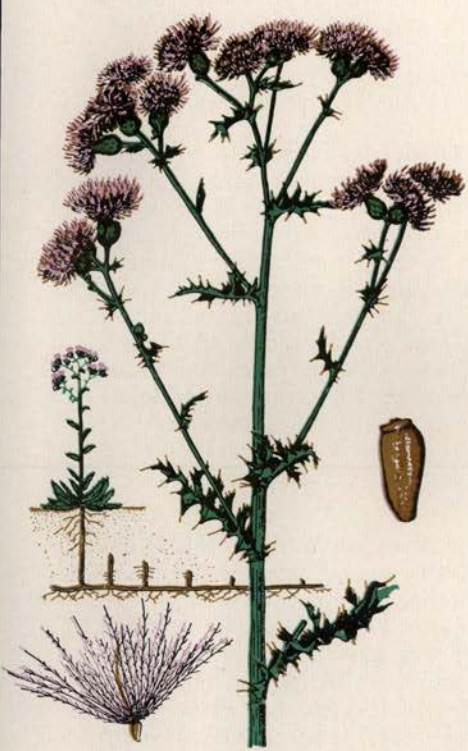


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Identification and Control

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IDAHO Agricultural
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CANADA THISTLE

Identification and Control

ROBERT E. HIGGINS and LAMBERT C. ERICKSON*

Canada thistle is the No. 1 perennial noxious weed in Idaho. It is a native of Europe and probably was introduced to this country in horse feed by Burgoyne's army about 200 years ago. It is commonly found in all northwestern states. It infests about 200,000 acres scattered throughout the State of Idaho. The heaviest infestations occur in the upper Snake River Valley and in Northern Idaho.

Canada thistle (*Cirsium arvense* L.) is easy to identify. It has spiny leaves and stem, purple to white small flower heads, and creeping, underground root stalks. It grows 2 to 5 feet tall, usually taller than oats, wheat, or barley and often forms dense patches in farm fields. The edges of the leaves usually have many indentations. The spines extend from the outer edge giving a spiny, ruffled appearance. The underside of the leaf is usually a lighter green than the upper side. This is due to numerous hairs on the underside.

The flowers are borne only at the top or at the tip of its branches. Male and female flowers are usually produced on separate plants but sometimes may occur in the same flower head. At maturity, the female flower head fluffs out to produce a cotton-topped appearance while the male flower turns dry and brown. Buds, flowers and seed may be found on a plant at the same time.

Canada thistle has elongated gray-brown seed with a downy parachute attached. The down breaks off readily on threshing, leaving the seed which is especially difficult to separate from alfalfa, clover and grass seeds.

A thistle patch can start from a single seed or root segment. In this case the whole patch will be made up of only male or female plants. Male patches and widely isolated female patches may not set seed. Usually the infestations are mixed male and female plants. Although seed is not always produced abundantly, even when pollination takes place, it usually germinates readily. Thistle seed remaining in crop seed samples has germinated up to 80 percent.

The root system of the thistle enables it to spread more rapidly than most other perennial noxious weeds. The natural spread may be as much as 10 feet per year. Lateral roots develop 8 to 10 inches below the surface of the ground. From these lateral roots new plants develop every few inches to a foot or more apart, depending upon the growing conditions. The new plant is a rosette which lies flat on the ground. It may not produce flowers until the second year. Vertical roots reach a depth of 7 to 10 feet.

Canada thistle grows best on deep, fertile soil. It is not as vigorous on poor shallow soil. However, it is more difficult to eradicate when growing under poor conditions.

*Extension Agronomist, Idaho Agricultural Extension Service, and Associate Agronomist, Agricultural Experiment Station, respectively.

Spread

Canada thistle has been introduced to most areas as an impurity in seed. However, it is spread by wind, water, birds, animals and farm equipment. Man has been responsible for most of this spread. Wind will aid in spreading the seed from a single patch to infest an entire field. Some field tests have shown that about 10 seedlings per square yard appeared for 3 years

after the parent plants were killed. These seeds may have been in the soil or they may have been blown in from the surrounding infestation. The seedling problem probably develops from seed from the surrounding area. Greenhouse tests have indicated that seed carried over in the soil is not apt to be a major problem.

Seed Law

The Idaho seed law prohibits sale of any seed containing seed of any primary noxious weeds. Canada thistle is classed as a primary

noxious weed. All crop seed must be tagged to show that it is free of noxious weed seeds.

