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Yes, You Can Control Crabgrass!

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Common Smooth Crabgrass
(*Digitaria ischaemum*)



Yes,
You Can
Control
Crabgrass

by Eliot C. Roberts and Harold M. Pellett

IF YOU HAVE an average lawn, it may contain 10-12 crabgrass plants per square foot by midsummer. Besides spoiling the uniformity of an even-textured lawn, these clumps of coarse broad-leaved grass weaken permanent lawn grasses by competing with them for moisture and nutrients. If your lawn is heavily infested with crabgrass, this competition can result in a complete kill of large areas of bluegrass.

You can rid your lawn of crabgrass, however, through both cultural and chemical control. And two new chemicals, in particular, show considerable promise in preventing crabgrass seed germination and seedling establishment.

Crabgrass control falls into three general categories, which may be used singly or in combination: (1) cultural prevention of the conditions which favor the germination, growth and spread of crabgrass; (2) chemical control or prevention of crabgrass germination and establishment; and (3) chemical control of established crabgrass.

We'll look at each of these sep-

arately. But first, let's consider the nature of the pest we're seeking to eliminate.

Crabgrass . . .

Three different types of crabgrass add to the weed population of lawn turf: Smooth Crabgrass (*Digitaria ischaemum*), Hairy Crabgrass (*Digitaria sanguinalis*) and Silver Crabgrass or goose grass (*Eleusine indica*). All three look much alike and are annuals. They develop from seed to mature plants that flower and seed by the latter part of August.

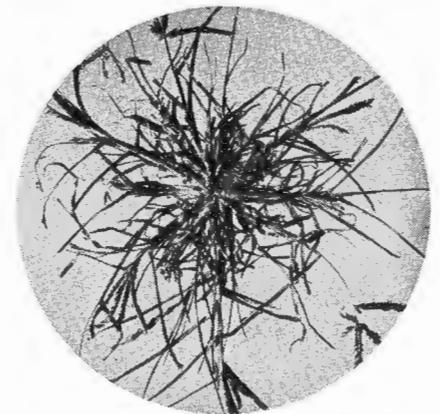
Seedling crabgrass emerges from the soil in a 2-leaf stage. The leaves are oval in shape and light green. As they develop, the plants become coarse and have spreading shoots that root at the joints and produce seed at the tips.

Crabgrass plants are killed by cold weather in the fall, but the seed lies on the soil surface over winter—to germinate and to produce a new weed crop in the spring. The earliest seed germination varies from late April to early June, germinating first where soils are warm and moist. In central Iowa, seedling plants normally appear in the last half of May—often coinciding with the period of blossom drop for the common or old fashioned purple lilac.

How It Spreads: Lawns which have been relatively free of crabgrass may suddenly become badly infested. Seeds may be carried in from neighboring property by foot traffic, by animals, by mowers or other lawn maintenance equipment, or by wind and water. Seeds often remain in the soil for more than a year if conditions for germination aren't favorable. Earthworms and insects may bring them to the surface.

To keep crabgrass from gaining a foothold in your lawn, remove as much seed as possible from the plants when mowing. Mow a little lower than usual in late August. Catch the clippings and seed, remove them from the lawn and burn them.

Good-quality lawn seed mixtures don't contain crabgrass seed. So you can be certain that crabgrass which develops in a new turf



Silver Crabgrass (*Eleusine indica*)

comes from seed already in the soil.

Cultural Control: Crabgrass seeds may germinate over a long period of time in summer months. This makes control difficult. Moist soil conditions favor germination. Thus, frequently watered lawns are more likely to be infested with crabgrass than others.

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Proper watering (less frequently but with large amounts of water), on the other hand, doesn't favor crabgrass germination at the soil surface.

Once the seedlings have taken hold, crabgrass thrives on hot, dry weather and plenty of sunshine—at times when the permanent lawn grasses usually are less vigorous. This makes it "easy" for the crabgrass to gain a foothold.

