

The greens are fertilized three times in the spring and twice in the fall. I apply the equivalent of one pound of nitrogen (mostly organic nitrogen) each month during the spring and fall. These applications are supplemented with light rates of ammonium sulphate when I feel it necessary.

A good preventive fungicide program is important especially in the maintenance of bentgrass putting greens in our region. I prefer to take preventive measures as I feel that anything that I can do to prevent spore formation will be of decided value in combating diseases.

The members at the Chattanooga Golf and Country Club are well pleased with the bentgrass putting surfaces. Since the bentgrass greens have been open for play, we have had an increase in membership

and guest players at Chattanooga. Now that our members have tasted bentgrass putting surfaces, they vow that they will never go back to bermuda-ryegrass putting-green turf at Chattanooga.

EDITORS' NOTE: *Mr. McKay has been a golf professional, golf course architect, consultant and golf-course superintendent for thirty years. In that time he has built 120 bentgrass putting greens in the South. Ten of these years were devoted to work in Louisville, Ky., where he designed and built the Shawnee Country Club, rebuilt the Cherokee Country Club, the Crescent Hill Country Club, the Audubon Country Club and the L. & N. courses. He then moved to Charleston, W. Va., where he designed and built the Meadow Brook Golf Course and rebuilt the greens at the Edgewood Country Club. Later he moved to Knoxville, Tenn., and worked on the greens at the Holston Hills Country Club, rebuilt the greens at the Cherokee Country Club, and rebuilt the greens at the Chattanooga Golf and Country Club, where he is now employed.*

CHINCH BUG CONTROL

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There is perhaps no other insect of national distribution which is more injurious to turf than the hairy chinch bug (*Blissus leucopterus say.*)

The insect is apparently native to tropical America. It has migrated northward up the Atlantic Coast, the Mississippi Valley and the Pacific Coast and is now found everywhere south of the St. Lawrence River and the Great Lakes. It also extends into the Dakotas, southern Canada and the eastern slope of the Rocky Mountains to Texas. Reports of its presence in areas of the Pacific Coast states are current.

Altitude up to 3,000 feet appears to be no barrier to its survival. When surface temperatures range between 75° F. and 80° F. the insects may, when present, be observed and collected. This insect, obviously of tropical origin, appears to survive the winter as adults only in some areas. There are reports, however, of successful overwintering of immature indi-

viduals during mild seasons in the Northeast.

Winter is passed in protected places, such as under quantities of fallen leaves, in piles of discarded plant material, fence rows, tufts of heavy grass and in dense thatch which has been accumulating in well-kept turf areas for a few or a number of years.

In the spring, in most years, the bugs leave their winter quarters when the temperature is about 70° F., which for the most part may not occur until May. This year, however, in Connecticut an exception to the rule developed.

Investigations of a report of serious and undetermined injury to turf on an athletic field in the vicinity of New Ha-

NEW SUBSCRIBERS TO GREEN SECTION SERVICE

Barteldes Seed Co., Denver, Colo.
Hodges & Sons, Julesburg, Colo.
Lappala, Dan L., Cook, Minn.

ven during early April revealed the presence of hordes of adult chinch bugs damaging the current season's growth.

Eggs for the first of the season's several broods are laid by the hundreds on the ground at the base of the grass plants or on the roots just below the surface, the process continuing for about a month. After a week or two the eggs hatch into small, very active bugs, reddish or yellow with orange tinge, with a band of white on the back just behind the wing pads. They become dark as they grow older and on reaching the adult stage acquire full-sized wings.

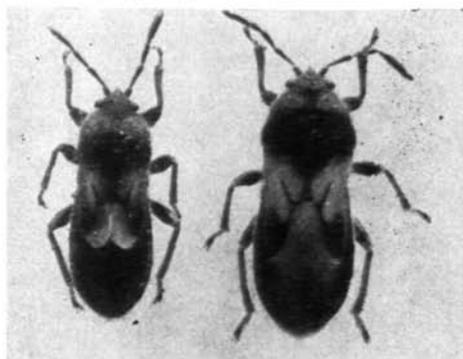
Chinch bugs in all stages are dependent for their food supply on the sap of growing grass plants. Consequently, during dry years they may multiply and spread rapidly enough to become a major pest of turf in golf courses, parks, home lawns, cemeteries, athletic fields and so forth. Irregular, reddish-brown areas begin to appear and multiply until the entire turf area may become involved in infestation. By autumn almost all of the grass area may have been killed, leaving only crabgrass, weeds and clover which appear to be less desirable food plants. Sun-drenched turf in protected places may be more seriously injured than grass in semi-shade.

Chinch bugs are particularly affected by weather conditions, dry weather being favorable and wet weather unfavorable. Dry weather appears to induce migration, and a succession of several dry years favors a large increase in numbers and consequently in injury. They frequently injure bentgrass and young bluegrass, as well as old stands of bluegrass and fescue, before their presence is realized. Wet weather in early summer, when the young chinch bugs are developing, may reduce their numbers.

