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CONTROL OF CRABGRASS

ONE of the interesting features of our work is the opportunity of observing the language used by correspondents in consigning to perdition one of the most abundant products of Mother Nature. Some call it Crabgrass, Wire Grass, Summer Grass, Fall Grass, and Water Grass. Others use names which must be censored here.

FIGURE NO. 1

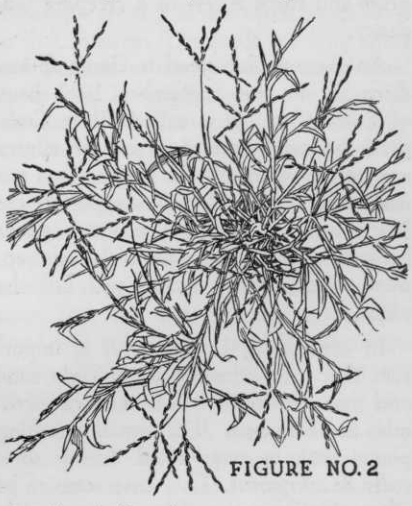


FIGURE NO. 2

Side and top views of Crabgrass. Notice the shallow but extensive root system, the pronounced creeping tendency, and the prostrate seeding stems.

Crabgrass grows in nearly all parts of North America. It is worse in the southern half of the United States because it is distinctly a hot weather growth. It thrives best in full sun, grows not at all in medium or deep shade. It makes a vigorous growth in almost any type of soil provided the competition from other grasses is not too keen. Crabgrass will not cause much trouble in a heavy stand of turf.

Being a *summer annual*, Crabgrass appears each year only as new growth from seeds. These germinate mainly in the spring and early summer, beginning about the tenth of April in the vicinity of Washington, D. C., but a little later in sections further north. While the seedling plants do not seem to make much headway above ground for the first month or so, the root systems are rapidly developing during that time.

Varieties

At least two varieties of Crabgrass are bothersome in lawns. The one known as Large or Common Crabgrass is by far the most troublesome. (Figures 1 and 2.) It has coarse, pale green, hairy leaves three to six inches long and one-quarter of an inch wide. But worst of all are its jointed creeping stems which take root wherever they come in contact with moist soil. The appearance of Large Crabgrass is quite in contrast to that of desirable turf grasses. It is easily recognizable a day or two after mowing because it grows so much faster than other grasses.

Less objectionable is the Small or Smooth Crabgrass. The blades of this variety are not as wide and coarse and are free from hairs. Usually the growth is more upright than that of Large Crabgrass and there is less of a creeping tendency.

Another similar weed is Goose Grass, discussed in the September 1932 issue of *Lawn Care*. It is called Silver Crabgrass because there is a sort of silvery cast to the sheath of the leaves. It is not nearly so commonly distributed as the other varieties. Control is much easier because a few drops of crude acid applied to the heavy crown will kill the plant.

In controlling Crabgrass it is important that it be attacked at the right time and that certain lawn maintenance methods be followed. The small seedling plants may be overlooked during their early development. They may seem to be of no significance until late June or early July when the growth gets under way in earnest. About this time the jointed stems begin taking root causing the plants to spread rapidly. By late July or early August seed-bearing spikes appear. These will produce and mature seeds when the spikes are either upright or lying flat against the ground. Thus ordinary mowing will not prevent seed production as it does with most weeds and grasses. To the contrary, it increases the pest because pieces of stems scattered by the lawn mower contain joints or nodes which take root and produce new plants.

The stems of Crabgrass are coarse and wiry and are very hard to cut. When in the full seeding stage an ugly reddish brown or purplish color is presented by the seed heads. Many are not conscious of the presence of this weed until it has reached the stage where the seeds are formed and are already dropping to the ground in preparation for the next year's invasion. By then the real damage has been done because millions of seeds will have been added to the soil. A single Crabgrass plant may produce 200,000 seeds. As many as 400 seedling plants have been counted thriving on one square foot of ground.

Having provided for continuation of its kind by a heavy seed production, Crabgrass ceases growth with the advent of cooler weather. The first heavy frost kills the plants and causes them to turn an ugly brown color. They are very unsightly during the fall months when the desirable grasses are of good color and vigor. Moreover, the ragged ugly brown growths remain in evidence all winter or until raked out.

Hot Weather Weed

One reason for the ability of Crabgrass to grow so abundantly in hot weather is because it is a native of tropical climates. More important, however, is its extensive, shallow network of fine rootlets which are able to take up whatever limited moisture is available in dry seasons. Thus the usual practice of giving lawns a light sprinkling every day may simply be for the benefit of the Crabgrass alone. Although it is more of a dry weather plant than the desirable lawn grasses, it likes moisture too, and will grow profusely in wet seasons.

