

# WHAT CAN WE DO ABOUT

**R**ECENT increase in interest in weed control on golf courses is probably due to several reasons. Drought and other unusually severe weather conditions in the past few years have caused much damage to turf in certain sections of the country with the result that weeds have been able to thrive where competition from the grass has thus been reduced. Curtailments in maintenance budgets have resulted in such neglect of turf that the spread of certain weeds has been encouraged. The increase in the use of water has in some cases proved to be a greater boom to weeds than to the turf grasses.

The increased interest in the control of weeds however is not entirely due to an actual increase in the number of weeds. It is due in no small measure to ever-rising standards of turf on golf courses. It is self evident that as turf is gradually improved the nuisance of weeds is more appreciated. Years ago the chief interest in weeds was that of controlling them in putting greens. When weeds are eradicated from putting greens it is only natural that an effort should be made to eradicate them from the turf immediately surrounding the putting green and from the tees. The next step in progress is to check them in the fairways. Attention is then focused on weeds in the rough where they cause much difficulty due to lost balls and delay of the game as well as serving in those places to provide a constant source of supply of weed seeds to contaminate adjoining turf.

## Fairways Now as Weed-Free as Greens of Former Years

Not many years ago putting greens of fairly good clubs contained as many weeds as are now found in similar areas of well-kept fairways. Judging from the change in attitude towards weeds that has been coming about gradually in recent years it seems quite reasonable to predict that within a few years weeds in the fairway will cause as much unfavorable comment in better clubs as is now caused by weeds in putting greens. Even now with the present reduced budgets it is not uncommon to find fairways being hand weeded.

The Green Section from the beginning has recognized the weed problem in turf and has done considerable work with the

various weed prevention and eradication methods. Recognizing the increasing interest in this problem the Green Section in 1931 started a weed control research program to thoroughly test out the various chemicals that it might be practical to use on large areas of turf. Some of the most promising of these methods are still in the experimental stage but they have already been developed far enough to offer much hope. No doubt some of them will come into more general use in the near future.

Before considering the newer methods of controlling weeds it is well to review the old established methods.

**Hand Weeding**—The earliest method for the eradication of weeds from golf course turf is that of picking them out by hand. This method remains the most effective method for the control of many

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weeds. Its chief objection is that the cost is excessive and the method is therefore impractical for many of the largest weedy areas on golf courses.

Certain weeds are easily picked out by hand whereas others are difficult to remove by this method. Dandelions, for instance, must have the roots cut off at a considerable depth otherwise new shoots will be produced from the top of the root that is left in the ground. Certain weeds as, for instance, clover and chickweed, can not easily be picked out since they have underground stems or produce roots from many points along the surface runners. They can, however, be effectively removed by the hand method in limited areas by removing the sod with some sodding or plugging tool and replacing it with new weed-free sod.

It should be pointed out that there is still much hand-weeding that is not effective simply because it is not done soon enough. Probably the most common example to illustrate this mistake is that

# THOSE WEEDS?

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of removing crab grass. One frequently finds crab grass being removed from turf after it has already produced some seed. This grass is an annual and does not survive the winter. The next season's crop of crab grass comes from seed produced by plants this year or during previous years.

If crab grass plants are picked out of turf early in the summer before they have a chance to produce any seed, the number of plants next year naturally will be very greatly reduced. Early picking also has the advantage of avoiding the big scars that are so commonly found in putting greens when crab grass weeding is delayed until late in summer or early fall.

**Clean soil and seed.**—Any weed control program naturally must include some preventive treatments as well as weed removal. In new plantings it is important to try to get the soil as free from weeds as circumstances will permit. It is also important to use seed relatively free from seed of obnoxious weeds. After a turf relatively free from weeds is established it is important to use no topsoil, manure or other materials that contain weed seed. A mistake that is still costing golf clubs substantial sums of money for weed removal is that of topdressing with soil containing large quantities of weed seed.

