of stand (older stands develop earlier). Expected seed production ranges from 56 to 168 kg/ha (50-150 pounds per acre) on dryland to 112 to 336 kg/ha (100-300 pounds per acre) on irrigated sites. As seed capsules mature and turn from green to brown, the stand should be swathed (often early in the morning to reduce shatter). After 3-4 good drying days the windrows can be combined. The threshing action of the combine will separate the individual seed capsules from the plant but will not remove the kidney shaped seed from the capsules.

The seed cleaning process involves running the combine-run material over a screening mill utilizing the size of the encapsuled seed to screen away smaller weed seeds. The seed is then run through a hammermill to extract the seed from the capsules. The seed is further cleaned using a screening mill, indent cylinder and gravity table.

Figure 1. Naked seed (left) can be removed from the capsules (right) using a hammermill.

Environmental Concerns
Slender white prairieclover is a non-aggressive native forb which is usually a minor component of late seral native prairie stands, but can be a pioneer species on shallow soils and gravels. The forb has a taproot and will not spread vegetatively. The heavy seed does not travel far from the parent plant except through the digestive systems of ungulants and birds.

Germplasm Release
In 2000, the Bridger Plant Materials Center, in cooperation with the Bismarck PMC, released Antelope Tested Class Germplasm of slender white prairieclover. This is the first release of this species to the commercial seed industry. The original seed collection was made in 1947 in Stark County, North Dakota along the Antelope Creek drainage southwest of Dickinson. The original germplasm was first evaluated in North Dakota as NDL-56. In the early 1960's seed was sent to the Bridger PMC, where it was evaluated on coal strip mines, rangeland renovation, highway roadsides, bentonite mines, pipelines, and wildlife plantings. G_1 seed (equivalent to Foundation seed) is available through the Foundation Seed program at Montana State University and the University of Wyoming. Only one generation (G_2) (equivalent to Certified) is allowed to be grown by commercial seed producers.

References
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