



Results of a Two-Year Pink Bollworm Survey in the Southern Plains of Texas and New Mexico

Dr. Jane Pierce, New Mexico State University, Artesia, NM

Warren Multer, Extension Agent – IPM, Glasscock, Reagan, & Upton Counties

Tommy Doederlein, Extension Agent – IPM, Dawson & Lynn Counties

Manda Anderson, Extension Agent – IPM, Gaines County

Scott Russell, Extension Agent – IPM, Terry & Yoakum Counties

Dr. Charles Allen, Texas State IPM Coordinator

Dr. Rick Zink, USDA, APHIS, CPHST

Dr. Michelle Waters, USDA, APHIS, CPHST

Summary

Cotton producing areas in the Southern Plains Region of Texas and New Mexico were surveyed using delta sticky traps baited with gossyplure, the sex pheromone for pink bollworm (PBW). Non-cotton producing areas south of these areas were also surveyed for moths potentially moving into the El Paso/Trans Pecos Pink Bollworm Eradication zone. Cotton producing counties surveyed were, Chaves and Eddy Counties in New Mexico and Dawson, Gaines, Glasscock, Martin, Midland, Terry, Upton and Yoakum counties in Texas. The counties surveyed have experienced PBW infestations in the recent past and 1.3 million acres of cotton planted in them annually.

No PBW moths were caught in any of the areas surveyed except for a relatively small area in southern Midland County. Nine fields in this area caught PBW moths in summer trapping (May-August). A total of 119 moths were caught during this time. Seventy-two percent of the moths caught were caught on two “epicenter” fields of non-Bt, organic cotton. Fall trapping, September through early November detected PBW activity in the same area. Six fields caught a total of 728 PBW moths. The two non-Bt, organic “epicenter” fields accounted for a total of 704 moths, 97% of the total fall capture. Since most of the fields in the region are planted to Bt cotton, it is likely that only two fields, less than 100 acres, had reproducing populations of pink bollworms in this region (1.3 million acres of cotton) in 2011.

Introduction

Pink bollworm (PBW) is one of the world’s most important cotton pests. Losses to PBW prior to the availability of Bt cotton and the initiation of the eradication program were estimated at \$32 million per year (NCC 2001).

PBW eradication began in the El Paso/Trans Pecos (EP/TP) zone in Texas in 2001 and is nearing completion. It is threatened by PBW migration from the southern plains of Texas and New Mexico, areas not in eradication programs.

The Pecos Work Unit (east side of the EP/TP zone), caught no wild PBW moths in 2007 or 2008. In 2009, 669 wild moths were caught on Bt cotton fields between late September and the end of November. The question was, “Where did these moths come from?”

When PBW reproduction occurs and background populations are low, fall trap captures normally occur in “hot spots” indicating the locations of infested fields. The 2009 wild PBW moth captures in the EP/TP zone were distributed over a large land area and were not indicative of one or more infested fields within the work unit. Data from a few traps in the southern plains outside the EP/TP zone in 2009 suggested that reproducing PBW infestations may have been present in Midland County - 60 to 80 miles from cotton fields in the Pecos Work Unit.

The primary objective of this project was to investigate the correlation of cultural practices on PBW presence in southern plains cotton fields. A second objective was to investigate patterns of PBW movement from infested fields into the EP/TP zone. Data from these studies will be used to develop a model of pink bollworm populations in the southern plains region. The model will provide opportunities for the cotton industry to develop and implement areawide control programs which can intelligently target available resources to the fields which are likely sources of PBW reproduction and spread.

Trapping was conducted in 2010 and in the spring and summer of 2011. Results were as follows. In fall 2010 trapping, no PBW moths were caught in the Pecos Valley of New Mexico or the trap line to the south of this area. A single PBW moth was caught in Gaines County, TX and none were caught on the trap line south of Gaines County. Seven PBW moths were caught in Martin County. Three were caught on a single field – a Bt cotton field in southern Martin County. Four other fields caught a single PBW moth. Two were Bt and two were non-Bt. On Martin County fields where PBW moths were caught, captures occurred on a single week of trap inspection.

In Midland, Glasscock and Upton Counties, 11 fields caught PBW moths. A total of 1,434 moths were caught during the fall of 2010. Of these, 1,222 moths (85%) were caught on two non Bt, fields in organic production. Over 99% of the moths captured were caught within 5 miles of the two organic, “epicenter” fields.

In the spring of 2011, traps were run on the Midland, Glasscock and Upton County fields which had caught PBW moths the previous fall. Nine of these fields (90%) caught moths. A total of 119 moths were caught. Again, the majority of the moth catches were on the two non-Bt, organic, “epicenter” fields. One hundred and three moths (86%) were caught on them. One hundred and eleven moths (93%) were caught within five miles of these “epicenter” fields.

