Eradication of Poison Ivy and Poison Sumac

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Circular 222

June 1962

The CONNECTICUT Agricultural Experiment Station
NEW HAVEN

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The beauty of poison ivy is best appreciated from a distance. Few people are interested in cultivating this plant. This circular is, therefore, dedicated to its destruction.

Results of experiments at this Station with materials to kill poison ivy were first reported in 1944.[1] Since then newer materials also have been found effective. This publication summarizes the recent results of experiments and experience in controlling poison ivy and poison sumac.

DESCRIPTION AND OCCURRENCE: Poison ivy (*Rhus toxicodendron* L.) is a wild plant common throughout the United States, whereas poison sumac (*Rhus vernix* L.) is restricted largely to the Eastern States. Poison ivy is also called poison oak, mercury, three-leaved ivy, and poison creeper. Poison sumac is also called poison dogwood, poison oak, swamp sumac, and thunderwood. The names poison oak and poison dogwood are misnomers. No species of oak (*Quercus* spp.) or dogwood (*Cornus* spp.) are poisonous.

Poison ivy grows on all types of soils and under all conditions of light and shade and is found in several forms, ranging from trailing vines to erect shrubs. It is distinguished by shiny green leaflets, arranged in sets of threes. Hence the saying, "Leaflets three, let it be." The leaflets are pointed and the edges may be lobed, variously notched, wavy, or entire.

Poison sumac usually grows in swamps and on wet soils. It is often found growing in clumps, as a large shrub or small tree, but never trailing along the ground. The leaves are divided into 7 to 13 leaflets which are oval and pointed, with smooth margins. The leaflets are arranged in pairs with a single leaflet at the end of the midrib, as in non-poisonous forms of sumac. Poison sumac, however, does not have winged midribs as do the common non-poisonous forms. The leaves of poison sumac are bright orange when they first appear in the spring, later turning to glossy dark green and to fire red in the early fall. The bark of poison sumac is gray and the sap is abundant and milky. Both poison ivy and poison sumac are described more thoroughly elsewhere.[2]

POISONOUS ACTION: The principle in poison ivy and poison sumac that causes skin irritation is a non-volatile phenolic compound called urushiol. It is found in all parts of the plant, including the roots. Poisoning is caused by contact with the plant or with clothing or other objects that have contacted plants. Smoke from burning plants is said to cause poisoning. Poisoning also can be caused by eating the fruit or other plant parts. Prompt washing of exposed skin with laundry soap reduces the possibility of injury.

METHODS OF ERADICATION: Poison ivy and poison sumac can be eradicated either by hand or by chemical means. Digging out the roots requires the use of gloves and extreme care in avoiding skin contact. It is, however, almost impossible to remove all roots to eliminate infestation. Herbicides avoid the hazardous contact and the laborious work of digging out the plants. Several herbicides are very effective against both species.

1 Poison Ivy and its Eradication, by E. M. Stoddard. Conn. Agr. Expt. Sta. Cir. 160 (1944) and 170 (1949).

2 Poison Ivy, Poison Oak and Poison Sumac. Farmers' Bulletin 1972. U. S. Dept. of Agr. (1958). Available from the Supt. of Documents, U. S. Govt. Printing Office, Washington 25, D. C. Price, 15 cents.

SELECTIVE ERADICATION WITH HERBICIDES: The most useful herbicides for killing poison ivy and poison sumac are safe to handle and can be applied selectively, in order to kill the poison ivy without sterilizing the soil. These include amitrole, ammonium sulfamate, 2,4-D and 2,4,5-T, and silvex. Although each of these materials will kill or injure other plants when sprayed on their foliage, they are not absorbed through bark and, therefore, can be used to kill poison ivy growing on the trunks of trees. Each of these compounds may be sold under one or more trade names.

Amitrole (3 amino, 1,2,4 triazole) is obtained as a water-soluble powder. When sprayed on plants it is readily absorbed by foliage and translocated throughout the plant, causing chlorosis and inhibition of new growth. Amitrole is non-volatile in solution and is, therefore, safe to use around other plants. It is also relatively non-toxic to warm-blooded animals. Careful washing will remove it from a spray tank.

