

Heavy Hands

Monsanto's
control in
South Africa

GMOS in African Agriculture Series



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The African Centre for Biosafety (ACB) is a non-profit organization, based in Johannesburg, South Africa. It provides authoritative, credible, relevant and current information, research and policy analysis on genetic engineering, biosafety, biopiracy, agrofuels and the Green Revolution push in Africa.



©The African Centre for Biosafety
www.biosafetyafrica.org.za
PO Box 29170, Melville 2109 South Africa
Tel: +27 (0)11 486 1156

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Acronyms

AATF	African Agricultural Technology Foundation
ARC	Agricultural Research Council
ASA	Advertising Standards Authority (South Africa)
BMGF	Bill and Melinda Gates Foundation
Bt	Bacillus Thuringiensis
CEC	Crop Estimates Committee
CFS	Centre for Food Safety
DAFF	Department of Agriculture, Forestry and Fisheries
DoJ	Department of Justice (USA)
EU	European Union
FDA	Food and Drug Administration (USA)
GEAC	Genetic Engineering Approval Committee (India)
GMO	Genetically Modified Organism
HT	Herbicide Tolerance
IR	Insect Resistance
ISAAA	International Service for the Acquisition of Agri-biotech Applications
ISF	International Seed Federation
M & As	Mergers and Acquisitions
MFPP	Massive Food Production Programme
NGO	Non-Governmental Organisation
rBGH	recombined Bovine Growth Hormone
R & D	Research and Development
RR	Roundup-Ready
SANBI	South African National Biodiversity Institute
SANSOR	South African National Seed Organisation
SEC	Securities and Exchange Commission (USA)
UNFAO	United Nations Food and Agricultural Organisation
UPOV	International Union for the Protection of New Varieties of Plants
USDA	United States Department of Agriculture
USAID	United States Agency for International Development
WEMA	Water Efficient Maize for Africa project

About this paper

This paper seeks to update an earlier report, published by the African Centre for Biosafety (ACB) in 2004, titled 'A profile of Monsanto in South Africa'. In that paper we found that Monsanto dominated the GM crop market in South Africa and was using its considerable power to influence agricultural markets and debates in the country. In the intervening period, Monsanto has consolidated its position in both the global and South African seed markets. It also covets the vast agricultural seed market in the rest of Africa.

In order to situate Monsanto within the South African context, the paper first presents a brief overview of Monsanto's origins, its prodigious transformation to the agribusiness behemoth it is today, and point to some of the more dubious acts it has carried out in order to remain there. Next, we examine Monsanto's role in the South African agricultural landscape, with a particular focus on the maize seed market and the markets for Monsanto's herbicide, Roundup. Finally, we provide a brief summary of the South African maize sector in general and look at current and possible future trends in this sector and how Monsanto's operations could influence these.

Key facts and findings

- Monsanto is the world's largest agricultural seed company, owning a large share of the global seed market. In 2010, sales from its seed and agro-chemicals amounted to a whopping \$10 billion. Worldwide, it operates in 80 countries, including in 9 African countries.
- Monsanto's market dominance has been made possible through favourable seed and intellectual property laws that allow for patent protection on individual genes. Advances in agricultural biotechnology have enabled genes to be isolated in one species and transferred into other unrelated species such as plant crops.
- Although Monsanto has no historical record of plant breeding, it acquired seed companies that enabled them to transfer its patented genes into seeds of these companies, bred over generations, and claim ownership.
- Patent protection over these seeds gives Monsanto an enormous advantage over the farmers it supplies. For example, they can be made to sign extremely restrictive user contracts that prohibit the re-planting of old seeds, or any independent breeders from using them for research purposes. Similarly, as Monsanto owns the two most commonly used GM traits on the market, it can enter into licensing agreements with other biotechnology and seed companies, who pay Monsanto hefty royalties to use and sell Monsanto's GM traits. It also gives Monsanto the scope to influence the R&D activities of these companies, as they have the power to stop other companies from combining their own GM traits with those of Monsanto's. Monsanto's market dominance in the United States has prompted the Department of Justice to investigate Monsanto in terms of its anti-trust legislation.
- Monsanto has been operational in South Africa since 1968, though it was only in 1998 that it entered the country's commercial seed markets. In this short space of time, Monsanto now controls around 50% of the maize seed market in South Africa. Monsanto has even greater control over the market for GM maize: There is currently only one GM maize variety (of over 140 registered) on the market that does not contain a Monsanto owned trait. In the market for white maize, South Africa's staple food, currently every GM variety sold is either directly by, or under license from, Monsanto.
- The size of the GM maize seed market in South Africa has grown rapidly in recent years. In 2005, 20% of all maize seed sold in the country was GM. By 2010, this figure had reached 58% and is set to continue to rise in the near future. Of the 170,000 tons of GM maize seed imported into South Africa since 2001, an astonishing 99.9% of these have contained Monsanto's traits.
- Furthermore, in 2010 just over 900,000 ha in South Africa were planted with GMOs containing Monsanto's herbicide tolerant trait, up from 349,000 ha in 2006.¹ This trait confers resistance to glyphosate-based herbicides, of which Roundup is Monsanto's registered brand. Roundup has been hugely lucrative for Monsanto since its registration in 1975 and is still ubiquitous throughout the world. Though Roundup went off patent in 2000, the spread of Monsanto's

herbicide tolerant, also known as Roundup Ready (RR), GM crops globally (and in South Africa) has ensured Monsanto's continued dominance of the glyphosate based herbicide market. Although other generic varieties can be used with RR crops, farmers not using Monsanto's product forfeit any rights to compensation in the event of crop failure. By its own admission, Monsanto controls 60% of the glyphosate market in South Africa.

Introduction – the rise of a global seed super-power

Monsanto is the world's largest agricultural seed company, with a 23% share of the global market in 2007.² By 2010, Monsanto was netting combined

seed and agrochemical sales of \$10 billion.³ The geographical scope of its operations is enormous: Monsanto has a presence in 80 countries, across 6 continents. The agricultural landscapes the company operates in range from the most highly industrialized mono-cropping systems, such as the USA, Brazil and Argentina, to Malawi, where smaller holders dominate. Of these 80 countries, 9 are found in Africa.⁴ Through its close links to governments and public sector research institutions, in both the United States and elsewhere, it is able to wield extraordinary influence on global agricultural policies and debates.

The company was founded in 1901, though it would take another 50 years, and the emergence of the mammoth agricultural chemical complex in the US after the end of the Second World War⁵, for it to become a serious industrial player. During this post-war 'golden-age' of industrial expansion, Monsanto firmly established itself as a chemical giant, with strong links to the US military-industrial-complex. In Vietnam, its chemical defoliant 'Agent Orange' was used to devastating effect on the local environment and populace, while vast swathes of the Columbian countryside were doused with its chemical herbicide 'Roundup' during the so called 'war on drugs'.⁶ During the 1970s, the agricultural seed industry underwent a period of profound change, as research and plant breeding were increasingly becoming an endeavour of the private sector.⁷

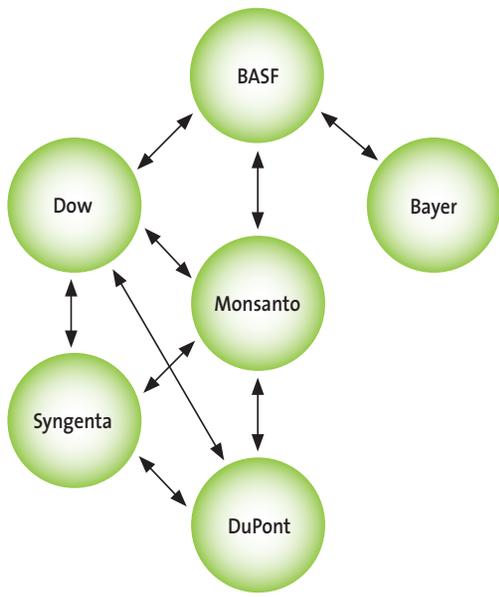
Concurrently, as a means to 'encourage' and 'reward' innovation, international seed agreements, such as the International Union for the Protection of New Varieties of Plants (UPOV), were being systematically revised to strengthen the position of plant breeders and notions of intellectual property, at the expense of the end users of the seeds, the farmer.⁸ The position of the breeder vis-a-vis the farmer was further buttressed with the landmark decision by the US Supreme Court in 1980 in *Diamond v Chakrabarty*⁹ that allowed for the patenting of a live organism (a bacterial strain in this case). In 1985, the case of *Ex Parte Hibberd* further confirmed this legal position in the field of plant variety protection. The *Hibberd* decision allowed plant patents to be included under the category of utility patents, which allows for the patenting of individual components of plant varieties.¹⁰

With the privatisation of scientific and academic research and the construction of an elaborate set of intellectual property (IP) laws to protect them, Monsanto saw its opportunity to simultaneously develop new lucrative technologies and revive, and even strengthen its position in the agro-chemical sector. The genetic engineering of crops that are tolerant to certain chemical herbicides (in the case of Monsanto, herbicides based on glyphosate, in which its own brand 'Roundup' is globally recognised) ensured that Monsanto would not only exercise ownership over seeds but also over a growing market for its flagship Roundup herbicide.¹¹ Patent protection on the 'Round-up Ready' seeds they had created ensured that, in legal terms, the seeds remained their property even once they had been planted in the farmer's fields. This gave (and still gives) Monsanto unprecedented influence over farming practices, including how the seed can be used and what chemicals can be used with them.¹² All that was needed to execute this elaborate marketing strategy on the scale needed was a large collection of seed germplasm to insert their protected traits into, and a network of seed dealers to distribute them to farmers.

