

SCREENING FOR RESISTANCE TO WHITEFLIES IN COTTON RACE STOCKS

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Abstract

Whiteflies (*Bemisia tabac*, *Biotype B*, Homoptera: Aleyrodidae) are pests of cotton crops, affecting the yield of the crop both indirectly and directly. These pests feed on the leaves of the cotton plants and produce “honeydew”, a sticky liquid secretion. This honeydew covers the lint of the open cotton boll creating problems in the processing of the lint. High densities of these pests can also decrease the productivity of the cotton plant by stripping it of vital nutrients. A primary objective of our current research was to screen 116 converted cotton race stocks for susceptibility/resistance to whiteflies. Responses of cotton race stocks to whiteflies are compared to that of known susceptible commercial cultivars PSC 355 and Delta Pearl. Screens for whiteflies were established using excised leaves placed in a nutrient solution (¼ strength Hoagland’s). Leaves were placed under lights that provided the leaves with a 12:12 light and dark period. Adult whiteflies, from a reared colony, were placed in clip cages on leaves and allowed 24 hours to oviposit. Adults were then removed leaving behind eggs to establish a cohort population. This population was followed every day and data taken on the number of whiteflies in each life stage (egg, first instar, second instar, third instar, fourth instar, and adult). This continued until the entire cohort reached adulthood some 35 days later. The development of the population was then charted from this data to compare cotton race stocks to current commercial cultivars.

Resistant candidates of the 116 converted race stocks were determined using a chi squared test comparing leaf averages for survival and developmental times of each converted race stock to that of the commercial checks. This test showed 6 race stocks to be significantly different (sig. 0.1) from the commercial checks for at least one of the two selection criteria. Of these converted race stocks TX0154 and TX0156 showed to have lower survival than the commercial checks, while TX0188, TX0195, TX0221, and TX0242 showed to have an increased developmental time. Future objectives for this line of research include continued screening of these selected converted race stocks along with other converted race stocks that show a combined effect of the two selection criteria that is better than the commercial checks. This will allow us to reexamine the selected race stocks for escapes as well as determine the amount of variability that exists within these selected lines.