Like many other weeds, Crabgrass will not grow in the shade of trees or buildings. Even a little shade may keep it in complete control. The small amount of shade offered by a thick

growth of grass may check seedling plants before they have a chance to become established.

Distribution

We are often asked why Crabgrass is so generally distributed and why it sometimes seems to take possession of a large lawn almost overnight. The explanation of distribution lies in the fact that the plants are such prolific seed producers. A few seeds may be scattered over a lawn by wind or in the droppings of birds. These may produce occasional plants here and there which pass unnoticed the first year or two. But it

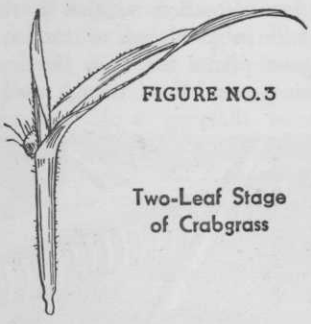


FIGURE NO. 3

Two-Leaf Stage of Crabgrass

doesn't take many plants having a production of almost a quarter million seeds to infest a good sized lawn in a hurry. These seedlings may be very inconspicuous at first but when it becomes hot they can make a tremendous growth in a short while. They may be overlooked in a casual observation of the lawn until such time as the seed bearing spikes appear. Thus it seems that the weed has sprung up quite suddenly when in reality it has been developing for several weeks.

A common cause of Crabgrass infestation is the use of topsoil or manure that is foul with its seeds. Tests have shown that these seeds may remain buried for many years without their vitality being affected to any extent. They simply remain dormant until conditions of light, air, temperature and moisture are favorable for germination.

A cemetery superintendent once told us of his experience in working a sand pit during the middle of a wet summer. This pit was dug out to a depth of six feet. Within a couple of weeks the bottom of the pit was covered with a solid stand of Crabgrass. This could have come only from seeds that had lain buried in the sand for many years.

Seeds Not in Lawn Mixtures

Contrary to common belief, lawn seed seldom contains the seeds of Crabgrass. This is confirmed by many agricultural authorities including the New York State Experiment Station, from whose bulletin we quote:

"Examination of lawn seeding mixtures shows that only a few of the very cheapest mixtures carry the seed of this weed, therefore it is not often introduced in that manner. The seeds are long lived and persist in the soil for some time. Seeds may be carried upon the lawn by any sort of litter or compost which may contain these seeds. Manure which is not well rotted will often be the means of infesting an otherwise good lawn. Soil brought in from fields or gardens and used as a top dressing will bring these seeds if the plants have previously grown upon that soil and matured seeds. The weed will come on year after year from seeds which drop to the soil from the clippings of the lawn mower."

Probably this last method is mainly responsible for the presence of Crabgrass in some lawns every summer. Unless steps are taken to prevent seed production, the growth is apt to get worse each succeeding year.

There are two methods by which Crabgrass can be kept in control or subdued once it gets the upper hand. The simpler way is to follow certain cultural practices that will be helpful to that end. The other method involves the use of specific chemicals which have been found highly toxic to Crabgrass but less so to desirable turf grasses.

1—Cultural Control

If possible, cultural control should begin in early May when the seedling plants are just developing. These can be distinguished readily from the other grasses because of the wide blades and pale green color. When the plants are in the first stage of growth, commonly called the two-leaf stage (figure 3), they are easily hand pulled. Even large areas can be cleaned in a comparatively short time. Not all plants will be removed in the first treatment because germination is not necessarily uniform. The lawn will bear close watching for some time during this critical period when Crabgrass is just getting under way.

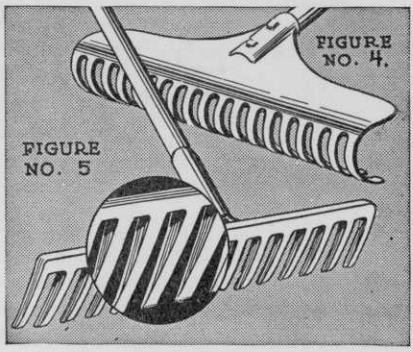
Mowing and Raking

Should the plants get beyond this seedling stage and into the creeping stage, control is effected by use of the lawn mower and rake. The area should be mowed in the regular way, then raked vigorously with a heavy iron rake or with a special weed rake. (Figure 4.) A heavy garden rake with the flat tines filed to a sharp edge (figure 5) is an excellent tool to use in pulling up a matted growth of Crabgrass. The purpose is to raise the prostrate creeping stems which escape mowing and later produce the seed heads. After the raking, mow again crosswise to the first direction. This will sever the creeping stems raked up to within reach of the cutting blades. Repeat this alternate raking and mowing until the ground is cleaned of creeping stems. The clippings from each mowing should be caught and destroyed, preferably burned —not added to the compost pile, so the jointed stems do not have a chance to take root and produce new plants.