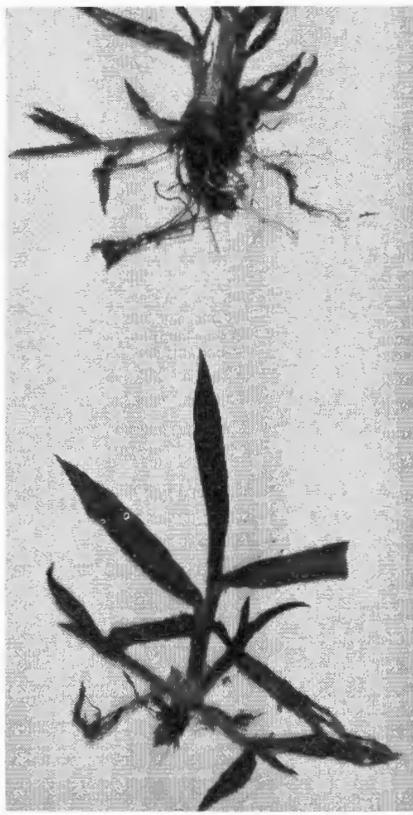
Crabgrass seldom is a serious pest in the shade. Because of this lack of shade tolerance, one of the most effective cultural control methods is to raise your mower to a 2-inch height of cut during May and June. Where your permanent grasses are dense, the additional shade retards the seedling establishment of crabgrass. Where your lawn is thin with much soil exposed, however, raising the clipping height won't be of much value. Also, if you have a poor and weedy lawn, late spring fertilization will often benefit crabgrass more than the permanent lawn grasses. This is because crabgrass has a faster rate of growth.

If your lawn is thick and growth is vigorous, late-spring fertilization helps to maintain this vigorous growth. In this case, crabgrass will be retarded by the shade and competition from the basic lawn grasses. Crabgrass doesn't need a fertile soil to become a serious lawn pest. Its growth and spread are slower on infertile soils but are just as inevitable unless you do something about it.

Chemical Control . . .

Established Crabgrass: Once you find crabgrass in your lawn, it isn't easy to kill chemically without injuring desirable lawn grasses. But the earlier you discover it, the better are your chances of obtaining complete control. Seedling plants are easier to kill than mature ones. But, at the same time, seedling crabgrass is harder to recognize than mature crabgrass.

For best results, it's essential to time chemical applications to treat crabgrass while it's still in



Young and seedling crabgrass looks much like a permanent lawn grass.

the seedling stage. After crabgrass starts to seed, there's little value in trying to kill the plants; cold weather will do this for you, but the seeds for next year's crop have already formed. No chemical is available that will kill sufficient seed to make treatment at this stage worthwhile. Also, where lawns are watered throughout the summer, frequent chemical applications are necessary to kill new seedlings as they become established. No effective chemical control has been found for established Silver Crabgrass.

Our tests: We've used three chemicals in varying formulations by several manufacturers in tests on our own lawn plots. The active ingredients of these materials were P.M.A. (phenyl mercuric acetate), D. M. A. (disodium methyl arsonate) and A.M.A. (amine or ammonium methyl arsonate).

We recommend that P.M.A. not be used on *Merion* bluegrass. Other bluegrasses, however, are not injured by the proper use of this chemical. Carefully follow the manufacturer's directions on application rates. Frequency of application must closely follow the seedling development of crab-

grass. Where seedlings get a good start, P.M.A. gives little control. If the lawn is frequently watered, treatments may be necessary as often as every 7-10 days.

D.M.A. and A.M.A. are much alike in effectiveness in controlling crabgrass. Application timing isn't as critical as for P.M.A. But these materials, too, aren't as effective on well-established plants as on young ones. Also, repeat applications are needed especially if the lawn is watered regularly.

Preventing Germination and Establishment: The most effective method of crabgrass control is to prevent seed germination and seedling establishment. This can be done by spreading a crabgrass preventer on your lawn early in the spring before seeds germinate.

The advantage of this method lies in eliminating the timing of chemical application as an important factor in the results obtained. Good results can be expected as long as the material is in the soil well ahead of germination and as long as it has enough residual or lasting effect to cover most of the summer.

A serious disadvantage is that some of the chemicals used may accumulate and remain concentrated in the soil for periods long enough to cause injury to the basic lawn grasses. Also, where your turf is thin, over-seeding with desirable grasses may be unsuccessful. This is because the chemicals used for crabgrass control to date

TABLE I. Crabgrass control from chemical crabgrass preventers applied before seedling establishment, 1960.