Control

Canada thistle can be controlled and eradicated with chemicals, by cultivation, or by cropping practices. A combination of these usually gives the best results. The method and materials depend on the size of the infestation and the conditions under which the weed is growing.

Chemicals

A selective spray of 2,4-D is the most economical chemical for the control of large infestations. When 2,4-D is used, infested fields should be planted to grain, or to grasses for hay or pasture.

In an irrigated area, spring-sown barley or wheat is a good competing crop. Increase seeding rates 10 to 25 percent and fertilize with 40 to 80 pounds of available nitrogen per acre to improve the competition from the grain. (See *A Fertilizer Guide For Idaho Farmers*, Ext. Bul. 325.) Spray with 2 pounds of 2,4-D amine in 30 to 50 gallons of water per acre. The spray should be applied before the grain is in the boot stage. This will avoid injury to the grain and give the best thistle kill. The thistle regrowth should be resprayed again after

the grain is harvested. Use a rotation providing for a grain crop for three consecutive years to permit repeated selective spraying. (See *Control Canada Thistle For Greater Profits*, Exp. Sta. Bul. 321.)

Under dryland conditions, the use of 2,4-D in grain is not as successful as it is under irrigation. Only one spraying a year is usually possible. In winter wheat the spraying must be done just as the wheat starts into the boot stage. When it is at this stage the thistle is too small for best results. Maintaining high fertility will improve results.

One of the best practices for thistle control is seeding infested fields to grasses to be cut for hay. Mow the fields for weed control 8 weeks after seeding. In the second year spray when the thistles are in the tight bud stage; that is, before they show any color. Apply 40 to 120 pounds of actual nitrogen each year to keep the grasses growing vigorously. Leave in grass for 3 or more years.

Amitrol (ATA, ATZ) (3 amino 1,2,4 triazole) should be used only for small patches on non-crop land. Avoid spraying where it will drift

to food or feed crops or where livestock will graze. Spray 8 pounds of 50 percent amitrol per acre in 50 to 150 gallons of water. Make the application when the thistles are 6 inches high to early bud stage. Spray regrowth with 2 pounds of amine 2,4-D per acre. Amitrol is not selective and will kill or damage most plants. It is adapted only for spot work.

Soil Sterilants

Sodium chlorate, chlorate-borate mixtures, or carbon bisulfide (CS₂) will eradicate Canada thistle. They cannot be used selectively in crop fields. Carbon bisulfide sterilizes the soil for 1 year. Sodium chlorate sterilizes for 2 to 5 years. Chlorate-borax mixtures sterilize even longer. The time interval depends on the material and rate used and the soil and moisture conditions in the area. Use sodium chlorate at 3 to 6 pounds per square rod and chlorate-borate mixtures at 12 to 16 pounds per square rod.

Apply soil sterilants in October and November so that the winter moisture will move the material into the root zone of the plant.

Trichloro benzoic acid (TBA), can be used for spot treatment on non-agricultural land. This is a long-lasting sterilant and should be used only as directed by the manufacturer on the container label.

Cultivation

Canada thistle yields readily to a thorough, clean cultivation program. Begin cultivation after harvesting the crop. Plow 6 or more inches deep. This turns under residue and sets the thistle back so that cultivation can continue effectively in the spring. Cultivate every 14-21 days with a duck-foot weeder or other cultivator that will cut off all the plants. Cultivation every 14 days is preferred for dry land areas where it is necessary to conserve moisture. Run the cultivator no more than 4 inches deep. In most areas, Canada thistle will be eradicated after 1 year of cultivation. In short season and poor soil areas it may take 2 years.

Thistle can also be eliminated in cultivated crops by persistent cultivation and hoeing.

Alfalfa as a Control

Dense, well-fertilized stands of alfalfa will eradicate Canada thistle. Where it is possible to cut 3 crops, it will usually take 3 years. This should be followed by row crops or 2,4-D spraying in a cereal crop to kill new seedlings. In areas where less than 3 cuttings are obtained, alfalfa helps in control but will not give eradication unless combined with some other method such as cultivation or grain that is sprayed with 2,4-D.

PESTICIDE RESIDUES: These recommendations for use are based on the best information currently available for each chemical listed. If followed carefully, residues should not exceed the tolerance established for any particular chemical. To avoid excessive residues, follow recommendations carefully with respect to dosage levels, number of applications, and minimum interval between applications and harvest.

(Cover illustration courtesy Oregon State College)
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ON WEED CONTROL IN IDAHO**