32. Insect Resistant Cotton (1)

Bt cotton varieties were introduced in 1996, providing control of three major cotton insect pests: tobacco budworm, cotton bollworm and pink bollworm. These varieties offer an alternative to conventional insect spray programs. Tobacco budworm infestations were particularly heavy in 1995, causing severe yield loss in some areas. The worst damage was sustained by Alabama growers, who on average experienced a 29% yield loss due to bollworm/budworm despite seven insecticide applications. These losses were attributed to the ineffectiveness of pyrethroid insecticides against budworm, due to the development of resistant populations in some states.

The adoption of Bt varieties was extremely rapid in states that experienced resistance problems (Arizona, Alabama, Georgia, Florida). After the year of very high budworm populations and damage in 1995, growers in Alabama adopted the new technology at an extremely rapid rate, planting over 60% of total acreage to Bt varieties in 1996. Bt cotton is credited with saving the cotton industry in Alabama. In 2001, 42% of cotton acreage in the United States was in Bt varieties. Adoption has been low in California (5%) because the worm pests are not a problem in the San Joaquin Valley and because California’s unique cotton cultivars have not been converted to Bt. Adoption was accelerated in certain states (Mississippi, Louisiana, Texas, Oklahoma, Arkansas, and Tennessee) due to implementation of Boll Weevil Eradication Programs (BWEP) and resistance problems experienced in 1995. Growers in BWEP areas are advised to plant Bt cotton due to the effects of the weevil sprays on predators of bollworms/budworms.

The impacts of the adoption of Bt cotton varieties include a reduction in yield losses due to Bt target pests, reductions in insecticide use, and cost savings.

Numerous surveys have found that growers are achieving higher yields and attaining higher profits by planting Bt varieties, due to better pest control and decreased insect control costs. The average increase in net income in 2000, comparing Bt to conventional varieties, was $20/acre, taking into account the technology fee. On average, per acre insect control costs were $2 higher. This increased cost was outweighed by a yield increase of 36 lbs/acre.

In recent years, the bollworm/budworm has become significantly less troublesome in the Southeast (Georgia, Alabama, Florida) narrowing the economic difference between Bt and nonBt acreage.

Estimated Impacts of Insect Resistant Transgenic Cotton (1)

| Change in Production: | 185 million lbs/yr increase in production |
| Change in Pesticide Use: | 1.9 million lbs/yr decrease in insecticides |
| Change in Net Revenue: | $103 million/yr increase in net revenue |

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