PLANTING DATE INFLUENCES THRIPS INFESTATIONS AND MANAGEMENT PROGRAMS IN GEORGIA COTTON

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Abstract

Field trials were conducted in 2015 and 2016 to evaluate the influence of planting date on thrips infestations in cotton. A split plot with four replications was utilized. Main plots included planting date (9 dates beginning in mid-April and continuing weekly until mid-June); split plots included at plant insecticide (Gaucho vs untreated), and foliar insecticide (Orthene vs untreated). Thrips infestations were sampled 2 times each week until seedlings reached the 4-leaf stage and various plant growth measures including yield were assessed.

Introduction

Thrips are a predictable and consistent insect pest of cotton in Georgia. Tobacco Thrips, *Frankliniella fusca* (Hinds), is the primary species of thrips infesting cotton seedlings. Thrips initially feed on the underside of the cotyledons, and when present reposition to the terminal to feed. Thrips use a rasping-sucking mouthpart to cause damage such as crinkled malformed true leaves, stunted growth, delayed maturity, reduced yield potential, and in severe cases stand loss and loss of apical dominance. Thrips rarely cause economic injury once the cotton seedling reaches the fourth true leaf and is growing rapidly. The growth rate of a cotton seedling affects thrips injury. Slow growing seedlings are more susceptible to thrips feeding compared with rapidly growing seedlings. Field observations suggest thrips infestations are greater on earlier planted cotton. The objective of this study is to quantify the effect of planting date on thrips infestations and injury potential and define optimal thrips management programs.

Materials and Methods

Field trials were conducted during 2015 and 2016 in Tift Co. Georgia. Cotton variety Stoneville 4946 GLB2 was used in 2015 and Stoneville 6182 GLT was used in 2016. Plots were four rows wide and thirty feet long and arranged in a split plot design with four replications. The main plots included nine planting dates. Plots were planted weekly on every Monday from mid-April to mid-June. The planting date plots were split with at-plant treatments which included untreated (fungicide only) and the insecticide seed treatment Gaucho. The at-plant treatments were split with an untreated and a foliar application of Orthene 97 (acephate at .18 lb ai/acre) applied 14 days after planting (generally 1-leaf).

Data Collection

Thrips were sampled twice per week (Monday and Thursday) until plots reached the fourth true leaf stage. Five plants were chosen at random from each plot and immersed and swirled in a container of seventy percent ethyl alcohol. The containers were taken back into the lab, washed into a petri dish, and counted using a dissecting microscope. The adults were saved for future species identification. Thrips damage ratings were taken at twenty-one days after planting. Damage ratings used a one to five scale where one was no damage, three was moderate but acceptable damage, and five was dead plants. Data was analyzed using Agriculture Research Manager 7 to conduct analysis of variance and means were separated using least significant difference (p=.05).

Results

The mean number of thrips sampled per plant in untreated plots by sample date are illustrated in Figure 1. The foliar Orthene alone treatment was removed since it is not a viable recommendation for thrips management. Thrips infestations were generally higher in 2015 compared with 2016. The maximum number of thrips infesting untreated plots occurred on 28 May in 2015 and 16 May in 2016. Seedlings are susceptible to thrips feeding until they reach the 4-leaf stage. The days required from planting to reach the 4-leaf stage ranged from 21 to 31 days (Figure 2).

Early planted cotton developed slower making seedlings more sensitive to thrips feeding in terms of plant injury and extended the time seedlings were susceptible.