After such a treatment a lawn may look somewhat moth-eaten compared to a neighbor's growth of Crabgrass. But the reward will come in later months and years in a clean, green lawn in contrast to the neighboring reddish brown Crabgrass plants.

The object of this raking and mowing is to prevent seed production. The procedure will not be successful unless it is started in July when the first seed heads appear and continued until the cool weather of early September when the production of seeds usually ceases. It is necessary to scrutinize closely a stand of Crabgrass to determine when to begin this treatment. The first seed heads are quite inconspicuous, and, let us repeat, will positively develop regardless of how often and how closely the lawn is mowed in the regular way.

After such a summer program the lawn is bound to be thin and in need of immediate attention so that a thicker turf will be produced to combat any Crabgrass plants that may develop the following year. Even though seed production is prevented one year there will still be plants the following spring. They come from previously deposited seed which had failed to germinate. There will be noticeably less plants, however, and after a year or two few will appear.



Fall Treatments

As soon as possible after Crabgrass ceases growth a fall improvement program should be inaugurated. The surface soil should be scarified with a sharp rake. Follow this with a heavy application of grass food washed thoroughly into the soil. Then seed heavily and rake

or roll the seed into the soil. A top dressing of good screened soil is quite beneficial—if it does not contain Crabgrass and other weed seeds. This is pretty difficult to procure, so sometimes pulverized peat is wisely substituted. Let the grass go into the winter with a fairly long growth, at least three inches.

It may be that after a summer of Crabgrass control the lawn will look so hopeless as to make a new lawn seem necessary. This is sometimes true but it should be remembered that turning over the soil may simply mean turning up a fresh batch of weed seeds which will germinate the next summer. The same thing may happen if the old soil is removed and new soil brought in. If the surface soil is made fairly free from Crabgrass seeds this advantage should not be lost. It is generally better to simply loosen the surface soil lightly and work the fertilizer and seed in as well as possible by vigorous raking and by rolling.

Spring Treatments

As with other lawns those apt to suffer from Crabgrass competition should receive their spring treatment earlier than is the usual practice. Late February or early March is the time to begin. Rake the areas to remove leaves and other debris that have accumulated over winter. Follow with the right nourishment in the form of a specific grass food. This should not be a straight organic fertilizer, such as bone meal, because organic materials do not become available until warm weather when Crabgrass will get greater benefit from it than the lawn grasses. Neither should this feeding be with a straight mineral or inorganic fertilizer because this is quick acting but short lasting. It simply over-stimulates the grass to a lush, heavy growth which the soil cannot support when the fertilizer is exhausted. A combination fertilizer composed of both organic and mineral elements certainly seems the wisest choice.

After feeding, bare or thin spots should be seeded. Rolling at the proper time is important. Too much emphasis cannot be placed upon the importance of avoiding close cutting. A mowing height of at least 1½ inches is essential. This serves a dual purpose. The longer growth is accompanied by a deeper and sturdier root development, and offers less favorable conditions for growth of new Crabgrass plants because of the shade produced by the tall grass.

Water deeply during dry weather. As pointed out before, Crabgrass gets more benefit from light surface sprinklings than the desirable grasses. A moisture penetration of at least three or four inches is necessary. By cutting sample plugs from the lawn during waterings it can be determined whether or not this is provided.

Feeding helps keep turf ahead of Crabgrass. Spring and fall applications of commercial fertilizer are recommended but late spring or summer applications are of doubtful value. Where Crabgrass is troublesome it is well to refrain from feeding after late April or early May, depending upon the climate. Later applications of food may simply be for the benefit of the Crabgrass which will be able to make good use of it during hot weather.

2—Chemical Control

If Crabgrass has taken complete possession of large areas the only practical control may be by means of chemicals. This method is somewhat new and at present is limited. No doubt greater use will be made of it as knowledge of the subject is broadened. We are indebted to the Green Section of the U. S. Golf Association for most of the helpful information about chemical control.

