to $268.00. Maintenance of the air-cooled motor was $84.00.

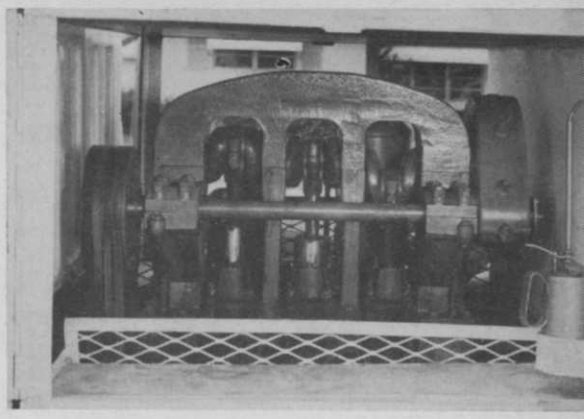
By eliminating the air-cooled motor and going to power take-off, (see W&T, July '63, p. W-8) and using a larger, slow-speed pump, our maintenance cost for the first 10 months has amounted to exactly 8 cents, which was the replacement of a cap bolt on the filter, which really has nothing to do with the pump. Bear in mind that this unit is working 6 days a week and so far as we can see is still in perfect working order.

There is one other cost factor that is most important: we find our gas consumption is approximately 4 gallons less per day doing the same amount of work. Remember, however, that this is brought about by installing a larger GPM pump in the beginning. If the pump were smaller, then the RPM would have to be faster; thus, gas consumption would naturally be higher.

We estimate our gasoline bill is reduced over $300.00 per year on each unit by the use of a larger and slower speed pump. It must also follow that a pump that is working only half of its rated capacity will last longer and require far less repair and maintenance.

There are many factors that must be considered in building a large spray truck, such as maneuverability, balance, safety, and appearance. It was easy to figure out the weight and balance factor and come up with the right size truck and the correct cab-to-axle measurement. We discovered we could not use the "cab over" type of truck, because this variety places too much of the weight on the rear axle and causes the front end to lift when loaded. Also, it is murder on rear springs, tires, universal joints, and clutch.

Care must be taken on the installation of the shafting, for the power take-off unit pillow blocks must be spaced fairly close together in order to prevent whip. Further, it is advisable to install the best that money can buy; and to avoid real trouble, these blocks must be lubricated once a week. On the average power take-off installation there will be only 7 places to grease. This operation will take a man approximately 5 minutes to do a complete lubrication. The alignment of the shaft and all shives must be perfect unless one wants to replace belts constantly. A little extra care at this point will pay off in longer belt life. Here again we use 4-B belts where, according to the experts, 3 will do. On the truck, we install 900x20 rear tires and 8.25 x20 front tires. We find these sizes give us longer tire life. Having an alternator on the truck is also a must due to the fact that the pumping is done at a speed comparable to idling speed.



Pump is mounted forward and low for easy maintenance. Fire hydrant attachment and meter are on opposite side of this same section.

Operator can add chemical to the lower tank with ease and speed, as this sprayman demonstrates.

Include Ample Baffles in Tank

Other important factors include ample baffles in the upper water tank. We divide the upper tank into 8 compartments, also utilizing the baffles to stiffen the sides, which prevents any wavy side condition. Our filling pipe is 2″, which, after entering the tank, runs up to within 2″ of the top. A 2½″ overflow pipe is then installed, which runs from below the tank up to within 2″ of the filling pipe. This supplies an "air gap" of 2″, thus preventing any syphoning action back into the fire hydrant. This syphoning action has happened; for example — a spray truck was filling at a fire hydrant when a fire truck hooked on to the same line several blocks away and actually drew from the spray tank.

Another important factor to remember is that in mounting the tank, it is a *must* to have the upper tank resting on wood. This support must be so constructed that the tank can "work." If mounted steel to steel and welded down, leaks will surely develop. In the case of some of our tanks mounted in this manner, there were splits from top to bottom.