A few years ago the Green Section took random samples from a number of golf courses of the compost that had already been screened ready for topdressing putting greens. These samples were tested for weed seed content. It was found that

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in some cases in a single topdressing each green received as much as 70,000 viable weed seeds. Since that time there has been evident on golf courses a much more critical attitude toward the topdressing materials used. Reduced budgets have made it impossible for greenkeepers to give this matter as much attention as it deserves, with the result that many weed seeds have recently been planted in putting greens by this means.

Various methods have been devised for ridding soil of weed seeds. Thorough composting or carefully prepared soil beds

will greatly reduce the weed seed content. Various methods for sterilizing topsoil by means of steam or dry heat have been used on golf courses to good advantage.

**Fertilizers affect weeds.**—It has long been recognized that fertilizers materially affect the weed content of turf. It is well known that certain kinds of animal manure carry large quantities of weed seeds. In addition to their freedom from weed seeds, certain commercial fertilizers have been found to have a decidedly beneficial effect in reducing the weed problem in turf. A well fertilized turf, when other things are favorable, will crowd out many troublesome weeds and will prevent new weeds from becoming established. In general, fertilizers containing relatively large proportions of nitrogen as compared with other common fertilizing elements are most effective in checking weeds.

**Soil acidity affecting weeds.**—It has been recognized for a long time that certain plants tolerate more acid soil than will other plants. Clover and many of the other legumes will not tolerate excessive acidity. The bent grasses on the

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other hand are able to thrive in soil that is decidedly acid. It is therefore possible to have a soil so acid that clover will not grow in it but still not be too acid for bent. The acidity of the soil can be changed by the use of certain fertilizers that leave acid or alkaline residues. Many years ago experiments were conducted that demonstrated it was practical to control certain weeds in turf by changing the soil acidity, and this led to what is known in golf course parlance as the "acid theory" for weed control. Although bent grasses can tolerate soils too acid for the growth of clover this method has the serious objection that a soil sufficiently acid to control clover is too acid for the best growth of bent grass and entirely too acid for the growth of some of our other common turf grasses, particularly in sections exposed to hot dry weather. In spite of all the recent criticisms against the application



Compost carries weed seeds. Each of the above flats contain finished compost from separate compost piles. Some were practically free from weeds, whereas others contained viable weed seeds at the rate of 70,000 in a single topdressing of one green.

of the acid theory however, there are still sections of the country where it undoubtedly has some good possibilities. In a general way however it has definite limitations for most golf course turf in this country.

Sulphate of ammonia and ammonium phosphate offered the most common means for making soils more acid on golf courses. The constant use of these materials it was observed, checked the growth of clover and other legumes and favored the growth of bent. After the repeated use of these fertilizers most soils became more acid and therefore weed control was generally attributed to the resulting change in the acidity of the soil. However, there were areas of turf in which any change in acidity was checked by the constant use of sand or water containing more than enough lime to neutralize the acid remaining in the soil from these fertilizers; nevertheless practically the same control of clover was accomplished. These observations and many others led to the general recognition that much of the favorable results of sulphate of ammonia and some other acid reacting fertilizers in turf were due to the effect of the nitrogen they contained rather than to the change that they made in the acidity of the soil. Since it was recognized that weeds could be controlled in most cases by the liberal use of nitrogen without running the risk of making the soils too acid for the growth of bent at all seasons, it was no longer necessary to make any effort to deliberately change the acidity of the soil; with the result that some of the turf ailments that are naturally associated with excessive soil acidity could be minimized without affecting the weed control.

#### Destroying weeds by heat or cold.—

Various attempts have been made to control weeds by the use of apparatus that will develop extremely high or low temperatures. Tests have been made with pans into which steam could be injected in much the same manner that farmers control weed seeds in tobacco seed beds and elsewhere. Blow torches and the large heating units that are used for repairing asphalt roads have also been tested for burning weeds. Although it is possible to kill weeds with this method, it is a slow and expensive method.