Sodium Chlorate

While several different chemicals may be employed successfully, Sodium Chlo-

rate is probably the most practical one known, considering cost, ease of application, and damage to desirable grass. This chemical has been developed specifically for the control of weeds, particularly such farm weeds as Canada thistle, bindweed, and quack grass. In quantities it costs around ten to twenty cents per pound and is procurable at most of the larger chemical or wholesale drug houses.

Sodium Chlorate ($NaClO_3$) is a dry crystalline salt which looks like common table salt. It is not considered poisonous to human or animal life, although in using it there is an attendant danger of fire. It dissolves readily in water or mixes well with dry carriers such as sand, screened soil, lime, or inorganic fertilizers. It may be applied in the dry form mixed with a carrier, or in liquid form by spraying or sprinkling. As both forms of application seem equivalent in efficiency, the easier method may well be the one selected. There is less of a fire hazard in dry applications.

Three Applications

The Green Section experimental work seems to indicate good control of Crabgrass with three successive applications of Sodium Chlorate. The first treatment should be made in early May when the seedling plants are in the two-leaf stage. The other two applications may follow at monthly intervals. Considering the possible danger to the good grasses, the maximum rate for the first treatment should be one pound to 1000 square feet (50 ft. x 20 ft.). This rate can be doubled for the other two applications.

Temporary discoloration of the turf will follow each treatment but the grass will recover, particularly if a light dose of an inorganic fertilizer is included with the treatment. Some grasses seem to develop a tolerance for Chlorate not shared by weeds so that later applications show less effect on the grass than the first one. Turf on sandy soils may be damaged more than that on the heavier clay and loam soils. This is due in part to the generally lower fertility of sandy soils.

In mixing the above quantities of Sodium Chlorate with carriers such as sand or soil the amount of such materials can be determined altogether by convenience. A two gallon bucket full of soil is considered adequate for an even spreading over 1000 square feet. Ground limestone may be substituted for sand or soil at 25 to 50 pounds per 1000 square feet. If an inorganic fertilizer is used the amount must be determined according to its analysis. When using the spray method the stock solution is usually five gallons to 1000 square feet while with sprinkling 25 to 30 gallons are needed.

Chlorate is apt to show pretty good control of other lawn weeds such as plantain, chickweed, ground ivy, and heal-all, as well as dandelions and goose grass.

For best results an optimum soil moisture at the time of application is important. If the soil is too dry the chemical cannot go into solution to be taken up by the roots. If the soil is too wet the strength of Chlorate is dissipated.

The effect of a Chlorate treatment will become noticeable within a day or two after application as the vegetation assumes a grayish cast. Later the plants take on a sickly, whitish hue and finally turn brown and curl up. The killing action is brought about by the disintegration of the protoplasm, thus preventing further production of necessary food. As a result the plant starves to death.

Caution Necessary

As brought out in several previous issues of *Lawn Care*, certain care is necessary in using Sodium Chlorate. By itself it is not inflammable, but a mixture of Chlorate and any burnable matter such as wood, clothing and dried vegetation becomes highly inflammable. Clothing upon which Chlorate spray has fallen and dried may be ignited by friction alone. The sun's rays may be strong

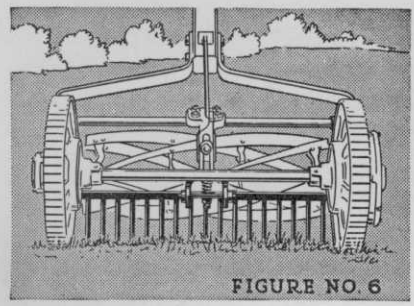


FIGURE NO. 6

A new weapon in the fight against Crabgrass is this rake attached to an ordinary mower. The teeth are intended to lift up strands of Crabgass so the mower can cut them.

enough to cause combustion of dried Chlorate-soaked vegetation. These fire hazards afford another reason for dry applications of Chlorate. The salt by itself or when mixed with soil or sand is non-combustible.

Possibly the greatest attendant danger is in the storage of Chlorate. It should not be stored carelessly but considered as dangerous as so much gasoline.

Destroying All Vegetation

Where Crabgrass has gotten completely out of control Sodium Chlorate may be used to destroy all vegetation. A heavy treatment, three or four pounds to the 1000 square feet, will kill the Crabgrass plants and the maturing weed seeds and still not lessen the fertility of the soil for more than a few weeks.

