

Transgenic Cotton Plants Resistant to Boll Weevil

Working group: Genetic cotton transformation module under the INTA – Provinces Technological Cooperation Agreement. Gene Delivery Principal investigators: Dalia Lewi, Laura Maskin, Mariana Turica (Genetics Institute - IGEAF); Ariela González (EEA Sáenz Peña). Principal Investigators: Design and development of gene constructs: Ricardo Salvador, José Niz and Analía Pedarrós (IMYZA), Esteban Hopp (Biotechnology Institute).

Statement of problem:

In Argentina, the presence of the coleoptera boll weevil (*Anthonomus grandis*) in cotton constitutes a challenge to cotton production. Presently, it is the most destructive pest for this crop, given its biological capability for reproduction, dissemination and colonization, which hinders its control with traditional methods.

Under the Technological Cooperation Agreement between INTA and the cotton-growing provinces (Chaco, Formosa, Santa Fe and Santiago del Estero) of Argentina, technology alternatives are being considered to control the boll weevil. One of the approaches is based on biotechnological tools. Modern biotechnology is a useful tool to improve crops in such cases, granting them novel and environmentally sustainable features.



Technology Readiness Level:

Medium. Firstly, cotton genetic transformation technology has been adjusted and for the first time in Argentina, transgenic cotton plants have been obtained.

Transgenic plants have been obtained with the specific sequences to generate RNA interference in the boll weevil. Such plants are developing in the biosecurity greenhouse.

Technological proposal:

INTA is working on the development of varieties resistant to the cotton boll weevil using the RNA interference (RNAi) strategy. It consists of achieving that a very small sequence of RNA is generated in the plant to specifically block the functionality of an essential gene in the weevil and, in this way, reduce its damage capacity.

The insertion of the DNA sequence is achieved by obtaining transgenic cotton plants.

Development requirements (testing, scale-up production, investment, etc.):

Se espera obtener descendencia para poder estudiar la eficacia de los eventos obtenidos, seleccionar los mejores, estabilizar las líneas y retrocruzarlas con variedades de alta productividad del plan de mejoramiento de INTA. En paralelo se realizarán ensayos de desafío frente al picudo tanto in vitro como a campo. Por tratarse de material regulado, los ensayos a campo deben ser autorizados por la autoridad competente, previo envío de solicitud y evaluación en CONABIA.