

**FIELD SURVEY TO ASSESS *LYGUS* SPP POPULATIONS  
IN OKLAHOMA AGRI-ECOSYSTEMS AND  
POTENTIAL PEST STATUS**

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**Abstract**

Sixteen plant bug species were collected across Oklahoma in field surveys conducted between June 12 and July 25, 2000. Species abundance and density varied by production region. Northern Oklahoma was the most diverse region recording 9 different species with the highest total catch followed by Southwest and West Central regions of Oklahoma respectively. *Lygus lineolaris* (Palisot) was the most abundant species caught followed by *Spanagonicus albofasciatus* (Reuter) and *Pseudatomoscelis seriatus* (Reuter). None of the species caught posed an economic threat to cotton during the sampling period. Alfalfa accounted for 38.8 % of the total number of plant bugs captured followed by cotton with 19.5 %. *Lygus lineolaris* (Palisot) was present in all three, production regions surveyed and poses the greatest threat where cotton is grown in close proximity to alfalfa.

**Introduction**

The cotton fleahopper has been a consistent pest of cotton in Oklahoma. Economic loss in Oklahoma varies annually. In the last 5 years monetary loss estimates ranged from a low of \$193,535 in 1996 to a high of \$668,173 in 1999 (Beltwide Cotton Insect Losses 1995 – 1999). Other Miridae (plant bug) species are noticed periodically in cotton but fail to reach damaging levels in traditional cotton production regions of Southwest Oklahoma.

Questions concerning the possibility of tarnished plant bug injury surfaced in 1999. These inquiries originated from new cotton production regions along the Kansas border. Climatic conditions coupled with unique cropping and production practices make this production region quite different from the traditional cotton regions in Southwest Oklahoma. Slight modifications in climate and agronomic practices could favor plant bug development in Northern Oklahoma compared to population dynamics observed in Southwest Oklahoma. A statewide *Lygus* spp. survey was designed to determine species composition and their potential to cause economic loss to cotton.

**Material and Methods**

The survey was designed to sample the cropping systems found in each production region of Oklahoma – Northern, West Central, and Southwest. Two or three counties in each production region Northern (Grant and Garfield), West Central (Custer, Kiowa, and Washita), and Southwest (Greer, Jackson, and Tillman) were sampled weekly weather permitting between June 12 and July 25, 2000. In each county, 18 fields (6 cotton and 12 other commodities) as well as each field border were sampled. Crops surveyed included alfalfa, cotton, peanuts, sorghum, soybeans, and sunflowers. One hundred sweeps were taken in each field and border (ditch). Insects were killed and placed in paper bags. County samples were sorted and a composite sample for each crop and border was sent to Don Arnold, Survey Entomologist with OSU Department of Entomology and Plant Pathology, for identification.

**Results and Discussion**

Sixteen species of plant bugs were caught and identified in 2000 (Table 1). Species abundance varied by region. The Northern region recorded the most plant bug species and highest numbers followed by Southwest and West Central regions. *Lygus lineolaris* (Palisot) was the most abundant species caught followed by *Spanagonicus albofasciatus* (Reuter) and *Pseudatomoscelis seriatus* (Reuter). These three species comprised over 60% of the species collected.

Three crops - alfalfa (38.8%), cotton (19.5%), and sorghum (3.2%) - accounted for 61.5% of the total numbers collected (Table 2). Adjacent crop borders were responsible for 30.6%; however, the order of abundance did not correspond with crop ranking. Sorghum borders accounted for 56.2% of the border collections followed by cotton borders - 28.6% and alfalfa borders - 15.2%.

During late June and early July most of the cotton grown in Oklahoma is squaring and is highly susceptible to plant bug attack. Peak catch for all regions occurred the week of June 26 and remained high through the week of July 3, 2000 (Figure 1). At this point plant bug numbers drop and remain low throughout the remainder of the sampling period.

