

you contracted a custom spray outfit to do the job for you, which was all right, but in many instances it was already too late to begin a herbicide program. May was a dry month, you couldn't keep much moisture in the ground, yet the weeds flourished and they were an eyesore. By the time you got to work one morning the custom spray operator had already done the job and was gone. How much herbicide material had he applied? How much water did he use per acre with the herbicide material? Only one man knows.

I have talked to many superintendents who have had custom work of this sort done for them; the superintendent hadn't the equipment or the time to have the weed eradication done by his own crew so he did the next best thing. When you're talking turf you always ask, "What herbicide did you use?" And the reply nine times out of ten is, "I don't know! Take a look on the can over there."

We have mentioned the requirements which are necessary for proper use of herbicides. We have discussed

the systemic and contact methods of spray application and how they effect the plant organisms. We know that effects to turf from the constant use of herbicides can destroy countless acres.

Have we overlooked something with our present herbicide management program? I feel that we have! We must ask ourselves these questions, "Has there been enough research on this herbicide to justify my using it? Should I use a herbicide this year to control my weed problem, or is there another cultural practice I might use? Does my weed problem warrant a herbicide? Have I tried my own research with this herbicide to see what it might do for my turf management program?"

We will continue to use herbicides and will understand them better as the years go along. But let's keep this mental note:

"Have I strengthened my turf population from the use of herbicides or has there been a decrease in permanent turf population from, LONG TERM EFFECTS OF HERBICIDES?"

The Troubles We've Seen

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Sunday morning, between the hours of 7 and 9:30, is the favorite time for calling a Green Section agronomist to discuss golf course troubles.

It is true that this is the time when he's most likely to be home. But it may not be the time when you'll find the agronomist in a humor to be greatly sympathetic to your problems, particularly when the club has encountered troubles through deliberate actions that could have been avoided.

Clubs could save themselves many troublesome and expensive situations if they asked questions *before* they

took actions. It is a distressing fact that relatively few golf course problems we encounter are caused by uncontrollable factors. Rather, they are brought about by poor management, poor construction, or a misunderstanding of plant growth principles.

These points probably can be illustrated most vividly by reciting some of the trouble calls that have come to one Green Section office during the past year. To save possible embarrassment to the club, the accounts are fictionalized to some degree, but all are based on actual cases. If a club member should recognize his own

club's problem among those presented here, he may take comfort in the fact that there are very few original mistakes and there are members of other clubs who think it is *their* problem which is being aired.

Compound Errors

1. In early spring a golf professional called to ask if it would be possible for the agronomist to "casually drop in" within the next few days. The club needed help, the season was advanced to the point where the golf course should be beautiful, but several temporary greens were in use. Inasmuch as the regular visit to the club was scheduled later in the season, the gentleman was told that we would respond to an official request for a special visit. The request was made and the course was visited.

The story that unfolded would have been comical except for the serious consequences. The superintendent the year before had topdressed greens late in the season and had burned them very badly with one of the topdressing components. He then resigned. When the new superintendent was hired he was under immediate pressure to get the greens in condition for an early spring tournament. By this time weather was too cold for any assurance that turf could be established by seeding. The only recourse appeared to be the use of sod. The club's nursery was limited but they were able to acquire sod from neighboring clubs. However, each lot of sod was grown on different soils and consequently when this was introduced into greens, the water requirement for each different piece of sod made it almost impossible to water greens properly.

When trouble occurs it appears that club members all begin to advise the superintendent and he fre-

quently compounds his difficulties by trying to placate all his critics. In the foregoing case, there were many additional complications arising from such pressures.

To overcome the difficulties created, this club faces a rather costly and time consuming renovation procedure. Much of the difficulty could have been avoided had competent advice been secured after the original mistake.

Toxicity from Herbicides

2. Two clubs called at about the same time during the month of May with the same problem. Both had applied materials in the fall of 1964 which had been recommended for pre-emergence control of *Poa annua*. One club had used calcium arsenate and the other had used a relatively new experimental material. In both cases, grass was doing very poorly, and was extremely susceptible to traffic damage. These clubs were about 1,300 miles apart, one in arid country and the other in a humid area, one grew bermudagrass and the other bentgrass, and they used two entirely different products, yet the nature of their problems was essentially the same. Each had a toxic material in the root zone of the turf plants.

About the only treatment that can be suggested is to water very carefully and to distribute traffic as much as possible. Only by allowing time for dissipation of the toxic substance can the problem be solved.

The Green Section's standard advice about the use of herbicides is to use only those materials which have been thoroughly tested not only by experiment stations, but by *your* own superintendent, with *your* equipment, applied by *your* crew, on *your* turf nursery. In the case of calcium

arsenate, this is an old product which was first tested by Green Section scientists almost 30 years ago and reported to be erratic and unpredictable but highly effective when everything goes right. The Green Section does not recommend its use on putting greens.

