

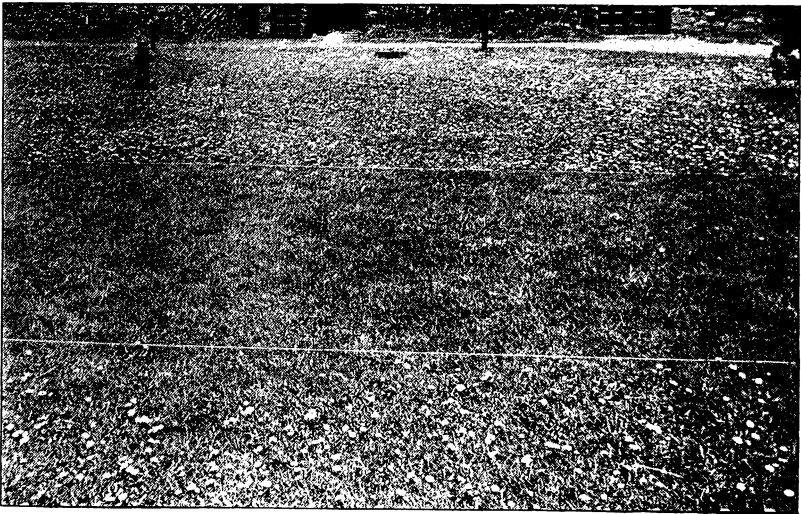
New York Agricultural Experiment Station.

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SPRAYING LAWNS WITH IRON SULFATE TO ERADICATE DANDELIONS.

M. T. MUNN.



DANDELION SPRAYING EXPERIMENT.

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[Part* of]

BULLETIN No 466.

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M. T. MUNN.

SUMMARY.

Experiments made at the Station during the past eight years demonstrate that dandelions may be eradicated from lawns, at relatively slight expense and without material injury to the grass, by proper spraying with an iron sulfate solution. Ordinarily, four or five applications are required. The first spraying should be made in May just before the first blooming period. One or two others should follow at intervals of three or four weeks; and, finally, one or two more in late summer or fall. During the hot, dry weather of mid-summer spraying should be discontinued because of the danger of injury to the grass. A conspicuous blackening of the lawn which follows each application soon disappears if the grass is growing vigorously. Of the other common lawn weeds, some are killed while others are but slightly injured by the spraying. Unfortunately, white clover, also, is killed. Spraying should be supplemented by the use of fertilizers and the application of grass seed in the spring and fall of each year. With proper management, it is necessary to spray only about every third year in order to keep a lawn practically free from dandelions.

The cutting-out method of fighting dandelions is laborious and ineffective unless the greater part of the root is removed. Shallow cutting, unless done frequently, is worse than none at all, because each cut-off root promptly sends up one or more new plants.

Tests of certain after-treatment measures in the form of reseeding, liming of the soil, and fertilization with commercial fertilizers and stable manure, used in conjunction with the spraying operations, gave results which serve highly to recommend their use either singly or in combination on lawns.

A study of seed production in the common dandelion shows it to be parthenogenetic, that is, capable of producing viable seeds without fertilization of the ovules by pollen.

* The complete bulletin may be had on application to the Station.

CONCLUSIONS AND RECOMMENDATIONS.

OUTLINE OF LAWN TREATMENT.

Eternal vigilance is the price of a good lawn free from weeds. The proper time to commence the fight against weeds is when the lawn is first made. Care should be taken to secure a thick, thrifty growth of grass at the start. Attempts to establish lawns on poor soil illy-prepared usually fail. After the lawn is established constant care is necessary to maintain it in a thrifty condition which will serve as a protection against weeds.

The measures most frequently used for the eradication of weeds from lawns are: (a) digging them out with a knife or spud; (b) heavy reseeding and fertilization to crowd them out; and (c) the use of chemical sprays to kill the foliage. The last-named method is the cheapest and as effective as any; but complete success requires the use of all three methods and some others.

