

NPR 149

Dival
Summary

149
FL-34
563
8008

PHYSIOLOGICAL AND GENETIC RESPONSES ASSOCIATED WITH TOMATO SPOTTED WILT VIRUS IN INSECTICIDE TREATED AND UN-TREATED SOILS

INVESTIGATOR: Maria Gallo

Agronomy Department, University of Florida, Gainesville, FL 32610-3610, 352-273-8124

RESULTS AND CONCLUSIONS: The first objective was to determine whether an association existed between particular phorate-induced peanut genes and TSWV suppression under field conditions. In the field, six genotypes: AP-3, Tifrunner, Georgia-02C, ANorden, Georgia Green and SunOleic-97R, representing a range from resistant to susceptible cultivars, were treated with phorate, aldicarb and water in three replications. The expression of two genes, one similar to *PR-4a* and the other *glutathione reductase*, were evaluated at 21 and 42 days after planting (DAP). Expression levels of both genes increased following phorate treatment for each genotype at the first sampling date. Interestingly, the TSWV resistant genotype AP-3 showed higher expression of these two genes following phorate treatment. These two genes were also highly up-regulated in the moderately resistant genotype Tifrunner at the second sampling date compared with the first sampling date. The moderately susceptible genotype ANorden showed elevated expression of these two genes compared to the other five genotypes in each treatment at the first sampling date. The results suggest that these two genes could be indicators of TSWV defense pathways activated by phorate in peanut.

In addition to phorate, it was hypothesized that other stress induced chemicals may lead to suppression of spotted wilt and result in a yield gain. Therefore, the second objective of this study was to evaluate the field effect of chemical treatments (acibenzolar-S-methyl, paraquat, sulfur) with and without phorate on control of spotted wilt in peanut and yields. A field trial was arranged as a 2 (main plot) × 4 (sub plot) × 3 (sub-sub plot) split-split plot design with three replications. The main plot included two levels (phorate and a no-phorate control). The sub-plot included three levels of supplemental chemical pesticide treatments (acibenzolar-S-methyl, paraquat, sulfur) and control. The sub-sub plot included three cultivars (AP-3, Georgia Green and SunOleic-97R) representing a range of resistant to susceptible cultivars, respectively. Under high TSWV pressure, pod yield correlated with the TSWV resistance levels previously identified for each cultivar. AP-3, which has the most resistance, had the highest yield regardless of the treatments. In this experiment, phorate treatment did not result in thrips population control or TSWV suppression. Data revealed that neither sulfur nor paraquat treatment affected pod yield or TSWV severity at the end of the season. However, acibenzolar-S-methyl was found to significantly increase pod yield, but did not reduce TSWV severity at the end of the season. Further study is needed to confirm and investigate the positive effect of acibenzolar-S-methyl treatment in peanut yield under high spotted wilt pressure.

EXPENDITURES

Funds were spent on supplies only.