Drainage by Theory

3. A new drainage theory was incorporated into the new greens established at one long established club in the Southwest. Essentially, the system involved the placement of a permeable seedbed mixture about 8 inches deep over a compacted, impermeable subgrade. Theoretically, water moves easily downward to the compacted soil and then moves outward to the edge of the green. The system works, except when water is applied too rapidly (as frequently happens in the case of rain) or when the slope is so long that water comes to the surface before it reaches the edge of the green.

It appears likely that these greens may need to be rebuilt again. The cost to the club for testing this theory will be considerable.

The Green Section has been involved with investigations of green construction methods for many years and has devised a construction procedure that has been proven to work well. We urge clubs to investigate thoroughly the merits of this procedure before undertaking to build greens on the basis of an idea that sounds attractive but which has not been tried.

Shallow Soil on Permeable Base

4. One relatively new golf course has experienced trouble from the day the course opened because greens are soft and they show footprints readily. We have been called to the club sev-

eral times because greens were not doing well. Numerous minor problems have been presented, but the basic factor underlying the other difficulties is a false water table too near the surface. Consequently drainage is poor.

The greens were established on a very premeable coarse textured soil. It would appear that drainage could not possibly be a matter of concern. However, when the greens were built about six inches of good topsoil was used for the seedbed mixture. The great difference in texture between the topsoil and the subsoil causes the topsoil to hold more water by tension forces than it would hold if the texture were uniform. This principle is used to advantage where the seedbed is deeper. In this case, however, the top six inches stays too wet and the greens are always soft and shallow rooted. The solution to the problem would appear to lie in the creation of a deeper seedbed.

Can We Buy Short Cups?

5. At a golf course in the process of construction the green committee chairman greeted the agronomist with the question, "Do you know where we can buy shallow cups?" It developed that the club was running short of money; the golf course had been designed on a rather elaborate scale with large greens, tees, and bunkers. Much effort had gone into the development of costly ponds and other artificial beauty spots. Now, however, as the course neared completion, and as the money supply neared depletion, someone had suggested that a good many dollars could be saved by reducing the thickness of topsoil on greens from 12 to 6 inches.

There is no question that the quantity of topsoil needed on greens is an expensive item but it is our opinion

that it would be poor economy to save money by sacrificing quality of putting greens. The normal minimum recommendation for topsoil depth is 12 inches. Inasmuch as 20 to 25 percent shrinkage is common, the green eventually is covered with about a 9-inch depth.

Mistaken Identity

6. When the club manager-professional-superintendent called he said that a serious disease attack was damaging bermudagrass rather severely. Upon arriving at the club, we found weather conditions to be typical of the Southwest in the summertime. The temperature was high but humidity was extremely low. We were told that there had been no rain for several weeks. Under such conditions disease is rarely a problem.

Upon inspection of the "diseased" areas, it became apparent that the trouble was caused by some sort of chemical burn. There was a dead plant of dallisgrass in the very center of every one of the diseased spots. It developed that one of the workmen had been dispatched with a hand sprayer and a quantity of disodium methyl arsonate with instructions to spot spray the scattered dallisgrass plants. DSMA is quite selective and at normal rates does little to damage bermudagrass. In this case, the workman apparently had held the cone-shaped spray on one spot until he was sure the weed was thoroughly saturated and in the process the bermudagrass suffered substantial injury.

This kind of problem is easy to diagnose and prescribe for, but it cannot be done by phone or correspondence.

Wrong Diagnosis

7. Sod webworms are the larvae of a tiny moth and individually they are capable of eating only a minute

quantity of grass. Collectively, they can denude a green in a few days.

It is easy to kill sod webworms if one recognizes that they are present. The difficulty is in detecting them. They are seldom seen during the day because they feed at night.

Our experience with webworms have been many and varied. Frequently they start to feed at a time when turf has been damaged by other agencies such as chemicals, fertilizers, or vertical mowing. The green is "off color" and the superintendent knows the reason for the situation. The perplexity arises when the green fails to recover as it normally should. Finally, it is discovered that sod webworms have invaded and are responsible for the green's failure to respond. Literally dozens of cases of this kind have come to our attention during the past decade. Because of their frequency of occurrence and their "sneaky" ways, sod webworms are always suspects whenever a subscriber starts to describe his problem by phone and a question about webworms is among the first that the agronomist asks.

At the beginning of this piece we said that clubs can very often avoid difficulties if they seek advice prior to taking steps that cause trouble. The Green Section staff members visit about 1,200 clubs each year and they have contacts with most of the investigators at state experiment stations and with most of the suppliers and purveyors of golf courses. Therefore if the agronomist cannot answer your question, he is quite likely to be able to refer you to competent people who can give you the proper advice. The essence of the matter is to call the Green Section before you get into trouble. It's much cheaper and less painful to all concerned.