In the beginning we worried about what coating to apply to the inside of the tank. We tried all the commercial coatings, including epoxy, and found them

Convenient storage tanks in the rear hold adequate supply of herbicides, insecticides, fertilizers, etc.

all to be unsatisfactory. In the end we found that one good coat of red lead does the job better than anything else. However, the steel must be treated first with "Metal Prep"; then once each month thereafter one quart of Toxaphene should be added to the upper tank, which keeps an oil film on the tank and prevents rusting.

The signal lights on the truck are so arranged that while the truck is pumping, the turning lights on the side and the rear can be left on and flashing.

Holds Enough Chemical for Weeks

The rear compartment can hold enough chemical to operate for several weeks if necessary. This compartment is kept locked when the operator is not present. The quick-fill valve is also located inside the locked compartment to prevent anyone from opening it and causing the "drop tank" to overflow. The "drop tank" is equipped with a locking latch so that the truck can be parked in complete safety.

We are constantly working to improve our trucks. Our next model will have a power reel, and the chemicals will be put into compartments from which they will be piped into a measuring chamber and from there into the "drop tank." Thus the operator will not handle the chemical at any time except when the chemical storage compartments are pumped full which is approximately once a week. We are certain that as time goes by we will think of many more improvements, and as we do they will be incorporated into our models. Our trucks are giving us a great savings in maintenance, and there is no waste of material since operators mix the "drop tank" for each lawn on an individual basis.

Dutch Elm Disease: Cause, Precautions

Dutch elm disease, one of several wilt diseases with similar symptoms that attack elms, has no known cure today. It is possible, however, to reduce losses by taking adequate precautions.

Usual symptoms of the disease are a wilting and yellowing or drying of foliage, usually followed immediately by defoliation and death of the affected branches. Although Dutch elm disease commonly appears on one or several branches and then spreads to other portions of the crown, the entire tree may suddenly develop disease symptoms.

A brown discoloration in the water-conduction vessels of the wood develops in all infected trees. In early spring this may be seen as brown streaks in the wood layer just under the bark of diseased branches.

Principal carriers of the Dutch elm disease fungus are two elm bark beetles: the smaller European elm bark beetle, by far the most important of the two, and the native elm bark beetle.

Habits of European Bark Beetle

European bark beetle, chief carrier of the fungus, will attack all species of elm, and plants of some closely related genera. Feeding attacks by adults are made only in living elm trees, usually in one- or two-year old twig crotches. Although adults do most feeding near their birthplace, they have been found feeding more than two miles from breeding areas.

Bark beetle feeding during the spring and early summer is most likely to result in a severe case of Dutch elm disease. Late season feeding, however, usually results in very localized infections that seldom cause serious damage to the tree.

Beetles Prefer Dying Trees

Dead or dying elm material is preferred for broods of young, although it is not uncommon for beetles to make so many attempts to breed in certain weakened but living trees that the trees eventually die and broods of the insect are successfully established.

If the fungus is established in dead or dying trees or in cut wood used by the bark beetles for breeding places, the entire generation may contact spores of the fungus on their bodies and then introduce Dutch elm disease into living trees.

Once the disease does appear in an area where the bark beetles are well established, it increases at an extremely rapid rate unless steps are taken to control it.

No cure for the Dutch elm disease is available yet. Two precautions that should be taken to curb possible loses are:

(1) Eliminate material the beetles use for breeding. Remove living elms severely weakened by drought, dead or dying elm trees, and any broken limbs or any recently cut wood. This material should be burned or the bark surfaces thoroughly wet with an insecticidal spray.

(2) Spray all living elm trees in the spring and early summer with a large gallonage of DDT or methoxychlor to prevent or reduce feeding by beetles in living elm trees.

Sanitation a Must For Plant Disease Control, Agman Notes

Contract applicators cannot keep the spread of plant diseases to a minimum unless sanitation becomes a regular practice, Dr. R. E. Partyka, plant pathologist at Ohio State University Extension Service, Wooster, points out.

Dr. Partyka recommends disinfecting tools immediately after they are used. One suggested method is to soak them for a few minutes in a crock containing 1 gallon of commercial formaldehyde in 18 gallons of water. "Methyl bromide can be used in a small, confined space," Dr. Partyka notes.

