

# KILLING WEEDS WITH CHEMICALS

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## Control of Weeds by Chemical Treatment

**T**HERE are many areas infested by weeds where it is impracticable to apply the usual field methods of weed control by hoeing, cultivation, etc. In order to meet such conditions a number of chemical treatments have been developed, some of which have proved very useful. These chemicals either act directly as a poison to the living substance of the plant (copper and iron sulphate) or indirectly in that they draw water out of the plant (common salt). Some of the poisons kill all the plants in the area treated (sodium chlorate) while others act selectively as, for instance, iron sulphate, which kills the mustard plants in the grain fields, but which does not injure the grain itself.

### Weeds in Fields

Grain fields infested with wild mustard, wild radish, small ragweed, pepper-grass, pigweed, shepherd's purse, etc. may be freed from these weeds to a large extent by the use of a 20 per cent solution of iron sulphate (100 pounds of iron sulphate to 50 gallons of water). This is sprayed on the plants with a power or hand sprayer. Great care should be used to secure a spraying outfit and nozzle which is adapted for applying the solution as a very fine mist. This last cannot be emphasized too strongly because the whole value of this spray lies in its power to reach every part of the leaves, since it is the part of the plant above ground that is killed and not the roots directly. If a solution is sprayed on in coarse drops, it rolls off the plant with very little or no effect.

Perennial and biennial weeds are much more difficult to control than annuals because of their underground storage organs which are not killed by the spray. The eradication of wild mustard will be considered in detail, as this is the most important weed in the grain fields. It is well to wait until the plants are just beginning to show the buds before spraying, for at this time all the seeds in the ground will have germinated. It is also of special importance to spray on a clear day and to spray at a time when fair weather is predicted for the day or two following. The value of this treatment is much reduced if succeeded within a short period by a shower. It is customary to use 50 gallons of 20 per cent iron sulphate solution per acre.

Another substance which is also used for the destruction of mustard is a 4 per cent solution of copper sulphate sprayed on at the rate of 45 to 90 gallons per acre. This 4 to 5 per cent solution of copper sulphate is as effective as a 20 per cent solution of iron sulphate, the market price of the two determining which is the more economical to use in the case at hand. Peas, vetches, and potatoes are injured by these sprays, hence weeds among these crops must be controlled by other methods.

### Weeds in Lawns

Iron sulphate also kills chickweed and purslane after repeated sprayings. Heal-all, gill-over-the-ground, broad and narrow-leaved plantain are either killed or badly injured by the spray. The use of this spray should be followed in the fall by top-dressing with a complete commercial fertilizer or with well-rotted manure. The bare spots left after killing the dandelions should be filled in by reseeding with a mixture of Kentucky bluegrass, redtop, and a little white clover seed. This iron sulphate will not kill crab-grass and other weed grasses. Also, it must be remembered that it is injurious to clover.

The Rhode Island Experiment Station has found that the application of fertilizer giving an acid reaction tends to eliminate many weeds from lawns as most weeds will not thrive on acid soil, whereas the best lawn grasses (Rhode Island and other bent grasses as well as the fescues) do best where the soil is

slightly acid. They recommend a top-dressing of 250 pounds sulphate of ammonia, 400 pounds acid phosphate, and 250 pounds muriate of potash per acre. The top-dressing is applied annually in the spring, decreasing the amount in proportion to the rate of disappearance of the weeds. On newly seeded lawns the amount used should be somewhat less than the rate given above. It should be noted, however, that such treatment will tend to decrease the stand of clover in a lawn and some soils rich in lime will not respond to this treatment.

Moss in lawns is often eradicated successfully with a 15 per cent solution of iron sulphate at the rate of 50 gallons per acre, but one should bear in mind that moss indicates a poorly drained soil or a soil lacking sufficient nutrient substance so that, after killing the moss, it is well to remove the cause of its presence by enriching and liming the soil. It is also advisable to top-dress lawns, after spraying with iron sulphate, with nitrate of soda to stimulate the growth of the grass.

Substances termed lawn sands, usually a mixture of sulphate of ammonia and sand or brick dust, may often be used to good advantage to rid the lawn of plantain and daisies. Sulphate of ammonia has a somewhat poisonous action on the weeds, but its main action is to increase the growth of the grass, thus crowding out the undesirable weeds.

Dandelions may be eradicated successfully by four or five sprayings of iron sulphate, the first being applied in May before the blossoming period, after first mutilating the plants with a wire mat drag. Two other sprayings should follow at intervals of three or four weeks. In late summer or fall two more sprayings are advisable to complete the treatment. The strength of solution used is from  $1\frac{1}{2}$  to 2 pounds of iron sulphate per gallon of water. One gallon of this solution covers about 350 square feet of lawn. The importance of applying the spray as a very fine mist cannot be overemphasized.

