

CRISPR gene editing could fuel fight against evolving cotton pests

[B]ugs are biting back by adapting to crops genetically engineered to kill them.

A new study published in the *Proceedings of the National Academy of Sciences* identifies a dominantly inherited mutation that confers resistance to engineered cotton in caterpillars of the cotton bollworm, one of the world's most destructive crop pests

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"It's a remarkable detective story," said Bruce Tabashnik, Regents' Professor in the UA Department of Entomology and co-author of the study. "Without the latest advances in genetic technology, it would not have been possible to find the single DNA base pair change causing resistance in the bollworm's genome."

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"In comparing the sequences of those 17 genes between the strains, there was only one consistent difference," Tabashnik said. "There was one position where all of the resistant bollworms had one DNA base pair and all of the susceptible bollworms had a different DNA base pair."

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With the mutant base pair identified, the second challenge was to determine if this single mutation causes resistance. To find out, the research team used the gene-editing tool CRISPR to precisely alter only the HaTSPAN1 gene. When the gene was disrupted in resistant bollworms, they became completely susceptible to Bt. Conversely, when the mutation was inserted in the DNA of susceptible bollworms, they became resistant – proving this single base pair change alone can cause resistance.

Read full, original article: [Genetic search reveals key to resistance in global cotton pest](#)