Prior to sampling we speculated that the cotton fleahopper *Pseudatomoscelis seriatus* would be the most abundant species due to its history of infesting cotton and causing economic loss. However, the low survey density mirrored the actual cotton fleahopper infestation experienced in Oklahoma in 2000. Although *Lygus lineolaris* was the most abundant species surveyed, populations failed to reach damaging levels. However, if favorable climatic conditions exist for development *Lygus lineolaris* could possibly reach pest status. Cotton fields grown in close proximity to alfalfa have the greatest risk. A rapid build up of *Lygus lineolaris* could occur in cotton when alfalfa is cut forcing plant bugs to migrate in search of a new food source.

The key to detection of cotton fleahoppers and tarnished plant bugs is to employ proper scouting techniques. Besides terminal and plant exams, utilizing a sweep net can improve plant bug detection. Other helpful tools to assess square initiation and fruit retention are plant mapping and keeping track of heat units related to the overall growing conditions.

**Acknowledgements**

Special thanks go to Mr. Ron Coggeshall for his assistance in data analysis and to the following County Extension Agents - Scott Price, Ron Robinson, Ron Wright, Kent Orrell, Wayne Chambers, and Marty Montague for their help in field operations. This project was funded by Cotton Incorporated State Support Funds and State IPM mini-grant.

**References**

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Table 1. Miridae species collected across Oklahoma, summer 2000.

Species	Region			Total
	Southwest	Central	Northern	
<i>Lygus lineolaris</i>	3	5	105	113
<i>Spanagonicus albofasciatus</i>	16	0	37	53
<i>Polymerus basalis</i>	9	1	24	34
<i>Pseudatomoscelis seriatus</i>	4	0	29	33
<i>Adelphocoris lineolatus</i>	0	0	19	19
<i>Trigonotylus</i> sp.	0	0	19	19
<i>Chlamydatus associates</i>	1	0	17	18
<i>Trigonotylus pulcher</i>	2	0	15	17
<i>Lygus hesperus</i>	11	1	1	13
<i>Rhinacloa forticornis</i>	1	0	10	11
<i>Trigonotylus tarsalis</i>	0	0	8	8
<i>Lygus elisus</i>	2	0	0	2
<i>Ceratocapsus fuscosignatus</i>	0	0	1	1
<i>Melanotrichus coagulatus</i>	1	0	0	1
<i>Plagiognathus politus</i>	0	0	1	1
<b>Total</b>	<b>50</b>	<b>7</b>	<b>286</b>	<b>343</b>

Table 2. Crop and border preference by Miridae species surveyed across Oklahoma, summer 2000.

Regions	Total Number Plant Bug Specimens Caught <sup>1</sup>
<b>Southwest</b>	
Alfalfa	19
Cotton	13
Milo	0
<b>Border</b>	
Alfalfa	5
Cotton	5
Milo	1
<b>West Central</b>	
Alfalfa	7
<b>Northwest</b>	
Alfalfa	107
Cotton	54
Milo	11
<b>Border</b>	
Alfalfa	11
Cotton	24
Milo	57

<sup>1</sup>Top 2 species collected (number): Southwest - *L.hesp.*(10) and *P. basa* (5), West Central - *L. line.* (5), *L. hesp.* (1), and *P. basa* (1), and Northern - *L. line* (80) and *A. line.* (17).

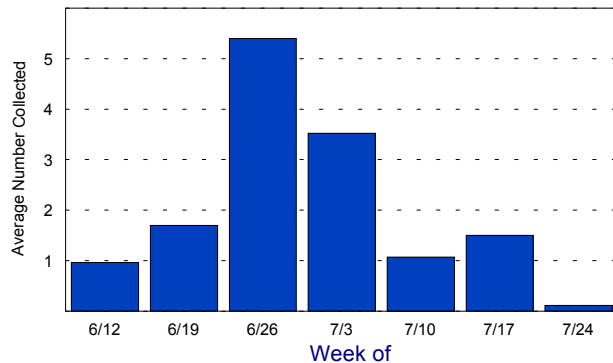


Figure 1. Seasonal collection of plant bugs across Oklahoma, Summer 2000.