The dandelion and certain other weeds may be eradicated from lawns, without injury to the grass, by proper spraying with iron sulfate solution. However, the weeds will soon return unless supplementary measures are employed. Unfortunately, there is no escape from the menace of dandelions seeding on adjacent grounds, because one has no control over the premises of his neighbors. Nevertheless, the occasional plants which survive spraying should be prevented from seeding by digging them out or by applying gasoline, kerosene, or dry iron sulfate to their crowns. The lawns should be mowed frequently, watered in dry weather, well fertilized, and the bare spots reseeded. Whenever the dandelions reappear in considerable numbers it will be necessary to again resort to spraying.

CUTTING DANDELIONS.

Cutting off dandelions below the crown with a knife or spud is not only laborious but ineffective unless practically the entire root is removed or the foliage completely removed several times during the season, so that the plant has no opportunity to store up reserve food in the root. Shallow digging, unless done frequently, is worse than no digging because the root, when cut off, sends up from one to several new plants and the final result is a more profuse growth of dandelions. Deep digging, whereby practically the entire root is removed with a spud, stiff-bladed knife, asparagus knife, chisel, or other special tool,

is recommended as a means of removing the few plants which survive spraying.

SPRAYING LAWNS.

Spraying with iron sulfate solution will usually prove effective when carefully, persistently and intelligently done.

NUMBER OF TREATMENTS AND TIME OF MAKING THEM.

Our experiments indicate that at least three (or, usually, five) thoro applications during a season are necessary to eradicate the dandelions from the average lawn in this state. To be the most effective, the spraying should be repeated as soon as the dandelion plant has regained new foliage and just before it is full grown — usually when the leaves are three or four inches long. This forces the plants to use up their reserve food stored in the roots, and eventually starves them. On the Station lawns, which were exposed to dandelion seeds from adjoining untreated lawns, it was found necessary to spray every second or third year, and to supplement the spraying with other control measures.

The time of application appears to be important. In our tests, the best results were secured when the first application was made in early spring after the central blossom buds were formed, but before blossoming. The first application should be followed by two or three later ones at intervals of three to four weeks during the spring growing season, and one or two others in late summer or fall. The last application should be made late enough in the summer or fall to prevent the plants from recovering before the close of the growing season.

A suitable day for spraying is one on which there is little wind and slight probability of rain for several hours. The sky may be either cloudy or clear. A heavy dew the following night is advantageous. Spraying should be discontinued during periods of drought in mid-summer, when the grass is inactive and soil is very dry. Serious injury to the grass may result from spraying at such times. As far as possible, it should be arranged to spray two or three days after mowing and to mow two or three days after spraying.

STRENGTH AND QUANTITY OF SOLUTION, AND MANNER OF APPLICATION.

The spray solution is prepared by dissolving one and one-half or two pounds of iron sulfate (also called copperas and green vitriol)

in each gallon of water. The weaker solution appears to be entirely satisfactory, and is probably the one to be preferred. Used at this strength, the quantity of iron sulfate required for a single application is approximately 175 pounds per acre, or four pounds per thousand square feet of lawn. A gallon of the solution will cover about 375 square feet. Iron sulfate for spraying purposes is usually offered for sale in the granular or "sugar" form, which is readily soluble in water. It is comparatively inexpensive, costing, usually, from one to two dollars per bag of one hundred pounds. Since it corrodes metals, the solution should be prepared in wooden or earthenware vessels.

Experience has demonstrated rather conclusively that the effectiveness of the spray solution upon the dandelions depends, to a considerable extent, upon the manner in which it is applied. The best results are secured when the solution is applied in the form of a fine, mist-like spray well driven down among the foliage. While fairly satisfactory results may be expected when the solution is applied judiciously with a sprinkling can, it is recommended that some form of a spray pump be used. The kind of outfit selected should depend upon the size of the area to be treated. For small lawns a compressed-air sprayer, knapsack sprayer, or good bucket pump with brass cylinder, and equipped with a fine nozzle will be found satisfactory; while for large lawns a sprayer mounted on wheels is desirable. For very large areas (parks, roadsides, etc.) a power-driven field or orchard sprayer will be found most practical. A lead of hose at least 80 to 100 feet long should be used on the power outfits. In any case, the nozzle should be capable of delivering a fine mist-like spray which will drift evenly over the foliage, and the area should be sprayed evenly, avoiding the drenching of any particular part. One of the new type spray-guns attached to a power sprayer will be found to facilitate the work very materially when it is desired to cover a large area quickly and evenly.

