



FRED GRAU

HOW TO FIGHT *Weeds*

By **FRED GRAU**
(GSA Convention Paper)

THE best weed control is a good turf, but there are so many factors that enter the picture, some of which are under the control of the superintendent, and many which are not, that we are going to have weeds with us for a long time to come. So we don't want to get too hasty about any weed control program; we want to do a considerable amount of thinking first.

Just briefly, I will mention some of the weeds that are particularly objectionable and troublesome on golf courses, fairways, and roughs, and leave the greens out of the discussion.

Dandelion probably tops the list; chickweed is another important one—in the roughs, primarily; and buckhorn and plantain are the taller growing weeds that are not subjected to close clipping on the fairways. A great many weeds that occur in the roughs do not occur in the fairways due to your type of management and fertilization. Therefore, there is the possibility—and I have seen this happen in some Pittsburgh and other Pennsylvania courses—many weeds can be controlled by adequate fertilization. I don't think there is any question but that some factors, such as watering and close clipping, which we must do in order to give the golfer good playing conditions, serve to bring in certain types of weeds that can't be controlled by our usual management methods.

Control Is Not a Cure-All

Understand, the weed control problem is not designed as a cure-all; it is simply another tool in your hands to help you attain the desired results, and anyone who looks upon it as a cure-all should change his thinking.

What are some of the factors that bring weeds in? I think we have got to consider the whole management picture on the golf course, and there is no substitute for good

management. Your soil conditions are one of the first considerations; also poor drainage, because we know that with good drainage and aeration the grasses root more deeply and they are better able to withstand unfavorable conditions. We have excesses and deficiencies of certain nutritional aspects that must be considered. Then there are our climatic conditions—we have heavy rainfalls, followed by sudden prolonged periods of high temperatures, and some of the grasses which have come in as the result of our management practices are not able to withstand those conditions. And, as we all know, "Nature abhors a vacuum," and she is going to cover a bare surface with some type of vegetation and it is going to be weeds probably, first of all.

Watering, Cutting Bring Weeds

The watering practices may enter into it in encouraging certain types of weeds that wouldn't be there unless the water were applied at the time of fertilization. We know the effects of certain types of weeds and grasses. Our close cutting certainly brings in certain types, certain species that wouldn't be there, and that aren't found in the roughs under higher cutting. And finally, we have to consider the pests, insects, and diseases, which have a great influence on the turf species and which allow the weeds to come in.

What is the first step in planning some kind of weed control program? The first thing you must do is to take stock, a sort of inventory of your conditions and your practices, and, in many cases, the superintendent is able to do this by himself, but you have several sources to draw upon. You have the USGA Green Section to help you in analyzing those factors. You have the agricultural experiment stations in your various states who will help you to analyze those factors, and by all

means take into your confidence in this analysis your board of directors and your green-chairman; get their backing on any kind of control program.

Control Not 100% . . . Yet

Briefly stated, the chemical treatment of weeds is effective in reducing weed population. When we say "control," we think of 100% control, and I don't know of any place yet where 100% control has been achieved. I don't think we should try for it. What we are trying for is a reduction in the weed population so as to give us a better chance to cultivate and improve the desirable species. And no weed control program will be satisfactory and successful unless proper management practices are applied in addition. You can put on your treatments, get rid of your weeds, but unless you follow that up with proper fertilization, seeding, and other things, the chances are you are going to be very badly disappointed.

I think one of the good places for a weed reduction program is in renovation. We will say, for instance, that the club has been in financial difficulties and insufficient fertilizers have been applied in the past years so that more weeds than usual have come in. And when our budget is restored to its normal level, in order to get those fairways back in playable condition, it will mean reducing those weeds so as to get a better grass population. That would be a renovation program, as distinguished from a maintenance program. You can apply the principles of weed control, weed reduction, to almost every type of turf that you have.

One of the most important factors is soil moisture. It is essential to have the soil moisture at a normal level that promotes the good growths of grasses. If it is below that, the chances are that you will get more injury and slower recovery of the grass. Your selection of a chemical is important.

At first, we talked more about sodium

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Prairie Dunes Golf Course, which many say ranks among the best 9-hole American golf layouts, is also one of the smartest smaller city clubs in advertising itself as a civic asset. A large calendar widely distributed by the Mutual Press of Hutchinson, Kans., carries as its illustration a photograph of the number two green at Prairie Dunes.

The course, laid out by Perry Maxwell, was financed in its organization stages as a private club by the Carey brothers, long prominent in mid-continent golf.

chlorate than we did about sodium arsenite. Today we are suggesting sodium arsenite probably ten to one as against sodium chlorate, because it is more generally applicable to conditions. It is applicable over a greater period of the year, and it is effective in small quantities. The cost per acre is lower. There are a number of advantages in sodium arsenite. The fire hazard which is connected with the use of sodium chlorate—particularly in solution, has been one of the limiting factors in the use of that chemical. We have learned so well to use poisons that we do not regard the poisonous factors of sodium arsenite as very serious, because we are using much stronger poisons in regular maintenance practices.