During the ‘Roaring ‘90’s’ (to borrow the title of a book by Nobel economic laureate Joseph Stiglitz), the agrochemical, pharmaceutical and biotechnology industries engaged in a frenzied series of mergers and acquisitions. By the time the dust had settled, at the turn of the twenty first century, just six companies controlled the global biotechnology, seed and agrochemicals market (and with it a significant segment of the global food industry): Syngenta, Dow Chemicals, DuPont / Pioneer Hi-Bred, Bayer, BASF, and Monsanto.¹³ Through the acquisitions of DeKalb genetics (\$2.5 billion), Delta and Pine Land (\$1.5 billion), Cargill’s International Seed Division (\$1.4 billion), Seminis (\$1.4 billion), and Holden’s Foundation Seeds (\$1.02 billion)¹⁴ Monsanto had acquired the germplasm and seed dealer networks to carry out its full-scale dominance of the global agricultural landscape.

In addition to simple mergers and acquisitions (M&As), a spate of cross licensing agreements in the agro-chemical and seed sector has further eroded competition, without attracting the same level of attention and scrutiny that traditional M&As do (what the ETC group has termed ‘non-merger mergers’). Monsanto has established cross-licensing agreements with every major player in the industry, including a massive \$2.5 billion collaboration with German chemical giant BASF towards developing drought tolerant crops. In South Africa, all seed companies that sell GM seeds do so under license from Monsanto and only one company sells a non-Monsanto trait. Details on these deals are notoriously thin on the ground. Contained in its latest submission to the US Securities and Exchange Commission, a nine-year licensing agreement (signed in 2008) which grants Swiss agrochemical giant Syngenta access to Monsanto’s Roundup Ready 2 Yield soybean traits, will earn Monsanto a minimum of \$91 million over this period.¹⁵

Figure 1: Cross-licensing agreements in the agro-chemical and seed industry



Source: Howard, 2008.

Today, Monsanto’s size and power allows them to manipulate and control the industry. In the words of a lawyer representing US chemical giant DuPont, for a seed company to stay in business, “essentially they have to do what Monsanto tells them to do.”¹⁶ Although Monsanto has suffered numerous setbacks during 2010, including a dramatic decline in its revenue from Roundup and disappointing field yields from its newest round of GM crops¹⁷, its market power and political influence are still formidable. The financial gains the company has made since its foray into the seed sector has been matched by the political capital it has accrued over this period.

‘Producing more, conserving more, improving lives’ – Monsanto at a glance

More than a decade ago, the undue influence Monsanto had over policy makers in Washington, ergo agricultural

policy makers world-wide, was noted by the New York Times, itself hardly a bastion of radical anti-corporatism. An investigative article bluntly stated: “What Monsanto wished for from Washington, Monsanto, and by extension, the biotechnology industry got”.¹⁸

During the mid 1980s, to great fanfare from the medical fraternity, the use of biotechnology in pharmaceuticals exploded. Dr. David Golde, physician-in-chief at a prominent cancer research and treatment centre in New York exclaimed that the advent of transgenics had ‘changed human health’. Recognising that tinkering around with people’s food may not be greeted with the same fanfare as the creation of a blockbuster ‘life-saving drug’, a Monsanto draft strategy document produced in October 1986, recommended engaging elected officials and regulators around the world, to ‘create support for the biotechnology at the highest U.S. policy levels’, using the impending presidential election of 1988 to gain endorsements from both the Republican and Democratic parties.¹⁹

By 1994, when Monsanto released its first biotechnology product on to the US market; a GM Bovine Growth Hormone (rBGH) used to increase milk production in cows, the strategy appeared to have borne fruit. When the United Nations food safety authority, Codex Alimentarius, refused to approve its use,²⁰ the US Food and Drug Administration (FDA)’s guidelines on rBGH labelling announced that products labelled ‘non-BGH’ must carry an additional label stating there is no difference between rBGH and the naturally occurring one. It was later revealed that the FDA’s deputy commissioner Michael Taylor, who wrote the regulations, had previously worked for Monsanto on the very rBGH labelling issue.²¹

In 2009, Taylor was appointed by the new Obama administration as ‘advisor to the FDA commissioner’.²² Other noteworthy agricultural appointments under the Obama administration include: Former governor of Iowa (once named ‘governor of the year’ by the biotechnology industry) Tom Vilsack as secretary for agriculture; Roger Beachy, former director of the Monsanto funded Danforth Plant Science Centre, as director of the USDA National Institute for Food and Agriculture; Islam Siddiqui, former vice president of Monsanto funded pesticide lobby group CropLife, as agricultural negotiator for the US trade representative and Rajiv Shah, former agricultural development director for the Gates Foundation (a frequent Monsanto partner), as head of the United States Agency for International Development (USAID).

Monsanto has also used its close links to policy-makers in the United States to strengthen its position internationally and, without a hint of irony, has engaged in a massive public relations exercise to promote genetically modified seeds as the only solution to alleviating global hunger. Its first GM venture into Africa, with its partner USAID, was the disastrous GM sweet potato project in Kenya, which is no closer to commercialization today than when it was originally mooted 15 years ago.²³ This has not dampened the company’s resolve, as it is currently collaborating with German chemical giant BASF and the Bill and Melinda Gates Foundation to genetically engineer maize for ‘drought tolerance’.

The Water Efficient Maize for Africa (WEMA) project, funded by the Gates Foundation and involving GM and non-GM drought tolerant maize, is being rolled out in 5 African countries: South Africa, Uganda, Kenya, Tanzania and Mozambique. The agency responsible for coordinating and implementing WEMA is the African Agricultural Technology Foundation (AATF), a long-time ally of Monsanto and USAID, who has lobbied vociferously for weak biosafety legislation on the African continent. Monsanto has been very vocal in advertising that it will donate four drought resistant varieties alongside BASF, to the project. The potential \$3 billion dollar market they will earn for drought tolerant crops should more than adequately compensate for any losses incurred from the donation. Further insight into the true modus operandi of the project became known when it was

revealed that between April and June of 2010, the Gates Foundation purchased \$27 million in shares in Monsanto.²⁴

Hearts, minds and Wikileaks

In the course of ‘producing more, conserving more, improving lives’²⁵, Monsanto has become synonymous with the power and corruption of the global corporation. In 2005, it was fined \$1.5 million for bribing an Indonesian official \$50,000 while attempting to avoid an environmental impact study from being conducted on its GM cotton. Monsanto also admitted to bribing a number of high-ranking officials in Indonesia, between 1997 and 2002.²⁶ In 1998, the Canadian newspaper Ottawa Citizen reported that Canadian government scientists had allegedly been offered between \$1 and \$2 million by officials from Monsanto to approve the highly controversial rBGH.²⁷

In India Monsanto, together with its local subsidiary Mayco, has embarked on an aggressive campaign to firmly imbed GM seeds into India’s vast small holder farmer network, first through Bt cotton, then in 2009 and 2010 with Bt Brinjal. In the case of Bt Brinjal, it was discovered that several passages from the safety data submitted had been lifted, verbatim, from a publication from the biotech industry lobby group, the International Service for the Acquisition of Agri-biotech Applications (ISAAA). Furthermore, the chairman of the regulatory agency in India in charge of GMO approvals also sits on the board of the ISAAA.²⁸

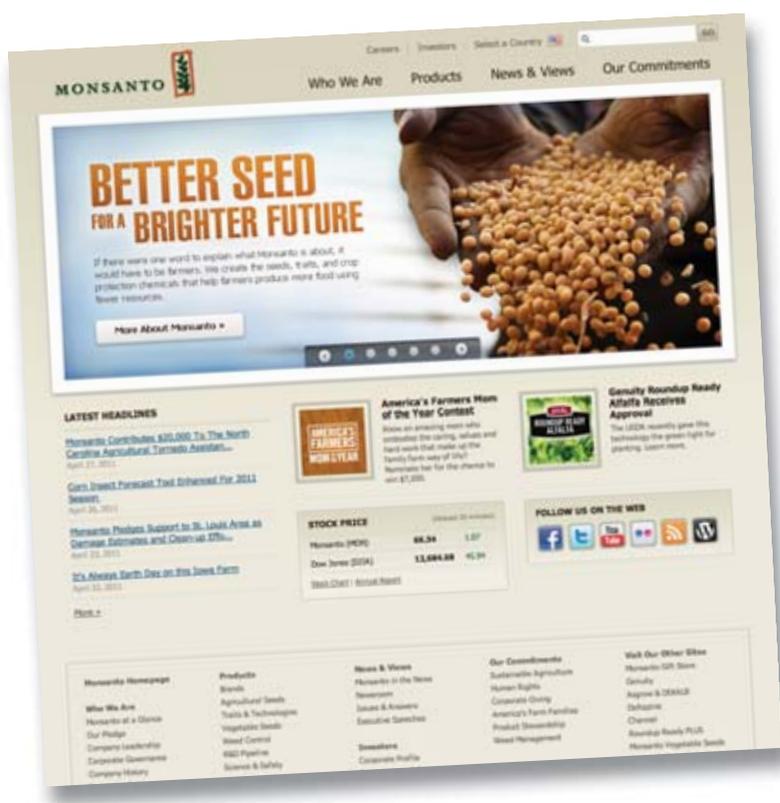
Several diplomatic cables recently released by Wikileaks have illustrated just how extensive Monsanto’s influence is within the US government and consequently upon global agricultural policy debates. In 2009, Kenya, which has long been a country of immense strategic importance to the biotechnology industry²⁹, signed its Biosafety Act into law. A cable sent to the US Secretary of State in March of that year by US ambassador to Kenya, Michael Rannenberger, revealed how the use of financial and technical support had helped to speed up and overcome opposition to the Bill. Monsanto featured prominently in this campaign, supplying its seeds and being deeply involved in the organisation and funding of the All Africa Congress on Biotechnology in Nairobi in 2008, thought to be the largest biotechnology conference held in Africa.³⁰

