Scientific Name: *Hesperostipa curtiseta* (A.S. Hitchc.) Barkworth
Family: *Poaceae*

Common Names: western porcupine grass, Canadian needle grass, shortbristle needle and thread

Plant Description

A perennial bunch grass, 40 to 60 (100) cm tall with roots to 1 m; old leaf sheaths remain in crowns of older plants; panicles 15 to 20 cm long, fully exerted, narrow, nodding, with slender branches each bearing 1 to 2 spikelets; spikelets relatively large, one-flowered giving rise to a single seed; glumes papery, often bristle-tipped, noticeably longer than the lemma; leaves up to 5 mm wide, light green, shiny, generally flat, ridged and rough on upper surface, smooth below; sheath round, split, white or purplish at base, prominently-veined, with translucent, hair-fringed margins; ligule up to two mm long, blunt or rounded, sometimes notched or split, fringed with hairs; auricles absent (Moss 1983).

Seed: 12 to 15 mm long with a sharp-pointed, hairy callus; lemma brown, hairy at the base and margins, strongly rounded; awn prominent, 5 to 11 cm long, twice-bent with the last segment straight, twisted below; seed hulls (lemma and palea) remain attached to seed (Moss 1983).

Ripe seed heads of western porcupine grass.

Habitat and Distribution

Prairie grasslands, prairies, parklands and rocky mountains. Western porcupine grass is an indicator of dry grasslands. In the boreal forest region it is found only on the driest, open microsites with rapid, complete drainage (Schwarz and Wein 1999).

Seral Stage: Appears mid to late successional stages.

Soils: Prefers medium textured loamy and mesic soils with medium soil texture (Gerling et al. 1996). Is not recommended for use on saline soils.

Distribution: Dominant species on loam soils in the central part of the Canadian prairies; British Columbia, southern District of Mackenzie to southern Manitoba south to Montana, South Dakota (Moss 1983).

Phenology

Long-lived, cool season perennial; grass growth begins in mid-April, flowers in mid-June, seed ripens early to mid-July and then shatters approximately two weeks later (Coupland and Brayshaw 1953). In boreal regions seeds can shatter as early as mid-July.

Pollination

Wind; presumed out–crosser.

Seed Dispersal

No literature found.

Genetics

2n=46 (Moss 1983).

Seed of *Hesperostipa curtiseta*. Seeds are generally 12 to 15 mm long exclusive of the awn.

Seed Processing

Collection: Although seeds can be harvested by hand, hand held strippers can be used in large stands. Do not store seed in cotton or burlap bags as awns will become entangled in the cloth.

Seed Weight: Seed weights can vary depending on growing areas. Smreciu et al. (2006) report 12.5 g/1,000 seeds average from seeds harvested in northeastern Alberta whereas Pahl and Smreciu (1999) measured 5 to 6 g/1,000 seeds.

Fruit/Seed by Weight: 178,000 seeds/kg in southern and central Alberta (Pahl and Smreciu 1999).

Harvest Dates: Mid July in north-eastern Alberta (Smreciu et al. 2006).

Cleaning: Seeds need to be debearded and this is best done at lower seed moistures. Seed screen can be used to clean seeds from chaff (top screen 4/64 x ½ slotted; bottom screen 6 x 24 mesh) (Pahl and Smreciu 1999).

Storage Behaviour: Likely Orthodox, seeds can be dried, without damage, to low moisture contents; longevity increases with reductions in both moisture content and temperature (Royal Botanic Gardens Kew 2008).

Storage: 100% viability following drying to 15% moisture content and freezing for 4 months at 20°C (Royal Botanic Gardens Kew 2008).

Longevity: Unknown.

Propagation

Natural Regeneration: Rhizomes or seeds (Gerling et al. 1996).

Germination: 19% after 30 days using fresh seeds, and 39% after 30 days using one-year-old seeds (Smreciu et al. 2006); 45% in 6 to 14 days if stratified; 52% in 6 to 14 days given a gibberelic acid treatment after piercing seeds (Pahl and Smreciu 1999).

Pre-treatment: Four weeks cold stratification (2 to 4°C) or GA treatment of pierced seeds.

Seeding Depth: 2 to 4 cm (Pahl and Smreciu 1999); 3 to 6 cm (Weaver 1931).

Seed Rate: In cultivation, 100 to 164 seeds/linear m of row.

Vegetative Propagation: Spring burning stimulates reproductive performance, but fall fires reduce cover and seed production (Bailey and Anderson 1978).

Aboriginal/Food Uses

Stiff ends used to make hair brushes (Walkup 1991).

Wildlife/Forage Usage

Wildlife: Good forage value for ungulates (Tannas 1997).

Livestock: Low to good forage value (Gerling et al. 1996). Good palatability. Mature seed can cause irritation in the mouths and gums of domestic livestock, for this reason they avoid grazing the plant once the seeds have been produced (Tannas 1997). Considered one of the most important native forages in Canada's mixed prairies (Coupland and Brayshaw 1953).
Grazing Response: Canadian needle grass is a decreaser (Gerling et al. 1996, Saskatchewan Forage Council 2007).

Commercial Resources

Availability: Limited quantities of seeds are occasionally available in Alberta.
Cultivars: None known.

Notes

Synonym – *Stipa spartea* (Walkup 1991). *Hesperostipa curtiseta* is a moderately competitive plant and grows well under *Elaeagnus commutata* (Nernberg and Dale 1997).

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