Such treatments may be the only solution in those sections of the country where climatic conditions make it almost impossible to hold Crabgrass in check. If all vegetation is killed off in early September, by the last of the month the soil could be loosened slightly, fertilizer applied and seed sown. Within a short while a nice stand of grass would be quite in contrast to the ugy brown Crabgrass of adjoining lawns. Moreover, this green turf would probably be in evidence all winter and well into the following summer. The same process could be repeated each fall after Crabgrass had taken possession. All this sounds more complicated and expensive than it would probably prove to be. It is only feasible in the south or in other locations where Crabgrass is almost uncontrollable by other means.

Other Chemicals

Other chemicals have been tried in this continuing search for Crabgrass control. Some of them show fairly favorable results but the cost of such treatments is almost prohibitive. One such chemical will positively destroy the germinating ability of any seeds that happen to be in the upper quarter or half inch of soil, but it is quite expensive. It will not affect Crabgrass plants but only the seeds.

Healthy Turf Best Control

As with most other lawn problems, the fight with Crabgrass will be much simpler if it is being waged on a lawn that was built right in the beginning. In fighting weeds the best defense is a good offense. If conditions are fairly favorable, grass will be strong enough to more than hold its own against all kinds of weeds. That is the main reason for the success of Creeping Bent in keeping down Crabgrass and other weeds. It makes such a thick solid turf that there is no room for them.

A common statement is that "Crabgrass has killed my grass." This is not what generally happens. Instead the grass probably succumbs first because of insufficient strength to withstand hot dry weather or other unfavorable factors. As a result Crabgrass easily takes complete possession because it has no competition.

It has been suggested in *Lawn Care* several times that Crabgrass might be controlled if the turf were strengthened by following the best known maintenance practices. Emphasis was placed upon regular feeding in the spring and fall with the right grass food, and upon the

method of mowing. A minimum height of cut of 1½ inches was recommended, particularly for the late spring and summer cuttings. It has been quite a satisfaction to receive letters from many readers of *Lawn Care* telling how they have been able to control Crabgrass by following these suggestions. While no one accomplished 100% control in one season, Crabgrass has been subdued entirely in two or three years by means of these cultural practices.

We do not want to give the impression that it is possible to control Crabgrass by raising the height of cut in mid-summer when Crabgrass becomes evident. It might be disastrous to do it then as that would simply encourage the pest to faster growth and greater seed production. If Crabgrass is to be checked by a longer growth of grass it must be done while the plants are small.

Aside from its value in Crabgrass control, higher cutting is recommended as a more general practice in turf maintenance. (See *Lawn Care*, August 1932.) This may mean more frequent mowing, but the lawn will actually be better and look better. Close cutting is not the thing that makes lawns more attractive after mowing, it is the evenness of the stand of grass. This can be accomplished just as well by higher cutting which has proven its value in making grass stronger and better able to overcome the competition of weeds, grubs, insects, and unfavorable weather.

August Next Issue

This number of *Lawn Care* replaces the one previously mailed in June. The next issue will reach you in early August, in time to plan your fall lawn improvements.

In the meantime you are invited to write us about any troublesome lawn problems. Your own experiences in controlling Crabgrass will also be welcomed.

Scott Publications

This issue of *Lawn Care* is just one of a series of such bulletins published five times each year. Subscriptions are free to anyone interested. In addition you can obtain several other Scott publications on lawns, including the following:

Lawns—The amateur gardener's guide to better lawns. Condensed but very complete information on soils, fertilizing and seeding. Free.

Bent Lawns- A practical discussion of the most beautiful of all lawn grasses. Tells how to plant with either seed or stolons. Many natural color illustrations. Free.

Lawn Care—This is the thirty-fifth issue of these bulletins which have been published continuously since 1928. In previous numbers the following lawn problems have been discussed:

1928—Crab Grass, Dandelions.
1929—Moss, Grubs and Beetles, Chickweed, Buckhorn.
1930—Ground Ivy, Yarrow, Earthworms, Heal-all, Ants.
1931—Speedwell, Creeping Buttercup, Moles, Knot Grass.
1932—Sheep Sorrel, Quack Grass, Spurge, Trefoil, Goose Grass.
1933—Nimble Will, Knawel, Terraces, Shepherd's Purse, Chinch Bugs.
1934—Sedge, Shade, Purslane.
1935—Peppergrass, Shade, Crabgrass.

Send 10 cents in coin or stamps for all back issues in a paper cover.

Lawn Care Binders

A loose-leaf binder of imitation leather containing all back issues of *Lawn Care* with an index, is available. Kindly send 50 cents to partly defray costs. This binder will serve as a convenient file for all lawn information.