The European Union, by some measurements a larger economy than even the United States, has not been immune to the biotechnology industry’s aggressive tactics. After France, together with several other European countries, banned Monsanto’s highly controversial MON810 variety, the Iowa-Washington axis set about taking remedial action. Secret diplomatic cables sent from the US embassy in Paris in 2007, in language eerily similar to that used in the Cold War, urged for ‘a target retaliation list that causes some pain across the EU since this is a collective responsibility, but that also focuses in part on the worst culprits. The list should be measured rather than vicious and must be sustainable over the long term, since we should not expect an early victory’. In 2009, members of the Spanish and US governments reportedly met with a regional director from Monsanto in order to flesh out a GMO policy for the country.³¹ If the Biotechnology industry is able to yield this level of pressure upon the European Union, one can only imagine the extraordinary power it holds over governments in the global south, and Africa in particular.

In December 2009, at the Copenhagen Climate Change Summit, Monsanto’s efforts to undermine genuine efforts at tackling climate change through sham solutions such as ‘Climate Ready’ crops and agrofuels was recognized by Friends of the Earth’s ‘Angry Mermaid Award’. The biotechnology giant polled 37% of the vote, beating such luminaries of climate change denial as Royal Dutch Shell and the American Petroleum Institution into second and third place respectively.³²

Monsanto’s legal clout

Monsanto has invested significant time and resources to protect its interests through the courts. Monsanto’s latest submission to the US Securities and Exchange Commission (SEC) hosts a litany



of 'various legal proceedings that arise in the ordinary course of its business'. Part of Monsanto's 'normal course of business' includes having to defend itself against charges of environmental pollution, discrimination against employees in its pension plan and accusations that it facilitated investment from a pension fund through 'false and misleading statements'. Three further derivative suits have been filed against past and present executive officers, all relating to claims of 'breach of fiduciary duty, abuse of control, gross mismanagement, corporate waste, unjust enrichment and insider selling and misappropriation under Delaware³³ law'. Monsanto Brazil has also been involved in

a lengthy tax dispute with the Brazilian ministry of finance, the latter seeking payment of approximately \$250 million in unpaid taxes, penalties and interest charges.³⁴

The value of the global agricultural seed market is immense: it was estimated to be worth around \$33 billion in 2010.³⁵ Monsanto has thus been relentless when it comes to enforcing its intellectual property rights over seeds against its main customer base: the farmer. In Canada, the case of Canola grower Percy Schmeiser is often held up as a prime example. Schmeiser had been using farmer saved seed to grow canola for three years prior to Monsanto introducing its Roundup Ready GM canola variety into the area in 1996. In 1998, investigators from Monsanto discovered that some of Schmeiser's canola crop had been contaminated by the recently planted GM varieties. Far from offering Schmeiser compensation for the damage caused to his farming operation (the loss of organic certification for example), Monsanto successfully sued Schmeiser through the courts for patent infringement.³⁶ The US based NGO, the Centre for Food Safety (CFS), has been monitoring Monsanto's 'unprecedented' use of patents and restrictive licensing agreements to investigate and sue farmers suspected of seed saving. Based on information from Monsanto's own website, as of July 2006, the corporation had instituted up to 4,500 out of court settlements with farmers for what it deems to be 'contract infringements.' The total damages from these settlements awarded to Monsanto have been calculated to be as high as \$160 million.³⁷

Though the litigiousness of South African society has not yet approached levels found elsewhere, events in 2009 portend to what may become a reality on the ground. In April of that year, nearly 200,000 hectares of maize planted with Monsanto's GM varieties (MON810, NK603 and MON810 x NK603) failed to pollinate. Despite promptly compensating affected farmers to the tune of \$42 million, these same farmers were strictly forbidden from speaking to the media by being made to sign non-disclosure agreements. Monsanto submitted a 3 page report to the GMO registrar, citing 'the genetics of the female used in the production process of the three varieties' as well as an 'unprecedented combination of environmental conditions' as reasons for the crop failures. Information gleaned from the minutes of the May 2009 meeting of the Executive Council (South Africa's GMO decision making body) subsequently highlighted that the crop failures 'may have resulted from incorrect spraying regimes being implemented', an issue not reflected in any of Monsanto's reports on the matter.³⁸

In light of these disparities in information, the ACB wrote an open letter to the Minister of Agriculture, Forestry and Fisheries (DAFF), Ms Tina Joematt-Pettersen, to illustrate a number of concerns including: “The startling fact that the DAFF had shown little capacity or political will to monitor GMOs once released into the environment, preferring instead to rely on self regulation in the industry; that the DAFF had not seen fit to publicise an official explanation of the failures or explained to the public the process that was followed in resolution of the matter; that only Monsanto was given access to the affected plant material, and barred farmers from speaking out about the crop failure.”³⁹

Monsanto under anti-trust investigation in the USA

In January 2010, the US Department of Justice (DoJ) issued a civil investigative demand into Monsanto’s soybean genetic traits business. Several complaints were received from seed dealers to the effect that the Monsanto was pushing farmers towards its new Roundup Ready 2 Yield soybeans through means including overly stringent user agreements. As Monsanto’s contracts also ban independent companies from breeding plants that contains its patented genes without Monsanto’s written permission, Monsanto effectively has the power to lock out competitors, as nearly all U.S. crops contain at least one of Monsanto’s patented genes. In the words of a lawyer for chemical giant DuPont, “a seed company can’t stay in business without offering seeds with Roundup Ready in it, so if they want to stay in business, essentially they have to do what Monsanto tells them to do”.⁴⁰

A 2009 report from the UN on the impact of agribusiness on the right to food makes explicit reference to the potential role of national competition laws in promoting food security. Generally, competition law seeks to protect end consumers; the South African Competition Act 1988 ‘illustrates the potential of Competition Law to play a role in food security in the case brought against dairy processors for colluding to fix prices in a way that was detrimental to suppliers.’⁴¹

Monsanto in South Africa

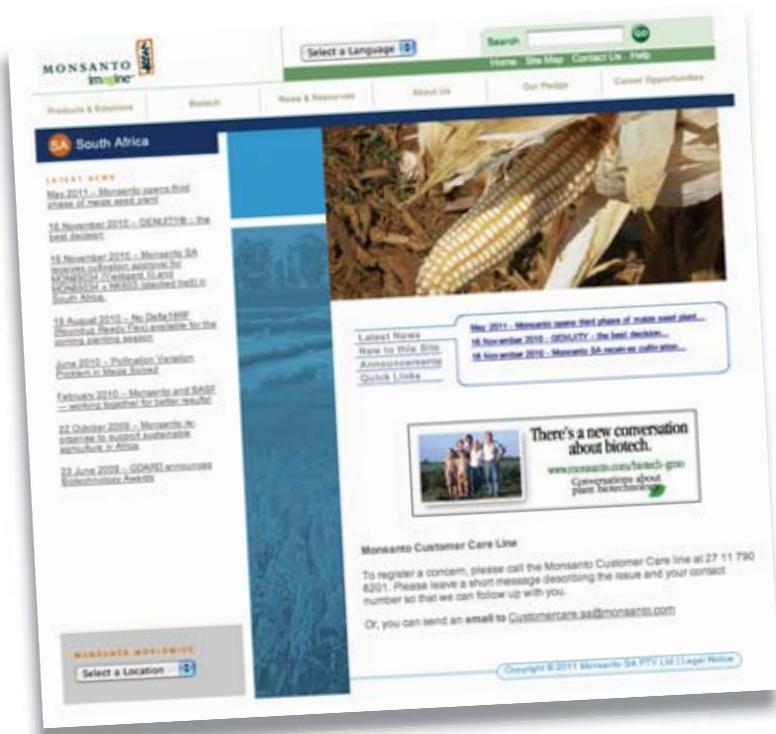
Although Monsanto has had operations in South Africa since 1968, it was not until 1998 that it entered the agricultural seed market.⁴² During 1999 and 2000, Monsanto purchased two of South Africa’s largest seed companies, Sensako and Carnia.⁴³ By 2009, Monsanto by its own admission, controlled approximately 50% of the South African maize market.⁴⁴ It has an even stronger hold over the market in GM maize seed and controls 60% of the country’s commercial glyphosate market.

