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Green Section Wins Two Year Battle on Crab Grass

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THIS is the first published digest of the Green Section's highly valuable research into the chemical control of weeds, with particular reference to crab grass.

Maintenance budget reductions in recent years have given crab grass and other weeds an opportunity to threaten seriously the fine turf standard which golf clubs have won at the cost of many dollars and many years.

It is hoped that the significance of the Green Section's research triumph and the release of this information at this time will not be lost on those clubs that ought to belong to the USGA and do their part in preserving the essential activities of the Green Section.

To many clubs, not now members of the USGA, this crab grass control article is definitely worth far more than the \$30 annual dues in the USGA.

Do you think that your club, as an organization of sportsmen, should "ride on a pass" and make use of this helpfulness of the USGA without spending \$30 a year for its ticket?

AFTER TWO YEARS of careful experimentation at the Arlington turf garden, University of Maryland, the Chicago and New Jersey districts and elsewhere, it has been rather well established that crab grass, one of the oldest pests of turf, can be quite successfully controlled. The nature of this control is a simple treatment with a common inexpensive chemical which requires no more fuss or bother than mixing up a batch of bichloride of mercury or broadcasting a pailful of sulphate of ammonia over a putting green. The chemical is sodium chlorate, an ordinary-looking, coarse, white, granular salt having very much the appearance of coarse barrel salt. The price of the chemical ranges around 7c to 7½c a pound in 100-pound lots.

More than 1,500 separate tests over two years have been made with this chemical in addition to perhaps as many with several others as well. Every conceivably good combination of this chemical with other materials, fertilizers and inert carriers has been made and tested under a wide variety of soil and other conditions. The best results have been obtained on the heavier types of soils, silt loams, loams, and clay loams. The results on lighter sandy soils have not been so promising.

Crab grass begins its insidious work long before most of us ordinarily suspect its

presence. Around Washington, D. C., crab grass seedlings sometimes may be found around the first of April but do not ordinarily become noticeable until close to the first of June. During this time very little top growth is made but the root system enlarges enormously, thereby enabling the crab grass plants to over-run the turf grasses later in the summer. These very young crab grass plants are quite easily killed by rather small concentrations of sodium chlorate.

Application Rates and Time.

Sodium chlorate may be applied to lawn and fairway turf, under proper moisture conditions, at rates up to 2 lbs. to 1,000 sq. feet. This represents the upper safe limit of rate of application. At this rate as many as four successive applications have been made with no more than temporary injury to the turf. However the experiments carried on by the USGA Green Section indicate that the first application of sodium chlorate should be made on or about the first to the middle of May in the vicinity of Washington, D. C., and somewhat later in more northerly and westerly climates. At this time the crab grass plants being small, an application of $\frac{1}{2}$ to 1 lb. to 1,000 sq. ft. will quite effectively handle the situation. At this rate the turf grasses are injured only slightly and completely recover within two to three weeks. Bad burns may result from faulty application, however, especially at the heavier rates.

Since sodium chlorate apparently does not injure the germinating power of seeds, new crab grass plants will appear as soon as the toxic effect of the chemical is lost; therefore a second application must be made within three to four weeks. About the middle of June, then, a second application of from 1 to $1\frac{1}{2}$ pounds to 1,000 sq. ft. may be made. This increased rate is necessary to kill any crab grass plants which being older, are more resistant to the chemical and may have escaped the first treatment. Now under the proper conditions the turf grasses, largely freed of competition, are able to develop normally with a little encouragement by light fertilization. Since the competition is removed, there need be no fear of summer fertilization for the weeds largely have been removed.

Some crab grass plants will still come in even after mid-summer, so that a third application at the 2 lb. rate will most likely be necessary about the middle of Aug-

ust. This will catch the crab grass plants just before they begin to produce seed heads and the toxic effects will last sufficiently long to effectually prevent any plants from maturing seeds. This is important since it has been shown that a single crab grass plant may produce as high as 200,000 seeds and that as many as 400 crab grass plants may exist in one square foot of soil. Within two or three weeks after this last application of chlorate a generous fertilization with a complete fertilizer should be made in order to encourage the turf grasses to occupy the soil completely and prevent the re-establishment of weeds more effectually.

