

Goatsrue, *Galega officinalis*, in Pennsylvania

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Galega officinalis, commonly called goatsrue, is a member of the Legume family (Fabaceae) (Fig. 1). *Galega officinalis* is native to southern Europe and western Asia. Historically, it has been a popular garden plant in both Europe and the United States, partly because of its religious and medicinal associations.

Goatsrue was introduced to the western United States in the late 1800s as a possible forage crop. Both the leaves and stems of the plants were later shown to contain a poisonous alkaloid called galegin, making it unpalatable to livestock. Feeding trials proved that eating the plants would kill sheep and cattle (Evans, 1984). Goatsrue subsequently has become an invasive weed in northern Utah, where it infests approximately sixty square miles (Evans, 1982). In 1980, it was designated a federal noxious weed. Several thousand dollars have been spent in an effort to eradicate the plant.

Although it is not reported to be a common weed of Pennsylvania (Rhoads and Klein, 1993), goatsrue has exhibited invasive characteristics at the Morris Arboretum and adjacent properties in Philadelphia, Pennsylvania. In 1964, John M. Fogg, Jr., the

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Director of the Arboretum, wrote an article in the Morris Arboretum Bulletin entitled “*Galega officinalis*: A weed new to the arboretum (Fogg, 1964).” When Fogg first spotted goatsrue, he did not recognize it, so he enlisted the help of several colleagues for identification. Fogg then researched herbarium records and learned that *G. officinalis* had been collected in several locations in the eastern United States. After reading the bulletin, John S. Stokes responded with an article, “*Galega officinalis*: an adventure in plant naturalization,” describing how he had grown goatsrue from seed from 1953 through 1955 on a property adjacent to the Arboretum, and then scattered his excess seed in an attempt to naturalize it along the roadside dividing the properties (Stokes, 1964). It has since traveled down the stream corridor flowing between the two properties and has naturalized in the Arboretum’s flood plain.

Upon learning of its status as a federal noxious weed, Dr. Ann F. Rhoads, Director of the Department of Botany at the Morris Arboretum, contacted both state and federal officials to notify them of the occurrence of *G. officinalis* at the Arboretum. With the support of weed control specialists from the USDA and the Pennsylvania Department of Agriculture, the Arboretum is experimenting with control strategies for the plant. Treatments including use of herbicides, cutting, removal of young shoots, and combinations of these are being implemented in experimental plots.

Description: *Galega officinalis* is an herbaceous perennial, typically one meter tall at maturity, but occasionally reaching heights of 2 meters, although larger plants tend to become decumbent (Fig. 2). Leaves are pinnately compound, up to 22 cm long, with 11-17 elliptic to lanceolate leaflets, 1 to 5 cm long. The inflorescence is composed of 20-50

purple to white flowers, each about 1 cm long, arranged in terminal or axillary racemes. Flowering begins in June and continues throughout the growing season. Each flower produces a pod, 2-4 cm long with up to 9 seeds. The dull, mustard yellow seeds are oblong and approximately 2.5-3 mm long.

Similar species: Although goatsrue may be confused with crown vetch (*Coronilla varia*), it is taller than crown vetch when upright. The flowers of crown vetch are usually pinker than those of goatsrue, and while flower shape is similar between the two plants, the inflorescence of goatsrue is a raceme and that of crown vetch is an umbel. The leaves and leaflets of goatsrue are pointed and larger than those of crown vetch. Goatsrue leaves “unroll” as they develop, a characteristic visible even when the plant is very young.

Biology/Ecology: Goatsrue forms dense crowns capable of regenerating for several seasons. The plants spread along waterways even though the seeds do not float. Apparently, the pods of the plant are buoyant for a short time before becoming saturated with water and sinking.

Herbivorous animals avoid goatsrue as a food source. In Pennsylvania where white-tailed deer are prevalent, no signs of browsing can be seen on the plants. Grazing cattle and sheep in the western United States eat plants around goatsrue, encouraging it to spread. Because of this avoidance, poisoning of animals is a minor concern.

Habitat: *Galega officinalis* grows along stream banks and in moist areas (Fig. 3). It prefers full sun, but will tolerate light shade.

Control: Dr. John O. Evans, professor at Utah State University specializing in weed science, says that cutting and mowing are not effective control methods for goatsrue in Utah, although this may not be the case in Pennsylvania. Goatsrue is capable of flowering and producing seeds on short branches that can develop even after cutting several times in a growing season. Dr. Evans believes the use of selective herbicides is the most efficient control of goatsrue. His control suggestions include use of 2,4-D with dicamba (Evans, 1982). Of course, pesticide applications must conform to label instructions.

Until now, studies of goatsrue have not been conducted in the humid eastern climate. Trials of both selective and non-selective herbicides and repeated mowing are in progress at the Morris Arboretum. Results of the experiments will be used to establish appropriate methods of eradication or control for *G. officinalis* in the eastern United States.

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