A BOLL WEEVIL MANAGEMENT PLAN FOR THE LOWER RIO GRANDE VALLEY OF TEXAS

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Abstract

The authors take the position that the Texas Boll Weevil Eradication Foundation program following the Frisbie-Brazzel Plan (Frisbie and Brazzel, 1990) put in place in the spring of 1995 in the Lower Rio Grande Valley of Texas (LRGV) contributed to the massive cotton crop failure that season. Therefore, an eradication effort modeled after the Frisbie-Brazzel Plan is not suitable for the LRGV and should never again be implemented. We feel there is a much better and cost-effective way to suppress the boll weevil for profitable cotton production in the LRGV. A realistic and workable boll weevil management plan would have an absolute six month host-free period as its base with pre-emptive sprays for the surviving overwintering boll weevil population and uniform boll weevil insecticide tank mixes with defoliants. The expense of boll weevil pheromone traps would be eliminated. The goal of the management plan would be not to eradicate the boll weevil, but rather to strongly suppress the population to an extremely low level each year. The management plan would be environmentally friendly and utilize the sound integrated pest management practices for the LRGV that have been developed over the last twenty-five years. In no way would the management plan put the ability of the cotton grower to "make a crop" in jeopardy.

Introduction

The Texas Boll Weevil Eradication Foundation (TBWEP) implemented an area wide "eradication" program following the Frisbie-Brazzel Plan in the Lower Rio Grande Valley of Texas (LRGV) in the spring of 1995. The four counties of Cameron, Hidalgo, Starr, and Willacy comprising this LRGV area are uniquely different from every other cotton production area in the USA. The authors take the position that the TBWEP contributed to the massive cotton crop failure of only 54,101 bales of production from 374,000 acres in 1995 and therefore should never again be implemented in the LRGV.

The biologically flawed plan for the LRGV required more than two million pounds of active ingredient malathion to be applied during the 1995 growing season. Not only was the LRGV cotton crop a disaster, but there was an abnormally high incidence of boll weevil reproduction during July and August of 1995 (Summy, et. al.). Boll weevils in the LRGV were actually increased rather than reduced.

Some 86% below the historic average yield, the 1995 LRGV cotton crop gives evidence that one boll weevil eradication plan is not right for all areas. Specifically stated, an eradication effort modeled after the Frisbie-Brazzel Plan is not suitable for the unique cotton production area of the LRGV.

We feel that there is a much better and cost-effective way to suppress the boll weevil populations for profitable cotton production in the LRGV. The authors have previously advanced a strategy for the management and containment of the boll weevil in the LRGV (Scott and Lukefahr, 1997). Our objective in writing this paper is to present a realistic and workable boll weevil management plan for the LRGV.

The Lower Rio Grande Valley of Texas

Located at approximately 26° N latitude and bordered by the Gulf of Mexico a large portion of the LRGV has temperatures of 32°F or lower only two out of every five years. Many years this has not occurred until late December or January. This allows for cotton fruiting structures that will sustain boll weevil reproduction to be present throughout the entire winter.

Less than fifty yards wide, only the Rio Grande River separates cotton production of the LRGV and Mexico. This is not an effective barrier between the cotton zones in the U.S.A. and Mexico. Going south from the Rio Grande River into Mexico less than forty miles separates cotton growing areas for two hundred miles.

In 1997 the authors discussed the impossibilities of conducting an eradication program in the LRGV. The constraints for eradication of the boll weevil remain in place but are different for a realistic management program.

For instance, the close proximity to Mexico remains a continuing threat for any eradication program but would not jeopardize a management program where success is not based on the total elimination of the boll weevil population.

Cienfuegosia drummondii is a wild boll weevil host plant that occurs throughout the coastal areas of Texas. This plant is less prevalent in the LRGV coastal areas than in the Coastal Bend counties, therefore would not pose a threat to a management program in the LRGV. The high density of these plants in the Coastal Bend counties could support populations that could jeopardize an eradication program and influence the management program in the LRGV if migration took place from the wild host areas of the Coastal Bend southward to the LRGV.

