

Genetically modified cotton in Australia

Integrated Pest Management to improve yield and pest-resistance

Graeme O'Neill

When pesticide-resistant insects threatened to wipe out Australia's cotton industry in the 1970s, researchers began developing Integrated Pest Management (IPM) systems. Australia's cotton yields are now the highest in the world, resistance is well managed, and the industry has successfully reduced its environmental impacts. New, genetically modified (GM) pest-tolerant cotton varieties are beginning to transform cotton production in Australia, the USA and other nations. They offer an unprecedented opportunity to help make cotton production truly sustainable, although their full benefits will only be realized by incorporating them within IPM systems.

Introduction

Cotton, *Gossypium hirsutum*, a member of the hibiscus family (*Malvaceae*), is the world's most important fibre crop, accounting for 48 per cent of global trade in natural and synthetic fibres. Cotton is an ancient crop. Fragments of woven cotton fabric found by archaeologists in western Pakistan indicate that early farmers in the Indus Valley had already domesticated wild cotton over 5,000 years ago. Other reports indicate domestication may also have occurred independently in Africa, Mexico and Peru. Today, cotton is extensively cultivated in both sub-tropical and temperate regions around the world.

China and the USA are the world's leading producers, accounting for a quarter and a fifth of world production respectively, followed by India, Pakistan

and Uzbekistan. India is likely to overtake both China and the USA within the decade; it plants more cotton than any other nation, but insecticide-resistant pests, notably the cotton bollworm *Helicoverpa armigera*, have reduced yields to only 300 kg per hectare, the lowest in the world. The Indian Government has recently approved the cultivation of new GM varieties, known generically as *Bt* cottons, containing genes for natural, insecticidal proteins that kill leaf- and fruit-chewing pests. Australia and the USA have successfully grown *Bt* cottons for the past six years; they have the potential to increase Indian cotton production to levels comparable with other producing nations, and to significantly reduce the global use of pesticides.

In most countries where cotton has been grown in the past half century,

Mr. Graeme O'Neill
CSIRO Plant Industry
GPO Box 1600
Canberra 2601 ACT, Australia
Tel: (+61-2) 62465139
(+61-418) 626860
Fax: (+61-2) 62465299
E-mail: sophie.clayton@csiro.au
pi-enquiries@csiro.au