Monsanto, civil society and civil resistance

Monsanto South Africa is strongly supported by AfricaBio, a vociferous pro-GM lobby group based in South Africa, set on attacking individuals and organisations who question South Africa’s laissez-faire approach to GMOs.⁴⁵ AfricaBio has also been bitterly opposed to any form of labelling of GMOs in South Africa.⁴⁶

During 2010, members of the Lutzville community in the Western Cape objected to the presence of Monsanto’s GM drought tolerant maize field trials (part of the WEMA project) in their area; AfricaBio and the Agricultural Research Council (ARC) were quickly dispatched to the area. Meetings between AfricaBio, ARC and the Lutzville farmers were briskly arranged, and the standard utopian promises surrounding GMOs were rolled out. Not wishing to take any chances in an open debate, AfricaBio and the ARC flatly refused any requests to involve other civil society groups in the process, such as the ACB.⁴⁷ The resistance from farmers and civil society does appear to have been noted by the South African biosafety authorities, as the Executive Council (EC) meetings minutes for September 2010 show that representatives from Monsanto made a presentation on the WEMA project.⁴⁸

Small-scale farmers in South Africa have also felt the ‘benevolent’ touch of Monsanto’s activities. The introduction of Bt cotton into the Makhathini flats region of KwaZulu-Natal in 1998 was held



up by Monsanto, and a compliant Department of Agriculture, as a means to lift marginalized farmers out of poverty. Monsanto presented farmers involved in the project on the global stage, employing the most politically charged rhetoric (while simultaneously decrying GM opponents as being emotional and irrational) to promote their technology. Extensive research carried out by the NGO Biowatch over a five year period has revealed a very different picture to the one painted by Monsanto. Despite an initially enthusiastic uptake of Bt cotton, by 2004 adoption rates had plummeted by 80% in just four years. Farmer debts, and the inability to service these,

have been a significant contributing factor.

Small-scale farmers in the Makhathini flats have always been dependent on a credit system, but the introduction of more expensive GM seeds significantly increased farmers' vulnerability and risk. In addition, falling cotton prices globally and competition with massively subsidized cotton producers in the United States⁴⁹ meant that by 2004, the cumulative debts of all farmers in the area had topped \$3 million, or \$1,322 per farmer. Approximately 80% of the farmers in the scheme defaulted on their loans.⁵⁰

Monsanto has also been heavily involved in the planning and implementation of the Eastern Cape provincial government's Green Revolution and 'Massive Food Programme' strategies.⁵¹ Even the South African education system has not been spared Monsanto's reach: it recently donated half a million rand for the training of primary school science teachers in the Western Cape.⁵²

Monsanto's interests are also well taken care of by the South African National Seed Organisation (SANSOR). Established in 1989, at a time when the country was entering its post-Apartheid phase of liberalisation, SANSOR manages all seed certification schemes in the country on behalf of the Department of Agriculture, Forestry and Fisheries. This is carried out by a team of over 200 authorised seed inspectors linked to private companies in the seed industry. SANSOR also has an international role to "promote the visibility of the South African Seed industry through active participation at international level so as to *assist industry to survive and derive benefits from globalization and concentration of power*" and to "provide access to new technology, particularly seed treatments and genetic modification with the aid of modern biotechnology, with the new emphasis on the seed as vehicle for the technology to reach the plant, producer and consumer".⁵³ Monsanto has twice had a representative as chairman of SANSOR since it entered the South African seed market.

In February 2007, Monsanto placed an advertisement in 'You' magazine wherein it claimed that 'no negative reactions have ever been reported' in relation to GM food. This led to a complaint being submitted to the Advertising Standards Authority (ASA) of South Africa by Mr Mark Wells, an organic farmer in the Eastern Cape. Mr Wells brought to the authorities attention numerous independent studies conducted on GM foods since its commercialisation, calling Monsanto's statement into question. Judge King presided over the complaint on behalf of ASA, and upheld Well's complaint,

arguing that Monsanto's claim was unsubstantiated and ordered its withdrawal with immediate effect. King also ruled that the advertisement 'may not be used again in its current form until new substantiation has been submitted'.⁵⁴

Undaunted, barely 6 weeks later, Monsanto issued a media statement announcing that ASA had accepted its 'GM is Safe' advertisement", and that a revised version had been accepted to the effect that "no *substantiated scientific or medical negative* reactions to GM foods have ever been recorded." A second legal challenge to the advert was launched, with Judge King (who presided over the initial ruling) stating that, despite the amended wording, the overall communication remains the same, and therefore found Monsanto guilty of breaching his previous ruling.⁵⁵

Monsanto's market dominance in South Africa

Monsanto's primary area of operations in South Africa is concentrated in the maize seed market. By its own admission, by 2009 Monsanto controlled 50% of this market.⁵⁶ Aside from its maize seed business, Monsanto also owns a significant number of seed registrations of vegetable, oilseed and grain crops (including over half of all registered wheat varieties through its subsidiary Sensako).

About 10% of all maize varieties registered with the Department of Agriculture's Directorate for Plant Improvement are registered in Monsanto's name. For GM varieties (both of yellow and white maize), this figure is closer to 25%. However, it is not apparent from the seed variety list that nearly all of the GM maize varieties available in South Africa, whether they are registered to small local seed companies or transnational giants such as Pioneer Hi-Bred, contain Monsanto's patent protected transgenic traits.

Over the course of this investigation we were only able to find one variety of GM maize on the market (of more than 140 registered) that does not contain a Monsanto trait; a yellow maize variety that contains Syngenta's insect resistant gene (known as Bt11), sold by Klein Karoo seed. Klein Karoo has an exclusive license to sell Syngenta's traits in South Africa (as it also does for the Swiss giant's vegetable seed range). Until 2008, Syngenta sold its seed directly to farmers on the ground, before entering into an agreement with Klein Karoo (this appears to be part of a much broader global strategy undertaken by Syngenta to penetrate markets through local seed companies).⁵⁷

All other varieties on the market contain Monsanto's proprietary traits, meaning the companies who sell them are charged a 'technology fee' for this privilege, which is then passed on to the farmer. In some instances, seed companies are selling only Monsanto's genes, sold under license from a third party. For example, through its network of 80 dealers nationwide, Agricol sells several hybrid and GM varieties under license from Pioneer Hi-Bred. Although these varieties are registered in Pioneer's name, they contain Monsanto's insect resistant (known as MON810, or 'Yieldguard') trait. In this case, Pioneer pays the technology fee to Monsanto, not Agricol. The size of these fees is difficult to ascertain, as it is not listed separately, but is included in the seed price. Research from the International Seed Federation (ISF) has established that these fees can be as much as 25% in the case of maize, and a substantial 40% and 55% for soya and cotton respectively. These figures are only for single gene GMOs. In the case of 'stacked'⁵⁸ GMOs, the fees are much higher, sometimes amounting to as much as 67% of the overall seed cost.⁵⁹

Monsanto currently has five different GM maize varieties approved for commercial cultivation in South Africa⁶⁰: MON810 and MON89034 (both insect resistant), NK603 (herbicide tolerant – better known as 'Roundup Ready') and two varieties stacked with both traits, MON810 x NK603 and MON89034 x NK603. Both varieties featuring MON89034 were only granted commercial release in December 2010, although MON810 has been on the market since its approval in 2001, NK603 since 2003, and the stacked event MON810 x NK603 since 2007. Syngenta is the only other company that has successfully released a GM trait onto the market, the aforementioned Bt 11, which was given

clearance in 2003, and very recently – during the latter part of 2010, two new varieties, GA21 (for herbicide tolerant) and the stacked Bt11 x GA21.

In June 2005, Dow chemical company obtained approval for field trials of its own insect resistant trait,⁶¹ which had been inserted into Pioneer Hi-Bred’s hybrid maize seeds. At the time, it was expected that this would be commercially approved ‘within the next year or so’.⁶² The anticipated approval did not materialize and there is no further reference to the particular variety (known as DAS 1507) in the GMO permit lists. Suddenly, in 2010 a glut of field trials of DAS 1507 was carried out by Pioneer Hi-Bred. Undoubtedly connected to Pioneer’s efforts to acquire Pannar Seed, South Africa’s largest remaining Seed Company⁶³, none of these has yet been granted commercial approval. Based on information from the DAFF’s GMO permit lists, it typically takes three to four years for a variety to come to market. This means that Monsanto is likely to maintain a stranglehold on the GM trait market for some years to come.