Method of Application.

Now as to the method of applying chlorate. There are at least three ways in which it may be applied. The most common method of applying chemicals has been that of spraying. Spraying however requires large amounts of water, rather expensive equipment, and is more or less of a bother. Another method which has found considerable application on golf courses is that of distributing the chemical in solution as a coarse rain through sprinkling carts, barrels, and similar devices. This however is subject to more or less the same disadvantages as the spraying method.

The third and perhaps the most applicable method for this particular purpose is that of mixing the chemical with compost, sand, or crushed limestone, and either broadcasting it or distributing it through a lime spreader or any other suitable device. *The dry method has the further advantage in that sodium chlorate, when mixed with dry inorganic material, does not form a combustible mixture. This reduces to a minimum the fire hazard, which is ever present when sodium chlorate is used in solution.*

On what kind of turf may this sodium chlorate treatment be used? Experiments so far have been carried out principally on fairway and lawn turf. It has been tried to some extent on putting green turf but the tests have not been extensive enough to be conclusive. Bluegrass, Colonial bent, redtop, and fescue have been tested under fairway conditions and will persist and thrive under the treatments as described. Most of the common annual turf weeds, including crab grass, as well as plantain, disappear in a single season. Annual bluegrass is to a large extent discouraged. By this it may be seen that the method of

RUTGERS SHORT COURSE IS USUAL SUCCESS



Sixth annual short course in Turf Management, conducted at Rutgers University, New Brunswick, N. J., Feb. 19-23, was attended by 26 men, a majority of whom represented golf clubs from Massachusetts to Delaware. The course was an entire success, according to Howard B. Sprague, of the N. J. Agric. Exper. station, who was in charge.

A new feature, introduced this year, was to hold a dinner on the last day of the course, at which certificates of attendance were presented to those who had merited them.

treatment is applicable to approaches, banks, aprons, fairways, roughs, nearby lawns, parks, and similar turfed areas.

How Treatment Works.

The success of chlorate treatment depends largely upon a sufficient supply of moisture in the soil to bring the chemical into solution, in which state it is carried into the soil absorbed by the roots, and taken into the circulatory system of the plant. Once in the plant it acts upon the chloroplasts, which are the food factories of the plant. It disintegrates the starch granules and causes the plant to starve to death. The first indication of its action is a bleaching of the leaves, followed by a browning of the leaf tips and eventually the death of the entire plant. It is not definitely known just why sodium chlorate is so selective in its action but that it is selective is sufficient for our purposes at the present time.

Use With Care.

Sodium chlorate is an oxidizing agent, which means that in combination with material of an organic nature it promotes and assists combustion. In combination with sulphur, charcoal, clothing, wood and similar materials it forms an explosively combustible material. There have been serious accidents in connection with its use as a spray. Workmen's clothing become saturated and when dried they may be ignited simply by friction, rubbing against a car seat, or a spark from a cigarette, but by combining chlorate with dry inorganic ma-

terials such as compost, sand or crushed limestone, there is practically no danger. The material is not poisonous and is not dangerous by itself. It is handled in steel drums and should always be kept in steel containers—never in wood.

Further investigation regarding the applicability of this chemical to other types of turf and weeds should be continued. Other chemicals such as ammonium thiocyanate and arsenic compounds have also been investigated to some extent but there still remains a great deal of work to be done along this line. A complete report covering two years of investigation is to be published soon in the *Bulletin* of the USGA Green Section.

Relay Golf Game Makes Round in 20 Minutes

FRANCIS MARZOLF, pro at the Wyandot G. C., Columbus, O., and Tom Dempsey, manager of that club, organized a stunt that gives the golf nuts something to shoot at. With players shooting in relays, an 18-hole round on Wyandot was played in 20 minutes, 41 seconds. Gross score was 29 with one ball in a water hole and a four-putt green.

Mixed up in the mad rush were Marzolf, Dempsey, Johnny Florio, E. G. Livesay, Thornton Emmons, L. W. St. John, Millard Hensel, Don Dutcher, Glen Bishop, Stark Frambes, Mrs. Thornton Emmons and George ("Red") Trautman.