Clothing, and especially shoes, may carry an infestation from one lawn to another, he cautions CAs, and it is best to change, or take some other precaution, before moving on to another operation.

Equipment, such as sprayers, should be washed in 70% alcohol or chemically treated, whenever they are used, Dr. Partyka concludes.

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EASY TO USE—Dyrene is a 50% wettable powder that provides a good suspension in water and is suitable for use in all common types of spray equipment. The formulation is dyed green to blend with the turf and eliminate the unsightly appearance of spray deposits on treated areas. Once dried, the dye does not stain shoes or fabrics. Dyrene will not harm spray equipment, clog nozzles or corrode metal parts of the sprayer.

ERADICANT OR PREVENTATIVE—Under normal weather conditions, Dyrene should be applied at the rate of 4 oz. per 1,000 sq. ft. every 7-10 days. During weather particularly favorable for disease, such as high temperature and humidity, Dyrene may be applied more frequently (5-7 day) or at higher dosages (6-8 ozs. per 1,000 sq. ft.) to keep disease under control with no injury to fine turf grasses. It is common for golf course and park superintendents on a Dyrene program to use 3-4 ozs. per 1,000 sq. ft. of turf on a 12-14 day schedule. This has resulted in disease-free turf all season. When using Dyrene strictly as an eradicant, use 6-8 ozs. per 1,000 sq. ft. for best results. For complete instructions read the label or send for folder DY7.

4728 B

DEXON, another turf product of Chemagro Corporation, is amazingly effective against pythium. Even in trouble areas along the southeast coast, Dexon gives positive control. Completely compatible with Dyrene, Dexon and Dyrene may be used in combination.

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Tritac: New Weapon for Weed Control

By L. S. WHITCOMB
Market Research Manager
United States Borax & Chemical Corporation,
Los Angeles, California

DEEP-ROOTED perennial weeds, which have in the past been resistant to low-cost control measures, face another potent weapon as the result of the development of a unique new chemical.

Called Tritac, the new herbicide is a synthesized organic material, a product of research and another example of science's ability to fashion effective new tools from molecular building blocks. Originally synthesized in the laboratories of Hooker Chemical Corporation of Niagara Falls, N.Y., the product was later proved effective in extensive field tests conducted by Hooker and United States Borax & Chemical Corporation of Los Angeles, Calif.

Chemically known as 2,3,6-trichlorobenzyloxypropanol, the chemical weedkiller finds its most economical and practical application in the control of perennial weeds considered noxious by agriculture. Although it is designed for spray application, the primary herbicidal effect is through the root systems. Conditions enhancing movement into the soil, such as rainfall and porous soil, substantially increase the speed of weed kill. Volatility studies conducted according to the procedure described in the *Journal of the Association of Official Agricultural Chemists*, Vol. 43, No. 2, 1960, shows Tritac to be nonvolatile.

Tests Show Economical Control Of Herbacious Perennials

In field tests completed over a two-year period by Hooker and U.S. Borax, Tritac was applied in various concentrations on plots established in 15 states. Testing was carried out according to major market-potential areas. Results of the tests indicated that the new product will provide the most economical method yet developed for the chemical control of such deep-rooted herbacious perennial weeds as bindweed, Canada thistle, Russian knapweed, leafy spurge, bur ragweed, and toadflax.

Commercial formulation of Tritac is a 2-pounds-per-gallon emulsifiable concentrate. The organic solvent used in the formulation makes possible the inclusion of other organic herbicides where additional weedkilling effects are desired. Tritac-D, a formulation containing 2 pounds per gallon active 2,3,6-trichlorobenzyloxypropanol and 0.2 pound 2,4-D acid per gallon will be marketed jointly by Hooker and U.S. Borax. This formulation is designed to provide foliar activity on woody plants and to prevent seeding or plant maturity when applications are made during periods of drouth and/or in areas of low rainfall.

Both Tritac-D and Tritac are designed for application in water as a coarse spray with ground equipment using low or moderate pressure. If the spray is mixed thoroughly after dilution, equipment without agitation may be used for application. A minimum of 50 gallons spray solution per acre should be used where ground cover is light. A minimum of 100 gallons spray solution is recommended where ground cover is heavy. Spray volume should be sufficient to provide uniform coverage of soil and foliage.