Materials and Methods

From mid-September to early November, 2011, a trapping study was conducted in five areas of the southern plains. Trapping was conducted in the Pecos Valley NM, Gaines County TX, Terry/Yoakum Counties TX, Dawson/Martin Counties TX and Midland/ Glasscock/Upton Counties TX; cotton producing areas bordering or near the EP/TP zone on the north and east sides. Delta Sticky Traps baited with gossypure impregnated rubber septa were deployed, geo-referenced and serviced weekly. The protocol was to trap 10 Bt fields and 10 non-Bt fields – one trap per field - in each of the five areas. Cultural data collected on each field included: producer name, trap number, latitude, longitude, elevation, planting date, variety, acres, irrigation status/type and intensity, Bt transgenic, fall/winter tillage, whether the field was planted in killed wheat, winter irrigation, lbs. nitrogen (N) fertilizer/ac, and proximity to previous year non-Bt cotton.

Three highway trap line loops - with traps placed at five mile intervals - were established. Traps were geo-referenced and each trap line extended from the outside the EP/TP zone - near its boundary - into the zone. Data recorded as traps were inspected included: date of trap service, number of PBW moths caught and trap number. Highway loop trap lines were established 1. south of Carlsbad, NM; 2. south of Seminole, TX (the Kermit trap line) and 3. south of the Midland-Odessa, TX (the Crane trap line).

In the Pecos Valley NM production area, 20 cotton fields were trapped, including ten Bt and ten non-Bt fields. All fields were irrigated and tilled in the fall/winter of 2010-11. None of the fields were grown in

killed wheat cover or received winter irrigation. The Carlsbad trap line had 21 traps. The trap line ran south from Carlsbad NM to Orla TX, west to the Guadalupe Mountains and White City NM and northeast to Carlsbad.

In Gaines County TX, 20 fields were trapped of which ten were Bt and ten were non-Bt. All fields were center pivot irrigated. The Kermit trap line had 36 traps. It began in Seminole, TX and ran south to Gardendale TX (8 miles north of Odessa), west to Kermit TX, and north to Hobbs NM.

In Terry and Yoakum Counties TX, 20 fields were trapped. Nine were Bt and eleven were non-Bt. All fields were irrigated and all but 6 were planted row-till on killed wheat cover crops.

In western Martin and southwestern Dawson Counties 20 fields were trapped. All were center pivot irrigated Bt cotton fields. All fields received fall/winter tillage.

In Midland, Glasscock and Upton Counties 19 fields were trapped. Sixteen were Bt and three were non-Bt fields. Sixteen fields were drip irrigated and three were pivot irrigated. Fourteen fields received fall winter tillage and all fields received winter irrigation. The Crane trap line had 19 traps. It started north of Rankin TX and ran south to Rankin, northwest to Crane TX, north to Odessa TX and northeast to Midland TX.

Results and Discussion

Total trap captures are shown in Figure 1. No PBW moths were caught during fall trapping in four of the five areas trapped (Figure 1.).

