

**WRITTEN FINDINGS OF THE
WASHINGTON STATE NOXIOUS WEED CONTROL BOARD
(October 1999)**

Scientific Name: *Galega officinalis* L.

Common Name: goatsrue

Family: Leguminosae/Fabaceae

Legal Status: Proposed Class A

Description and Variation: A perennial herb that ranges from 2–6 feet tall. Each plant can produce up to 20 stems from a vigorous crown and a deep tap root. The leaves are alternate, odd-pinnate, with six to ten pairs of leaflets. The tip of each leaflet has a small hair-like appendage. The stems of goatsrue are hollow and cylindrical, tubular. The stipules (leaf-like appendage at the base of the lf. stem) is sagittate (arrowhead shaped) and toothed and lobed. The pea like flowers are whitish to bluish to purplish, and are found in terminal or axillary racemes. Goatsrue produces 1-9 seeds per pod, and each plant can produce 15,000 pods per plant, or more. The seed pods are narrow, round in cross section, and about 1 inch long. The seeds are dull yellow, bean-shaped and 2 ½ times larger than alfalfa seeds. Seeds may be viable in the soil for 5-10 years, but testing continues on seed longevity.

Goatsrue resembles wild licorice (*Glycyrrhiza lepidota*). Both plants are pictured in “Weeds of the West” and a detailed botanical description with drawings are in Cronquist et al. 1989.

	<u>Goatsrue</u>	<u>Wild licorice</u>
Stems:	hollow, cylindrical, tubular	solid
Seed pods:	narrow, smooth, >1” long	burlike, < ¾”
Inflorescence:		short, axillary spikes on long stems
Leaves:		with glandular dots when mature

Economic Importance:

Detrimental: Goatsrue is a federally listed noxious weed. It is known from two sites, nationwide. One site is a county in Utah, that reports 38,000 acres (60 square miles) of infested cropland, waterways, pastures, fencelines, roadways and wet, marshy areas. Eradication efforts have been costly and time consuming. Goatsrue is unpalatable and toxic to sheep. Goatsrue is capable of forming monocultures in wetland communities, displacing native or beneficial plants. Wetland wildlife vacate these areas once their food source or nesting material is gone. Goatsrue is fatal if ingested (Evans et al. 1997).

Beneficial: Possibly considered as an ornamental, as it was recently found for sale in a King Co. nursery (it was removed after they were informed that it is a federally listed noxious weed). It is also mentioned as a medicinal herb, and seed sources are found on the Internet. Medicinal sources mention “veterinary and human medicine to increase lactation”, and reduces blood sugar (Strictly Medicinal web site; Crellin and Philpott 1990).

Habitat:

Cropland, ditch banks, irrigation waterways, uncut pastures, fencelines, roadways and wet, marshy areas. The King Co., Washington sites include roadsides, and an open field. Associated species growing with goatsrue include reed canarygrass, *Spirea*, blackberries and purple loosestrife. Goatsrue is also found in established alfalfa fields, where mowing does limit its spread (Evans 1984).

Geographic Distribution:

Goatsrue is native to central and southern Europe and western Asia.

History:

In 1891, goatsrue was introduced from the Middle East to Utah, where it was tested for three years as livestock forage, or a green manure crop. However, it is unpalatable and toxic (lethal) to sheep and livestock. Over the next 86 years, this plant slowly spread to cover a 60 square mile area in Cache County, Utah, where it is primarily found in highline canals and in drainage systems of valley floors.

In 1974 goatsrue was listed as a noxious weed in Utah, with the intent to keep this plant from spreading further in Utah, or into nearby states.

In 1976 goatsrue was the target of an eradication project in Utah (Evans 1984). In 1981 USDA/APHIS targeted goatsrue for eradication, nationwide. An herbarium search found plants from 1890 to 1960, from 10 continental states and Washington D.C. (Evans et al. 1997). APHIS is working cooperatively with state agencies in Utah for total eradication. The Morris Arboretum in Philadelphia recently reported a small infestation.

In Washington State, records indicate that goatsrue was reported from Whatcom Co. in 1921, with no present populations known from that area. In 1999 ('98?) this species was noticed and identified in King Co. It was also found for sale, as an ornamental plant, in a King Co. nursery. It is reportedly found for sale over the Internet, as a medicinal herb.

Growth and Development:

Goatsrue is a perennial legume. The flowers are present from June until the fall frost. The leaves and stems contain the alkaloid galegin, which is toxic to livestock when eaten in quantity. The alkaloid content is highest in the spring. Animals will avoid the plant, which contribute to the establishment and spread in rangeland.

Reproduction:

Spreads by seeds. The seeds drop from the mature seed pods, and are spread primarily by irrigation or flowing waters. Seeds also spread by farm machinery, in animal manure and in contaminated soil movement. Seeds may be viable in the soil for 5-10 years, but testing continues on seed longevity.

Control:

In Utah, an integrated approach, that included landowner education, carefully mapping the infestation, crop rotation, tillage, mowing, digging, hand clipping for seed pod removal and chemicals are used in the battle to eradicate goatsrue. "Massive reproductive crowns" are proving to be difficult to eradicate. Seed banks produce seedlings annually in the original infestation area (Evans et al. 1997; Evans 1984).

Response to Herbicide:

Selective herbicides are considered the most effective for large sites. Dicamba, or 2,4-D and their combinations are very effective. Clipping initial growth at 24" tall, and then spraying the regrowth at

the same height is the most effective (Evans 1984). Be sure to check labels for site specific information on herbicide control before use.

Response to Cultural Methods:

Alternative cropping and row crops are effective. Cultivation interrupts the life cycle of goatsrue.

Response to Mechanical Methods:

Shallow cultivation, mowing, clipping and cutting are not recommended as a solitary control method. Flowers will be produced on very small plants. Seed pods can be clipped and disposed of to help prevent spread by seed in areas of eradication work.

Biocontrol Potentials: None known.

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- *References available from the Washington State Noxious Weed Control Board Office in Kent, WA.**

Rationale for Listing:

Goatsrue is a federally listed noxious weed. Nationwide, its distribution is very limited, and is only known from two sites, outside of our recent finds in Washington. The fact that 38,000 acres (60 square miles) of infested cropland, waterways, pastures, fencelines, roadways and wet, marshy areas are infested in Utah serve as a guideline, or warning that this species is invasive and difficult to control. Control efforts were started in 1976 in Utah, they have been costly and time consuming. In 1981 USDA/APHIS began working cooperatively with state agencies for total eradication, nationwide. Goatsrue is still found on the original site in Utah.

By listing this species as a Class A noxious weed, eradication would be required in Washington. At this time it appears that we have a very limited distribution in King Co. However, this species appears to be considered as an ornamental, and medicinal herb, and it is offered for sale by the nursery industry and over the internet. Education and required eradication should prevent establishment in our state. We are in the position to prevent impacts to our agricultural lands, our irrigation lands and our natural areas.