

Genetically modified organisms and sustainable food security in sub-Saharan Africa: An empirical assessment of evidence to date

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This paper shifts the biotechnology debate by moving past overly general claims about hypothetical risks and benefits, and instead examining in depth the actual results of current biotechnology programs in sub-Saharan Africa. A multi-criteria framework is developed and utilised for evaluating the 'appropriateness' crop engineering programs in Africa based on six requirements now widely recognized in agricultural research: demand driven; site specific; poverty focused; cost effective; and institutionally and environmentally sustainable. This framework is applied to the three most advanced genetically engineered crops in Africa: Bt cotton, virus-resistant sweet potatoes and Bt maize.

Analysis shows Bt cotton scores low on criteria of demand drive, site specificity, and institutional sustainability. It shows ambiguous results in poverty focus, and cost effectiveness. Environmental sustainability is currently moderate, but could potentially be moderate to strong. Virus-resistant sweet potatoes are also not greatly demand driven, site specific, poverty focused, cost effective, or institutionally sustainable. The environmental sustainability of modified sweet potatoes is ambiguous. For Bt maize, the analysis shows low demand drive, cost-effectiveness, and institutional sustainability. It is too early to detect unambiguous site specificity or poverty focus. Environmental sustainability is currently low to moderate, but could potentially be raised.

Possible explanations for investment in these three crop engineering programs despite the generally low level of appropriateness include crowding out of prioritized research by private donations, and persisting deficiencies in client-orientation of national and international agricultural research systems.