
Chinch Bugs as a Pest of Corn and Grain Sorghum



Introduction

The chinch bug *Blissus leucopterus leucopterus* (Say) is commonly found in all areas of Louisiana feeding on a variety of grass crops and wild grasses. In some years it is an economic pest on corn and grain sorghum, especially if high populations migrate into these crops in the early spring when plants are young. Chinch bugs damage crops by removing plant sap with their piercing and sucking mouthparts. Their damage is often compounded by dry weather conditions. To prevent stand loss and yield reductions, it is important to understand the biology and behavior of this pest as it relates to corn and grain sorghum.

Identification

The chinch bug is a small true bug, approximately 1/6 to 1/5 inch in length. Its body is generally black with white front wings that have a black spot near the middle of each outer margin. When viewed from above, adults appear to have a white X or a white hourglass on the back. The immature stage of the chinch bug is a nymph which generally resembles the adult except that it is smaller and lacks wings. The very young nymphs have reddish bodies with a white band across the back. After about the third molt, the nymphs become darker until they are almost black. Chinch bug eggs are small, cylindrical, yellow, and very rarely seen.



1/6- 1/5 inch in length

Figure 1. Adult chinch bugs



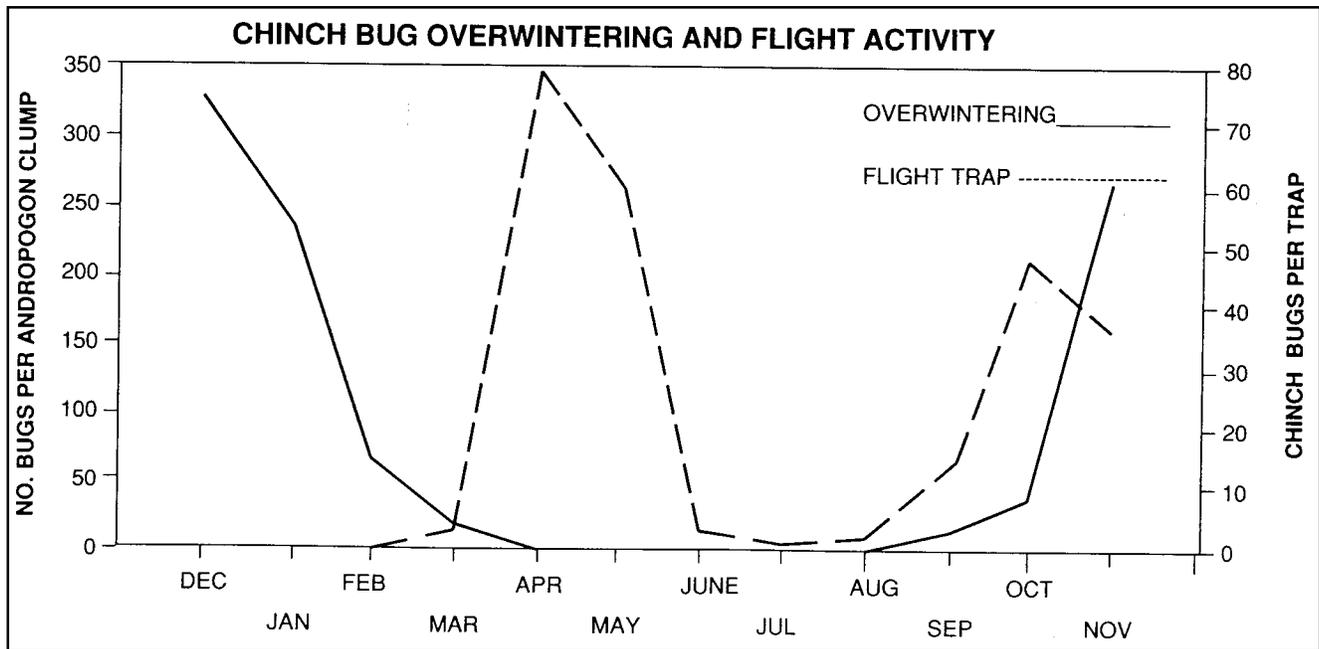
Figure 2. Chinch bug adult, nymphs and eggs.

Biology

Adult female chinch bugs normally lay their eggs on grass plants, either behind the sheaths of lower leaves or on the roots. Each female will lay 200 or more eggs during a three to-four-week period. The eggs will then hatch in one or two weeks into the nymphal or immature stage. Nymphs will undergo five molts during a 30-to 40-day period before they become adults. Temperature can have a significant impact on nymphal development. For example, at higher temperatures development occurs more rapidly. Both adult and nymph have piercing and sucking mouthparts, thus they damage grass crops in a similar manner.

