

Suggested Readings

Manwan, Ibrahim and Subagyo, Tanton. 2002. Transgenic cotton in Indonesia: Challenges and opportunities. Paper presented during the Regional Workshop for the Southeast Asian Biotechnology Information Centers. Concorde Hotel, July 30-31, 2002.

Manwan, Ibrahim. 2002. Laporan Pemantauan dan Pengawasan Kapas Bollgard di Sulawesi Selatan. Final Report for 2001 Cropping Season.

Suwanto, A., Y. Hala, N. Amin, P. Hidayat, G. Sarbini, H. Aswidinnoor. 2001. Analisis Resiko Lingkungan Kapas Transgenik. (Progress report of environmental risk analysis on transgenic cotton). Paper presented during the Second Scientific Discussion on the Evaluation of Limited Release of Transgenic Cotton in 2001 in South Sulawesi. Salak Hotel, Bogor, 2001.

Tim Pemantuan dan Pengawasan Penggunaan Kapas Bollgard (Team for Monitoring and Watching the Utilization of Bollgard Cotton) 2001. Perkembangan Pertanaman Kapas Transgenik MT 2001 di Sulawesi Selatan. Paper presented during the Second Scientific Discussion on the Evaluation of Limited Release of Transgenic Cotton in 2001 in South Sulawesi. Salak Hotel, Bogor, 2001.

Trisyono, Y.A., A. Rosmana, A.A.A., Gothama, A. Ala and Suguino M. 2001. Uji Multilokasi Kapas Bollgard (Report of the multi-location trials in South Sulawesi at 2001 planting season). Paper presented during the Second Scientific Discussion on the Evaluation of Limited Release of Transgenic Cotton in 2001 in South Sulawesi. Salak Hotel, Bogor, 2001.

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INTERNATIONAL SERVICE
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APPLICATIONS

ISAAA AfriCenter

c/o CIP-ILRI Campus
P.O. Box 25171

Nairobi 00603, Kenya

Tel.: +254 2 630743 · Fax: +254 2 631599; 630005

Email: africenter@isaaa.org

ISAAA AmeriCenter

417 Bradfield Hall
Cornell University

Ithaca, NY 14853 USA

Tel.: +1 607 2551724 · Fax: +1 607 255 1215

Email: americenter@isaaa.org

ISAAA SEAsiaCenter

c/o IRRI, DAPO Box 7777

Metro Manila, Philippines

Tel.: +63 2 845 0563 · Fax: +63 2 845 0606

Email: isaaa-seasia@isaaa.org

Bt Cotton in Indonesia





Background

Indonesia depends largely on imported cotton fiber and produces only 1% of its total needs. The major constraints faced by farmers are severe insect infestations, excessive use of pesticides, frequent changes in cotton farm management and technology limitations. The Indonesian government has taken the initiative to look for alternative technologies to improve the cotton industry.

South Sulawesi is one of the major cotton-producing provinces and contributes around 36% of the national cotton production in Indonesia. The introduction of *Bacillus thuringiensis* (*Bt*) cotton to South Sulawesi is regarded as an important strategy to help farmers solve many of the problems faced in cotton production. This insect protected cotton contains a naturally occurring substance, *Bt* protein, which has been the active ingredient in safe and effective biological sprays for over 50 years.

Prof. Ibrahim Manwan, chairman of the Indonesian team to monitor and control the development of *Bt* cotton, and Dr. Tantono Subagyo, research scientist of the Ministry of Agriculture's Agency for Agricultural Research and Development, discuss the challenges and opportunities for *Bt* cotton in Indonesia. They base their discussion on intensive studies conducted in South Sulawesi between 2000 and 2002 by academic and government agencies.

Benefits of *Bt* Cotton

Increased productivity

Bt cotton gave a higher yield than conventional cotton during the technical evaluation in a containment facility followed by field-testing and multi-location trials. During the 2000 cropping season, the average yield of *Bt* cotton was 2.2 tons per hectare compared with 0.92 tons per hectare of the local variety. In the 2001 cropping season, *Bt* cotton gave a yield of 2.37 tons per hectare while the conventional variety averaged 1.82 tons per hectare. The *Bt* cotton variety had an average 30% yield advantage over the conventional variety. The benefit of using *Bt* cotton is more pronounced when there is high insect infestation.

Reduced pesticide use

When conventional cotton varieties are used, farmers have to apply pesticides about 9-12 times. On average, pesticides are applied every 7 to 10 days at 10 kg per season. The excessive use of pesticide causes tremendous negative impact on the environment, biodiversity and health of farmers. When *Bt* cotton was used, the number of pesticide applications was reduced to only 0-3 applications. *Bt* cotton was found to be very resistant to bollworm and budworm, major cotton pests in Indonesia.

Increased income

Farmers' income increased more than five times when they used *Bt* cotton compared with the local variety due to higher productivity. When they planted local cotton varieties, farmers spent about 61% of the total production cost for pest control. Farmers also noted that when they planted *Bt* cotton they spent less effort and time for crop management and harvesting.

Environmental safety

Continuing environmental risk analyses are being done by a tri-university team.

Bt cotton helps conserve natural enemies of cotton insects that can be used as a biological control and contributes to achieving sustainable cotton production. Along with other components, *Bt* cotton can play a crucial role in an integrated pest management (IPM) system by drastically reducing excessive use of pesticides. Farmers' health also benefited from the technology because of reduced pesticide use.

Evaluation of *Bt* cotton is still being continually done. Socio-economic studies, however, note that farmers have a high satisfaction rate for the technology. Early indications show that the introduction of *Bt* cotton is an important strategy in boosting cotton production in Indonesia.