Amitrole is used at a rate of 4 to 6 lbs. of the 50 per cent powder per 100 gallons (6/10 to 1 ounce per gallon). Best results are obtained by spraying the entire plant when the leaves are fully expanded and the plants are actively growing, any time from June to early September. Repeat applications may be required the next year on some plants.

Ammonium sulfamate also is a water-soluble powder. In solution it kills woody and herbaceous plants by contact and systemic action. It is corrosive to metals, including brass, and should be thoroughly washed from a sprayer after use. Rinsing the sprayer with kerosene will prevent corrosion. Ammonium sulfamate breaks down readily in the soil and is relatively non-toxic to warm-blooded animals. Like amitrole it is non-volatile and thus safe to use near gardens, provided care is taken in application.

Ammonium sulfamate is sprayed on undesirable plants at a dilution of 12 ounces per gallon of water. Spreader-sticker should be added according to label directions. Ammonium sulfamate is effective any time the poison ivy is in full leaf—from June to September. Regrowth should be sprayed as it comes into full leaf.

Three *phenoxy herbicides* are effective against poison ivy and poison sumac: 2,4-D (2,4-dichlorophenoxy acetic acid), 2,4,5-T (2,4,5-trichlorophenonxy acetic acid) and silvex (2,4,5-trichlorophenoxy propionic acid). They are active against many herbaceous and woody plants but not against most grasses. 2,4-D and 2,4,5-T mixtures commonly are referred to as "Brushkiller." 2,4-D and silvex also are used to control certain weeds in lawns (see Bulletin 649 of this Station). All three compounds are available as amine-salt and ester formulations.

The amine salts are essentially non-volatile, water-soluble formulations, fairly safe for use around the home. The esters usually are more effective than the amine salts, but only the *low-volatile* ester formulations are safe for use near crops and gardens.

The amine salts and esters are used in water at a rate of 3 to 4 lbs. of the acid equivalent per 100 gallons or about 1/2 ounce of acid equivalent per gallon of spray. Brushkiller mixtures (2,4-D plus 2,4,5-T), 2,4,5-T, or silvex alone generally are more effective than 2,4-D alone. Used in water they are effective when sprayed on plants after the leaves have fully expanded and while the

plants are actively growing. Late summer applications may not be as effective as early summer applications.

To kill poison ivy or poison sumac during the dormant season, 2,4-D, 2,4,5-T, or silvex can be applied in fuel oil, diesel oil, or kerosene at a rate of 12 to 16 lbs. of acid equivalent per 100 gallons of spray mixture or 2 to 2½ ounces of acid equivalent per gallon. In this case the herbicide in oil is sprayed around the lower stem and roots of the poison ivy. Since the phenoxy herbicides in oil are absorbed through the bark, sprayed trees and shrubs also are killed by this treatment. The soil, however, is not sterilized for long periods, and adjacent trees and shrubs that are not sprayed remain unaffected. Such basal treatment also is effective during the growing season but is more costly than foliage treatment.

For the sake of desirable plants, the phenoxy herbicides should be respected as much as a loaded pistol. Only minute amounts are required to kill or injure crop and garden plants.

Because of the difficulty of removing the phenoxy herbicides from sprayers, a separate sprayer is usually used for applying these materials. Sprayers used only for turf application, however, can be used for applying phenoxy herbicides. With amitrole or ammonium sulfamate, the garden sprayer may be used without great hazard if care is taken to thoroughly wash the sprayer after use. With all of these materials, it is wise to spray when there is no wind to avoid injury to desirable plants by drift, using low pressures to obtain a coarse spray, not a fine mist.