Figure 2: GM maize seed imports into South Africa 2001 – 2010 (metric tons)

	MON810	NK603	MON810 x NK603	MON89034	MON89045 x NK603	Bt11	Total
2001	646.4						646.4
2002	3,068						3,068
2003	507						507
2004	429.3	30.1				5.4	464.8
2005	41.1	50.3					91.4
2006	8.6	1.5				0.5	10.6
2007	601.3	12.6	341			2.6	957.5
2008	4,105	626.2	1,082			0.8	5,814
2009	40,882	110,772	5,020			3.9	156,678
2010	324.9	1,181	1.2	33	25.4	4.2	1,569.7
Total	50,613	112,673	6,444.2	33	25.4	17.4	169,807

Source: GMO permit lists, Department of Agriculture, Forestry and Fisheries.

It is still a mystery why, nearly 8 years after commercialisation, Syngenta’s Bt11 has made such a small incursion into Monsanto’s market share. Since South Africa started commercially cultivating GM maize, it has imported around 170,000 tons of seed (see figure 2). Syngenta’s Bt11 accounts for 0.01% of these imports, the remaining 99.9% consists of Monsanto’s varieties. We have also noted a conspicuous decline in the number of GM seed import permits granted to smaller seed companies in South Africa over the last five years. When questioned, the director of Biosafety at the DAFF could not provide an explanation for this. The director ruled out tariff increases as these were marginal for import permits over this period.⁶⁴ Indeed, between 2005 and 2010 the tariff price for a GMO import permit rose from R170 to a still modest R330.⁶⁵

Despite this dominance in the seed trade Monsanto is intent on expanding its sphere of influence. It recently announced the completion of the third phase of its Lichtenburg maize seed plant in the North West province. Originally opened in 2006⁶⁶ the “Thobontle” (meaning ‘excellent harvest’) plant now has the capacity to store 140,000 bags of maize seed, including space to store 40,000 bags below temperatures of 15C (the cold storage will mainly be for carry over stock⁶⁷). The extension of the facility is believed to primarily produce seeds (both GM and conventional) for export to Africa, and other countries abroad, including the Philippines.⁶⁸

Accessing market share based on sales figures is problematic, as this information is not freely available in the public domain. However, it is common knowledge that in the Free State and the

North West, the two largest maize growing provinces in the country, Monsanto’s DKC 78 – 15B and DKC 78-45BR are the most popular varieties amongst farmers.⁶⁹ Since 2007, the price of these two varieties has risen by 44% and 34% respectively. Looking at price information accessed from GRAIN SA for Monsanto’s GM maize seed varieties, several trends emerge:

- Between 2006 and 2010, the *average* price of Monsanto’s yellow GM seed varieties increased by 49.7%. Its white GM maize seeds increased by 39% over the same period.
- From 2005 to 2010, Pioneer and Pannar, who both sell GM maize containing traits under license from Monsanto, saw their average prices for yellow GM maize seed rise by 39% and 44% respectively. For white GM maize, the increase was 48% and 44%.

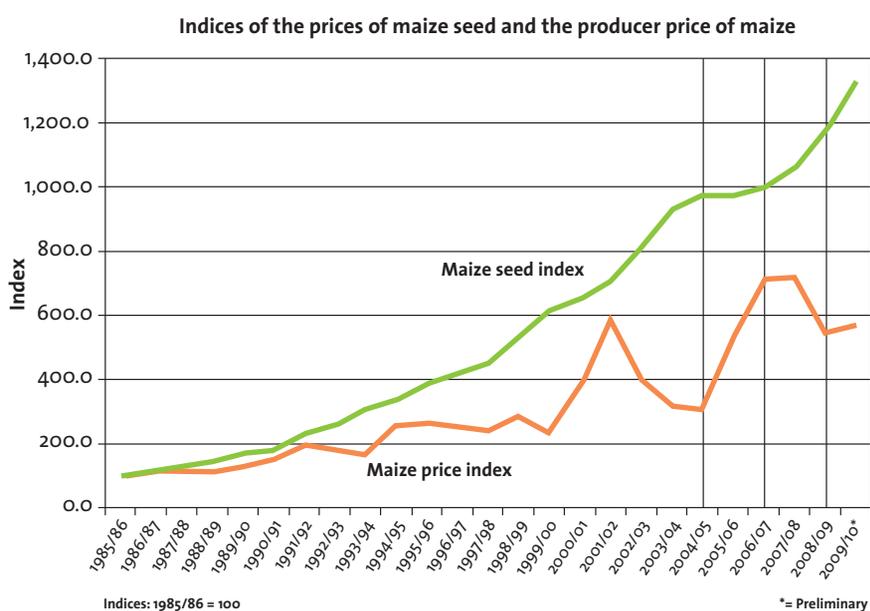
In 2007, three new GM varieties appeared on Monsanto’s price list. These new varieties are on average 18% more expensive than the existing varieties available (despite containing the same traits). This pattern is repeated in 2009, when four newly introduced varieties are on average 10% more expensive than the existing ones.

Seed pricing and competition

The South African Competition Commission⁷⁰ was established in recognition that historical legacies of colonialism and Apartheid served to exclude the majority of the population from formal economic activity and decision making. The preamble to the Act describes this situation as having resulted ‘excessive concentrations of ownership and control within the national economy’.⁷¹

In terms of section 7(a) of the Competition Act⁷² a firm is *dominant* in a particular market if ‘it has at least 45% of that market’. Monsanto clearly occupies a *dominant* position in the maize seed sector, and absolute dominance in the GM maize market. In terms of the Act, a dominant firm is prohibited from carrying out certain restricted practices. Such restrictive practises include the dominant firm charging an *excessive* price to the detriment of consumers⁷³. ‘Excessive’ is defined as ‘bearing no reasonable relation to the economic value of that good or service.’ As has been illustrated above, prices for both GM and non-GM maize seeds have increased significantly in recent years. However, over the same period, the price that farmers receive for maize (the producer price) has no correspondence to these seed price increases. As can be seen in the figure below, the producer price at the end of 2010 is actually below that received in 2006, and there has been a significant difference between the two over the last decade.

Figure 3



Source: GRAIN SA

When comparing seed price information from Grain SA with performance data from the Agricultural Research Council's Maize Information Guide (MIG)⁷⁴ for 2010, it immediately becomes questionable whether the price Monsanto charges farmers for seeds bears reasonable relation to their economic value. However, to point out the following:

- The yield averages were only recorded over one season;
- The averages are for large geographical areas, which themselves contain significant variations;
- Yield data was not available for all of Monsanto's cultivars; and
- Yield is not the sole arbiter of value, economic or otherwise, to the farmer.

Nevertheless, from what little information we have been able to access, it is clear that the prices Monsanto charge does not necessarily relate to yield performance. For example, yellow GM variety DKC 73-74BRⁱ cost R 2,133 per 60,000 kernels in 2010, and its average yields were 6.02 and 9.34 tons per hectare for the Western and Eastern growing regions, respectively. The yellow GM variety DKC 80-12B cost 23% less in 2010, yet its average yield performance was actually 1.3% higher in the western region and only 3.6% lower in the eastern region. When comparing white GM maize varieties, we found that DKC 77-61B cost 8.5% more than DKC 78-15B in 2010, yet in both the eastern and western regions, the average yield of the former was lower than the latter.

This pattern is consistent with experiences from the United States. In 2010, to much fanfare, Monsanto launched its blockbuster eight-gene 'Smartstax' maize variety. Before its release Monsanto had bullishly called Smartstax 'the highest yielding corn (maize) product available', yet this excitement soon dissipated when reports began to surface from farmers fields that Smartstax was actually yielding less than Monsanto's other cheaper GM maize varieties.⁷⁵ At the very least, this indicates the need for further investigation into Monsanto's seed pricing practices.

Figure 4: Maize seed yield performance vs. Price, 2010

Variety	White / yellow	2010 price (Rs / 60,000 kernels)	average yield Western region (mt)	average yield Eastern region(mt)
DKC 80-12 B*	Yellow	1,728	6.1	9.01
DKC 80-40 BR*	Yellow	2,034	6.35	9.17
DKC 66-36 R*	Yellow	1,507	5.42	7.83
DKC 73-74 BR	Yellow	2,133	6.02	9.34
DKC 78-15 B*	White	1,783	6.53	9.03
DKC 78-35 R*	White	1,793	6.61	8.93
DKC 78-45 BR*	White	2,089	6.55	9.17
DKC 77-61 B*	White	1,935	6.2	9.02

Source: Price information from GRAIN SA, yield information from the Agricultural Research Council.

MON 810

The vast majority of GM maize grown in South Africa is MON810, an insect resistant (IR) variety of maize (traded under the name Yieldguard), containing the Bt gene bacillus thuringiensis. Bt has been used as a pesticide in farming for many years. It was the first GM maize variety to be approved for commercial cultivation in South Africa, way back in 1997.⁷⁶ The first commercial seed imports began in 2001. Until 2008, over 80% of all GM maize seed imported into South Africa was the MON810 variety. From the beginning of 2011, over 50,000 tons of it has been imported.⁷⁷

i This variety contains both the insect resistant and herbicide tolerant genes.