The spray solution should be strained thru a fine strainer or two thicknesses of cheesecloth to remove any particles which would clog the nozzles.

CAUTION.

On stone, cement, metals, and cloth, iron sulfate solution produces a conspicuous yellowish-brown rusty stain which is extremely difficult

to remove. Accordingly, care should be taken to avoid getting any of the spray on one's clothing or on sidewalks, building foundations, monuments, curbstones and the like. Even the dragging of the wet hose across stone or cement sidewalks will stain them. In our experiments, when working around sidewalks and buildings, we have found it convenient to use a screen made of cloth tacked over a light wooden frame (3 by 6 feet). A helper is required to hold the screen in position and move it from place to place as needed.

After using, the sprayer should be washed out thoroly with clean water to prevent serious rusting. The working parts of the spray pump should be kept well oiled.

AFTER-TREATMENT MEASURES.

Our experiments and experience demonstrate that it is necessary to supplement the spraying operations with at least two after-treatment measures, namely, fertilization and reseeding.

FERTILIZATION.

The fertilization of lawns is essential in order to produce a thrifty growth of grass and dense turf for a protection against the encroachment of weeds. In our experiments, five methods of fertilization, in the form of surface applications, were tested in conjunction with spraying. Briefly, they are as follows:

(1) Spring and fall applications of bonemeal at the rate of 1000 pounds per acre, the fall application giving the best results.

(2) The application of slaked lime at the rate of 1000 pounds per acre. No noticeable response was secured from this treatment.

(3) The application of nitrate of soda at the rate of 100 pounds per acre in the spring after active growth had begun, and again in summer. This gave good results in the form of increased growth of the grass.

(4) The application of a complete commercial fertilizer in the fall.

(5) The use of well-rotted stable manure applied in the fall, and the coarse material raked off the following spring.

The results seem to indicate rather conclusively that the average lawn will require some form of fertilization to quicken grass growth and heal the turf after the dandelions and other weeds have been

killed out.² When well-rotted stable manure free from weed seeds cannot be obtained, perhaps the best course to follow would be to use a liberal quantity of complete commercial fertilizer in the fall after spraying and apply ground bone during the following two years.

SEEDING.

The renovation of lawns by heavy reseeding with grass seed or grass seed containing a little white clover, to thicken the turf and crowd out the dandelions, has been reported as having given good success in some cases.

Following the use of the spray solution in our experiments, it was found quite necessary to reseed the scars or bare spots in the turf left by the dead weeds. For this purpose a mixture of equal parts of Kentucky blue grass and redtop grass seed was used. This was sown on the sprayed lawn, and well raked into the bare spots, after which a dressing of compost was applied. The success attained by this method seems to warrant the following recommendation: Keep at hand, in a dry place, a supply of grass seed mixture containing equal parts of Kentucky blue grass and redtop grass seed known to be quite free from weed seeds. The two kinds of seed should be purchased separately and mixed at home. The prepared lawn mixtures upon the market are usually of very poor quality. They should never be used unless known by test to be composed of pure fresh seed. The home-mixed seed should be sown on the lawn in the spring (April or May) and again in September following spraying, and well raked into the bare spots left by the weeds. A satisfactory seeding requires five pounds of this mixture for a lot 50 x 100 feet, or one ounce per 100 square feet, at each application. If no spraying is to be done the following season, it is often advisable to add four ounces or more of white clover seed to each five pounds of the mixture. White clover responds quickly and aids in forming a dense growth over bare places where weed seeds may lodge and germinate.

² The subject of lawn fertilization is fully discussed in U. S. Dept. Agr. Farmers' Bulletin No. 494, which will be sent free from the Department, Washington, D. C.