4. Insect Resistant Peanut

Georgia is the number one peanut producing state in the U.S. The 2000 crop comprised 40% of national production and was valued at $355 million. The lesser cornstalk borer (LCB) is a caterpillar pest that can cause serious economic damage in peanuts. Larvae live in silken tubes attached to the plants and feed on plant parts that are at or just below the soil surface. They may bore into plant stems, interrupting water and nutrient flow, and they may feed on developing pegs and pods, directly reducing yields. Wounds caused by LCB feeding may also serve as entry points for infections of plant pathogens, including Aspergillus fungi which produce aflatoxin as a metabolite. Sandy soils and hot, dry conditions which are favorable LCB outbreaks are also favorable for Aspergillus development. Lesser cornstalk borer larvae have been found to be contaminated externally and internally with Aspergillus spores, suggesting that LCB larvae even play a role in spreading Aspergillus.

Peanuts are regularly monitored for aflatoxin contamination, from Aspergillus monitoring in the field to aflatoxin detection at the processor. If contamination at 20 parts per billion is detected in a peanut lot, the lot is graded Segregation III, diverted from edible markets to oil processing, and significantly reduced in value. During the drought year of 1990, an estimated $44 million in peanut production was lost to aflatoxin contamination.

Fungicides have not been shown to reduce aflatoxin levels in peanuts. However, the use of chlorpyrifos, the only insecticide labeled for use against LCB in peanuts, has been shown to lower aflatoxin levels in addition to reducing LCB populations. In 1999, chlorpyrifos was used on 12% of Georgia peanut acreage.

Researchers at the University of Georgia and USDA's Agricultural Research Service have produced peanut plants transformed with the gene for a Bacillus thuringiensis, or Bt, protein. Lesser cornstalk borer larvae that fed on the transgenic peanut plants died or had reduced weights, and in field trials 90% of the transgenic plants were free of LCB damage. The plants also showed resistance to other caterpillar pests. The impact of Bt peanuts' resistant to LCB on aflatoxin contamination is being researched.

Potential Impacts of Insect Resistant Transgenic Peanut
Change in Production: prevent $0.9 million/yr. loss to Segregation III downgrades
Change in Pesticide Use: 47,000 lbs./yr. reduction in insecticides
Change in Production Costs: $0.6 million/yr. savings in insecticide use

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For the full report click here