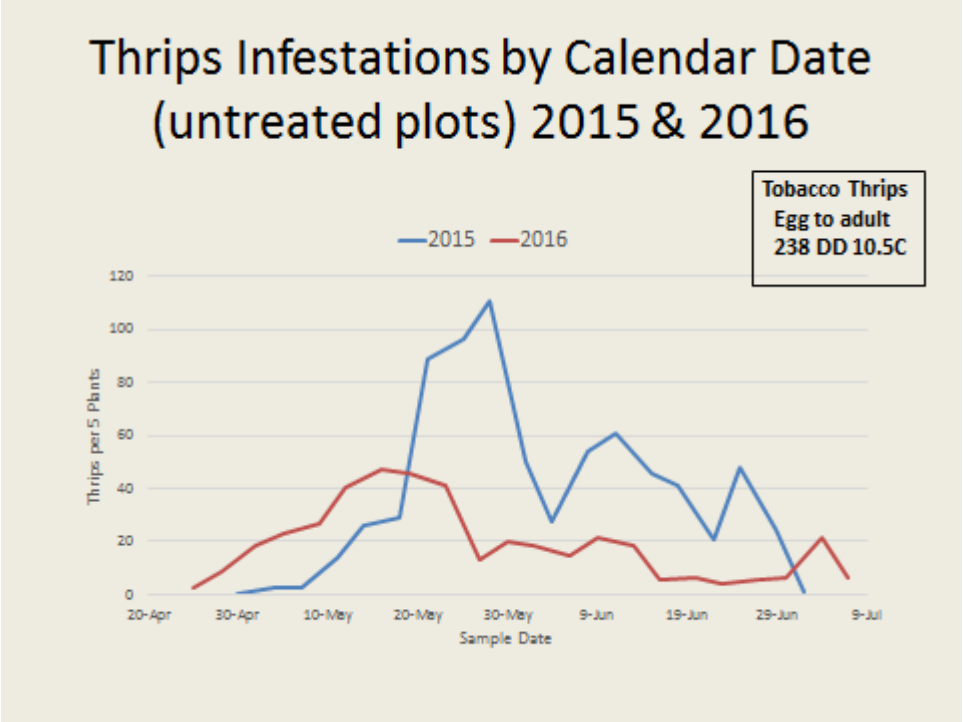

Figure 1. Mean thrips counts in untreated plots by sample date for 2015 and 2016.

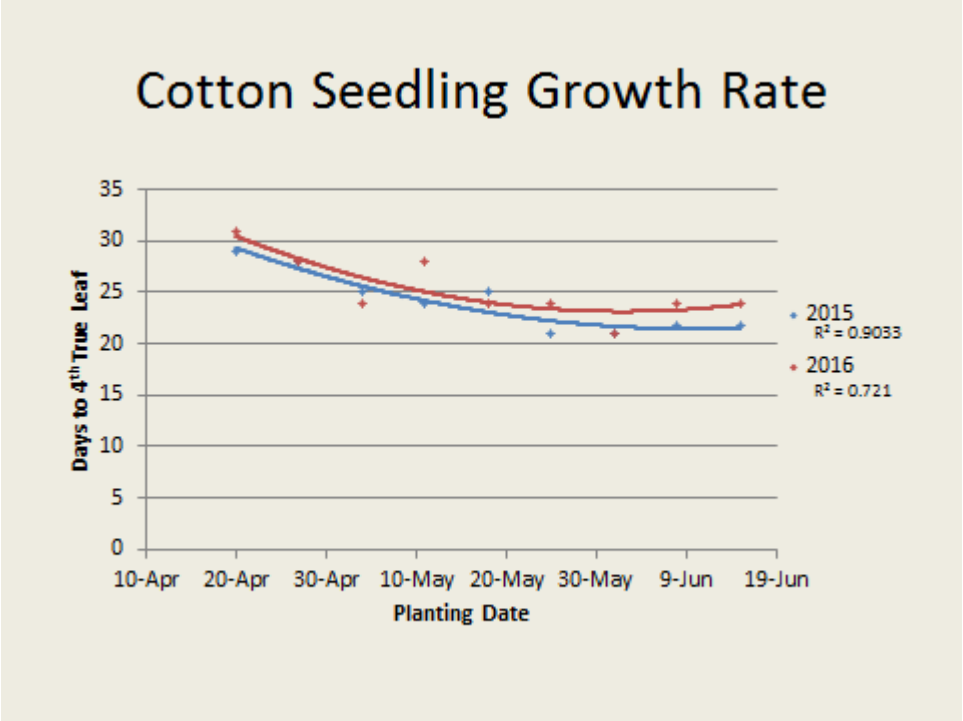

Figure 2. Number of days after planting for cotton seedlings to reach the 4-leaf stage.

