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STINK BUGS – AN EMERGING PEST IN OKLAHOMA COTTON FIELDS

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Abstract

Results of a consultant survey conducted in the fall of 2001 revealed that the cotton fleahopper was the number 1 pest in the state. Bollworms remained number 2 (despite the Bollgard popularity) tying thrips in dryland situations. Stink bugs grabbed the 4th spot and cotton aphids the 5th spot. Despite the interest generated by the presence of stink bugs in Oklahoma in 2001 only 4.9% of the irrigated acres surveyed were sprayed to prevent injury. Respondents agreed that depressed cotton prices could be as detrimental to their business as the boll weevil and may eventually force them out of consulting all together.

Introduction

Oklahoma's cotton industry is starting to reap the benefits of a highly successful boll weevil eradication program. Low surviving numbers across the state reduced the number of OBWEO sprays needed to prevent in-season reproduction in 2001. As a result a large percentage of the cotton acreage received little if any insecticides during mid-to-late season. Besides the absence of boll weevils to trigger sprays, the continued popularity of Bollgard cotton (approximately 107,000 acres planted to Bt cotton in 2001) also reduced the number of pyrethroid sprays normally required to control Heliothines in conventional cotton. This insecticide-free environment allowed many new insect faces to appear in Oklahoma cotton fields in 2001. The new faces seen in 2001 included general plant feeders consisting of stink bugs (in descending order of abundance - green stink bug, conchuela stink bug and brown stink bug) and leaf footed bugs.

General plant feeders pierce immature bolls with their needle-like mouthparts and extract plant juices. This feeding produces a dark, sunken spot on both the exterior and interior of bolls and is easily confused with tarnished plant bug injury especially on small 2 to 4-day old bolls. Concerns about general feeder buildups started in late-July. I was hesitant to address general plant feeders as potential pests since stink bug phobia had surfaced across the state in previous years. Much of this phobia stemmed from Farm Press articles highlighting problems associated with stink bugs from other production regions across the United States. However, more and more inquiries coupled with a gradual and steady increase in numbers pointed to the emergence of stink bugs as a potential pest as the state shifts into the post-eradication era.

Stink bugs were featured in the Cotton Sentry Insect Newsletter from the July 18th issue through the final edition on August 18, 2001. During that time period, stink bug numbers rose steadily from infesting 50% of cotton fields scouted the week of July 18 to a whopping 81.3% of the fields scouted the week of August 18, 2001. Despite their presence, only 15.7% of these fields required protection to prevent stink bug damage.

Due to the interest generated by the presence of stink bugs in 2001 a consultant survey was mailed to cotton consultants across Oklahoma. The purpose of this survey was to determine if consultants perceived stink bugs as an emerging pest and to seek their opinions on various other insect management issues. This survey was mailed on August 23, 2001, to get their thoughts while the season was still fresh in their minds. Despite incentives to return the survey, only 46.6% of those surveyed completed and returned it.

Results and Discussions

The first part of the survey builds a profile of the current cotton consultant in Oklahoma. The average length employed as a consultant was 11.4 years. Consulting fees varied depending on cropping scheme. Dryland cotton fees ranged from 21.4 cents to 35.7 cents/acre per week for basically once-a-week scouting. The average cost for a typical 14-week season was $4.28/acre. Irrigated cotton fees were higher due to the practice adhered by the majority of consultants surveyed - scouting as needed. This procedure relies on shortening the scouting interval only when building insect populations warrant. Again fees varied ranging from 25 cents to 39.3 cents/acre per check per week. The average fee charged for irrigated cotton was $5.91/acre for 20 checks during a typical 14-week season. Cotton acreage serviced varied widely. Seventy-one percent of the consultants checked an average of 2,580 acres of dryland cotton weekly. While 85% of the consultants surveyed checked an average of 3,700 acres of irrigated cotton each week during the summer. The average consultant surveyed, checked and made insect control recommendations on approximately 5,156 acres of cotton during the 2001 growing season.

Variety selection is always of interest as producers and consultants try to select the best adapted varieties to enhance production. Transgenic cotton varieties are very popular. Dryland production favors single gene stripper varieties while irrigated production favors stacked gene picker varieties. Most popular cotton varieties for dryland production (in descending order) were: Paymaster 2200RR, Paymaster 2326RR, Delta Pine 2156RR, Paymaster 2326BR, and Paymaster 2280BR. The most popular picker cotton varieties for irrigated production (in descending order) were: Paymaster 1218BR, Stoneville 4892BR, Delta Pine 451BR, Delta Pine 458BR. Paymaster 2280BR and Paymaster 2326BR were the most popular stripper cotton varieties grown under irrigation.

The next portion of the survey addressed insect pests and insecticide use patterns. As expected there were differences in pest rankings and insecticide usage between dryland and irrigated production (Table 1&2). The cotton fleahopper was the number 1 pest in the state. Bollworms remained number 2 (despite the Bollgard popularity) tying thrips in dryland situations. Stink bugs grabbed the 4th spot and cotton aphids the 5th spot. Prior to boll weevil eradication, the boll weevil would battle the bollworm for the top spot followed by cotton aphid, cotton fleahopper and thrips.