Effective applications of Tritac and Tritac-D may be made any time when the extent of weed infestation can be determined and when the ground is not frozen, preferably when seasonal rainfall can be expected to carry the chemical into the root zone of the soil. Fall applications are recommended. Spring applications should be made after full emergence of the weeds but before development of dense ground cover.

For control of certain deep-rooted perennial weeds such as field bindweed, Canada thistle, Russian knapweed, leafy spurge, and bur ragweed, the chemical should be applied in amounts of 4 to 8 gallons (8 to 16 pounds) per acre. For small areas, 1 to 2 pints can be mixed with 4 to 5 gallons of water to cover 1,200 square feet. To assure control of such perennials with extensive root systems, the treated area should extend 10 to 15 feet beyond the limits of visible weed growth.

At the recommended rates of application, a wide range of annual and perennial broadleaf weeds, such as ragweed, lettuce, plantain, dandelion, chicory, and bouncing bet may be controlled for a season or longer. Applications are not recommended for control of perennial grasses.

The new chemical is not selective in action and may be toxic to all types of vegetation; it may render the entire treated area totally or partially unproductive for one or more years. Care should be taken to confine the use or application to the particular area intended to be treated and to avoid its contact with lawns, trees, shrubs, crops, and other desirable plants which are not intended to be destroyed or injured. This includes precautions in treating areas which may be underlaid by roots of adjacent valuable growths. Careless application of this material, or washing by water runoff, to areas where desirable plants are growing or which will be used for later planting may result in injury to such plants. Water used to flush equipment should not be drained on or near these sensitive areas.

Tritac produces weed-free areas like the one in the center above, this article claims.

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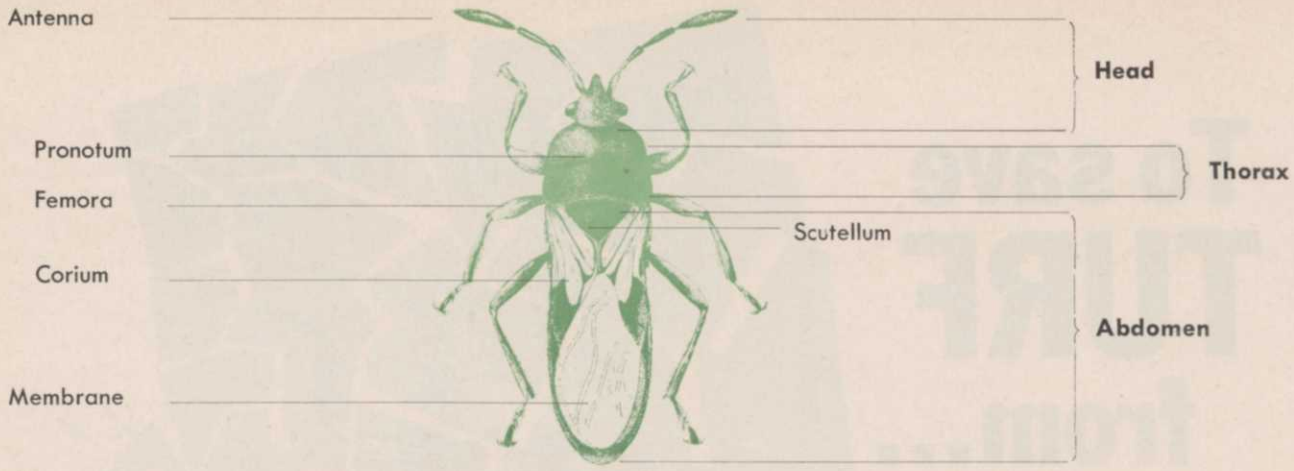

Drawing of typical chinch bug, *Blissus leucopterus* (Say); this is long-winged form.

