

## **REFUGE COMPLIANCE BY BOLLGARD GROWERS IN 2001**

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### **Abstract**

Since Bollgard® cotton was introduced to U.S. cotton growers in 1996, the U.S. Environmental Protection Agency has required growers to plant and maintain non-Bollgard cotton refuges to help prevent or delay insect resistance. Monsanto has voluntarily monitored Bollgard cotton growers for refuge compliance through a series of grower on farm visits. Monsanto, with the assistance of multiple institutions, individuals and agencies, has attempted to inform all growers of refuge requirements. Surveys of Bollgard cotton growers across the Cotton Belt from 1996 through 2001 show that a vast majority of growers appear to be following refuge guidelines.

### **Introduction**

Bollgard cotton was introduced to U.S. cotton growers in 1996. In October of 2001, EPA granted a 5-year extension for Bollgard registration. All growers who plant Bollgard cotton will again be required by EPA to plant and maintain a non-Bollgard cotton refuge to help prevent or delay insect resistance. All Bollgard cotton growers should know that Monsanto is required by EPA to monitor Bollgard cotton growers for refuge compliance.

Bollgard cotton growers have four refuge options in 2002: 5% unsprayed, 5% embedded, 20% sprayed and a Community refuge. Growers may choose a combination of these options. Details of each option are available in the Bollgard Cotton IRM Guide for 2002 that were provided to all Bollgard growers.

### **Materials and Methods**

Since the first refuge requirements were announced in 1996, the EPA has made several adjustments in the compliance options. Monsanto has made efforts to inform growers of all refuge requirements and changes prior to each planting season. The company has made these educational efforts with the cooperation and assistance of multiple individuals and agencies. Efforts included: A general letter to all licensed Bollgard growers; A National Cotton Council educational/promotional effort; Development of resistance posters for retailers and dealers; Educational programs by academics, Extension personnel and consultants; Media awareness tour with academics; Beltwide Cotton Conference poster and papers; Sales-sponsored grower meetings; and Withholding a license from a two-year abuser.

Since 1996, Monsanto has hired Bollgard resistance management representatives to review resistance management plans and to emphasize the importance of the refuge acreage. They also review other IPM practices that help prevent or delay resistance. Representatives looked at farm maps, visited fields, made telephone contact with growers and used Genecheck kits to confirm that the refuge cotton plants were non-Bollgard. Each year representatives visited significantly more growers than was necessary for a statistically representative sample. Initial efforts included a strong educational push as well as a requirement that all Bollgard growers attend educational meetings. Now that growers understand the concept of refuges, Monsanto is interviewing a lower number, but still a statistically relevant number of growers.

### **Results**

Grower contacts and visits ranged from more than 2,300 in 1996 to 528 in 2001. Grower compliance ranged from 99% in 1996 to 91% in 1998. In 2001, 96% of the growers contacted were found to be in compliance.

There are a number of reasons for a lack of compliance. A small number of growers lost refuge acres due to environmental reasons (floods, drought, etc.) Some planted too few refuge acres. Some had no refuge in place. Some planted refuge acres too far from Bollgard acreage. Some appeared to be spraying their 5% refuge acres. And some few growers were uncooperative with Bollgard resistance management representatives. There were no significant abuses of the Community refuge program detected in field visits or surveys in 2001.

Based on six years of on-farm visits, the vast majority of growers appear to be following the refuge guidelines. The surveys suggest that there is building support within the grower community in favor of refuge compliance.