Cumulative thrips sampled from emergence to the 4-leaf stage during 2015 are illustrated Figure 3. In general higher thrips counts were observed in April and early to mid-May plantings. Gaucho significantly reduced cumulative thrips on 11 and 18 May ant the 1 and 8 June compared with the untreated. The Gaucho plus foliar Orthene significantly reduced cumulative thrips compared with Gaucho on 20 and 27 April and 4 and 18 May. Gaucho significantly reduced thrips damage ratings on all planting dates except 25 May (Figure 4). Thrips damage ratings were 3 or less (acceptable injury) in Gaucho treatments on all dates except 20 April and 4 May. The Gaucho plus foliar Orthene significantly reduced thrips damage ratings on 4 and 11 May and 8 June.

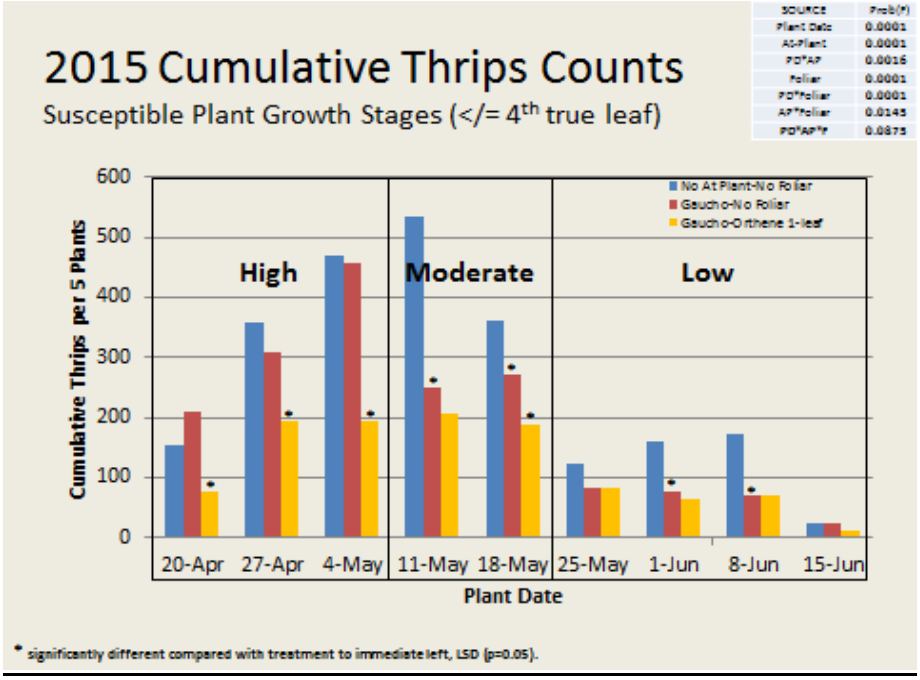

Figure 3. Cumulative thrips counts from emergence to 4-leaf by plant date during 2015.

