Tarnished Plant Bug: *Lygus lineolaris*

Tarnished Plant Bug (TPB) is an important pest of cotton throughout Mississippi. However, it is relatively more important in the Delta Region of the state than in the Hills. TPB is considered a "key" pest of cotton because it often reaches treatable levels during the early portion of the season and insecticides applied to control these early plant bug infestations often flare populations of secondary pests, such as aphids or tobacco budworms. Before boll weevil eradication the importance of TPB as a key pest of cotton was overshadowed by the boll weevil. Due to the success of the boll weevil eradication effort and the wide spread adoption of Bt-cotton, the importance of TPB has increased significantly in recent years. Not only have boll weevils and budworm/bollworm declined in importance, but the reduction in sprays applied to control these pests resulted in less coincidental control of TPB. As a result, the number of sprays required specifically to control TPB has increased in recent years, especially in the Delta.

Biology: TPB has an extremely wide host range, and develops on most row crops, as well as a large number of weed hosts. Plants bearing large numbers of floral buds are especially preferred. This insect overwinters as diapausing adults, but, in the Mid-South, reproduction may begin in late winter on winter weeds such as henbit and curly dock. Subsequent generations are produced on spring-blooming weeds, such as fleabane and coreopsis. These spring hosts can support high densities of TPB, which are forced to migrate as these plants mature. Heavy migration into cotton fields can occur at this time, but much of this population also moves into other crops or weed hosts. TPB complete several generations per year, and heavy migration into cotton can occur at any time of the season, depending on the proximity of cotton fields to other crops or alternate hosts. Intensity and duration of movement into cotton varies considerably from year to year and appears to be related to abundance of alternate hosts and availability of flower buds on these hosts. Large numbers of TPB are often noted moving into cotton fields when dry conditions or natural senescense causes a decline in blooms on alternate hosts, or when mowing or tillage operations destroy such hosts.

The eggs are inserted into plant tissue, such as stems and petioles. Eggs hatch in approximately 8 days, and it takes approximately 17 days to complete the five nymphal instars. There is also a pre-oviposition period of approximately 8 days, and it is during this time that TPB are most likely to move from one crop to another.

Damage: TPB have piercing-sucking mouthparts. Although they will feed on vegetative plant parts, they prefer to feed on developing flower buds or immature fruit. Feeding is accompanied by the injection of salivary enzymes into the plant, which liquify and pre-digest the plant tissue.

Although pre-squaring cotton is not particularly attractive to TPB, terminals can be killed when fed upon by adults, causing a loss of apical dominance and development of numerous secondary terminals, a condition referred to as 'crazy cotton'. Feeding on small squares (approximately 1/8 inch or less) usually results in 'blasted squares' that abscise within a few days, leaving an abscission scar at the point where the square was attached to the fruiting branch. Feeding on larger squares results in damage to developing anthers. Depending on severity of damage, larger squares may abort, but more commonly remain on the plant and develop into a bloom.

Although TPBs have a strong preference for squares, they will also feed on bolls, especially during late season, when squares are less available. The severity of boll damage depends on boll age. External signs of boll damage are dull, dark colored slightly sunken lesions on the outer boll wall. Close examination of such lesions often will reveal a glossy, pin-point sized spot at the site where the boll wall was punctured. Small to medium sized bolls often contain a translucent, jelly-like material at the site where salivary enzymes have been injected into the developing boll. Bolls damaged in such a way may eventually abscise, or fail to open. On larger bolls with more developed lint, feeding by TPB rarely destroys the entire boll, but may result in damaged seed, discolored lint, and reduced weight of harvestable lint.

Yield Effects: Although excessive damage by TPB can result in yield losses or delays in maturity, the overall yield damaging potential of TPB is considerably less than that of pests such as boll weevils or budworm/bollworm. This is because cotton plants can tolerate 20 to 25% early season square-loss without suffering yield loss. Still, prolonged heavy TPB infestations can result in substantial yield reductions. In research plots, yield reductions of 15% to 55% have been documented for plants infested with one to four bugs per plant. However, these numbers are much higher than established economic thresholds. During the past ten years, estimated annual yield losses attributed to plant bugs in Mississippi cotton have ranged from 0.2% to 3.6%, with losses as high as 4.7% being reported for the Mississippi Delta.

Control: During the pre-bloom stage of cotton development, adult TPB, which are migrating from senescing spring hosts, are the primary target of control. Insecticides are recommended when scouting results indicate that populations have exceeded the economic threshold, which varies from eight to fifteen bugs per 100 sweeps, depending on week of squaring. During mid and late season, insecticide applications may be required to control mixed populations of adults and nymphs. During some years, infestations can reach 50 to 100 bugs per 100 plants, which is well in excess of the threshold of 15 bugs/100 plants. Effective control of such heavy infestations requires multiple applications of effective insecticides at five to seven day intervals. Plant bugs can be difficult to control, especially in the Delta where resistance has been documented to pyrethroid insecticides, as well as to carbamates and many organophosphates. Insecticides recommended for control of TPB are listed below.

Table 3: Insecticides Recommended for Control of Tarnished Plant Bugs.

Insecticide	Trade Name	Lbs ai/acre
Acephate	Orthene	0.25 to 0.5
Dicrotophos	Bidrin	0.4 to 0.5
Imidacloprid	Provado	0.047
Malathion ULV	Fyfanon	0.92 to 1.22
Methamidophos	Monitor	0.33 to 0.5
Oxamyl	Vydate	0.25 to 0.33
Profenofos	Curacron	0.25 to 0.5
Thiamethoxam	Centric	0.047

Source: Cotton Insect Control Guide, 2003, Publication 343, Mississippi State University Extension Service

Plant Bugs: Adult tarnished plant bugs are approximately 1/4 of an inch in length and tarnished brown in color. The small inverted triangle located in the center of the back is typical of plant bugs and other insects in this group. The sharp downward bend in the wings is a useful character in identifying tarnished plant bug adults. .

The five distinct spots on the back of the **nymph of the tarnished plant bug** are useful characters to look for in identifying this fast moving insect. Plant bugs cause damage by feeding on small squares with their piercing/sucking mouthparts