Recognizing that certain weeds, particularly crab grass, are killed by frost whereas bluegrass and other permanent grasses withstand extremely low temperatures, efforts have been made to devise means for chilling turf sufficiently to kill these summer weeds. Pans containing salt and ice were first tested and later dry ice was used. One individual developed an interesting machine for distributing dry ice in turf to get it at the base of the plants to accomplish the maximum kill. These methods however have all proved to be only partially effective and too expensive for general use.

**Burning weeds with chemicals.**—It has been known for many years that certain chemicals are more injurious to some plants than to others. For instance, the grass family in a general way is more tolerant of arsenical poisonings than most of the other families of higher plants. This difference in susceptibility opens the way for treatments which will select and poison certain groups from a mixture of plants. By the use of this method it is possible to apply chemicals to turf and frequently destroy the weeds without kill-

ing the grass and without leaving any harmful residue that will prevent the normal development of the surviving grass. There are many of these weed killers already known to agricultural science and many of them have been used in turf in commercial killers or in so-called "lawn sand" in the past years. Unfortunately these materials are rather expensive and have been rather uncertain materials to use because of the danger of excessive burning.

One of the most common of these selective weed killers used on turf is iron sulphate. This chemical came into rather general use on turf over 20 years ago. It has, however, failed to come up to original expectations in many respects, particularly on many types of soil. There were, however, many instances where iron sulphate and other weed killers had given com-

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pletely satisfactory results at a moderate cost. Since it was possible to obtain favorable results even occasionally with these chemicals it was quite apparent that they had some practical possibilities for turf purposes. It was clearly apparent, however, from the many failures to obtain satisfactory results, that much more information was needed before they could be considered dependable for general usage.

With that in mind the Green Section five years ago undertook to systematically compare the effectiveness of the various chemicals that offered any possibilities for the control of the most troublesome turf weeds. These tests have included various arsenicals, sodium and potassium chlorate, sodium chloride, calcium chloride, iron sulphate, ammonium thiocyanate, calcium cyanamid and many others. Of these the most promising results were obtained from sodium chlorate, arsenic acid and sodium arsenite. The recent tests have concentrated on the use of these three materials.

These materials, like others, under certain circumstances can kill weeds effectively without injuring grass. However, in any work of this nature the problem is complicated by the fact that variations in soil, climate and the condition of the plants determine to a large degree the amount of injury that is accomplished by any one treatment. Take for example the

case of arsenic acid. This can be applied under certain favorable conditions at the rate of one pound to the thousand square feet without any appreciable injury to bluegrass but with a complete killing of weeds. Under entirely different climatic conditions, particularly during extremely hot dry weather, a half-pound rate of the same material may destroy practically all of the bluegrass. The problem therefore is not the simple one of determining what chemicals will serve this purpose well and the rates of application, but also the various soil and climatic factors that govern the effectiveness of any of these treatments.

Progress in these problems has been necessarily slow because of inadequate funds for carrying on the large number of tests that must be conducted under a wide assortment of conditions. These remedies as far as golf course turf is concerned are still in their infancy, but from the many favorable results that have been obtained from them to date it is reasonably safe to predict that within a few years much of this material will be used on golf course turf. Space will not permit a discussion of these treatments in the present article but the progress to date will be discussed in a later issue of GOLFDOM.

#### Movies of Spalding Field Staff in Action Available Soon

**A** VAILABLE before long will be an exceedingly interesting series of golf motion pictures of members of the Spalding advisory field staff. Pictures were begun right after the Augusta national tournament this spring under the direction of Bob Jones and were completed late in the summer.

Details of the showing of the pictures by pros at their clubs and to the general golfing public will be released soon by A. G. Spalding & Bros.

**Younger Caddies Reappear**—A good sign of general business improvement and of a healthier situation for golf's future is observed by Jimmy Meehan, veteran pro at Riverside CC (Chicago district). Jimmy says at courses in western area of Chicago there are 50% more small kids caddying than were in service last year. His conclusion is that older fellows have gone back to industrial jobs and youngsters, who are probable golf enthusiasts of the future, again find openings in caddie jobs.