

IMPACT OF NITROGEN RATE ON TARNISHED PLANT BUG POPULATIONS AND CONTROL**C.A. Samples****D.M. Dodds****Mississippi State University****Mississippi State, Mississippi****J. Gore****B.R. Golden****Mississippi State University****Stoneville, Mississippi****A.L. Catchot****J.J. Varco****J.D. Copeland****T.H. Dixon****D. Zachary Reynolds****Mississippi State University****Mississippi State, Mississippi****Abstract**

Tarnished plant bugs have become the key insect pest in Mississippi cotton production, particularly in the Mississippi Delta. In 2011, over 573,000 acres were infested with tarnished plant bugs resulting in 86,240 bales lost with an average cost per acre in the delta region of \$97.02. In 2012, 442,000 acres were infested and 80,243 bales were lost with an average cost per acre in the delta region of \$79.80. Over the last 10 years a large increase in number of applications for tarnished plant bugs in the Delta compared to the hills region of Mississippi have been observed. This increase in the number of applications is due in part to a decreased use of insecticides early in the year. It may also be attributed to a large increase in corn acres, as well as an increase in the number of wild hosts. Tarnished plant bugs have been documented to be resistant to organophosphate chemistries. This pest has also been shown to be 54 – fold more tolerant to permethrin and 35 – fold more tolerant to bifenthrin than in previous years.

Nitrogen is a key component in maximizing the yield of cotton. However, excessive nitrogen application rates can cause an increase in plant height, increased vegetative growth, and delayed maturity. Furthermore, tarnished plant bugs are drawn to rank, lush cotton; which could be an effect of excessive nitrogen. Previous research has been conducted on insecticide efficacy on tarnished plant bugs as well as evaluating the effect of planting date and cultivar maturity effect on control. However, little to no data exists on the effect of nitrogen application rate on tarnished plant bug infestation and control. Therefore, the objective of this study was to determine the effect nitrogen application rate has on tarnished plant bug infestation, cotton growth, and yield.

Experiments were conducted in 2012 and 2013 at the Delta Research and Extension Center located in Stoneville, Mississippi. Plots contained of sixteen – forty inch rows, which were seventy five feet long. All plots were replicated 4 times. Stoneville 5288 B2F was planted on 1 May 2012 and 14 May 2013. 32% UAN was applied at four application rates (lbs/acre) which included: 0 (untreated check), 40, 80, 120, and 160. Applications were made at pinhead square. For each nitrogen application rate as well as the untreated check, one set of plots were managed for tarnished plant bugs based on thresholds developed by the Mississippi State University Extension Service. An additional set of plots for each nitrogen rate as well as the untreated check were left untreated for tarnished plant bugs for comparison purposes. All plots were scouted weekly using appropriate methodology. All data were subjected to analysis of variance and means were separated using Fishers Protected LSD at $p = 0.05$.

Sprayed plots receiving nitrogen application rates ≥ 80 pounds per acre were observed to be significantly taller when compared to plots receiving no nitrogen. Unsprayed plots receiving application rates ≥ 80 pounds per acre were observed to be significantly taller when compared to plots receiving 0 lbs per acre. Total nodes were maximized in sprayed plots receiving application rates ≥ 80 pounds per acre when compared to plots receiving no nitrogen. Total nodes were maximized in unsprayed plots receiving nitrogen application rates of 160 lbs per acre. Sprayed plots receiving nitrogen application rates ≥ 120 pounds per acre were observed to have a prolonged infestation of tarnished plant bugs. Unsprayed plots receiving application rates ≥ 120 pounds per acre were not only observed to prolong infestation, but also contained higher numbers of tarnished plant bugs during the period of infestation. Lint yields were maximized at plots receiving ≥ 40 lbs per acre. Plots receiving nitrogen application at 80 lbs per acre were

observed to be to reduce the number of applications required for tarnished plant bugs by 1 to 1.5 compared to plots receiving 120 and 160 lbs per acre. Plots receiving no nitrogen were observed to reduce the number of applications for tarnished plant bugs by 0.5 to 1.5 when compared to plots receiving 40 and 80 pounds per acre.

Plots receiving 80 pounds of nitrogen per acre increased profit compared to all other nitrogen application rates and resulted in the least financial risk (based on a risk analysis) when compared to plots receiving ≥ 120 pounds of nitrogen per acre.