34. Herbicide Tolerant Cotton

Weeds can cause significant losses in cotton and require careful management by the grower. During the initial period of establishment, usually the first 6 to 8 weeks after planting, control of weeds is important in order to prevent undue stress upon the cotton seedlings. Weeds, if allowed to grow unchecked, can dramatically reduce cotton yields.

In 1995, the typical US cotton acre was treated with an average of nearly three active ingredients in nearly three treatments. There were also three cultivating made on the typical acre. Extensive use of hand-weeding crews has been utilized. In the early 1990s, 21% of US cotton acreage was handweeded annually with the highest use in California where 75% of the acreage was handweeded.

US cotton growers applied nearly 32 million pounds of active ingredients at an annual cost of $302 million just prior to introduction of transgenic herbicide tolerant cotton varieties. The total cost of weed control including herbicide, handweeding, cultivation and application costs was $797 million/yr.

BXN cotton varieties were introduced in 1995, offering cotton growers a cultivar resistant to bromoxynil (Buctril) a postemergence herbicide that kills may broadleaf plants. Roundup Ready cotton varieties were introduced in 1997. These varieties have been developed to tolerate glyphosate, a nonselective herbicide which normally cannot be applied over crops without severe crop injury. Research has not demonstrated better weed control in BXN or Roundup Ready cotton than that which can usually be obtained in nontransgenic cotton with traditional weed control systems. However, both transgenic cottons expand the options for weed management and make the mechanics of weed control much easier, less expensive and more convenient. The highest rates of adoption of BXN cotton have been in the states of Arkansas, Tennessee, and Missouri where morningglories are a significant problem and where sicklepod is not prevalent. The Roundup Ready system has been widely adopted as Roundup has a broad spectrum of activity, which includes most of the major annual and perennial grass and broadleaf weeds infesting cotton fields.

US cotton acreage planted with Roundup Ready varieties increased steadily following its introduction in 1997 reaching 70% of planted acreage in 2001. Numerous press articles have reported that cotton growers have adopted the transgenic cultivars as a way to significantly reduce their production costs. Growers have reported making fewer trips across fields applying herbicides, making fewer cultivation trips, and making fewer applications of herbicides. USDA surveys of herbicide usage by cotton growers show a general decline in overall herbicide active ingredient used per acre for most states since 1996/1997 to 2000. Extension Service cotton weed control specialists were surveyed to estimate the changes in tillage, herbicide application trips and handweeding that has occurred on the acreage planted to transgenic cotton. All states reported fewer tillage trips and less handweeding, while herbicide application trips were either reported as unchanged or reduced.

Impacts of Herbicide Tolerant Transgenic Cotton
Change in Pesticide Use: 6.2 million lbs/yr. decrease in herbicide active ingredients
Change in Production Costs: $133 million/yr. Savings in weed control costs

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