Chinch bugs are active in grass crops and pastures during the late spring, summer and fall. They overwinter in clumps of bunch grasses, the most common of which is *Andropogon spp.* Movement of chinch bugs into their overwintering habitat begins in September and peaks in October (Figure 3). The overwintered populations in *Andropogon* peaks in November or December. Winter mortality occurs from January until emergence is completed in the spring. The survival of the overwintered population usually ranges between 10% and 25%. Movement of chinch bugs from their overwintering sites usually begins in March or April, depending on the temperatures. Chinch bugs are most likely to exit overwintering sites on bright, sunny spring days after the temperature has exceeded 26.7 C (80F) for several days.

Figure 3.



Variable spring weather conditions also cause yearly variations in corn planting dates. The recommended corn planting period for Louisiana is rather wide, but the actual windows of opportunity to plant corn are usually narrow and inconsistent from one year to the next. Corn planted in March should be taller and thus better able to tolerate chinch bug damage, if migration occurs later in the spring. Corn planted in April may actually escape the major chinch bug migration if it occurs in the early spring. The environmental growing conditions that follow crop emergence are often more important than the planting date itself. Unfavorable weather conditions result in non-vigorous seedling plants that grow off slowly. Plants in this condition are always highly susceptible to chinch bug damage, and their window of susceptibility is always wider.

Contrary to the sequence of events in the Midwest, chinch bugs may migrate directly into Louisiana corn from their overwintering habitats. Here chinch bugs do not necessarily move to wheat first and then to corn. However, migration into grain sorghum may come from other crops or wild host plants because this crop is usually planted later in the spring following the corn planting period.

Further research indicates that corn planted in minimum tillage systems is more likely to have chinch bug problems than is corn planted with conventional tillage. This is caused, in part, by the presence of plant debris in no-till fields. The debris can provide additional shelter and habitat for chinch bugs that have moved into the corn from overwintering. The presence of wild grasses on no-till fields until shortly before planting can be another important factor. These grasses may attract and support overwintered chinch bugs until the natural vegetation is destroyed with a herbi-

cide. If planting follows soon afterward, then chinch bugs are still present in the field to infest the emerging corn.

Chinch bugs can also infest both crops during late season, but heavy populations are required to cause damage symptoms. Although these infestation levels are rare, they occasionally develop along field margins, field corners or isolated spots within the field.

Damage

Chinch bugs damage both corn and grain sorghum by sucking out plant sap with their beaks. This often causes a reddening effect in areas of the stem and leaves where feeding is intense. However, the red discoloration, especially on the lower leaves, can be caused by factors other than chinch bug feeding. If feeding continues, plants will eventually wilt and become stunted compared to neighboring plants that are not infested. Heavily infested plants may eventually die if the feeding persists.



Figure 4. Young grain sorghum plant with early season chinch bug damage.

Chinch bug damage can affect a corn or grain sorghum plant in two ways. First, chinch bug feeding can kill small plants during early season. This, in turn, may cause a stand loss or reduction in plant populations below the optimum level. Consequently, the grower may have to replant the field, possibly to another crop. The second type of damage occurs when plants are stunted by chinch bug feeding, but do not die. This often results in a yield reduction, even when plants recover and appear normal at the end of the season.



Figure 5. Stand loss in grain sorghum by chinch bug infestation.

Corn research indicates that damage in the seedling stage may ultimately result in reduced ear weight and ear length at harvest. Damaged plants may appear to recuperate, but they may not yield normally depending on the severity of early season damage. Also, plants damaged in early season are more likely to produce suckers.

The severity of chinch bug damage in corn and grain sorghum is determined by several key factors. Research and field observations indicate that young small plants, especially seedlings, are extremely susceptible to damage. The second factor is the number of chinch bugs or the size of the infestation.

Higher populations are likely to cause severe damage, especially on seedling plants. The third factor is the duration of the feeding, and the fourth is the environmental condition at the time of infestation. Chinch bug infestations are more damaging and much more difficult to control during dry weather.

Soil moisture also is a critical factor in chinch bug damage because corn or grain sorghum is already stressed. Chinch bugs compound the problem. Adequate moisture usually provides for more vigorous plants that develop rapidly, thus passing through the susceptible seedling stages in less time. Ideal growing conditions can help the crop escape chinch bug damage early in the season when damage is most likely to occur.

Scouting

Corn and grain sorghum fields should be scouted carefully during early season to detect chinch bugs before severe damage symptoms appear. If control is needed, insecticides should be applied before damage occurs to prevent stand loss or yield reduction. Begin scouting both crops soon after plant emergence.