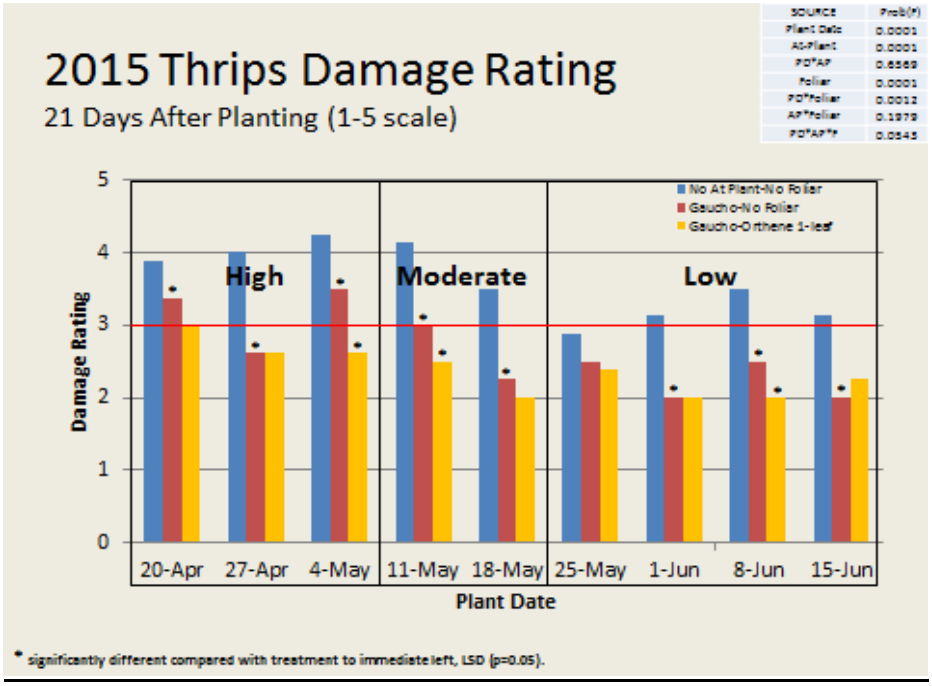

Figure 4. Thrips damage ratings by planting date during 2015; thrips damage ratings of 3.0 or less is acceptable.

Cumulative thrips sampled from emergence to the 4-leaf stage during 2016 are illustrated Figure 5. Thrips counts were generally highest in April plantings and declined as planting dates occurred later. Gaucho significantly reduced cumulative thrips on 25 April and 2, 9, and 23 May compared with the untreated. The Gaucho plus foliar Orthene significantly reduced cumulative thrips compared with Gaucho on 25 April. Gaucho significantly reduced thrips damage ratings on all planting dates during 2016(Figure 6). Thrips damage ratings were 3 or less (acceptable injury) in Gaucho treatments on all dates except 18 April. The Gaucho plus foliar Orthene significantly reduced thrips damage ratings on April.

