



Squarrose Knapweed

Centaurea virgata ssp. *squarrose* (Aka Protean knapweed)

Provincial Designation:
Prohibited Noxious



Steve Dewey, Utah State University, Bugwood.org



USDA Agricultural Research Service Archive, USDA Agricultural Research Service, Bugwood.org

Overview:

Squarrose knapweed is a long-lived perennial native to southwest Asia and the Middle East.³ Its method of introduction is not known, but it became weedy in the western U.S. in the 1950s and its spread was associated with the trailing of sheep.³ It is a tap rooted plant which develops a rosette of leaves in its first year of growth and then develops a woody root crown from which flowering stalks grow each season. Under unfavorable conditions squarrose knapweed plants can remain as rosettes for several years.³

Squarrose knapweed appears to be well adapted to the harsh climate of shrub steppe environments,³ making it a serious invader of these dry, rocky rangelands.

Squarrose knapweed flowers from June to August and seed dispersal continues through the winter.³ Basal leaves often wither by flowering. Seed heads are deciduous at maturity, although some seed heads can remain on the plant into the following spring.³ A Utah study of sheep coming off winter range found mature squarrose seed heads in the

topknot of 73% of sampled ewes. The germination rate of the recovered seeds was 69%.⁴

The flower head and bracts are very similar to diffuse knapweed (*C. diffusa*) but squarrose heads are more slender and urn-shaped.³

Habitat:

Squarrose knapweed prefers coarse, well drained soils on sites with cold winters and dry, hot summers. It is tolerant of alkaline soils and summer drought.

Identification:

Stems: Several highly branched, rough textured stems grow 20-50 cm tall. Stems are covered with tiny, fine hairs and tiny resin dots.¹

Leaves: Basal and lower stem leaves are 10-15 cm long, with petioles, and minutely resin-gland-dotted. Leaf margins are pinnately or bi-pinnately lobed. Leaves decrease in size upper stem, are sessile (no petioles) or almost bract-like and may be simple or pinnately divided.¹

Flowers: Are solitary at branch tips and composed of 10-14 linear, pink or pale purple florets.¹ Flower heads are small (7-8 x 3-5 mm) and narrowly oval or cylindrical. The base of flower heads are covered with overlapping bracts which pale green or straw colored, oval to lance shaped, sometimes purple tinged, smooth or finely hairy.¹ Bract margins have 1-3 mm recurved spines, the terminal spine longer and stouter than the four to six pairs of lateral spines.³ Seeds are light brown or straw colored, 2.5-3 mm long, with a pappus of 1-2.5 mm white bristles.¹ seeds may have faint linear stripes and an oblique scar where they detach from the head.³

Prevention:

Seeds can be dispersed in soil, hay, animal hair/fur or by plants caught in vehicles. Rangelands susceptible to squarrose knapweed invasion must be kept in a healthy condition.

Control:

Knapweed seeds have an extremely hard seed coat and can be viable for at least 5-10

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years. Therefore knapweed control sites will need to be re-visited for many years.

Grazing: Squarrose knapweed is palatable in the rosette stage, but palatability and nutrition diminish with plant maturity. Since the spiny bracts of seed heads can attach to animal fur any grazing of squarrose knapweed infested areas will likely only contribute to weed spread. Invasive plants should never be considered as forage.

Mechanical: Small infestations can be hand pulled or dug up before seed set. The root crown must be removed to prevent re-sprouting. Cultivation needs to cut the root at least 20 cm below the soil surface to prevent re-sprouting. dislodged rosettes can continue to grow if they are attached to a piece of root that touches the soil.³ Once a seed bank has developed seasonal control efforts will be required for many years.

Chemical: Currently no selective herbicides are registered for use on squarrose knapweed. Always check product labels to ensure the herbicide is registered for use on the target plant in Canada by the Pest Management Regulatory Agency. Always read and follow label directions. Consult your local Agricultural Fieldman or Certified Pesticide Dispenser for more information.

Biological: Two gall flies (*Urophora quadrifasciata*) introduced to control spotted and diffuse knapweed also reduce the seed production of squarrose knapweed.³



Flowers

Steve Dewey, Utah State University, Bugwood.org



Flower

Cindy Roche, Bugwood.org



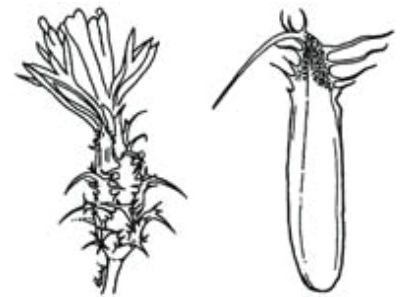
Plant

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Plant

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Flowerhead

Bract

REFERENCES

- 1 *Centaurea virgata* ssp. *squarrosa* in *Flora of North America*. www.efloras.org
- 2 Identification of Knapweeds and Starthistles in the Pacific Northwest. PNW 432. Pacific Northwest Extension.
- 3 C. Roché, L.C. Burrill. Squarrose Knapweed. 1994. Oregon State University Extension Service. Reprinted July 2008 as PNW 422-E, Pacific Northwest Extension.
- 4 C. T. Roché, B. F. Roché Jr., G.A. Rasmussen. Great Basin Naturalist. 1992. Vol. 52 No. 2