How to Identify and Control Chinch Bugs

Results of another *Weeds and Turf* field research project

THERE is some confusion in entomological circles which directly affects the turf pest control business. The mention of "chinch bug" by a worker in one part of the country can be interpreted by two other people, in other areas, as different insects. This part of the problem is practical, the other part is academic. It seems that there is confusion whether *hirtus* and *insularis* listed below as subspecies should be subspecies or should be listed directly under *leucopterus* as a separate and distinct species.

To begin a short study of chinch bugs, it is necessary to know something about the order and family to which chinch bugs belong.

Order Hemiptera is that insect group which comprises the true bugs. "Hemiptera" refers to the front wing structure of this order. The basal portion of the wing is thickened and somewhat leathery; it is called the corium. The apical or distal portion is typically membranous as is the second set or hind wings. With only half of the front set membranous, we get the term descriptive of the order, hemiptera or "half wing." At rest insects in this order fold their wings across their backs so that an "X" pattern is suggested.

Hemiptera also have piercing, sucking mouthparts made up of fused maxillae and mandibles (2 each). There are no accessory mouthparts as are found in the mosquito. At rest the stylet is held between the legs almost parallel to the body.

Another character which helps to distinguish Hemiptera is the scutellum. This is a triangular structure directly on the back of the insect which might be described as "right between his shoulder blades." Although Hemiptera share this character with another insect group, when one finds an insect with a scutellum and divided wings, he can be certain it's a Hemipteran.

The family which concerns us here is Lygaeidae (lie-gee'-ih-dee), sometimes called the chinch bug family, not because the chinch bug is typical but because it is the most destructive member of the family. Lygaeids are generally phytophagus or plant sap suckers. They insert their beaks into tender portions of plants, usually of the grass family, and feed on juices from the insides.

Blissus is the genus of this family in which we are interested. The following characters will help identify a member of the genus *Blissus*. The slightly cone-shaped head is bent gradually downward anteriorly. The antennae are as long as the head and the pronotum combined. The pronotum covering the thorax is convex in the middle, tapering downward at the sides. The scutellum previously described does not have a ridge down the middle of it as other members of this family may have. When the adult insect is at rest, all that can be seen is a small part of the sides of the abdomen below the wings; the wings do not completely cover the abdomen but leave a slight margin showing.

Blissus leucopterus (Say) is the chinch bug of agricultural infamy. Thomas Say, a nineteenth century taxonomist, originally described this species in a genus other than *Blissus*; that is why his name appears in parentheses after the species name.

Since *Blissus leucopterus* is the representative type for chinch

Figure 1. Here is the classification of the chinch bug, showing the "subspecies" which have perplexed some researchers.

Class: Insecta

Order: Hemiptera

Family: Lygaeidae

Genus: *Blissus*

Species: *leucopterus*

Subspecies:

-hirtus?

-insularis?

bugs, let us examine the life cycle of this agricultural pest and see how it applies to residential pest control.

Life Cycle

Adults come out of hibernation in the spring when temperatures rise into the 70's. They may have spent the winter in any number of places: in clumps of perennial grasses, under leaves and litter near small woods, under hedges, in shocks of corn, under bark of trees or in cracks of fenceposts, or under boards or shingles of homes or outbuildings. These hibernating places will generally have a southwest exposure to gain benefit from the sparse winter sun. Usually large groups of adult chinch bugs will be found hibernating in one place.

Mating is thought to take place before the bugs take flight from the hibernation spot. After mating, the few adults which have survived the winter fly to the nearest field of wheat or small grain where the adult females lay several hundred eggs over a period of about 20 days.

Eggs hatch, depending on temperature, in 1 to 2 weeks or perhaps longer. The young nymphs, as they are called, are bright red and about half the size of a pinhead. They insert their mouthparts into plants where they were hatched and begin sucking the plant juices. Many feed on the same plant and this is what causes the yellow spots on grass. As the insects move outward from the area which they have killed, a circular pattern of damage is seen.

Metamorphosis is gradual; nymphs pass through 5 instars or growth stages in becoming fully winged adults. They molt 4 times. There is no pupa or resting stage in the life cycle. Nymphs look essentially like the adults except for the bright red coloration and the absence of wings.