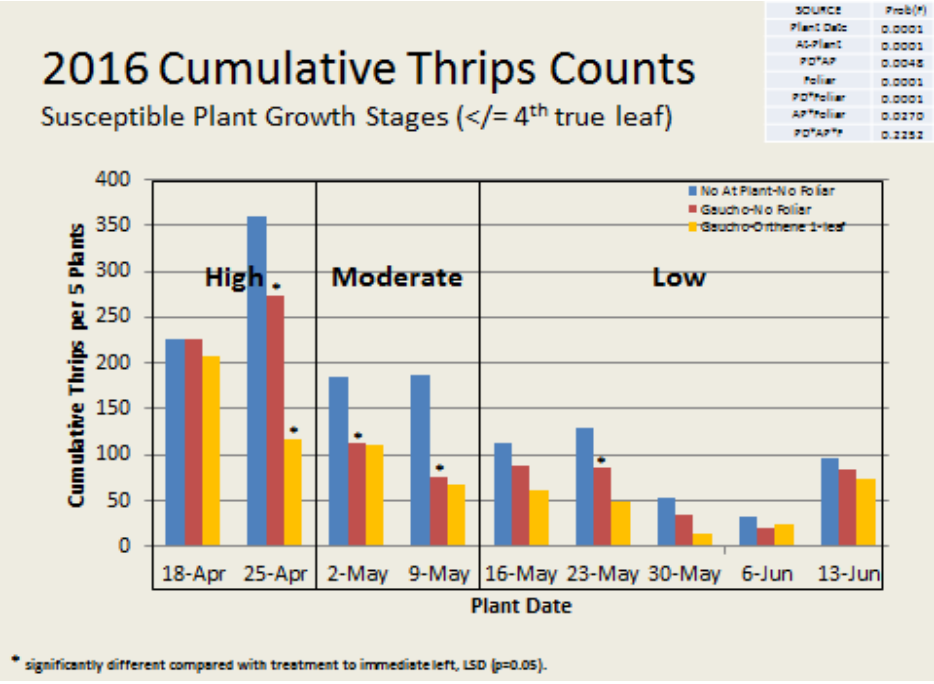

Figure 5. Cumulative thrips counts from emergence to 4-leaf by plant date during 2016.

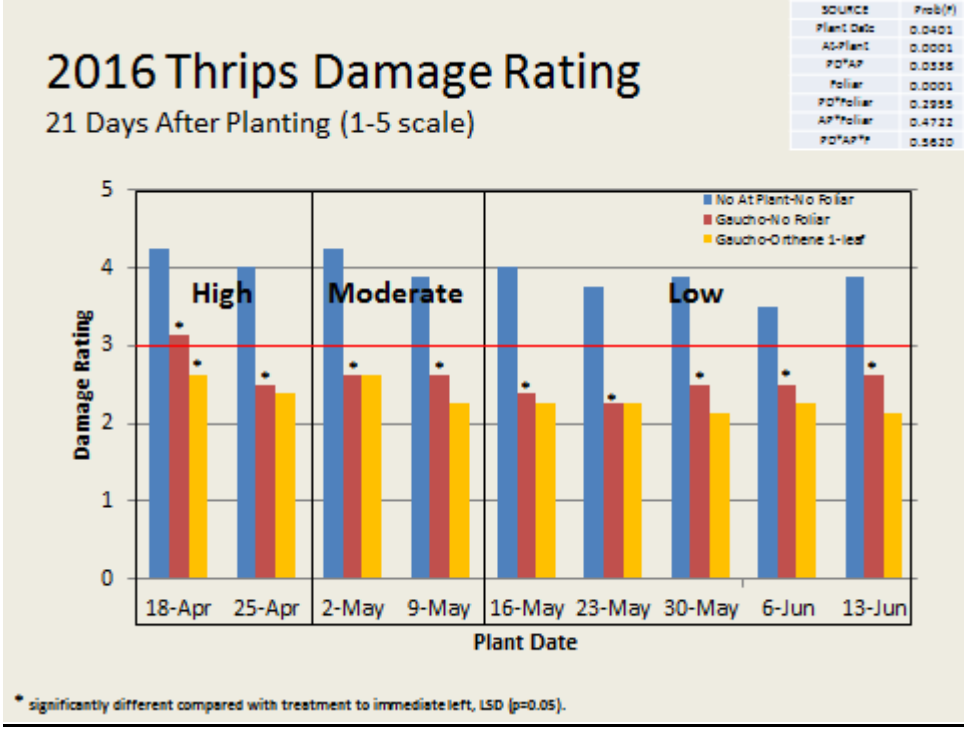

Figure 6. Thrips damage ratings by planting date during 2016; thrips damage ratings of 3.0 or less is acceptable.

Summary

Thrips infestation and seedling growth rate influence plant injury. Thrips infestations were generally higher on early planted cotton compared with later planting dates. Additionally seedling growth rate was slower on early planted cotton. Thus the risk of thrips injury was greatest on early planting dates. Our data suggests that more aggressive thrips management programs (i.e. Gaucho plus Orthene 1-leaf) will be needed when the risk of thrips injury is high. Temperature and rainfall influences thrips dispersal. When the risk is low, Gaucho at plant provides acceptable control. Thrips dispersal varies from year to year. Peak infestations occurred 12 days earlier in 2016 compared with 2015. The ability to predict thrips dispersal will allow growers to better predict planting dates with high risk for thrips injury and adjust management strategies.