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Another consideration is the range land cotton that occurs in South Texas but not in the LRGV area. Ranchers in South Texas feed tons of raw cottonseed to livestock during the winter months. This is spread on the ground where livestock consume it; however, some is scattered under the canopy of brush and trees where a small amount will germinate and grow when rains come. These protected plants can persist for long periods of time and furnish fruiting forms for boll weevil development. These plants could pose a threat in an eradication program but not in a management program. The LRGV has very little range lands.

The major rainy season of the LRGV occurs from mid-August to October with more than 40 percent of the annual rainfall historically received during this time.

Realistic and Workable Plan

Considering the uniqueness of the LRGV, to strongly suppress the boll weevil to an extremely low level each year, rather than to attempt to eradicate the boll weevil is the only realistic goal of a management plan. With this as the goal, a cost-effective and workable management plan becomes possible.

Based on the sound integrated cotton pest management (IPM) practices for the LRGV that have evolved over the last twenty-five years, the plan would consist of three main components. An absolute six month host-free period would be the cornerstone of the plan. Pre-emptive sprays for the overwintering boll weevil population would be the second component. The final component of the management plan would be uniform boll weevil insecticide combination sprays with defoliants at the end of the growing season.

Using the sound IPM practice of in-field scouting and spraying when treatment thresholds are reached with an economical and effective rate of the pesticide labeled for the pest identified, growers would be responsible for all in-season pesticide applications including those for boll weevils. The management plan would not use perimeter pheromone traps as the LRGV is assured of damaging boll weevil populations each year and programs designed to cope with these populations would not benefit from pheromone traps.

The management plan must have local input and control so that the cotton producer's goal of "making a crop" is never jeopardized by the management plan. We suggest that the LRGV be divided into zones, and that the management plan be initiated one zone at a time. We propose beginning in a north-central zone that has historically high boll weevil populations.

Host-Free Period

An absolute six month host-free period is the cornerstone of the boll weevil management plan. Without this, all other efforts and activity become ineffective in suppressing boll weevil populations. The cotton fields must be made non-hostable to the boll weevil quickly after harvest and remain that way for six months.

With producers increasingly opting for the farming practices of "no-till" and conservation tillage, alternate methods of cotton stalk destruction are being used. Not all cotton fields are being shredded and plowed to destroy the stalks. Stalk pullers have been shown to be efficient and quick in killing cotton stalks. They have great adaptation when the soil is dry and too hard to plow. Growers are also using the alternate method of chemically killing the stalks with varying degrees of effectiveness.

This change in farming practices by many cotton producers requires the application and acceptability of the term non-hostable crop.

Non-hostable crop - the absence of any fruiting forms that would sustain boll weevil reproduction.

Although a host-free period in the LRGV is mandated by Texas Department of Agriculture (TDA) regulations of cotton stalk destruction under the control and interplay with TDA by a Cotton Administrative Committee, this host-free period has rarely been achieved. The Cotton Administrative Committee is composed of cotton growers representing each county in the LRGV and appointed by the Texas Commissioner of Agriculture. The non-hostable crop terminology and application need to be made a part of the TDA cotton stalk destruction regulations.

Limitations to Host-Free Period

In recent history there have been only a few years that a thorough stalk destruction program was achieved in the LRGV. Although mandated by regulations, cotton stalk destruction has been difficult to accomplish in the LRGV. For the management plan to be successful the following limitations to obtaining the host-free period must be addressed.

Grower Attitudes

A minority number of cotton growers simply do not place stalk destruction at a high priority. Poor, late, and ineffective work operations in killing cotton stalks has become common place with these growers. Many fields are out of compliance year after year and the same growers are violators of the August 31 deadline. It is easy to blame the TDA and Administrative Committee for these fields, and they are responsible for interpreting and enforcing the regulations. However, the grower that planted the cotton should act responsibly and destroy the stalks without the threat of fine by the TDA.