With each successive molt, the red color diminishes until the adult color, black, is reached. Adults are ⅕ inch long and black with only slight reddish tinges around their legs. Their bodies are somewhat hairy or fuzzy. Adult wings are white (leuco-pterus means "white wing") with a black triangle on the outer margin of the front wing. This is a good point for recognition of the species.

Total maturation takes about 35 days. Egg-laying processes begin 7 to 10 days after the adult stage is reached. Females will lay second generation eggs usually on young corn plants or other grasses which may be succulent at this time.

In the southern portion of the chinch bug's range, there may be three broods of young each year; in other places only two.

There are two forms of the chinch bug *Blissus leucopterus*, a long-winged form, with wings extending over the abdomen, and a short-winged form with fully developed wings which hardly cover the abdomen. Throughout the central United States where the chinch bug is mainly an agricultural pest, the long-winged form predominates.

Blissus leucopterus has a range almost covering the entire United States. It is mainly an agricultural pest in the Mississippi, Missouri and Ohio River valleys, but it causes trouble from the Appalachians to the Rocky mountains. The

agricultural chinch bug ranges as far north as Quebec and New England and west to British Columbia; south and west to Florida, Texas and Mexico.

Although not generally found in California, Arizona, and Washington, *B. leucopterus* has been collected in those states.

With facts about *Blissus leucopterus* well in hand, we can continue to investigate the other species which are nonagricultural yet economically important and troublesome.

Hairy Chinch Bug

In the northeast sector of the United States, we find another chinch bug. It is called the hairy chinch bug. There is divided opinion whether it is a separate species or only a subspecies of *leucopterus*. Consequently two names are found in the literature describing it: *Blissus hirtus* Montandon and *Blissus leucopterus hirtus* Montd.

Color characters which attempt to distinguish *hirtus* (we shall call it simply *hirtus* because of the doubt as to its status) come from Blatchley's *Heteroptera of North America* (1926): "More robust than typical *leucopterus* with longer and denser and more erect yellowish hairs on the pronotum and sides of the abdomen. The femora are often dark brown (rather than reddish)."

Hirtus is a domestic pest, that is, it attacks lawns and golf courses rather than agricultural crops. Its feeding causes circles of yellowing and death of grasses, mainly bentgrass, in lawns.

Although found predominately in New England, the hairy chinch bug does extend its range west through New York, Pennsylvania, Ohio, and even as far west as Iowa. *Hirtus* has also been taken in Minnesota.

Just as chinch bugs (*leucopterus*) have long- and short-wing forms, long predominating, there are long- and short-wing forms for the hairy chinch bug. Short-wing forms are the most common for *hirtus*.

"At one time," explains Professor J. B. Polivka of the Ohio Agricultural Experiment Station at Wooster, "*hirtus* was considered a distinct species because 50% of the specimens taken were the short-wing forms." This is thought by some to be a criterion for elevating it to species rank.

Short-wing forms are those with smaller, yet mature, wings. These forms do not appear to have large scale migrations from one food plant to another as is commonly observed for the long-wing form.

Lawn Chinch Bug

A third chinch bug exists in the southern parts of the United States. Opinion here is also divided as to whether the lawn chinch bug, as it is commonly called, should be named *Blissus leucopterus insularis* Barber or *Blissus insularis* Barber.

Insularis is described as being shorter and narrower than typical *leucopterus*. The antennae have a relatively shorter terminal segment. The pronotum is a deep velvety black, and has a prominent silvery-gray pubescence (hairiness) on the anterior portion. The overall hairiness (villosity) is shorter and sparser than *leucopterus*.

The wings appear more whitish, and the dark portions of the wings are described as being strongly

piceous (pitchy black with a reddish tinge). The femora are frequently castaneous (chestnutty) in color.

The lawn chinch bug is the most damaging species in Florida and in the Gulf region, according to Dr. S. H. Kerr of the University of Florida at Gainesville.

Again as with *hirtus*, the short wing-form of *insularis* predominates. This perhaps gives strength to the argument that it, too, may be a distinct species.

An unknown author refuting the idea that *insularis* is a species has said, "*Insularis* is but a color form of *leucopterus* found in sandy regions. Specimens of typical form from sandy places in Indiana have the front half of the pronotum more silvery-gray than those from nonsandy areas."

