ACB BRIEFING PAPER No.1, 2008

GMO Trials in South Africa in 2007: who is doing what and where?

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contents

GMO Biohazard Map update now available!

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1. Background

Questions around GMO field trials in South Africa continue to be asked – where exactly are they happening, when will there be adequate environmental risk assessment and post–release monitoring, what are the effects on neighbours of GMO field trials and what are the cumulative affects of all the field trials that have happened in South Africa?

Within this context, the African Centre for Biosafety (ACB) has sought to place more information in the public domain and highlight some of the issues around GMO field trials in South Africa. In January 2007, a briefing document **Field trials of GMOs: who is doing what and where in South Africa** was produced.[1] This was a focus on field trials that occurred in 2006. A GMO Biohazard Map of South Africa was also produced.

In November 2007, data for field trials as well as medical clinical trials for the year was obtained from the Department of Agriculture using the Promotion of Access to Information Act (PAIA). An overview of these GMO trials is provided in this document with details of the field trials on the updated GMO Biohazard Map.[2]

There have been fewer field trials in 2007 than in 2006. However, there have also been approvals for applications which have not yet been planted – these can or will still be planted. It should also be noted that there have been two significant applications for GMO trials that have been refused. These are ARC's application for trial release of GM cassava[3] and Biological Control Products' trial release of GM mosquitocide.[4]

2. What is happening where?

Similarly to 2006, out of South Africa's nine provinces, only the Eastern Cape has been spared field trials in 2007. The GMO field and clinical trials that have taken place in 2007 are given below:

Western Cape	–	GM potatoes, GM HIV vaccine, GM TB vaccine
Northern Cape	–	GM cotton
North-West	–	GM maize, GM groundnut, GM HIV vaccine
Gauteng	–	GM maize, GM potato, GM HIV vaccine
Limpopo	–	GM cotton
Mpumalanga	–	GM maize, GM cotton
Free State	–	GM potato
KwaZulu-Natal	–	GM cotton, GM sugar cane, GM HIV vaccine

In 2007, there were 21 different field trial sites and 11 medical clinical trial sites (with 32 different field trial sites in 2006).

As was the case in 2006, the traits that are being expressed in the field trials are predominantly "stacked" meaning that more than one trait has been engineered into the crop, e.g. insect resistance and herbicide tolerance, as has happened with many of the maize and cotton field trials. Other traits expressed in the 2007 field trials, include insect resistance (in potato field trials), herbicide tolerance (cotton field trials), drought resistance (ground nut field trials), viral resistance (sugarcane field trials) and production of an "alternative" product, inulin (sugarcane field trials).

3. Who is doing what?

In 2007, as in 2006, many of the field trials were run by the giant GM multinationals, namely Delta and Pinelands (D&PL), Monsanto and Syngenta. The Agricultural Research Council (ARC) and South African Sugarcane Research Institute (SASRI), the two South African research institutes involved in GMO field trials in 2006, have also continued with field trials. Tricilinium and the University of the Witwatersrand are the two institutions involved in medical clinical trials. These multinationals and institutes with their respective GMOs are given below:

D&PL:	–	GM cotton (Cotton BGII x RR Flex = MON15985 x MON88913)
Monsanto:	–	GM maize (MON89034, MON89034 x NK603)
Syngenta:	–	GM maize (GA 21)
ARC:	–	GM ground nut (high praline), GM potato (Potato Spunta G2)
SASRI:	–	GM sugarcane (Sugarcane 1-2-3-3, SCMV)
Triclinium	–	GM HIV vaccine (VRC- HIV DNA 16-00-VP and VRC-HIV ADV1 4-00-VP), GM TB vaccine (AERAS-412 and MVA85A)
Wits	–	GM HIV vaccine (MRKAd5 HIV-1 gag/pol/nef vaccine)