The presence of the insect may be detected by examining the grass at the surface of the ground. The small (1/5 inch to 1/6 inch in length) black, fast-moving adults, with white wings, will be seen scurrying about in an effort to conceal

themselves. The smaller, immature stages may be seen wherever the infestation is severe.

Control of the chinch bug in the past was undertaken in several ways. Eight years ago DDT was shown to be effective for the purpose. It would appear, however, that both Dinitro-*o*-cresol and Sabadilla are faster acting and more efficient. Rather heavy applications of DDT dust were required, and adult chinch bugs seemed to be more susceptible to the insecticide than the nymphs. Finely ground tobacco dust with a nicotine content of not less than one per cent, or derris or cube dust containing 0.5 per cent to 1.0 per cent rotenone was used with varying degrees of success. Several



Conn. Agricultural Experiment Station photo

Short and long winged chinch bug adults (*Blissus leucopterus say*) enlarged approximately sixteen times.

of these materials had the disadvantage of washing off easily with rain, and repeat treatments were often necessary. Some of the newer insecticides, such as Chlordane, Aldrin, Dieldrin and DDT, do not have this drawback and will give excellent control of chinch bug.

When the grass is kept closely clipped, injury by chinch bug may not be too severe. However, in the event damage begins to develop, one of the chlorinated hydrocarbon insecticides mentioned previously (Chlordane, Aldrin, Dieldrin or DDT) should be employed to destroy the population. No matter which material is

used, the grass should be cut short before application.

Chlordane

Chlordane applied to an infested turf as a 5 per cent dust at the rate of 5 pounds to each 1,000 square feet or as 48 per cent emulsion applied at the rate of 6 ounces in 1.5 gallons of water to each 1,000 square feet, will destroy both adult and immature bugs within twenty-four hours or less. Its residual action in preventing reinfestation assures complete protection for at least from two to three months. Since chinch bugs become active in late spring and early summer, a treatment applied on July 1 will give protection for the rest of the season.

Aldrin and Dieldrin may be used as 2.5 per cent dusts at the rate of 5 pounds to 1,000 square feet or as 25 per cent emulsions, applied to infested turf at the rate of 4 ounces in 1.5 gallons of water to 1,000 square feet.

DDT

DDT will not destroy chinch bugs nearly so fast and completely as will Chlordane. In many instances the status of a treated population appears to be virtually the same twenty-four hours after treatment as before. As the infestation gradually declines, many adults apparently remain normally active for days. Actually, from one to two weeks are required in midsummer for complete mortality of the population, and reinfestation begins to appear in about seven to eight weeks subsequent to treatment. For best results, DDT may be applied to an infested turf as a 10 per cent dust at the rate of 5 pounds to 6 pounds to 1,000 square feet.

Methods of Application

Any of the insecticides mentioned above may be applied as taken from the package or they may be combined with sand or fertilizer as a diluent, thus providing a greater bulk of material to

achieve a more even and thorough distribution.

When large turf areas, such as golf-course fairways, are to be treated, a mobile hydraulic sprayer, having a tank capacity of 50 gallons or more, may be used. To each 50 gallons of water an emulsion of either Chlordane, Aldrin or Dieldrin or DDT should be added so as to obtain 8 pounds to 10 pounds of technical insecticide to 50 gallons of water to the acre. A spray boom consisting of a series of nozzles (10 or more), spaced 18 inches apart, should be fastened to the rear of the spray truck at a height of about 30 inches from the ground and connected with the sprayer.

When the spray nozzles with fine orifices are used on a boom at 18-inch intervals and the rate at which the sprayer is drawn over the ground is carefully to 50 gallons of finished spray material should be sufficient to treat one acre of chinch bug infested turf.

COMING EVENTS

- May 18-19 Turf Conference, Southern Turf Association, Chickasaw Country Club, Memphis, Tenn. J. E. Hamner, Superintendent, Memphis Country Club, Memphis, Tenn., general chairman.
- June 8: Turf Field Day, Central Plains Turf Foundation, Wichita, Kan.
- August 3: Field Day Purdue University, West Lafayette, Ind. W. H. Daniel.
- August 10: Field Day, Texas Turf Association, City Auditorium, Wichita Falls, Texas. A. B. La Gasse, Director of Parks and Recreation, Wichita Falls, Texas, in charge.
- August 11: Field Day, Rutgers University, New Brunswick, N. J. Ralph E. Engel.
- August 19-20: 22nd Annual Greenkeepers Turf Field Days, University of Rhode Island, Kingston, R. I. J. A. De France.
- September 8-9: Turf Field Day, Pennsylvania State College, State College, Pa. H. B. Musser. (Field day starts at noon September 8 and ends at noon September 9.)
- October 21-22: 4th Annual Central Plains Turf Foundation Turf Conference, Manhattan, Kan. William F. Pickett.
- November 16-20: American Society of Agronomy Meetings, Dallas, Texas, L. G. Monthey.