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Identification and Control of American Germander

American germander (*Teucrium canadense*) is a troublesome perennial plant of the mint (Labiatae) family that spreads by rhizomes and by seed. The plant is native to southern Canada and the northeastern United States and is found mainly on fertile, moist soils. In Minnesota, American germander has become a serious weed problem in crops grown on river bottom land or in lowland areas that have been drained and put into crop production. Germander has been especially troublesome in corn and soybean fields in southern Minnesota, but it is also common in several northern Minnesota counties where it grows well on high organic soils. Germander is resistant to most herbicides that are commonly used in these crops.

Crop Competition and Yield Losses from Germander

If uncontrolled, germander makes vigorous, early growth and competes seriously with most field crops for nutrients, light, and moisture. However, yield reductions are much more serious when soil moisture is limiting. For example, uncontrolled American germander reduced corn yields 76 percent in a year of limited rainfall, but only 23 percent in a year of adequate rainfall. Crop losses are usually much more serious in soybeans than in corn.

Germander Control in Field Crops

Germander does not respond well to most cultural methods of weed control including repeated tillage. Under ideal fallow conditions, fair to good control is possible if a year or more of repeated tillage with a field cultivator or similar implement is carried out to bring rhizomes to the soil surface where they can dry out. Also, germander infestations can be reduced but usually not eliminated by the establishment of a good stand of alfalfa on an infested area using direct-seeding

Identification of American Germander

Germander has the typical square stem, opposite leaf arrangement and irregular flowers of the mint family. Plants are commonly one to two feet tall but may grow three feet tall or more on moist, fertile soils. The square stems are downy-hairy, especially on the angles, and they are often branching (See figure 1, inset A). Leaves are an inch or more broad and three to four inches long. They are ovate to oblong in shape, with pointed leaf tips, and tapering to rounded leaf bases. Leaf margins are finely toothed and pubescent, and leaf petioles are short. Germander has often been confused with a closely related species, field mint. However, the flowers of germander occur in long, crowded racemes at the terminal end of the stem or branches, while the flowers of field mint occur primarily in the axils of the leaves. Racemes of germander are commonly six to eight inches long, but may reach one foot in length, making the plant showy and conspicuous when in bloom. The flowers are usually rose to rose-purple in color, but white-flowered varieties are found occasionally. The flowers have petals fused into two distinct lip-like divisions (see figure 1, inset B). The lower lip is composed of one large, rounded, spreading lobe in the center with two small pointed ones on the sides. The upper lip is split, making an opening through which the long stamens protrude. Individual flowers are often nearly an inch long, in whorls of six or more, on very short pedicels. Seeds are light to dark brown, covered with minute ridges, scattered white hairs and glandular dots, and are borne four to a circular nutlet (ovary of individual flower). Seeds are approximately 2.0 x 1.7 x 1.3 mm, and are egg-shaped. A prominent seed scar (point of attachment of seed to ovary) covers roughly one-third of one side of each seed.

Life Cycle of Germander

Plants are perennial from long, slender rhizomes. Vegetative growth begins in early spring and plants bloom in mid- to late summer. Germander tends to be indeterminate in bloom, with racemes flowering from base to tip as terminal growth progresses. Flowering may continue on an individual plant for a month or more, with ripe seeds being formed at the base of the raceme while terminal flowers are still being formed. Seeds mature from August to November with the plants showing considerable cold tolerance. Seeds exhibit strong dormancy characteristics and do not germinate until spring. Some seed may lay dormant for several years before germination occurs. Seed production and seed viability is generally low, however, germander reproduces and spreads primarily from rhizomes.

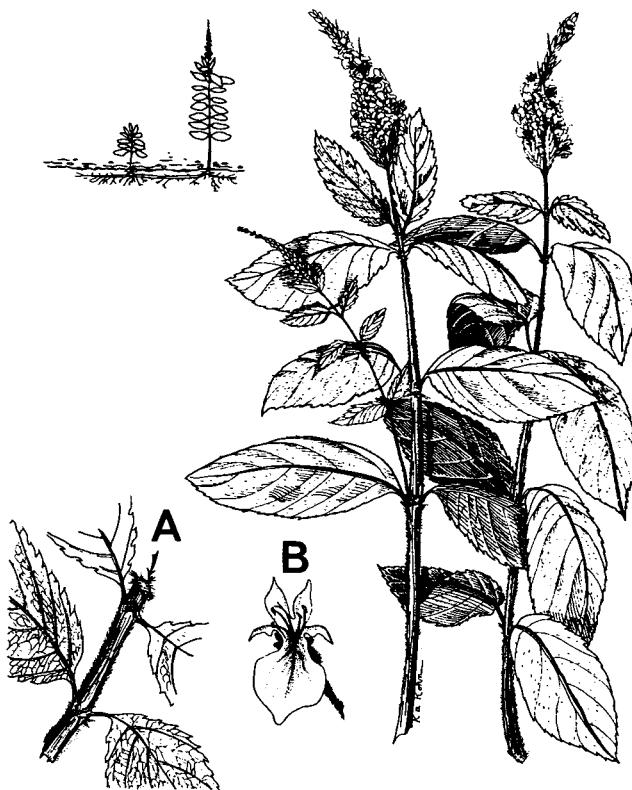


Figure 1. Germander has the typical square stem, opposite leaf arrangement and irregular flowers of the mint family.

methods with EPTC (Eptam) applied and worked into the soil prior to seeding. Intensive management of the alfalfa with needed lime and fertilizer and with three or four cuttings of alfalfa per year has been effective in reducing germander stands. However, usually a combination of cultural and chemical methods are needed over a year or two to eliminate germander.

Like many perennial members of the mint family, germander is resistant to most herbicides commonly used in field crops. Minnesota research directed toward control of germander in field crops has failed to find a good method for control of germander in soybeans. Suppression or partial control of germander is possible in soybeans and other crops by spot treatment with glyphosate (Roundup). However, glyphosate is a nonselective herbicide, and if crop contact is made by drift or misapplication, the crop will be seriously injured or killed. It is possible, however, to get suitable control in corn with herbicides. Therefore, fields where germander is a problem should be planted to corn if possible, and a vigorous control and/or eradication program should be carried out.

Germander Control in Corn

Dicamba and 2,4-D have been the most widely used herbicides for control of perennial broadleaf weeds in corn. However, both of these herbicides, when used separately at labeled rates in corn, have failed to give satisfactory germander control. In field experiments conducted in corn near Redwood Falls, Minnesota in 1976 and 1977, the best herbicides for control of American germander were EPTC + protectant (Eradicane) applied preplanting with soil incorporation and atrazine + oil applied early postemergence (table 1). A tank mixture of EPTC plus protectant and atrazine, both applied preplanting incorporated, also gave effective season-long control.

A summary of the herbicides and herbicide combinations that have given effective control of germander in corn are listed in table 1.

Table 1. Suggestions for chemical control of American germander in corn.

Herbicide	Pounds per acre of active ingredient or acid equivalent broadcast ¹	Time of application	EPA limitations on crop use
EPTC (Eradicane or Eradicane Extra)	3 to 6	Preplanting with immediate incorporation	None
EPTC + atrazine	3 to 4 + 1 to 1-1/2	Preplanting with immediate incorporation	Do not graze or feed forage for 21 days after treatment.
Atrazine + oil ²	2	Early postemergence when germander is 3 to 5 inches tall.	Do not graze or feed forage for 21 days after treatment.

¹ Rates vary depending on soil type. See label.

² May be vegetable or petroleum oil properly emulsified.

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