

AGRICULTURAL EXPERIMENT STATION
Oregon State College
Wm. A. Schoenfeld, Director
Corvallis

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CONTROLLING LAWN WEEDS WITH SINOX-AMMONIUM SULFATE SOLUTION

by
L. E. Harris
Assistant Agronomist

Much back breaking work in lawn weed control may be avoided by the proper use of a selective spray recently worked out by the Experiment Station. The spray consists of a mixture of sodium dinitro-ortho-cresylate, commercially known as Sinox, and ammonium sulfate, a common commercial fertilizer.

Many lawn weed control experiments have been tried during the past three years, and the results of the Sinox-Ammonium sulfate combination are generally better than those of any other chemical or method used, except for certain specialized weed problems. The advantage of this selective spray is that it destroys broad-leaved weeds without permanently injuring most of the perennial grasses. In addition to its weed killing qualities, the spray also stimulates a vigorous green growth. Several factors in lawn weed control need further study and the Agricultural Experiment Station is continuing the research.

This treatment can be used on most all of the varieties of grasses that are used for lawn or turf purposes, with the exception of the shallow-rooted annual grasses or some stoloniferous grasses with very shallow roots. No permanent injury has occurred on the other types of bent grasses, blue grass or the lawn fescues. The rather heavy rates of chemical application necessary to obtain any permanent effect on the perennial weeds will often permanently injure shallow-rooted grasses. Additional work is needed to work out a safe program for such grasses.

The method is intended for use on old, established lawns and where the weeds have been growing for a considerable time. Established grass plants, even though the weeds and other vegetation present may have tops or tops and roots destroyed, have the ability to send up new shoots and start growing again.

For the treatment of new lawns that have been seeded for less than a year, it is very necessary that the rate of application be reduced. The young seedlings of any type of plant, including grasses, are more easily injured than old, established plants. The root system of a grass seedling is small and near the surface of the soil and burning of the leaves may cause permanent injury to the rooting system, destroying the grass plant. Successful treatment can be made, however, on new lawns, but the rate of application of the solution must be cut down considerably.

The types of weeds that can be treated include most of the species of weeds that commonly infest lawns. The most successful killing occurs on the more broad-leaved weeds, particularly those with shallow rooting systems. Effective treatments can be made, however, on some of the persistent perennials such as cat's-ear or false dandelion, common dandelion, buckhorn plantain and broad-leaved plantain.

Results have been considerably better for broad-leaved plantain than for the other three types of weeds. In some cases the dandelions have been more effectively controlled than buckhorn plantain. Other lawn weeds that have been eradicated include most of the small annual clovers, such as hop clover and Japanese clover; very good results are usually obtained on the small daisy, wild buttercup, and chickweed. The treatment is much more effective on the troublesome mouse-eared chickweed than it is on the common or garden chickweed.

This method has been very effective for the control of moss in lawns and in general most all broad-leaved and soft-leaved types of weeds can be treated successfully. Waxy leaved weeds may not always be killed. The spray is injurious to the clovers and treatments should not be made on lawns containing more or less of white clover, if it is desired to retain the clover.

The success of this method of lawn weed eradication depends in part on the condition of lawn. A lawn that has a dense grass cover will respond to the treatment better than one in which weeds predominate and the grass is extremely thin. The value of the ammonium sulfate is not only for its effect as a part of the weed killing spray, but also as a fertilizer that so stimulates the grass that it competes successfully with many weeds and does not allow their recovery. The increased vigor of the fertilized grass assists in killing weakened weed plants which might otherwise re-establish themselves. This increase of grass vigor also prevents new weeds from developing from seeds that may be lying dormant in the soil.

In a lawn largely occupied with the larger weeds like cat's-ear dandelion and the plantains, the grass may be too thin to quickly re-establish cover and therefore may not be able to prevent regrowth of partially killed perennials or the development of seedlings of new weedy plants.

Lawns heavily infested with the perennials mentioned above should be sprayed with a heavier concentration so the weeds will be completely killed. In some cases where danger of poisoning birds and small animals is not a factor, it may be better to spray with a solution of sodium arsenite which is a better killing agent for such weeds, than the Sinox-Ammonium sulfate spray. Sodium arsenite is also more severe in its effect on the green grass plants. After killing such dense stands of weeds, it is desirable to rake the surface and sow some good clean weed-free grass seed.

Directions for using Sinox-Ammonium sulfate spray:

1. Mow or clip the grass one to three days before the spray is applied. This reduces the leaf surface of the grass and allows the weeds to start new leaf growth which increases their susceptibility to the spray. The newly clipped surface allows for better penetration of the spray into weed crowns and provides more complete coverage of weed leaves with the spray.
2. Dissolve the Sinox at the rate of 1 pint to $2\frac{1}{2}$ gallons of clean water.
3. Dissolve the ammonium sulfate separately at the rate of three and one-half pounds to $3\frac{1}{2}$ gallons of clean water. Make sure that all the sulfate has gone into solution. A powdered form of ammonium sulfate will go into solution more rapidly than the granulated or crystalline type of this fertilizer. Water and the chemicals to be used must be clean and free from foreign materials which might result in any clogging of the spray nozzles.

