EVALUATION OF PRE HERBICIDE AND SEED TREATMENT ON THRIPS INFESTATION AND COTTON GROWTH, DEVELOPMENT, AND YIELD

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Abstract

Since 2011, foliar treatments for thrips in cotton in Mississippi have increased to nearly two applications per acre on 80% of total acres in spite of these acres being planted with seed treated with an insecticidal seed treatment. Additionally, glyphosate-resistant Palmer amaranth has become problematic for Mississippi producers. As a result, the use of preemergence (PRE) herbicides has increased dramatically since 2008. From 2008 to 2012 the number of cotton bales lost due to thrips damage increased from 152 bales lost in 2008 to 5,057 bales lost in 2012. In cotton, both thrips damage and PRE herbicides can interfere with emergence and early season growth. Previous research on thiamethoxam and imidacloprid has shown both to be effective in controlling thrips in cotton. Given the increased use of PRE herbicides in Mississippi cotton production, it has been suggested that PRE herbicides may be contributing to the increased damage from thrips observed over the past several growing seasons. Therefore, the objective of this research was to evaluate the use of PRE herbicides and seed treatments on thrips populations as well as cotton development and yield.

Studies were conducted at three locations in Mississippi which included the Black Belt Branch Experiment Station near Brooksville, the R.R. Foil Plant Science Research Center near Starkville, and the Delta Research and Extension Center in Stoneville in 2013 & 2014. Seed treatments included thiamethoxam + fungicide, imidacloprid + fungicide, and fungicide only. Preemergence herbicides included Cotoran 4L at 32 fl oz/ac, Direx 4L at 32 fl oz/ac, Reflex at 16 fl oz/ac, Dual Magnum at 16 fl oz/ac, Dual Magnum + Cotoran 4L at 16 + 32 fl oz/ac, respectively as well as an untreated check. Experiments were conducted using a factorial arrangement of treatments in a randomized complete block design, with the two factors being PRE herbicide and seed treatment. All data were subjected to analysis of variance and means were separated using Fishers Protected LSD at $p = 0.05$.

Cotton seed treated with imidacloprid resulted in significantly less injury from thrips than cotton seed treated with thiamethoxam and fungicide only treatments. Thrips counts at the four leaf stage indicated significantly greater infestation on cotton treated with thiamethoxam compared to cotton treated with imidacloprid. Cotton seed treated with imidacloprid resulted in significantly taller cotton plants throughout the season than those grown from thiamethoxam treated seed. Cotton seed receiving treatment of fungicide only as a seed treatment significantly increased nodes above cracked boll when compared to cotton seed treated with imidacloprid and thiamethoxam, indicating a delay in maturity. Cotton seed treated with imidacloprid resulted in the highest yields. Averaged over all PRE herbicides, cotton seed treated with imidacloprid produced seed cotton yields of 5370 lb/ac whereas cotton seed treated with thiamethoxam produced seed cotton yields of 5227 lb/ac. Trends in reduced thrips control with seed treatments are present, specifically with cotton treated with thiamethoxam. Even if seed treatments are applied, it is still critical to scout and treat thrips according to threshold.