Chlorate Starves Weeds

Probably there are still some of you who would like to know how sodium chlorate and sodium arsenite act on weeds. How do they do their killing? We would like to know more about it ourselves. We know some things: we know that sodium chlorate enters the plant either through the leaf or through the root, because it goes into solution very readily, and once in the plant, it seems to first break down the chloroplast—those little green bodies in the plant which take some life or energy and manufacture carbohydrates and sugars. It breaks those down, disintegrates them and, virtually, the plant starves—that actually is what happens.

Sodium arsenite works a little bit differently. Once the sodium arsenite comes in contact with the soil, its chemical reactions are very similar to those of phosphorus. It becomes fixed in the soil and does not stay in a soluble state, so it does not penetrate through the soil; it works more through the leaves, and it doesn't necessarily break down the chloroplast and starve the plant. It actually acts as mercury would; it seems to precipitate the proteins, particularly the nucleus in a cell, and that has virtually the effect of starving the plant because it stops all the processes in the plant.

Sodium arsenite is regarded more as a cool weather chemical because then we get less damage to the grasses. Sodium chlorate cannot be used well in cool weather because its effects last too long—it breaks down, disintegrates much more rapidly at higher temperatures, and some of it is still being used, more particularly for crab grass control, in July and August.

We always must take into consideration the effect on turfs, and unless you prepare

your membership, your committee, and your chairman, for the discoloration that is bound to occur, you haven't done your whole job. We have got to expect it. We know that it happens, so it is one of the limiting factors of weed control work—frequent applications give you frequent discolorations, and it may affect your membership adversely. It is going to complicate matters and there is where you have to do some thinking on how to apply it.

The effect on the grasses: we know that some grasses are more severely affected than others, and we must take that into consideration. And, if we have largely a bent population in our fairways, our rate of application is necessarily going to be lighter than if we had 90% bluegrass. Our fescues are a climatic expression of applied psychology—fescues will not take as much of a beating as Kentucky bluegrass, and do not recover as quickly. We have to graduate our rate of application on the basis of the grasses that are present. The kind of application is very important. We know, in a general way, that this is always true. The younger a weed is, the more easily it is killed, and it will take less material to kill a young weed; and naturally, you will get less discoloration on your turf, but you have to fit that into your maintenance schedule.

Keep Seeds Down

One of the principles of using the chemicals is to limit the seeding of the weeds. If you can control seed production, eventually you can control the weeds' because they have to regenerate, most of them, by the seed they produce.

You are going to have to do some more thinking on the method of application used in the early experiments that were reported in the Green Section bulletin, on both dry and liquid applications. And there is still room for a great deal of discussion and experimental work that is going on at some of the other state agricultural experimental stations.

The spray application has an advantage in that it is rapid; it is easily controlled as to the rate of application—because if you are running a sprayer at a definite pressure with a certain amount of chemical in there, per 100 gallons, or whatever you have, you can control the rate of application simply by increasing the speed of your outfit, and there is where calibration enters into the picture. You should calibrate your equipment before you

start out to do a large area, and certainly, if you are not accustomed to using materials—go slow, and put it on a plot on a trial basis for some time before you go on a large scale operation. It is impossible for anyone to tell you exactly what the results are going to be.

The spray application is more economical of material with sodium arsenite; it takes about half as much per unit area, principally because with a dry application the material comes in contact with the soil and it is fixed much more than with a spray treatment. With a spray it sticks to the leaves and therefore, it is more efficient.

Rates of Application

The rate of application is something rather difficult to give you any definite suggestions on. However, we do know that a maximum safe rate of application is going to depend on the types of turf. For Kentucky bluegrass, as a spray, 3 to 4 oz. to 1,000 sq. ft; dry, approximately twice that. For fescues, that comes down, probably 2 to 3 oz. maximum, twice that dry. For bents, much less, and there again it is going to depend upon the type of bent. Some of them are much better adapted to withstand that shock than others, and you are going to have to determine that pretty largely for yourself.

I am not going to say much about sodium chlorate because it is so little used on golf courses, but the rates grade downward from about 2½ lbs. to 1,000 sq. ft. as a maximum application, and you get a severe discoloration at that rate.

Sherwood Heads PGA Seniors.—W. C. Sherwood, pro at the Memphis (Tenn.) CC, has been elected president of the PGA Seniors' organization. Alex Cunningham was elected V. P., W. H. Way, hon. VP., and Charles Clarke, sec. "Sherry" is one of the liveliest of the veterans and you have to look twice at the guy to make sure that he qualifies for the 50-year minimum age qualification. The time-defying seniors will hold their 1942 championship at Fort Myers, Fla.

The scores of the sprightly elders fool you, too. Gil Nichols and Jack Campbell as leaders in B class of the 1941 Seniors' tournament knocked around in smart figures. Bertie Way, shortly after Mayfield CC had tossed a party celebrating his 40 years with the club, won the PGA Seniors' Class A championship with 88-82.