4. The GMO Biohazard Map

Besides new data for 2007 being added to the map, the design and functioning of the map has been changed. Within the map of South Africa, one can click on the different provinces and then within each province one will be able to click on the towns that have field trials taking place close to them. A list and details of all the GMO field trials happening in that locality will then pop up, for example:

Potchefstroom

Monsanto's GM maize, insect resistant and herbicide tolerant, MON89034 and MON89034 x NK603, permit for 26 May 2006 – 31 May 2008

Syngenta's GM maize, herbicide tolerant, GA21, permit for 02 June 2006 – 30 June 2007

ARC's GM ground nut high praline, drought resistant, permit for 10 November 2005 – 30 November 2007

5. What is in store for 2008?

Field trials that were approved in 2007, but have not yet been planted include GM sugarcane (pleurocidin, 8H0019), GM potato (insect resistance) and GM cotton (insect resistance. Applications to the Department of Agriculture will also continue throughout the year – for import permits, field trials, commercial release – and some of these applications will be approved for field trials that will happen in 2008.

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6. Issues and concerns

Many of the issues and concerns written about in **Field trials of GMOs: who is doing what and where in South Africa**[5] are still valid (see items a – d). However, there are three other issues that need to be highlighted, namely field trials for alternative products, medical clinical trials and environmental risk assessment (see items e – g).

a. Level of public awareness

Most South Africans do not know that they have genetically modified field trials taking place in their country. It is highly likely that most of the people in South Africa's six neighbouring states also have no knowledge of this. Considering that all of the field trials involve highly significant crops (staple foods, key agricultural crops) and that there is international concern regarding the negative environmental and socio-economic impacts of GM crops, this is of great concern.

b. Access to information

Although the Department of Agriculture (DoA) has a section on its website giving details of the permits approved for each year,[6] key information such as the locality of the field trial is not included. To obtain this information, the African Centre for Biosafety had to use the Promotion of Access to Information Act (PAIA). This is a time-consuming and costly business and the geographic information received is still at a coarse level – the nearest town to the field trial is given as the locality. This "town" locality may cover large areas of land, often of vastly different terrain and biodiversity, spanning commercial and small scale farmers' land and somewhere within this area will be the field trial.

This geographic information should not be "Confidential Business Information" but should be in the public domain. The public and farmers have a right to know exactly where these field trials are taking place.

c. Field trials – getting riskier?

Field trials initially involved only one trait, e.g insect resistance. However, in 2006, the majority of field trials involved stacked genes, i.e. crops exhibiting two traits (insect resistance and herbicide tolerance).

Stacked genes increase the level of uncertainty and increase the level of risk.

d. Keeping track of the field trials

Keeping track of the field trials in South Africa is difficult for any member of civil society. Field trial permits are usually issued for one year (except in the case of crops like sugarcane and potatoes). The approved field trial permits are included with permits for contained use, trial release, general release and commodity clearance on DoA's website[7] – during the period January–June 2006, 128 permits were granted (129 during January-June 2007)! It's also important to track what happens as a result of the field trial – what is the next step for the multinational or local institution? Is there post trial monitoring and if so what are the findings?

Hopefully the Biohazard Map and its updates will help keep civil society informed of some of these issues.

e. Field trials for "alternative" products

With the increasing focus on food security, the field trial for GM sugarcane that produces an "alternative" product is of particular concern. This field trial is investigating sugarcane that has been genetically modified to producing inulin, a carbohydrate polymer, that is not normally produced by sugarcane. Sugar, although not a food, is used substantially by the food industry and issues of food security are paramount. It should also be noted that in 2007, the Executive Council (the decision-making body under the GMO Act) turned down a commodity clearance permit application by Syngenta for maize that had been genetically modified to produce 2 "novel" proteins. This maize was genetically modified for industrial use (not as a food) for ethanol fuel production. Reasons for this refusal relate to food and feed safety issues, allergenicity and possible negative impacts on exports.

f. Medical clinical trials

Although these clinical trials are different in several respects to agricultural field trials and are more highly regulated, they do involve GMOs and are governed by the same piece of legislation (the GMO Act). For this reason, ACB has included them in this briefing document.