Chinch bugs can be found almost anywhere on seedling plants, although they are usually located either behind the leaf sheaths or at the base of the plant. Sometimes it is necessary to scratch the soil surface with a knife or pencil to disturb and locate chinch bugs at the base of the plant. Under dry conditions, chinch bugs may actually be found underground feeding on the crown and roots. This is especially true on heavy clay soils, which tend to clod and crack under dry conditions. A complete plant inspection includes digging up the soil and clods around the root system. Conversely, chinch bugs will almost always be found above ground following a heavy rain that soaks the soil.

Chinch bugs are usually not evenly distributed throughout the field, especially in the early stages of an infestation. Field margins should be carefully observed, because migratory chinch bugs will often infest these areas first before spreading inward to the rest of the field. It is not unusual for one end of a field to be heavily infested while the other end is relatively clean of chinch bugs. Therefore, fields should be thoroughly scouted so that chinch bug hot spots do not go undetected.

When scouting for chinch bugs, it is important to check more than one plant because all plants may not be equally infested, even in the same area of the field. In an infested field, it is not unusual to find a heavily infested, damaged plant right next to a plant without chinch bugs. Therefore, at least five consecutive plants should be inspected at each randomly selected sampling location accurately to measure the infestation or lack of such.

Because of differences in size and vigor of seedling plants between corn and grain sorghum, each crop has its own economic threshold or time to treat. In corn, rescue treatments are necessary when five or more adult chinch bugs are found on 20% of the seedling plants—those plants less than 6 inches tall. In grain sorghum, treat when two or more chinch bugs are present on 20% of the seedling plants—those plants less than 6 inches tall. It is important to understand that 100% infested plants is not necessary to justify treatment.

Treatment of larger plants may be necessary in some instances, but this requires a decision based on the number of chinch bugs present, the size or maturity of the crop, growing conditions and damage symptoms. There is no well-defined or quantitative economic threshold for large plants in either crop. Late-season infestations normally occur in isolated areas of a field and often go unnoticed until extreme damage symptoms appear



Figure 6. Late season chinch bug foliage damage in grain sorghum.

Control

In general, there are two main approaches to control chinch bugs in corn and grain sorghum. One is the use of seed treatments and in-furrow or banded soil insecticides applied at planting. The second is the use of foliar sprays or rescue treatments after the crop emerges and if an infestation develops. The first method is preventive and the second is reactive.

Soil insecticides should be considered if there is a strong likelihood for chinch bug infestation, because this method of control is normally more effective than foliar sprays. Also, corn producers may already be using a seed treatment or soil insecticide for other soil insect pests. If this is the case, then growers should select a soil insecticide that will also control chinch bugs. (Refer to LCES Publication 2284 for current recommended insecticides.)

Recommended seed treatments and soil insecticides will normally provide effective control for about 18 days after emergence. This is usually enough protection to allow seedling plants to grow through the most susceptible growth stage without chinch bug injury. If corn and grain sorghum plants can escape early-season infestation, then the likelihood of later problems is small.

The main advantage of a soil insecticide is that it is already in place to provide continuous chemical protection from the time that the crop emerges. However, there is one disadvantage. That is, the performance of a soil insecticide is somewhat weather dependent because the material may not activate and translocate into the plant if conditions are dry. If this condition prevails, then chinch bugs may infest and damage the crop even if a soil insecticide was applied at planting. The soil insecticide may still be activated later if rainfall occurs. Too much rainfall following planting can cause the soil insecticide to leach below the root zone before it can be taken up by the plant.

Several foliar insecticides can be applied as rescue treatments for chinch bug control. (Refer to LCES Publication 2284 for current recommended insecticides.) All of these materials can be effective if you can get the insecticide to the chinch bugs. Application is the key because, in many cases, the pest will not be directly exposed to the spray. As stated above, chinch bugs are often located behind leaf sheaths or below the soil surface. Therefore, foliar insecticides should be applied with high volume, high pressure ground equipment that directs at least part of the spray to the base of the plants. If possible, apply a minimum of 20 gallons per acre of finished spray. Aerial application is not recommended.

Soil moisture is an important factor in chinch bug damage and control. Not only will soil insecticides perform better when moisture is adequate, but plant growth will be more vigorous. Crops under drought stress will succumb to chinch bug damage faster, especially in the seedling stage. Another disadvantage of dry weather is that the chinch bugs are more likely to be below ground because of the soil cracks and clods. Thus, control is difficult at best if foliar applications are needed. In some cases rainfall following a drought may actually reduce the pest population, because some of the chinch bugs are likely to be entombed beneath the soil surface.

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