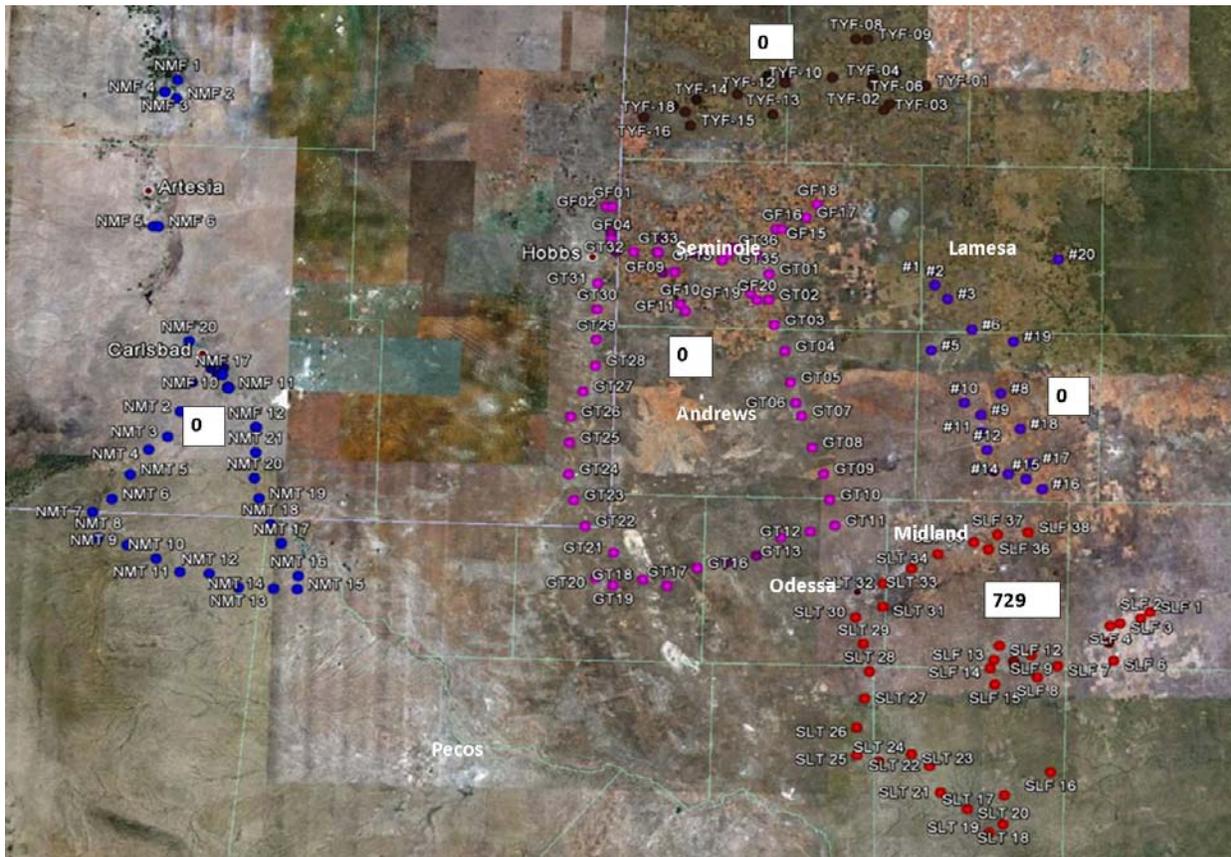


Figure 1. Southern Plains region of Texas and New Mexico showing pink bollworm trap locations and pink bollworm trap captures during the fall of 2011.

No PBW moths were trapped in Pecos Valley, NM trapping the blue spots on the west side of Figure 1. None were caught in the Terry and Yoakum Counties, TX, shown as the brown spots at the top of Figure 1. None were caught in Gaines County trapping, the pink spots in the center of Figure 1. And, none were caught in fall trapping in Dawson and Martin counties, the blue spots to the right side of Figure 1. However, 728 PBW moths were caught from seven fields near the Midland/Upton county line. These are shown on Figure 1 as the red spots in the lower left on the map.

Individual trap captures are shown in Figure 2. Fields which had non-Bt cotton were, from the top, SLF 36 (in which a few rows of non-Bt cotton were planted in a variety trial), SLF 12 (organic production), SLF 13 (organic production) and SLF 10 (organic production). No PBW moths were caught on SLF 10.



Figure 2. Fall 2011 pink bollworm moth captures in Midland and Upton Counties.

A total of seven fields caught PBW moths. Three PBW moths were caught on field SLF 36, two hundred eleven were caught on SLF 12, Four hundred ninety-three were caught on field SLF 13, fifteen were caught on field SLF 14, one was caught on SLF 11 and 4 were caught on SLF 8. Moth capture was highest during the last two weeks of September and the first three weeks of October.

The two fields which caught the highest number of PBW moths were SLF 12 and SLF 13. These fields are non-Bt cotton grown using organic production practices. Field SLF 10 was also a non-Bt field, but no PBW moths were caught on it.

Conclusions

A total of 728 PBW moths were caught during the fall 2011 PBW trapping study in the southern plains region. Well over 99 percent of came from four fields within a five mile radius of SLF 13. Ninety-seven percent of the PBW moths captured came from SLF 12 and SLF 13, two organic, non-Bt, “epicenter” cotton fields. These fields almost certainly had reproduction in them and appeared to be the epicenter of the population in the area.

This study and previous studies suggest reproducing populations of PBW are no longer widely spread throughout the region. The data from the fall 2011 study suggests reproducing populations may be limited to only ~100 acres of non-Bt organic cotton, the “epicenter” fields, in southern Midland County. Preliminary plans are being made to eradicate this population in 2012.

References

Grefenstette, B., O. El-Lissy, and R. T. Staten. 2008. Pink Bollworm Eradication Plan in the U.S. http://www.aphis.usda.gov/plant_health/plant_pest_info/cotton_pests/downloads/pbw-erad-plan2-08.pdf. 9 pp.

Multer, W., T. Doederlein, M. Anderson, J. Pierce, C. Allen, R. Zinc, M. Walters, D. Kerns and J. Westbrook. 2011. Pink bollworm trapping in the southern plains of Texas and New Mexico. *In* S. Boyd, M. Huffman and B. Robertson (eds.). Proc. Beltwide Cotton Conf. National Cotton Council, Memphis, TN. pp. 753-757.

National Cotton Council of America. 2001. Pink Bollworm Eradication: A Window of Opportunity, 1-6 pp.