## Weeds in Tennis Courts and Walks

It is essential that such areas be free from all vegetation in contrast to the lawns and fields where the problem is to rid the grass of undesirable weeds. Therefore, much more powerful weedicides can be used.

Among the chemicals successfully tried out in recent years, sodium chlorate, applied either as a spray or as a dry powder, has proved very useful. All types of vegetation are killed by this salt and it is, therefore, not suited for use against weeds in lawns or among crops, but its use is indicated where the weeds occur in patches. It has been used effectively against quack grass, *poison ivy*, Canadian thistle, bindweed, orange hawkweed, and other perennial and annual weeds.

The spray is most destructive to the weeds when applied just before blossoming. Two or three sprayings may be needed on badly infested areas at six-week intervals.

This chemical is used at the strength of 1 pound to 1 gallon of water and sprinkled over the infested area at the rate of 1 gallon per square yard either by means of a watering pot or, if the area is large, by a sprinkler which can easily be made by any local plumber. It consists of a water-tight box or barrel mounted on wheels and fitted with a 3-foot brass pipe,  $\frac{3}{4}$  inch in diameter, with  $\frac{1}{8}$  inch holes bored in the lower side at intervals of 1 inch. Shut-off valves on the pipe will be found convenient. The sprinkler is wheeled over the infested area, slowly where the weeds are thick and more rapidly over the bare places.

Sodium chlorate kills all vegetation and has the property of remaining in the soil for a long time so that one or two thorough treatments should be all that is necessary to completely free a driveway, tennis court, walk, or similar area from plant growth.

Recent studies have shown that dry sodium chlorate (3 to 5 pounds per square rod) applied to the weed patches late in the fall (early November) will leach down

and kill the roots. This is simpler than spraying and avoids the fire hazards connected with the use of sprays. By spring the toxic action of the salt has disappeared sufficiently to permit growing of crops the following summer.

## Scattered Weeds

In the case of isolated weeds in lawns, walks, etc., the crowns of the plants may be jabbed with a pointed stick or bar and a small amount of sodium chlorate solution or gasoline poured into the hole from a long-spouted oil can. There are certain patented weederers on the market which are thrust into the crown of the weeds and release there a small quantity of the poisonous liquid near the roots of the plants. It is much cheaper to fill the instruments with sodium chlorate or gasoline than to buy expensive patent compounds often sold with them.

## Miscellaneous

**Poison Ivy**--This plant may be eradicated from the base of trees, walls, buildings, etc. by the use of sodium chlorate, 1 pound to 1 gallon of water. The soil at the base of the vines should be thoroughly soaked with the solution, taking up some of the sod, if necessary, to insure reaching the roots of the ivy. Two or three treatments may be needed in the case of large luxuriant vines.

If the ivy is in patches in a field or garden, it is better either to plow it up and cultivate the area until the ivy is gotten rid of or to smother it by the use of tarred paper, weighting down the paper with stones. Treatment with sodium chlorate would prevent the growth of other vegetation and leave unsightly patches, whereas if the poison ivy is smothered out, the area may be planted later to grass or other plants.

Salt brine (30 pounds of ground rock salt to 10 gallons of water) has given good control if persistently used, either sprayed on the leaves or saturating the soil about the roots after cutting off the tops of the plants. If new growth appears, repeat the treatment at intervals of two weeks.

The New Jersey Station recommends salt (ground rock salt is best) applied early in the growing season at the rate of 100-500 pounds per square rod. The salt gives best results if applied just before a rain. In a dry season the soil should be well watered with a hose, for the salt, until it is in solution, will not be effective in killing the ivy.

**Weeds Along the Fence Line**--A simple means of killing weeds along fences, which may harbor insects or mature seed and so be a serious menace, is to sprinkle an area along the base of the fence with sodium chlorate 1 pound to 1 gallon of water, or with salt brine 30 pounds to 10 gallons of water.

**Weeds and Algae in Ponds**--Stagnant pools and ponds often become filled with a green unsightly slime made up of numerous different algae or water plants. Ponds can be rid of this growth to a large extent by the use of copper sulphate, either spraying on to the slime a solution containing 1½ ounces of copper sulphate to 2 gallons of water, or else the whole pond or pool may be treated by dragging copper sulphate in a cloth bag through the water. The copper sulphate should not be used stronger than 1 pound to 125,000 gallons of water. If the copper sulphate is used much stronger, any fish in the pond are likely to be killed by it. (Multiply the average length, breadth, and depth of the pond in feet by 6¼ to get the average number of gallons in the pond.) Undesirable water plants may be eradicated by placing in the muck about their roots handfuls of copper sulphate which diffuses through the muck and gradually kills the roots.

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