Abandoned Acreage (Insurance Cotton)

The practice and strategy of growing cotton with essentially no insect management inputs must be dealt with. If and when a grower has lost insect control of a field, a mechanism must be in place to allow the grower to destroy the field. With boll weevils reaching third generation around mid-June in the LRGV, these abandoned fields produce massive numbers of weevils until destroyed. Many times the fields have not been destroyed past the August 31 deadline.

Double Cropping Following Cotton

The long growing season in the LRGV allows enough time to grow a second crop following cotton. This practice of "double cropping" is also a major limiting factor in obtaining the host-free period. This practice results in volunteer cotton on thousands of acres of popcorn, field corn, grain sorghum, sugarcane, vegetables, watermelons, etc. These cotton plants become hostable quickly, under almost ideal growing conditions, and will produce a large number of boll weevils. Many of these plants remain until the second crop is harvested. For the management plan to be effective these plants must be made non-hostable.

Cotton in Non-Crop Areas

Another limitation in obtaining the host-free period is cotton growing in non-crop areas. These include brushy areas along field margins, gin yards, farm equipment areas, oil mill yards, road right-of-ways, ditch banks, drainage ditches, etc. Everyone must do their part in identifying this cotton and addressing this problem if the management plan is to be successful.

Land Ownership and Operator Changes

Every year there are any number of cotton fields that wind up in limbo after the deadline. Although someone always owns the land, someone is not always farming the land. Many times this cotton does not get destroyed quickly. An example of this is a field on FM 803 in the Brownsville area from last year that has ample hostable cotton at this time as a developer is building homes on the field.

Pre-Emptive Sprays for Boll Weevil

As the authors have previously stated (Scott and Lukefahr, 1997) weevils that have survived the winter "host-free" period are low in number and in a weakened physiological state. They are susceptible to low dosages of insecticide, and their populations can be greatly reduced before fruiting forms are large enough to support larval development. Two properly timed pre-emptive sprays in the early spring, based on cotton plant growth stage, are very effective in reducing this "overwintering" population and thereby drastically reducing in-season sprays for boll weevil.

The first pre-emptive spray would be applied at the pin head square cotton growth stage. The second pre-emptive spray would be applied at the a grown square cotton growth stage. Since sprays that control plant bugs, aphids, and thrips are usually required and routinely applied at this time, the cost of adding boll weevil insecticides to this application will be minimal. It is important to time these sprays with the development of the cotton plant. If they are applied later than a grown square cotton growth stage, boll weevils can escape control and beneficial insects do not have time to recover, increasing the possibility of secondary pest outbreaks. Because of this concern in the LRGV none of these sprays should be applied after May 1 regardless of cotton growth stage.

Boll Weevil Insecticides with Defoliation

The addition of a boll weevil insecticide with the defoliant would serve to reduce the overwintering population. Combinations of methyl parathion, Penncap M, or Guthion with reduced rates of Dropp have been shown to be a very effective cotton defoliant in the LRGV (Scott, 1999). Def has been shown to actually produce a slight additive effect on the lethal potential of methyl parathion and Guthion for boll weevil control (Ganyard and Brazzel, 1967). The uniform addition of boll weevil insecticides with defoliants is a major component of the management plan and would be very cost-effective as the combinations give excellent defoliation results at equal or less expense than other defoliant options.

Formation of Zones in the LRGV

We suggest the LRGV be divided into zones. The boll weevil management plan should be implemented one zone at a time. We propose beginning in a north-central zone that has historically high boll weevil populations. The management plan must have local input and control so that the cotton producer's goal of "making a crop" is never jeopardized.

Summary

A boll weevil eradication effort following the Frisbie-Brazzel Plan is not suitable for the LRGV. A plan that has as its goal to strongly suppress the boll weevil population to an extremely low level each year is much more realistic given the uniqueness of the LRGV. A realistic and workable boll weevil management plan of the LRGV is presented by the authors. This plan consists of an absolute six month host-free period, pre-emptive overwintering boll weevil sprays, and uniform boll weevil insecticide sprays at defoliation.

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