MON 810 was first granted commercial approval in the United States in 1995, followed by the European Union in 1998, though several EU member states⁷⁸ had subsequently banned the cultivation of MON810 in light of scientific studies highlighting potential negative impacts on human health and the environment.⁷⁹

In January 2011, the results of a three-year study on the impacts of MON810 on the South African environment were released. The study was spearheaded by the South African Biodiversity Institute (SANBI) involving experts from three South African Universities and the renowned GENOK biosafety centre in Norway. The study found several significant differences in both the physical size and expression levels between naturally occurring Bt proteins and those that are recombined in MON810. In the North West Province, one of the country's key maize growing areas, insect populations have already developed resistance to the Bt toxin produced in MON810. Consequently, current refugia⁸⁰ requirements were found to be woefully inadequate to prevent further resistance from developing.⁸¹ Given that in 2005, only 20% of the maize grown in South Africa was GM⁸², this resistance has developed in an amazingly short period of time, and is consistent with resistance occurring in other regions such as India and China, where Bt crops are grown.⁸³

When contacted by the ACB as to what the government was going to do about the SANBI report, the Director of Biosafety at the Department of Agriculture Forestry and Fisheries (DAFF) would only confirm that the SANBI report was 'up for discussion' with the Executive Council.⁸⁴ Dr. Lukeshni Chetty, who led the SANBI study, advised us that she had not been personally contacted by the industry in light of the report's findings. SANBI hopes to continue its post-release monitoring work of MON810 - funding permitting. Monsanto's MON89034, also an insect resistant variety, was approved for general release in October 2010. Dr. Chetty has indicated that SANBI would like to conduct post release monitoring of this variety sooner rather than later, as the work done on MON810 was 'left a little late'.⁸⁵

Roundup – Monsanto's Golden Goose

Roundup, registered in 1975, is Monsanto's flagship non-selective⁸⁶ herbicide, raking in billions of dollars for the company every year. The success of Roundup is the result of an elaborate business strategy, where seeds have been genetically engineered to be resistant to glyphosate (Roundup's active ingredient) based herbicides. According to the company website, 'Roundup Ready herbicide is the only formulation registered to be used on Roundup Ready crops.'⁸⁷

Roundup, registered in 1975, is Monsanto's flagship non-

Roundup is a significant component of Monsanto's business portfolio. However, the herbicide went off patent in 2000 and the market flooded with cheaper generic varieties, many coming from China.

Monsanto's huge profits for Roundup peaked at \$478 million in 2008.⁸⁸ However, profits declined by 7% in 2009, followed by a massive 92% decline in 2010. Foreseeing this downturn, Monsanto's Board of Directors initiated a restructuring plan for the company's glyphosate business in June 2009. Included in these plans are steps to 'better align the resources of our global seeds and trait business' and a certain degree of 'product and brand rationalisation within our seed businesses.' Monsanto is obviously anticipating that its foray into 'drought tolerant' crops will reap great benefits. The company's Roundup business will remain viable provided it can continue to increase the global acreage of Roundup Ready GMOs being planted. In the United States this 'trait penetration', from Monsanto's point of view, has been hugely successful. In 2004, the area planted with Monsanto GM maize seed without the RR gene was 25.3 million acres. By 2008, this area had fallen to under 5 million acres.⁸⁹ By expanding this trait penetration globally, including in South Africa, Monsanto

will still be able to exert considerable influence over the market for non-selective herbicides, in spite of the loss of patent protection.

Despite glyphosate being marketed as being a safe and environmentally friendly product, numerous studies associate exposure to glyphosate with increased risks of miscarriages, premature births and the cancer, non-Hodgkin's lymphoma.⁹⁰ In California, glyphosate is the third most commonly reported chemical related illness amongst agricultural workers. Independent research conducted in the US has shown that far from reducing the amount of chemical inputs being used in US agriculture, GMOs have, since their introduction in the mid 1990s, been responsible for an additional 318.4 million pounds of chemical herbicides being applied to American fields⁹¹ (and a bonanza for Monsanto's shareholders). This massive increase in applications has resulted in a plethora of Round up resistant 'super-weeds' establishing themselves across the United States.

Far from seeking alternative weed-control strategies, the response from those in US agribusiness has been to advocate for even greater quantities of herbicides being used, together with the reintroduction of older, even more toxic varieties of weed killers.⁹²



<http://www.infiniteunknown.net/wp-content/uploads/2010/06/monsanto-roundup.jpg>

Round-up ready soybeans were planted on 19 million hectares of Argentina's cultivated lands in 2009, and doused in over 200 million litres of glyphosate- based herbicides. Reports of health and environmental problems associated with glyphosate were reported in soy producing areas as far back as 2002, two short years after the first large commercial harvests. In 2010, a senior Argentine government scientist, Prof. Andres Carrasco, published a research paper that linked exposure to glyphosate with birth defects, stating at a conference at the University of Buenos Aires Medical School that it is not unusual for a woman in GM soy producing regions to have up to five miscarriages in a row.⁹³

In 2010, an organized mob attacked people who had gathered to hear Carrasco talk in La Leonesa, an agricultural town that had become a centre for resistance against the indiscriminate use of glyphosate. Undeterred, the Environmental Lawyers Association of Argentina petitioned the Supreme Court of Argentina to ban the use of the chemical. Glyphosate is so central to Argentina agriculture that the Argentine Crop Protection Association argued that a ban would mean 'we couldn't do agriculture in Argentina'. Though no national ban has been implemented, in March 2010 a regional court upheld an application to have the spraying of glyphosate banned near populated areas in the Santa Fe province.⁹⁴

The Roundup market in South Africa

Syngenta and Bayer are the two dominant players in the South African agro-chemicals market,⁹⁵ mirroring their global position. Nevertheless, Monsanto still holds a significant position in the South African agrochemical market, particularly in respect of glyphosate-based herbicides. According to its website, Monsanto supplies over 60% of all glyphosates to the South African market. Over 30 varieties of pesticides, fungicides and herbicides containing glyphosate are registered in Monsanto's name. They have wide ranging uses - from food crops such as maize and olives - to 'municipal situations' and 'firebreaks'.⁹⁶

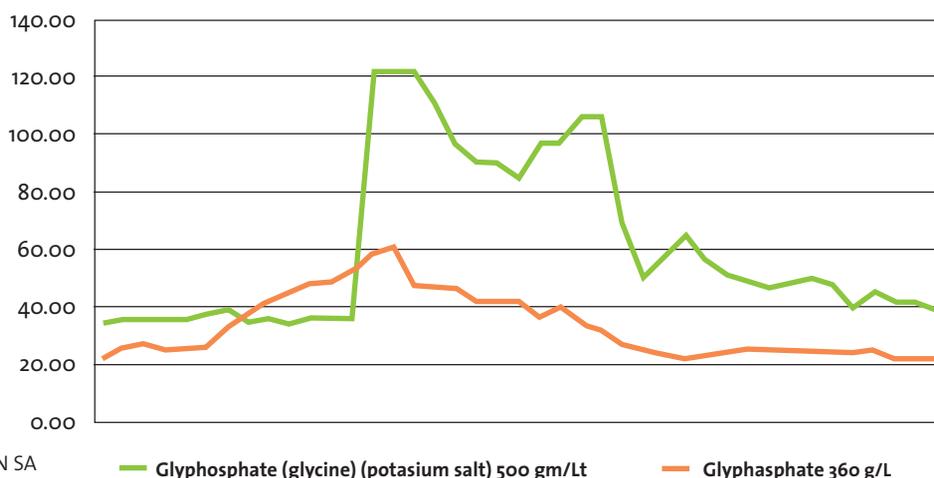
The glyphosate market in South Africa is highly susceptible to international trends. For about 10 years, a glut of glyphosate on local and global markets, and fierce competition (in the form of

generic versions being manufactured in China) led to a downward spiral in prices. This trend halted abruptly in 2004 due to surging raw material prices.⁹⁷

In mid-2008, ahead of the Beijing Olympics, the Chinese government curtailed industrial production across a number of sectors in response to concerns about air quality around the Chinese capital. This included producers of generic glyphosate, leading to dramatic price increases. As can be seen from figure 2, South Africa was not shielded from this increase.⁹⁸ Conversely, in 2009, production in China was markedly increased as part of the government’s general industrial stimulus package; this resulted in high price volatility at the global level.⁹⁹

A number of factors influence market competitiveness. Between competing firms, it is usually stronger when demand for a particular product is growing slowly.¹⁰⁰ Does the brisk penetration of RR crops (as discussed above) portend to the weakening of competition in this particular market segment? One study into the impact of RR crops on the glyphosate market in South Africa (conducted in 2004) noted that, unlike most segments of the agrochemical market, there is a high cost to the buyer when switching brands in the Roundup market.¹⁰¹ In theory, farmers can use any glyphosate-based herbicide on RR crops, including cheaper generic alternatives. The reality is that those who do use generics forfeit their entitlement to any claims in the event of problems with their seeds.¹⁰² Thus, Monsanto is able to, in spite of increased competition from generic varieties, maintain extraordinary influence over the herbicide market in South Africa.