Insecticide usage pattern is quite different. All the insecticide applications applied to dryland cotton were directed at controlling thrips and cotton fleahoppers. Thirty-nine percent of the dryland acres surveyed received thrips protection. Twenty-nine percent of the treated acres received two applications to prevent thrips injury. Bidrin and Orthene were the products of choice for thrips control. Forty-seven percent of the dryland cotton received protection to prevent cotton fleahopper damage. Twenty-seven percent of the treated acres received two insecticide applications. Vydate, Orthene, and Bidrin were the insecticides preferred by the respondents for cotton fleahopper control.

Greatest insecticide usage occurred in irrigated cotton. Fifty-two percent of the irrigated acreage received some sort of thrips protection. Temik was applied infurrow on 32.3% of the treated acres while over-the-top sprays of Orthene and Bidrin accounted for the remaining 19.9% of the acres sprayed to prevent thrips injury. A whopping 95.9% of the irrigated acres were sprayed to prevent cotton fleahopper loss. Eleven percent of the surveyed acres received two insecticide applications. Vydate, Orthene, and Bidrin were the insecticides most often mentioned by respondents. The high percentage receiving fleahopper protection reflects the emphasis on earliness by producers and consultants alike and the dependency on overwintering sprays to delay boll weevil infestations. Prior to boll weevil eradication, 1 to 2 overwintering sprays were automatically applied prior to bloom to prevent boll weevil colonization. This practice was so religiously followed that it is very hard for some to break as weevil numbers dropped. These pinhead square applications may helped suppress early season buildups of general plant feeders reducing the acreage that warrant stink bug protection during boll set.

Bollgard influence is readily seen in the amount of irrigated acres treated to prevent bollworm loss in 2001. Only 15.8% of the total acres surveyed received bollworm protection. Pyrethroids remain the product of choice for bollworm control (at least during light beet armyworm years). Fury and Karate were the only pryrethroids mentioned by the respondents.

Stink bugs were the target of insecticide applications on only 4.9% of the irrigated acres surveyed. Fifty-seven percent of the consultants surveyed sprayed for stink bugs. Seventy-one percent of those surveyed were not surprised by the emergence of the stink bugs in 2001. When asked to explain the economic threshold use to determine damaging infestations, only 28% of the consultants that sprayed stink bugs listed anything. Responding consultants mention slicing and examining the inside of bolls for signs of feeding and discoloration and delaying treatment until 10 to 20% of the bolls sliced showed internal injury. When asked what was the reasons for the appearance of stink bugs as a pest responding consultants replied reduce use of insecticides to control bollworms and boll weevils. For broader spectrum insect control, consultants opted to use Fury or Karate. Bidrin was the product of choice where cotton aphids were present or producers feared releasing cotton aphids by using a pyrethroid.

Only 3.9% of the cotton acreage survey received Furadan to control cotton aphids in 2001. Cotton aphid numbers has gradually declined since 1996. Much of this population decline is attributed to waning dependency on insecticides and the popularity of Bollgard cotton promoting an environment that allows beneficial insects to flourish and regulate cotton aphids and other potential insect pests below economic threshold levels.

Finally, consultants were asked if continued depressed prices would impact their business. All responded yes with some fearing that prolonged depression in cotton price would not only be detrimental to their business but may eventually force them out of consulting all together.

Conclusion

A successful boll weevil eradication program coupled with continued popularity of Bollgard cotton has decreased the dependency on insecticides creating an insecticide-free environment that favored the development of general plant feeders not considered a pest in cotton before the 2001 season. Despite their emergence - the cotton fleahopper, thrips, and the bollworm were the top three insect pests in 2001. Responding consultants agreed that depressed cotton prices are detrimental to their business. The irony of the situation is depressed prices - not the boll weevil could eventually force many of them to quit consulting and seek other employment.

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Table 1. Top Five Insect Pests – 2001.

Dryland Production	Irrigated Production
♦ Cotton Fleahopper	♦ Cotton Fleahopper
♦ Thrips/Bollworm	♦ Bollworm
♦ Stink Bugs	♦ Thrips
♦ Cotton Aphid	♦ Stink Bugs
	♦ Cotton Aphid

Table 2. Insecticide Use Pattern for Various Production Systems in Oklahoma in 2001.

Insect	Acres Treated %	Products
	Dryland Cotton	
Thrips	39[1], 29[2]	Bidrin/Orthene
Cotton Fleahopper	47[1], 27[2]	Vydate, Orthene, Bidrin
	Irrigated Cotton	
	32.3 infurrow	Temik
Thrips	19.9[1], sprays	Orthene/Bidrin
Cotton Fleahopper	95.9[1], 11[2]	Vydate, Orthene, Bidrin
Bollworm	15.8[1]	Fury/Karate
Stink Bugs	4.9[1]	Fury, Karate, Bidrin
Cotton Aphid	3.9[1]	Furadan

[1] = Percent of acreage receiving 1 application.
[2] = Percent of acreage receiving 2 application.