In 2007, there were three clinical trials in South Africa at 11 sites. Two of these were for GM TB vaccines and one was for a GM HIV vaccine. The GM vaccine clinical trial (MRKAd5 HIV-1 gag/pol/nef) was stopped in September 2007 by Merck as the vaccine seemed to increase risk.[8]

The ACB, in 2006, had made a detailed submission on this application to the Registrar of the GMO Act and highlighted that there were a number of unanswered questions relating to the health of the vaccinees as well as the creation of new recombinant viruses and non-target effects. There were also concerns with the use of adenoviruses, aspects of the risk assessment, the understanding of the terms "risk" and "probability" and various specific concerns and questions.[9]

g. Environmental Risk Assessment

Since 1999, GMO field trials have been happening in South Africa. Despite the length of time that field trials have been occurring, South Africa still does not have Environmental Risk Assessment (ERA) and post-release monitoring in place. It is hoped that the Department of Environmental Affairs and Tourism (DEAT) much awaited ERA document[10] will be finalized in early 2008. In terms of biosafety, it is critical that ERA and post-release monitoring are in place.

7. Further reading

Mayet, Mariam. 2007. **Regulation of GMOs in South Africa: details and shortcomings**. African Centre for Biosafety. Biosafety, Biopiracy and Biopolitics Series: 2.

Williams, Rose. 2007. **Interrogating GMO decision-making: critique of GMO permit applications in South Africa 2004-2007**. African Centre for Biosafety. Biosafety, Biopiracy and Biopolitics Series: 1.

To follow up on GMO trials, contact the Department of Agriculture:

The Registrar
Genetically Modified Organisms Act
Private Bag X973
Pretoria
0001
Tel: 012 319 6000

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8. References

1. Williams, R. 2007. **Field trials of GMOs: who is doing what and where in South Africa**. African Centre for Biosafety. HYPERLINK "http://www.biosafetyafrica.net" http://www.biosafetyafrica.net (accessed 3 December 2007).

2. African Centre for Biosafety. HYPERLINK "http://www.biosafetyafrica.net/portal/index.php?option=com_wrapper&Itemid=62" http://www.biosafetyafrica.net/portal/index.php?option=com_wrapper&Itemid=62 (accessed 3 December 2007).

3. Minutes of the Executive Council under the GMO Act, 1997 held on 13 March 2007.

4. Minutes of the Executive Council under the GMO Act, 1997 held on 17 July 2007.

5. Williams, R. 2007. **Field trials of GMOs: who is doing what and where in South Africa**. African Centre for Biosafety. HYPERLINK "http://www.biosafetyafrica.net" http://www.biosafetyafrica.net (accessed 3 December 2007).

6. National Department of Agriculture website. 2007. HYPERLINK "http://www.nda.agric.za/docs/geneticresources/forms_pdf.htm" http://www.nda.agric.za/docs/geneticresources/forms_pdf.htm (accessed 4 December 2007)

7. National Department of Agriculture website. 2007. HYPERLINK "http://www.nda.agric.za/" www.nda.agric.za/

8. Altman, Lawrence, K. & Pollack, A. 8 November 2007. **In test, AIDS vaccine seemed to increase risk**. *New York Times*. HYPERLINK "http://www.nytimes.com/2007/11/08/health/08hiv.html?_r=1&ref=research&oref=slogin" www.nytimes.com/2007/11/08/health/08hiv.html (accessed 3 December 2007).

9. African Centre for Biosafety, 24 June 2006. **Comments and Concerns on the application made by Prof. Glenda Gray in respect of the HIV clinical trial of genetically modified organism (MRKAd5 HIV-1 gag/pol/nef)**. HYPERLINK "http://www.biosafetyafrica.net/" http://www.biosafetyafrica.net/ (accessed 3 December 2007).

10. Minutes of the Executive Council under the GMO Act, 1997 held on 18 September 2007.

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