4. Pour the thoroughly dissolved sulfate into the Sinox solution slowly.
5. Stir vigorously while the mixing is taking place. If the mixing is not done properly, a precipitate or sediment occurs which makes it difficult to keep nozzles free and to cover the weed leaves thoroughly. The amount of precipitate is greatly increased if one or the other of the chemicals is too concentrated when the mixing takes place, or if the undissolved Sinox is poured into the sulfate solution. If the solution is too thick and does not flow readily through the spray nozzle, addition of more water will correct the difficulty.
6. The thoroughly mixed solution can then be applied by any type of sprayer that discharges the solution in a fine mist, which gives the best coverage of the weed leaf surface. For small areas or for individual use a small hand knapsack sprayer is very satisfactory. Any implement delivering the solution in drops like those from a sprinkling can is not recommended due to the uneven and ineffective wetting of weed leaf surface as well as loss of much spray material.

The following tabulation shows quantities of materials and water needed to cover various areas of lawn to be sprayed.

1. 1 pint Sinox in $2\frac{1}{2}$ gallons of water and $3\frac{1}{2}$ pounds of ammonium sulfate in $3\frac{1}{2}$ gallons of water will cover 375 to 400 sq. ft.
2. $\frac{1}{2}$ gallon Sinox in 10 gallons of water and 14 pounds of ammonium sulfate in 14 gallons of water will cover 1500 - 1600 sq. ft.
3. 1 gallon Sinox in 20 gallons of water and 28 pounds ammonium sulfate in 28 gallons of water will cover 3000 - 3200 sq. ft.

If larger areas are to be sprayed larger quantities should be mixed in the same proportions as given above.

Where the weed plants are in scattered patches or growing only in spots, it is only necessary to spray the weed plants or weedy patches for weed killing, but it is generally best to add the same rate of fertilizer to the entire lawn. Otherwise uneven fertilization may cause differences in growth and cause a bad appearance.

Spraying should be done during clear weather as results are better if a few days of sunshine follow the application. Successful treatments have been made from the middle of March throughout most of the summer months. Best results are secured by spraying either in early spring or early fall. The weeds appear to be more susceptible to the spray at that time and the milder temperatures are more ideal for preventing injury to grass. The effect of the spray is more severe on the grass during hot weather than during cool weather. However, in each case where the grass was burned down with the combination, recovery took place in a few days and the grass was much better than before treatment. The best range of temperatures, however, at the time of application has been from approximately 60° to 85° F. Cool temperature allows for slower reaction of the chemical after it comes in contact with vegetation and increases the effectiveness on the broad-leaved weeds, while at the same time decreases the burning or any injurious effect it may have on the grass.

If clear warm weather continues for several days, it is essential to lightly sprinkle the lawn after about two to four days following the application. If evaporation is rapid, the spray dries on the leaves and reaction with the plant tissue cannot take place until moisture is added. With a light sprinkling of water chemical reaction continues and the weed plants are killed at deeper levels. Light sprinkling should be continued every day for three or four days, and then heavy applications of water should be made until the grass is growing vigorously. Should any serious burning of the grass leaves occur as on badly tramped places, heavy watering should be given immediately.

After two or three weeks following the application, some weeds may recover and new seedling weeds may start growing. It is then desirable to spray such spots or individual plants again.

For these second or later sprays the best mixture of chemicals is about one to two ounces of Sinox in one-half gallon of water and one to two ounces of ammonium sulfate in one-half gallon water, using the same method of mixing as was described for the original solutions. This method proved to be very satisfactory in the last two seasons of experimental work, and in nearly every trial 95 per cent or more of the weeds were eliminated. For some lawns, containing very persistent weeds, it may be necessary to continue the spraying for the elimination of such weed plants.

On lawns that are only a few weeks old and where heavy weed growth is appearing, the rates of application should be reduced to at least one-fifth of the rates that have been listed. More solution may be safely used on somewhat older plantings, but it is necessary for the operator to use reasonable care and judgment in deciding on the concentration of mixture best suited to the age and size of the grass and weed plants. Weeds are more easily killed when they are young seedlings; consequently, a small amount of solution is very effective on the young weed plants and is unlikely to injure the grass. In fact the ideal time to treat a lawn is when the weeds are first appearing. They are easily killed with the solution at the early seedling stage and less material is required.

From observations made during the past two seasons, it is not advisable to fertilize the lawn grass heavily just before application of the Sinox-Ammonium sulfate spray is made. Any plant that has had generous amounts of nitrogen fertilizer is very succulent and is easily injured. This condition is more pronounced in young grass, and it is possible that where a spray is applied a few weeks after heavy applications of nitrogen fertilizers during the winter and spring, permanent injury may result. It is, therefore, neither advisable nor necessary to add fertilizer to a new lawn before this weed spray is used, because the ammonium sulfate in the mixture furnishes all the nitrogen fertilizer that is required.

Sinox is manufactured by the Standard Agricultural Chemicals, Inc., Hoboken, New Jersey.

Retail dealers in Oregon are:

Portland Seed Company, Portland, Oregon
J. B. Stanley Company, Portland, Oregon
Wagner Seed Company, Imbler, Oregon
Murphy Seed Company, Albany, Oregon
Slentz Feed and Seed Company, Salem, Oregon

There are also other dealers in various towns throughout the state.

Ammonium sulphate can be purchased from any seed or feed dealer.