

Clover and Crabgrass Control In Greens and Fairways

By O. J. NOER

CLOVER and crab grass have been bad in many places. The wet spring and early summer encouraged both. High temperatures after that made crab grass very bad. Many ask about immediate control with chemical weed killers. Others are interested in lessening the chance for a recurrence next season.

Although most complaints are about fairways, a few are concerned about clover and crab grass in greens. The aprons around some greens are bad and heavily infested with crab grass and occasionally with goose grass, otherwise known as silver or hard crab grass.

A chemical to kill clover is not the best solution to the clover problem in greens. Sooner or later, and usually sooner, clover reappears because nothing was done to remove the basic cause. Many superintendents never give a thought to clover in greens because they know the secret of keeping a dense cover of tight turf. Clover does not have a chance in that kind of green.

A thin open turf is associated with clover in greens. In most instances failure to use enough nitrogen fertilizer is the cause. Occasionally, the grass itself is an inferior strain, such as Colonial bent which is prone to become thin in hot wet

weather. This grass does well in Canada and the adjoining parts of the United States, but not farther south where summers are longer and hotter.

Disease, insects, over-watering, poor drainage, etc., alone or severally are other reasons.

On greens where the grass is mostly bent, the sensible approach is to ascertain the cause for thin turf. If it is due to any of the causes just mentioned, the answer is simple. Control of disease and insects, correction of poor drainage, over-watering, etc., come first. After that it is a matter of fertilization. Bent grass greens need one to one and a half lbs. actual nitrogen per 1,000 sq. ft. per month of



A good, clean turf of good grass in 1953 after renovation program shown at left in 1952.

growing season. Some of the aggressive growers such as Toronto may require even more.

Preliminary Step

The use of a little dry sulfate of ammonia to burn to clover may be a good preliminary step, where the infestation is bad, but is not the answer in itself. Customary practice is to use the dry sulfate in late afternoon at one to three lbs. per 1,000 sq. ft., and water it in the next day. The secret is to use an amount which will scorch the clover without permanent injury to the grass.

Where poa annua is the sole grass in the green, the problem is more difficult. The first step is to introduce enough bent



Preparing seed bed on renovated fairway at Park Ridge CC. (Chicago dist.). Sprayed four times with sodium arsenite, aerified, spike disced, fertilized and seeded with mixture of Astoria and Highland bent.



Clover control with sodium arsenite, used twice, dry method. Some clover in far plot treated once only. One of first plots established almost 20 years ago.

so it predominates. This can be done over a period of years without rebuilding, but in many cases rebuilding is the best method because it is the quick way.

Crab grass has become a more troublesome weed since Chlordane and related compounds replaced the lead arsenate for grub and worm control. Chlordane has earned a place for itself but lead arsenate is due for a comeback. Despite seemingly high cost, its use on golf greens can be justified. Those who use it in the spring, at about the time crab grass seeds begin to germinate, have little crab grass. They claim the lead arsenate checks *Poa annua* in addition. Phenyl mercury acetate is useful also. To succeed with it, treatments must begin before or at the time crab grass starts growth. Potassium cyanate is excellent for killing more mature crab grass, but is rather drastic on the bent grasses and hence, not safe for use on greens. The same is true of sodium arsenite and arsenic acid.

Chemical treatment with lead arsenate and phenyl mercury acetate is justified on greens where crab grass has been bad over a period of years. An effort should be made to locate the original source of infestation. The seed may have come in the soil used in the top-dressing mixture. Then the top-dressing should be sterilized, or crab grass free soil secured.

A heavy crab grass infestation in the aprons or banks surrounding the green is another likely source. The crab grass in these areas should be killed by using lead arsenate and phenyl mercury acetate, but sodium arsenite or potassium cyanate used now would be cheaper and safe enough. By doing both these things for

several years, lead arsenate alone may then keep crab grass in check.

Goose grass is causing some concern. Hand weeding is the only safe way to rid greens of this bad pest. When goose grass is bad on aprons or banks it can be killed with moderately heavy rates of sodium arsenite, especially in hot weather when mid-day temperatures are 85 degrees or higher. The sodium arsenite is rather rough on any bent grass. In Louisville, goose grass on aprons has been killed by drenching the plants with a mixture of PMAS and 2,4-D. They use $4\frac{1}{2}$ ozs. PMAS



Joe Faringa at Kent CC points to clover in *Poa annua* part of fairway and its absence in renovated and seeded part at right.



Jim Morrison's vertical mower for cutting crab grass seed heads. Morrison used old rotary hoe and cutters from plows.

and $1\frac{1}{2}$ ozs. 2,4-D (50% amine type) in 3 gals. of water. Re-seeding afterwards is necessary because the treatment kills most or all of the grass also.

Develop Good Turf

The clover and crab grass problem on fairways has one thing in common with greens. The best and most practical permanent solution is to develop a good body

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of turf. Then the problem in future years becomes simple; but the acreage involved changes the picture with respect to method. It is necessary to rely upon less costly herbicides.

The Milwaukee CC started watering fairways in the late years of the decade starting in 1920. They made the mistake of cutting the grass too close and of not using fertilizer of any kind. By 1933 the bluegrass was so poor that clover and knotweed were bad. Generous fertilization was started then, and has been continued ever since. Bent grasses asserted themselves as a result of feed and water.

With the development of a good turf, the clover and knotweed problem solved itself. Chemical herbicides were unknown then. Their use might have brought good turf sooner, but would have had no other effect.