Material	Av. No. crabgrass plants per sq. ft.	
	Location 1	Location 2
No treatment	17.8	7.8
Arsenic A	6.0	0.7
Arsenic B	6.0	0.5
Arsenic C	4.0	0.7
Chlordane	2.2	3.7
Dacthal	0.5	0.9
Zytron	0.0	0.5

Arsenic A, B and C, respectively, were Pax (manufactured by Pax Co. of Kelly-Western Seed), No Crab (produced by Amchem Products, Inc.) and Granular Calcium Arsenate (formulated by Allied Chemical Co.). Chlordane was Halts (formulated by O. M. Scott). Dacthal is manufactured by Diamond Alkali Co. and is being marketed by Swift and Co. as Rid and VitoGro Crabgrass Preventer. Zytron is manufactured by Dow Chemical Co. and will be marketed as Dow Crabgrass Killer.

show little selectivity between crabgrass seed and lawn grass seed.

Our tests: Tests at Iowa State over the past 2 years have shown several chemicals to be effective in preventing crabgrass seed germination and seedling establishment. These include various arsenic formulations (arsenate of lead, arsenous oxide, tricalcium arsenate), chlordane, Dacthal and Zytron. We applied several commercial products containing these to lawn turf according to manufacturers' directions. Statistical analysis of the results of these tests has led to the following conclusions (see table 1):

- All four materials—arsenic, chlordane, Dacthal and Zytron—resulted in significant reduction of crabgrass plants in comparison with nontreated plots. Where more than one crabgrass plant per square foot remained, however, we didn't consider crabgrass control as satisfactory.

- Dacthal and Zytron (granular formulations) resulted in better crabgrass control than chlordane or the materials containing arsenic. Dacthal and Zytron were equally effective in this regard. Results from the use of these two new chemicals were more consistent at different locations than the results from the other materials. An average of less than one crabgrass plant per square foot was left in treated areas, and this was considered to be satisfactory crabgrass control.

- Chlordane and the materials containing arsenic weren't consistent in performance. At one location, the arsenic compounds gave very poor control (leaving 4-6 crabgrass plants per square foot), while chlordane gave fair control (2.2 plants per square foot remaining). At another location, the arsenic materials left only 0.5-0.7 plants per square foot, while chlordane left 3.7. It's this inconsistency in performance that makes these chemicals less than ideal for crabgrass control. The inconsistencies are difficult to explain—differences in the complex soil environment from one location to another may be involved. But the trouble is that these in-

consistencies may occur on home lawns just as in our plot tests.

- The compounds containing arsenic produced slight injury to bluegrass turf. Injury varied from discoloration of foliage to a slight burning and wilting of the plants early in the season. Chlordane, Dacthal and Zytron, however, resulted in no injury to lawn grasses at the rates used.

Residual effects: We checked on the residual effects of chlordane and arsenic-containing materials by observing the degree of crabgrass reinfestation the follow-

lawn grasses. (2) Reseed thin spots in fall and early spring to assure a uniform coverage of lawn grasses. (3) Raise the cutting height to 2 inches from late April through early summer or for as long as crabgrass is germinating. (4) Don't water your lawn too frequently but soak it well when you do water; then let the *surface* dry out and remain dry as long as possible between waterings. (5) In late spring, apply lawn fertilizer only where the turf isn't thin and will respond by maintaining a thick, vigorous growth.



When crabgrass plants mature, they form coarse clumps that can ruin bluegrass lawns by competing for moisture and nutrients.

ing year with no additional treatment. Less crabgrass came back into the plots previously treated with arsenic than in the plots that had been treated with chlordane. Both materials were about equally effective in controlling crabgrass in the year of treatment, but the arsenic residual was considerably more effective in the second year. The trouble in this case, however, is that the residual effect of arsenic is more likely than chlordane to cause injury to bluegrass and red fescue turfs.

Our Suggestions . . .

For best results in over-all crabgrass control, we suggest a combination of cultural and chemical control practices.

Cultural Control: (1) Fertilize your lawn in fall and early spring to encourage vigorous growth of

Chemical Control: Use one *or* the other of the following methods.

(1) Apply a chemical crabgrass preventer to your turf in March or early April. Carefully follow the manufacturer's directions. The active ingredients, Zytron and Dacthal, have given very good results in our tests; the arsenic formulations and chlordane have given fair to good, but inconsistent, results in our tests at Iowa State.

(2) Watch for crabgrass germination from late April through midsummer. Whenever you see crabgrass seedlings, make an application of P.M.A., D.M.A. or A.M.A. Use only one and apply it carefully according to the manufacturer's directions. Properly timed repeat applications are necessary for good control.