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CONTRIBUTIONS OF NON-COTTON HOSTS TO BOLLGARD® REFUGE

Dick Hardee, John Adamczyk, and Jeff Gore
USDA-ARS
Stoneville, MS
Randy Luttrell and Marvin Wall
Univ. of Arkansas
Fayetteville, AR
B. Roger Leonard and Ashley Peters
LSU Ag Center
Winnsboro, LA
John Ruberson
Univ. of Georgia
Tifton, GA
J.R. Bradley and Ryan Jackson
North Carolina State University
Raleigh, NC
John Van Duyn
North Carolina State University
Plymouth, NC
Graham Head, Sakunta Sivasupramaniam, J. Walt Mullins, and Richard Voth
Monsanto Company
St. Louis, MO

Abstract

A regional multi-year project was initiated in 2002 to determine whether *Helicoverpa zea* moths produced in non-cotton hosts effectively supplement the external unsprayed refuge for Bollgard® cotton. More than 100 monitoring locations in grower fields were established in the states of AL, GA, LA, MS and NC. Each monitoring location consisted of a Bollgard field paired with an alternative host crop (corn, soybean, non-Bt cotton, Bollgard cotton, grain sorghum (in the mid-South) and peanuts (in the Southeast)). Each sampling pair was replicated four times in each state. Weekly evaluations were made by quantifying the number of moths captured in pheromone traps placed at the paired-field interfaces and by determining the number of large larvae (L4-L5) produced per acre in each alternative host crop and Bollgard fields. Even though there were large differences in the number of *H. zea* larvae produced in the various fields sampled, these differences were not reflected in the numbers of moths captured in the pheromone traps. Averaged across all locations, there were no statistically-significant differences in the numbers of moths captured per week in the pheromone traps for the various alternative host crops. Corn was a large and consistent producer of *H. zea* larvae (> 30,000/acre) during the reproductive stage of growth, which resulted in a large spike in moths captured at all crop interfaces. *H. zea* productivity in grain sorghum was slightly less than that of corn but was highly variable (depending on farmer management and location) and occurred approximately one week later. Peanuts and soybeans were significant producers of *H. zea* larvae at many locations with their productivity being later than that in corn and sorghum. These preliminary results suggest that *H. zea* production occurs largely on crop hosts other than cotton and that very few are being produced on Bollgard cotton. Temporal occurrence of *H. zea* on Bollgard cotton and other crop hosts was synchronous. Furthermore, *H. zea* moths are widely distributed across the landscape in a manner unrelated to larval production. For additional evidence of crop host relationships, wing samples from moths at all study sites are being analyzed to determine whether the moths fed as larvae on C3 or C4 plants. Satellite imagery is being used to determine the spatial relationship between host crops and other land-cover types extending out to 20 miles from each sampling location. These data will be used to better understand the relationship between bollworm productivity in the landscape, dispersion of host plants, and the subsequent distribution of moths relative to supplementing the Bollgard refuge program. These studies will be repeated in 2003.