NON-SELECTIVE ERADICATION WITH HERBICIDES: In addition to the above materials, several herbicides are effective against poison ivy or poison sumac, but cannot be applied selectively so as to avoid injuring grass or trees on which the poison ivy is growing. These include herbicides that are primarily soil sterilants, killing most plants on or near where they are applied. Among these are sodium chlorate, sodium arsenite, polychlorobenzoic acid, fenuron, erbon, and borax. An exception is the use of foliage sprays of *sodium chlorate* (10 to 12 ounces per gallon) which can be used to kill poison ivy growing on trees, if the tree foliage is not sprayed. Sodium chlorate is very combustible and, therefore, hazardous for weed control unless combined with a fire retardant.

Foliage sprays of sodium chlorate have been most effective in Connecticut when applied during August and September. Soil applications of sodium chlorate at rates of 1 to 1½ lbs. per 100 square feet kill most plants and sterilize the soil for two or more years.

Sodium arsenite also can be used as a foliage spray or as a soil application. As a foliage spray, however, it also kills stems of other woody plants and cannot be selectively applied with ease. With foliage sprays, at 4 to 6 ounces of sodium arsenite per gallon, repeated treatments usually are required for kill of poison ivy roots. Sodium arsenite is far less desirable than other materials available as a treatment for poison ivy. Sodium arsenite is very poisonous to warm-blooded animals, and precautions should be taken in its storage and use.

Common *borax* (sodium tetraborate), scattered on the soil surface at a rate of 4 lbs. per 100 square feet, is a safe, economical treatment for killing poison ivy where soil sterilization is not a problem. Like other soil sterilants, borax acts through the roots of most plants and should not be used under or near desirable trees or shrubs.

Fenuron (3-phenyl-1,1-dimethyl urea) is applied as a granular material around the base of the plants to be killed. Compared to borax, sodium chlorate, and sodium arsenite, very low rates of fenuron are required to kill plants; hence it is very effective for killing brush or poison ivy in areas where selective control is not required. Only 1 or 2 tablespoons of the granules at the base of each plant are sufficient. Since it is used in spot treatments, grass is not affected in the general area, but trees with roots growing into the treated area may be killed or injured.

Erbon (2-(2,4,5 trichlorophenoxy) ethyl 2,2-dichloropropionate) and the *polychlorobenzoic acids* (trichlorobenzoic or tetrachlorobenzoic acids) act through the foliage, as well as the roots, and are sprayed on the plants and the soil. In our tests both materials also have shown promise for non-selective control of Mexican bamboo (*Polygonum cuspidatum*), also called Japanese fleece-flower or Japanese bamboo.

The polychlorobenzoic acids are used during the growing season at rates of 10 to 20 lbs. of acid equivalent per acre or about ½ to 1 ounce of acid equivalent per 100 square feet.

Erbon is applied to plants that are in full leaf and actively growing, at rates of 4 to 6 ounces of actual erbon per 100 square feet. Neither erbon nor polychlorobenzoic acids should be used in the root zones of desirable trees or shrubs.

Borax, fenuron, erbon, or the polychlorobenzoic acids are not very poisonous or dangerous to handle, but erbon or the polychlorobenzoic acids require the same precaution in use as the phenoxy herbicides. With foliage sprays of soil sterilants, as well as the selective herbicides, adjacent grass and plants can be injured by drift of spray droplets if precautions are not taken.

Summary

A number of herbicides are effective in killing poison ivy and poison sumac without the hazard and labor of hand digging. Some of these are mentioned in this circular. Amitrol, ammonium sulfamate, and the phenoxy herbicides are best for general home use from the standpoint of selectivity, effectiveness, and lack of toxicity to warm-blooded animals. Although they will kill many other plants as well, they can be applied selectively to avoid injury to desirable plants.

Several soil sterilants are effective for killing poison ivy or poison sumac in areas where desirable shrubs, trees, or grass are not present. All of these materials require judicious use to avoid injury to desirable plants.

Although herbicides offer the most effective control of poison ivy, none can be expected to produce 100 per cent kill of all plants with one application. Repeated applications are often required. Even when killed with herbicides, poison ivy and poison sumac plants can cause poisoning; therefore removal and burying or burning of dead stems, with care to avoid the smoke, may be necessary.