Figure 5: Glyphosate Prices in South Africa (Rs), August 2007 – December 2010



Source: GRAIN SA

— Glyphosate (glycine) (potassium salt) 500 gm/Lt — Glyphosate 360 g/L

The Spread of Roundup Ready crops in South Africa

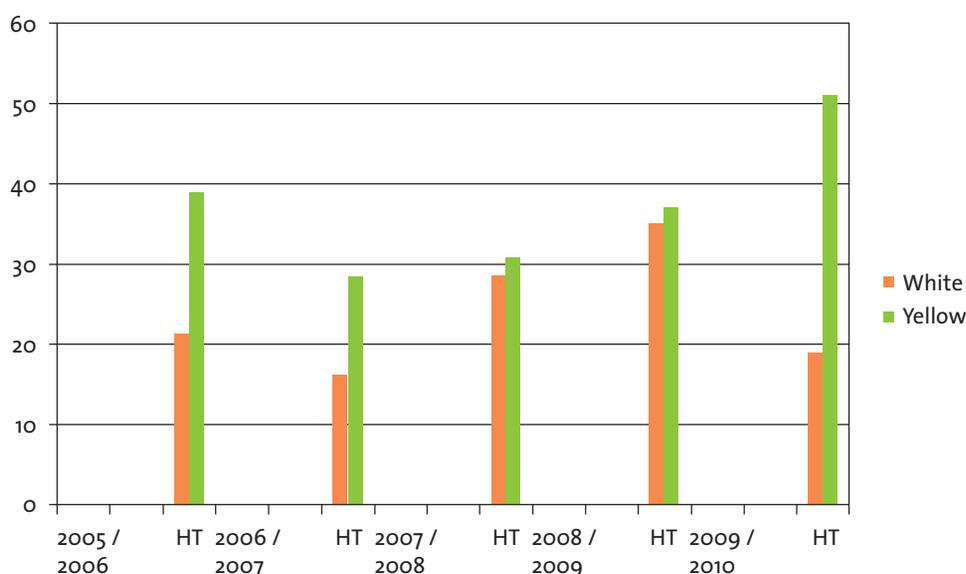
Monsanto’s Roundup Ready maize (NK603) was first approved for general release in South Africa in 2003, while the stacked variety, MON810 x NK603, (stacked with Bt and Roundup Ready genes) was granted commercial approval in February 2007. In October 2010, another Roundup Ready stacked maize variety was released, this time being stacked with MON89034 (a new insect resistant variety). In December of 2010, Syngenta was granted general release approval of its own herbicide tolerant variety, GA21 (together with approval for its stacked GA21 x Bt 11 variety¹⁰³); though it is difficult to ascertain presently what impact these approvals will have on the maize seed markets in South Africa.

Although insect resistant maize varieties are still the most commonly planted GMOs in South Africa, the last five years have seen a marked increase in the adoption of herbicide tolerant (‘Roundup-Ready’) GMOs. Since 2005/06, the percentage of GM maize planted with the herbicide tolerant

trait has not fallen below 20%. It has hovered around the 30% mark for the last three years (when single HT and varieties stacked with both IR and HT are included). Perhaps more significantly, the percentage of yellow maize (which itself is predicted to increase in relation to white maize production) containing the HT trait has been significantly higher (over 50% in 2010) than in white maize¹⁰⁴ (see figure 3, below). The ISAAA states that in 2006, approximately 137,000 ha of HT yellow maize were grown in South Africa.¹⁰⁵ By 2010, this had more than doubled, to over 340,000 ha.¹⁰⁶ Bearing in mind that Monsanto controls 60% of the country's glyphosate market,¹⁰⁷ the rewards to Monsanto for controlling a market growing at such a rate are substantial.

A brief perusal of the GMO permits lists from the Department of Agriculture reveals that since 2009, over 111,000 tons of Monsanto's Roundup Ready maize (variety NK603) has been imported into South Africa, more than double all other GM seed imports combined.¹⁰⁸ In addition, 98% of all soybeans grown in South Africa are genetically modified. Despite only owning two varieties on the DAFF plant variety register, every GM soybean variety sold in South Africa contains Monsanto's Roundup Ready gene. According to the Crop Estimates Committee (CEC), the latest Soybeans area planted in South Africa is expected to be 25% larger than for the previous 2009/10 season.¹⁰⁹

Figure 6: % of white and yellow GM maize planted in SA with Herbicide Tolerance (HT)¹¹⁰



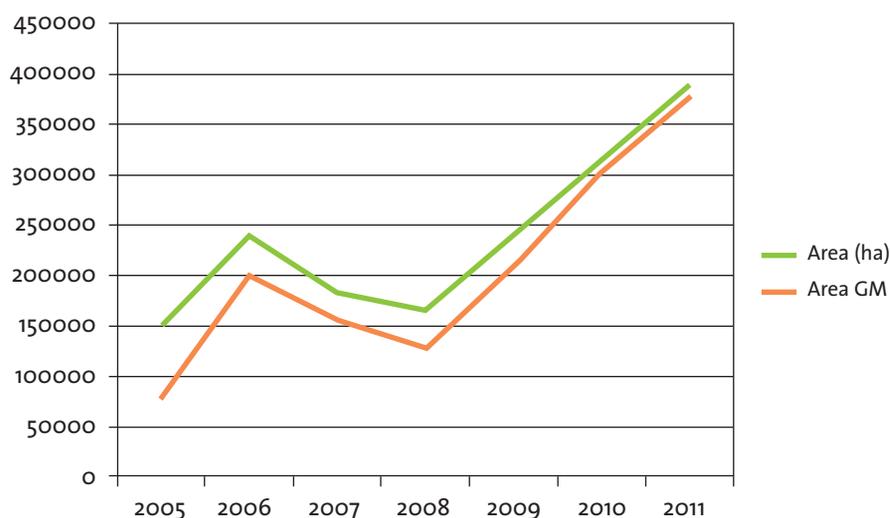
In March 2009, reports of the aerial application of glyphosate near a school in Marblehall, Limpopo, enraged parents and members of the general public alike. The public outcry forced the Association of Veterinary and Crop Associations of South Africa (AVCASA) to issue a public statement, condemning the actions in the strongest possible terms.¹¹¹ The devastating experiences from Argentina should serve as a stark warning against the rapid increases in Roundup Ready crops in South Africa.

Currently there is no independent monitoring of the environmental or health impacts of the use of Roundup in South Africa. However, according to Dr. Lukeshni Chetty, SANBI hopes to begin work on HT crops during the 2011 financial year. Dr. Chetty stressed, however, that such research is at an extremely early stage, and that important baseline information has yet to be collected.¹¹²

During 2000, just over 80% of the global area planted with GM crops contained the RR gene, either as a single GM crop, or as part of a GMO stacked with RR and insect resistance. This translates into an area of 35 million ha.¹¹³ By 2010, the proportion of RR crops grown in relation to the total GM area had barely changed, at 83%, though the physical area planted to RR crops had increased to 120 million ha.¹¹⁴

It should be noted that in the United States, the introduction of RR soybeans has had a dramatic effect on the price of soybean seed in general. Historical price data reveals that, between 1975 and 2000, the price of soybeans increased by 63%. In the decade following (RR soybeans were introduced in the mid 1990s), the price increase was a staggering 230%.¹¹⁵ Looking at seed price data from GRAIN SA, the average increase of RR seeds between 2008 and 2010 (for both maize and soybeans) was in the region of 30%.¹¹⁶ Both globally, and locally in South Africa, the increased penetration of RR crops has resulted in dramatic cost increases for farmers, both in terms of seeds, and the herbicides used with them.

Figure 7: soybean plantings in South Africa (ha)



Source: Crop Estimates Committee and SANSOR

Maize production in South Africa

Given that maize is a staple food for millions of South Africans, the maize market (unlike that of soybeans or oilseeds) is highly significant for food security in the country. Although Monsanto's South African headquarters is located close to the country's commercial hub in Gauteng, Monsanto conducts its operations in the maize production areas. Monsanto has a comprehensive seed dealership network in all the major maize growing areas of the country (see annexure 7).

Local climatic conditions, of which South Africa has a wide variety, largely determine maize cultivation. This, coupled with generous support given to the agricultural sector under Apartheid, has endowed the country with a rich diversity of germplasm, particularly for white maize. By diminishing the variety of maize cultivars that are planted, and supplanting these with its patented GM varieties, Monsanto has a dominant position in the market. This could have particular implications for specific geographical regions, where fewer varieties may be suited or available, or where competing seed companies may have less of a footprint.