The lawn chinch bug is the only major enemy of St. Augustine grass, upon which *insularis* feeds. Many lawns in Florida and Gulf States where St. Augustine is a favorite grass have been laid to waste by lawn chinch bug damage.

In some areas of very dry land where St. Augustine adapts, its cultivation as a lawn grass has been abandoned because of chinch bug ravages.

It appears as though the subspecies or species *hirtus* and *insularis* are the only nonagricultural chinch bugs. *Blissus leucopterus* is not, from our reports, a domestic pest. It is not reported as a pest of home lawns and golf courses.

Professor Harold Gunderson, of Iowa States University at Ames, told *Weeds and Turf* that it is apparently "the abundance of lush pasture grasses, small grains, and corn (in Iowa) which is responsible for the failure of the chinch bug to attack lawns."

Genetics May Solve Mystery

Apparently superficial coloration studies which originally determined species and subspecies are not sufficient to overcome this identity problem. At present, work is being done at the Connecticut Agricultural Experiment Station by David E. Leonard which may determine through genetic breeding trials whether or not *hirtus* and *insularis* are distinct species, or subspecies of *leucopterus*.

The criterion which Leonard uses is the definition of a species, an animal which will reproduce its own kind. Chinch bugs are being bred to see if they will produce fertile offspring. Sometimes interbreeding will produce offspring, but these offspring of two different species are sterile and will not reproduce themselves.

If, for instance, *hirtus* is only a subspecies of *leucopterus*, a mixed pair will successfully breed and the offspring will be able to reproduce. If *hirtus* is separate and distinct, offspring may be produced, but these will be sterile.

To understand this more clearly, consider the fact that the domestic dog is *Canis domesticus*, regardless of the variety on pedigree papers. Domestic dog varieties will interbreed and the offspring can reproduce.

To demonstrate sterile offspring, we look to the cross between a horse and an ass, two different species. The offspring in this case, a mule, has characters of each parent species, but will not reproduce mules because mules are sterile.

The status of chinch bugs awaits results of these tests at Connecticut.

Damage

Chinch bug damage, whether in the Northeast or South, will be similar except for the species of grasses attacked.

When chinch bugs hatch, the nymphs begin feeding around the bases of the grasses on which eggs were laid. Their feeding causes the grass blades to become yellow because water is being withheld from the leaves above.

The grass dies and turns brown and the nymphs move to adjacent plants away from the central dead area. Their outward movement causes large dead circles in lawns unless measures are taken to stop them. Sometimes infestations are blamed on grass diseases and other disorders, because the nymphs are so small they may not be noticed right away.

An easy test to detect the presence of chinch bugs uses a large tin can which has both ends removed. Push one end about half way into the grass around edge of an area of suspected infestation. Fill the can with water and wait five minutes.

Young chinch bugs, if they are there, will soon float to the top of the water. Positive identification can then be made.

Hemiptera possess odor organs which cause vile smells when the bugs are crushed. An experienced contract applicator can detect infestations by simply walking across lawns and keeping his nose alert for the odor.

Although the hairy chinch bug may be found on many kinds of grass, the most probable, and the one which receives the most damage, is bentgrass.

The lawn chinch bug is found usually on St. Augustine grass, but has been recorded feeding on other grasses such as Bermuda and centipede. St. Augustine can grow on dry sandy areas where chinch bug development is favored and the grass resistance is lowered.

Biological Control

Greatest chinch bug infestations occur during hot dry spells. More humid weather fosters development of a white fungus called *Beauveria globulifera* which decimates populations during damp conditions. This fungus occurs naturally and is not commercially produced as is the milky disease fungus which controls the Japanese beetle.

A small wasp described as a "speck in one's hand" has been credited with parasitizing 30 to 50% of chinch bug eggs in a single area which was tested. This wasp

Confusion among some entomologists and lawn spraymen over the classification of certain chinch bug variants led the *Weeds and Turf* technical staff to prepare this comprehensive article on chinch bug control. Several agricultural experiment stations cooperated in the compilation of this research data.