Unintended Effects of Genetic Manipulation
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Adoption of GM Cotton Slowing in West Africa Due to Concerns About Inferior Qualities of Crop

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The West African nation of Burkina Faso, once a showcase for small farms growing genetically modified (GM) cotton cultivars, has been phasing out GM cotton because its qualities have been inferior to those of the prized local, non-GM cultivars the engineered cotton had replaced. So reports a study published in January 2016 in *African Affairs*, a peer-reviewed journal published by the Oxford University Press.

It turned out that a much lower percentage of the GM crop yielded the long fibers that premium cotton products require. There was also a decline in the ginning ratio – a measure of how much useable fiber, relative to a unit weight of the cotton delivered to a gin, is actually available to spin once the gin separates it out from the seed. Monsanto attributed the decline in these qualities to weather-related stresses, but the decline persisted through the years, according to the authors of the study.

"In theory, inserting the Bt gene into the Burkinabè germplasm should have left the resultant progeny identical to its parent in every way except for the inserted trait conferring insect resistance," the researchers stated. "But, in reality, the process of introgressing the Bt trait into the local variety appears to have interfered with some of its most important characteristics. Monsanto scientists are at a loss to explain the precise mechanism that has created these problems. The company is attempting to identify and correct this fault."

Fallout from the situation in Burkina Faso may slow the adoption of GM cotton elsewhere in West Africa, the researchers suggested, and "could have significant implications for the future of GM crops in Africa." (In fact, according to a later press report of May 2017, discussed below, that fallout has already interfered with the adoption of GM cotton in Ghana.)

Encouraged by Burkinabé government officials, Monsanto had backcrossed its Bt cotton, which was engineered to resist cotton bollworms, with three of Burkina Faso's local cultivars, explained the authors of the study, who are from the University of San Francisco and Dalhousie University. The researchers added that the non-GM local cultivars had been bred to be well adapted to local conditions and were valued for producing the long, strong, uniform fibers that are required for the most expensive cotton textiles. The resulting GM seed, which is far costlier than the local non-GM seed, was first available to farmers in Burkino Faso in 2008. By 2013, about 70 per cent of cotton fields in the country were planted with the GM seeds, the researchers reported. As of 2015, that was still the case and Burkina Faso was the top producer of cotton in Africa, in terms of total metric tons. The GM cotton did increase yield and, in the short term at least, farmer profits, and it also was credited, as of 2014, with reducing both the use of pesticides and reports of pesticide poisonings.

But the cotton companies – which loan small farms the money they need to buy seed and other inputs and then buy the farmers' cotton – struggled to sell the GM cotton, especially at the price they would have received for the local non-GM cotton, the researchers added. The

frustrated companies, starting in the planting year of 2015-2016, began reducing the amount of GM seed available for farmers to plant. They also set a goal to totally switch back to the non-GM local cultivars in time for the planting season of 2017-2018. The cotton companies are seeking the equivalent of tens of millions of dollars from Monsanto, claiming this as reimbursement for their financial losses related to the inferior quality.

Related to the controversy, Monsanto has ended its funding for field trials of GM cotton in Ghana, and, without Monsanto's support, further trials are not going forward at this time, according to a press report in May 2017. That development corresponds to the researchers' suggestion that concerns about the quality of GM cotton may slow the adoption of GM cotton elsewhere in West Africa, and may have larger impacts for GM crops across Africa as well.

Sources

Dowd-Uribe, Brian and Matthew A. Schnurr (2016). "Briefing: Burkina Faso's Reversal on Genetically Modified Cotton and the Implications for Africa," *African Affairs* vol. 115, no. 458, pp. 161-72. doi:10.1093/afraf/adv063. The authors have also made the article freely available here.

Ibrahim, Abubakar (May 11, 2017). "CSIR Suspends GMO Cotton Trials as Monsanto Withdraws Funds," *Joy Online* (Ghana news website). See: http://www.myjoyonline.com/news/2017/May-11th/csir-suspends-gmo-cotton-trials-as-monsanto-withdraws-funds.php