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Chemical Weed Eradication

By Dr. C. M. Murray, D. S. O., Royal Cape Golf Club, Capetown, South Africa

Though the recognition of the value of soil acidity in the maintenance of turf has led to a considerable diminution of the amount of weeds to be coped with in putting greens, there will still be an annual invasion to be coped with. The main source of this invasion is undoubtedly wind-born seed. The summer air becomes charged with myriads of seeds which are steadily deposited over the surface of the turf.

Topdressings have always been blamed for the introduction of weeds. With a view to avoid this source of infection we have carried out experiments with heat sterilized topdressings. Very little, if any, difference was noticeable. The small amount of weed seed in well-prepared topdressing must be fractional compared with the mass deposited from the air. What the topdressing undoubtedly does is to supply a germinating bed for the seeds already there.

The problem then is how to combat this annual invasion. Hand weeding is slow, laborious, disturbing to the play and very expensive. The preparations sold under the title of "lawn sand" which depend for their action on the various hygroscopic salts used, were a step in the right direction. But as the importance of the acidity factor was not known it is more than probable that alkaline salts were used, thus rendering the ultimate results sufficiently unsatisfactory to prevent their universal adoption.

It was to overcome these difficulties that led us to adopt the suggestion of a chemist, to use sulfate of iron in combination with sulfate of ammonia. The advantage of this mixture is that both these salts are acid reacting. In 1910 we commenced experiments with this mixture on a small scale. By 1914 we had achieved very gratifying results when our researches were brought to an end by the Great War.

After the war we resumed with a mixture of 75 per cent of sulfate of iron and 15 per cent of sulfate of ammonia. The two salts are melted and 10 per cent of sand added to prevent recrystallization. The resulting cake is easily crushed to a fine powder.

This powder is highly hygroscopic. When dusted over the green on a bright sunny morning just as the dew is beginning to dry off, the powder sticks to the herbage. The weed leaves present a larger surface and retain the moisture longer than the narrow blades of the grass, and so receive the bulk of the powder.

As the dew dries away the weeds which have thin porous skins, and a high water content, absorb the hygroscopic salts, and in the course of a few days turn black and shrivel up. The grass blades are

coated with a hard, shiny skin, due to the deposition of silica salts, and also have a relatively low water content. For these reasons, in the first place it is difficult for the powder to adhere; and, secondly, even if it does the low water content makes their absorption less easy. Unless an extremely heavy dose is applied the grass, therefore, escapes uninjured.

This preparation may be applied at the rate of from 25 to 100 pounds to a green of 800 square yards. Even under our fierce summer sun the maximum dose produces very little scalding of the turf. If a particularly hot spell follows the application the process may be stopped at any stage by a liberal soaking with the sprinklers.

This method has been used by us with increasing confidence for the past seven years, whilst for the past four years we have used it entirely for the eradication of weeds on all our greens and tees, and as far as we could afford it on our fairways.

A point of interest is that the sulfate of iron appears to have a decidedly beneficial effect on the turf, rendering it finer, sturdier, and of better color than when sulfate of ammonia alone is used.

The method provides a means of eradicating weeds with speed and precision, and at a fraction of the cost of hand weeding. It does not disturb the play, is thorough, and in the end provides a splendid stimulant for the turf.

Dr. Murray's paper is most interesting, and while there can be no doubt that the treatment described has given excellent results in South Africa, we feel called upon to issue a word of caution to greenkeepers in the United States. Iron sulfate applied as a spray at a much lighter rate than the maximum here recommended has seriously injured turf grass, and its use in a dry form would be attended with considerable risk. It is also recognized that ammonium sulfate applied at the rate of three or four pounds per 1,000 square feet is likely to injure the grass during hot weather unless applied with caution and watered in. It may be that when the two salts are fused some reaction takes place that results in a less injurious compound. It is also possible that the combination would injure Bermuda grass less than other turf grasses. Furthermore, results are likely to vary under different soil and climatic conditions. Unfortunately we have no tests on which to base the probable effect of the combination on turf grasses in this country though arrangements have been made to give the method a thorough trial at Gainesville, Florida, in the immediate future. In the meantime, greenkeepers are advised to proceed with considerable caution, and in trying the combination here recommended should first experiment on a small scale where injury to the grass would be of no particular consequence.—*Editors.*

The average greenkeeper looks with dread upon an incoming green committee at the beginning of each year. He knows that, if the personnel of the committee has been changed, he will be asked to apply a lot of new, half-baked notions that are contrary to his practice. There is something so obvious and simple about growing grass that even the cliff-dweller of the city thinks himself an authority.