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PREDACEOUS ARTHROPODS AND THE STINK BUG/PLANT BUG COMPLEX AS FACTORS THAT MAY LIMIT THE POTENTIAL OF B.T. COTTONS

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Abstract

Several developments have contributed to a substantial decline in applications of broad-spectrum insecticides in cotton. The Boll Weevil Eradication Program, the numerous studies demonstrating that high retention of early squares is unnecessary, and the rapid adoption of Bollgard® varieties that express proteins of the Cry1A(c) strain of *Bacillus thuringiensis* (B.t.) for control of certain lepidopterous pests. Also, Bollgard II® varieties that afford control of most major lepidopterous pests by expressing proteins of both the Cry1A(c) and Cry2A(b) strains of B.t. will soon be available to producers. Such varieties will further diminish the need for insecticides.

Low-insecticide environments in B.t. cottons have allowed populations of predacious arthropods to increase. Also, boll damage from stink bugs [primarily *Nezara viridula* (L.), *Acrosternum hilare* (Say) and *Esuchistus servus* (Say)] and plant bugs (primarily *Lygus lineolaris*) has become prevalent in much of the cotton belt. Mortality to predators and the stink/plant bug complex was commonplace prior to emergence of current low-insecticide environments.

Insecticidal disruption of predacious arthropods in Bollgard® varieties in early season has resulted in the need for more insecticides for control of lepidopterous pests later in the season. Conservation of predators in Bollgard II® varieties will also be important in suppression of pests and even in managing potential resistance to the B.t. proteins because predators will prey upon escaped lepidopterous larvae. As use of broad spectrum insecticides declines, so does coincidental control of the "bug complex"; causing them to invoke high levels of damage in many areas. There is a dearth of information on relating "bug" populations to damage and damage to subsequent yield and quality of the crop. We have no reliable treatment thresholds for stink/plant bugs in B.t. cottons and, as a consequence, growers are inclined to overtreat in order to protect their crops.

Unless beneficials (particularly predacious arthropods) are conserved and viable treatment thresholds are developed for the "bug complex" we risk limiting the potential of B.t. cottons. If too many lepidopterous pests begin to develop because of destruction of predators and too many applications are made because of unreliable thresholds for "bugs" it is understandable that to growers the "costs" of B.t. cottons may appear to exceed their "benefits".