Until recently, the Los Angeles CC was plagued with crab grass in their fairways. Mr. C. C. Simpson and Wm. Beresford sought the answer to the cause and then adopted the right kind of program. Fennell covered large areas of the fairways in the winter. There was bare ground when it disappeared in the spring

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until crab grass provided cover. Their program was based on using sodium arsenite to check the fennel and crab grass, along with generous fertilization to induce the sparse stand of bermuda grass to spread and form a dense turf. This is how they produced all year good playing fairways.

Start This Fall

With the right kind of grass in the fairways, the control of clover is not difficult. The task should be started this fall to insure better fairways in 1954.

Some have used 2,4-D at light rates to keep clover in check and have been successful even on fairways with bent grass. Others have obtained excellent control with 2,4,5T or a mixture of 2,4,5T and 2,4-D.

Those who use 2,4,5T need not apply more than 1 lb. actual acid equivalent per acre. Some authorities claim the ester formulation gives better results than the amine type. On our plots, the end result was the same with either formulation. Quicker action by the ester type was the principal difference. It is usually a week to ten days before there is any visible effect on the clover. With us the 2,4-D had no additional effect on the clover, but its

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use is justified along with 2,4,5T to kill broad-leaf weeds if they are present. Under such circumstances, a mixture of 1 lb. 2,4,5T and $\frac{1}{2}$ lb. 2,4-D per acre is adequate.

Clover resists wetting so low gallonage sprayers do not give best results. The amount of water should be in the 50 to 100 gal. per acre range, and a small amount of wetting agent should be added.

The promiscuous fall use of 2,4-D especially, and possibly of 2,4,5T is unwise, especially on fairways where the turf is largely creeping bent, or where it is present in appreciable amounts. Injury to the bent may thin the turf and pave the way for invasion by poa annua. There is evidence to justify this statement about 2,4-D. The discoloration caused sometimes by 2,4,5T must act as a warning and justify caution in its use until more evidence is at hand.

Secret of Success

Sodium arsenite will control clover and is safer for fall use where fairways contain creeping bent. Chickweed is controlled also and sodium arsenite tends to reduce the amount of poa annua.

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senite is to spray three times at least, and preferably four. The soil moisture should be good and the sodium arsenite should be allowed to act for 24 to 48 hours before water is applied. There should be no rain for 12 hours after an application. The usual interval between sprays is 7 to 10 days, but formation of new leaves on the clover stems is a better guide. It is important to spray before the new leaves are fully developed. After weakening the clover winter kill completes the task.

Discoloration is greatest with the first spraying so the rate should be about one



Windburn damaged bent grass fairway in Spring. Injury aggravated by two fall applications of 2,4-D.

lb. the first time; then it can be increased to $1\frac{1}{2}$ to $1\frac{3}{4}$ lbs. per acre. The amount of water should be sufficient to wet the plants. Excessive pressures which produce fog should be avoided.

On fairways where the ground cover of grass is largely or entirely poa annua, the problem of clover control is difficult. When the poa thins next summer, clover reappears. Complete renovation accompanied by re-seeding is the best answer. Since this should start in July, details will be discussed later.

It would be well to spray these fairways four times this fall with sodium arsenite. Then there is bound to be less clover next year.

Those who rely upon sodium arsenite this fall will do more than kill clover, and will not harm the bent grass provided there is enough soil moisture to a 5 in. depth to sustain growth. Then any persistent surviving clover can be killed with a little 2,4,5T in May or June. The rate should be $\frac{3}{4}$ to 1 lb. per acre with 50 to 100 gals. of water. The 2,4,5T will check bloom immediately and the clover will dis-

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Aside from the belt extending from Washington and Philadelphia through Cincinnati, Louisville and St. Louis to Kansas City, crab grass is not a serious problem provided fairways are covered with the right kind of grass, namely fescue, blue grass or a combination of this with Colonial bent on unwatered northern courses, and bent grass on the watered ones. In the South, a well maintained bermuda grass turf will resist crab grass invasion.

In the transition belt mentioned above, crab grass is a vexing problem. Clover-nook and Camargo in Cincinnati are examples of unwatered courses with good fairways. The turf contains some bent. There is some crab grass each summer but turf comes back after the crab grass dies in the fall.

Prevent Seed Formation

In most instances, crab grass control is a matter of prevention of seed formation and checking its growth along with the introduction or encouragement of a good grass. Jim Morrison at Hershey, Pa. accomplished this with a homemade vertical cutter to shear off the seed heads. Others have used combs on mowers, sections of wire fence, or steel mats before mowing to raise the seed heads, so fairway mowers can cut them off.

Some watered courses in the New York to Chicago belt have been plagued with crab grass on watered fairways because the turf was mostly close cut blue grass. They are solving the problem by spraying with sodium arsenite at light rates during June, July and August; followed by re-seeding in early September to introduce Colonial bent which makes a tight turf and will stand close cutting. The choice of sodium arsenite over potassium cyanate or phenyl mercury is a matter of cost per acre, besides the fact that sodium arsenite also checks poa annua.

HOME CLUB PRO

(Continued from page 41)

stated. "The student must be convinced that the recommendations the instructor gives are the ones he is seeking for his specific case.

"It seems that everyone who knows how to knock a ball down a fairway seems to think that he is a magician. Some students receive recipes from all over and the instructor must convince them that