Production areas

Maize is produced throughout South Africa, with the Free State, Mpumalanga and the North West provinces producing approximately 83% of the total production in the 2009/10 growing season¹¹⁷. Maize is produced mainly on dry land, with less than 10% produced under irrigation. The Department of Agriculture, Forestry and Fisheries has divided maize growing into 36 grain production areas. Regions 1 – 9 are winter rainfall areas in the Western Cape, as well as the Eastern Cape and the Karoo where no commercial maize is produced. Region 10 is Griqualand West, region 11 is Vaalharts and regions 12 to 20 are in the North West province. Regions 21 to 28, which are located

in the Free State and the North West Provinces, are the principle production regions in the country. Regions 29 to 33 are within Mpumalanga, the third largest maize-producing province (by hectares planted and production volumes). Region 34 is within Gauteng, region 35 within Limpopo and region 36 in KwaZulu-Natal.¹¹⁸

During 2010, South African farmers produced the largest maize crop since 1982, with a surplus of 6 million tons. Export markets in many countries in Africa were difficult to penetrate because of several countries experiencing bumper harvests and enforcing stringent biosafety regulations. The Department of Agriculture has consequently expended enormous resources in trying to find new markets for this maize. Several large shipments were organized, for example, 1 million tons of GM maize to South Korea. In the main, East Asian markets are effectively closed, as these are dominated by the US. Indeed, between 1996 and 2008, US maize farmers received over \$74 billion in federal subsidies,¹¹⁹ equal to around 20% of South Africa's GDP for 2010.¹²⁰

In response to this, maize farmers (up to 30% of whom are at risk of default due to crippling low prices), have reduced their maize plantings by 11.5% and 7.5% for white and yellow maize respectively.¹²¹ Consequently, the first production forecast for 2010/11 (11.04 million tons), is a 13% decline on the previous year's record crop.

Figure 8: % Change in maize area planted: 2009/10 – 2010/11

Province	White maize	Yellow maize	Total
W Cape	-40	-15	-20
N Cape	0	-12	-11
Free State	-6	-7	-6
E Cape	-6	-9	-9
KZN	-17	-5	-11
Mpumalanga	-20	-2	-11
Limpopo	-8	-14	-10
Gauteng	-6	4	-3
North West	-13	-11	-15
Total	-11.5	-7.5	-10

White and yellow maize production in South Africa

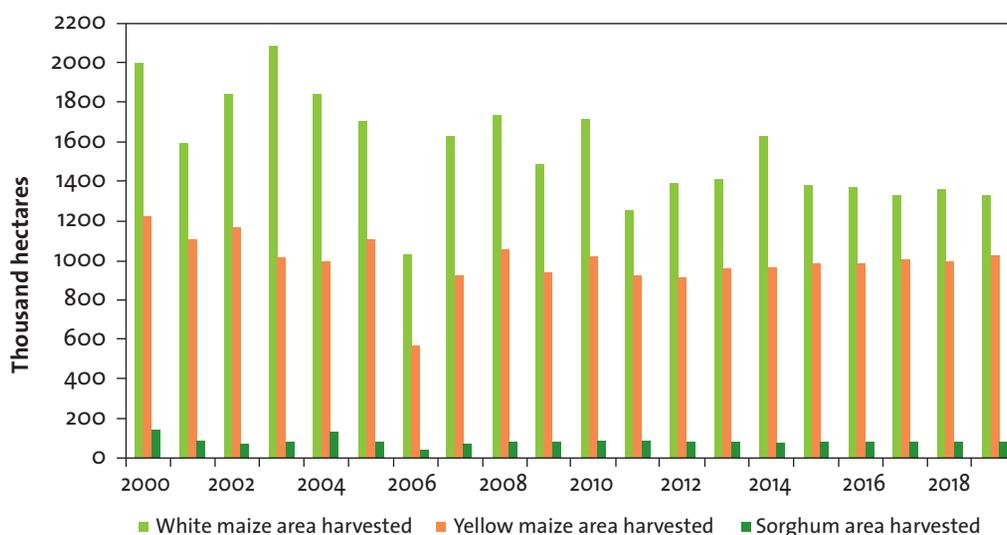
The bulk of South Africa's commercial maize production is either white or yellow maize. White maize is grown for human consumption, and is dry-milled to produce maize meal and other products such as samp, maize grits and maize rice, un-sifted, sifted, course, super, and special maize meal. In 2008/09, around 37% of the total maize deliveries were processed for human consumption. Yellow maize is dry milled for animal feed, with 60-70% consumed by the poultry industry. Products derived from yellow maize are also widespread throughout the food and manufacturing industries, from high fructose corn syrup and food thickeners, to the paper and textile products.¹²²

In the North West Province and north western Free State,¹²³ white maize accounts for approximately 75 – 80% of the maize crop, making this the major white maize producing area in the country. Conversely, the north eastern Free State, Mpumalanga, parts of eastern Gauteng and KwaZulu Natal (KZN), yellow maize accounts for a similar proportion of the whole yellow maize crop.¹²⁴ However, in KZN and Mpumalanga the ratio of white to yellow maize production is closer to 50:50, though both saw a reduction in the area planted to white maize in comparison with yellow maize between the current season and the last (see table above). The reasons for this clear division in production areas are both agronomic (for example white maize is more suited to the hotter, longer days found in the western growing areas¹²⁵) and economic; there is a higher concentration of cattle and poultry

farming located in the eastern growing region, while more white maize milling capacity is found in the west.¹²⁶

As yellow maize is used primarily in the animal feed industry, and since increased consumption of meat is associated with increasing affluence in general, demand for yellow maize is set to increase in the long term. Consequently, the Department of Agriculture, Forestry and Fisheries (DAFF), predicts that the total domestic consumption of meat will increase by 11% over the next 3 years. It is also interesting to note that the gross value of animal products nearly doubled between 2004/05 and 2008/09, to just around R60 billion.¹²⁷ The South African Agricultural baseline survey for 2010 predicts that demand for yellow maize in South Africa will increase by an average rate of 3.2% per annum over the coming decade, to a total consumption of 6.1 million tons in 2019. However, the survey also predicts that from 2011 South Africa will likely become a net importer of yellow maize, driven in particular by the demand at the coastal areas, where bulk imports will become cheaper than maize transported from inland.¹²⁸

Figure 9: Yellow and white maize area harvested (and future projections) in South Africa 2000 – 2018



Source: Bureau for Food and Agricultural policy, The South African Agricultural Baseline, 2010.

This move towards more yellow maize cultivation is significant, particularly since the yellow maize market is far less competitive than that for white maize.¹²⁹ Moreover, the proportion of yellow maize that contains the herbicide tolerant trait is also significantly higher than those for white maize. Until the latter part of 2010, Monsanto owned the only registered HT trait on the market in South Africa. Though Syngenta’s GA21 received regulatory approval in December of last year, it remains to be seen as to how successful they will be in penetrating this market.

Conclusion

Monsanto has positioned itself at the very summit of the global seed industry through a combination of acquisitions, intellectual property rights and aggressive lobbying, both directly and through proxy organisations and individuals. Monsanto undoubtedly dominates the global GM seed market, and accounted for nearly 1 in 4 seed sales in 2007. It holds a similarly imposing position in the global market for agro-chemicals, mainly through its non-selective herbicide brand, Roundup. Though Roundup has been registered since 1975, and in spite of it going off patent more than 10 years ago, the brand has become synonymous with GM herbicide tolerant seeds, particularly Monsanto’s Roundup Ready maize and soybean seeds. By impelling farmers to plant more Roundup Ready crops, including GMOs stacked with both insect resistance and herbicide tolerance traits, Monsanto has been able to reap huge profits, even in the

face of rising competition from cheaper generic varieties from China. It is notable that the United States Department of Justice has started investigations into Monsanto's dominant position in US seed markets.

Monsanto's ascent in the South African commercial seed market has been meteoric. It controls 50% of the maize seed, 60% of the glyphosate market and exercises in effect, an absolute monopoly over the GM seed market. Monsanto thus, holds South Africa's agriculture, food security and its farmers in a vice grip. The 6 million ton surplus of maize produced last year would seem to indicate that, for human consumption at least, a ceiling appears to have been reached. However, the animal feed and oilseed industries, which are reliant on yellow GM maize and GM soybeans, are lucrative enough to ensure Monsanto's continued harrising of farmers and policymakers in South Africa alike.

Monsanto's presence in the former homeland areas, through its participation in schemes such as the Massive Food Programme in the Eastern Cape, have not resulted in the successes promised (it would appear that lessons from the Bt cotton debacle in the Makhathini Flats were not learnt). Nevertheless, Monsanto is unlikely to give up on this markets, as it affords them an ideal testing ground for their efforts to penetrate much larger markets throughout Africa, where hundreds of millions of potential customers are to be found.

Given that even the United States government, which has done so much to promote the biotechnology giant abroad, has deemed it necessary to investigate Monsanto's market dominance, the Competition Authorities in South Africa, who have so far demonstrated remarkable fortitude, should follow suit.

Annexure 1: Seed companies in South Africa by operations

Company	Breeders	Broker / Agent	Conditioner / cleaner	Exporter	Grower / producer	Importer	Mail order	Packet Seed	Retailer	Wholesaler
Advance Seed										
All-Gro										
ARC GCI										
Capstone										
Cradock Saad verspreiders										
DMS genetics										
Eastern Free State Cape Trade Org.										
Free State Co-Op										
G.W.K										
Klein Karoo Saad bemarking										
Link Seed										
Madzivhandila										
McDonald Seeds										
Monsanto										
National Seeds cc										
N.W.K										
Pannar										
Peu Seed processors										
Pioneer Hi-Bred										
Procell										
Senwes										
Sensako										
Starke Ayres										

Annexure 2: Plantings and production of white / yellow maize in South Africa, 2009 – 2010.

Province	Area planted (ha)			Final estimate (tons)		
	White	Yellow	Total	White	Yellow	Total
W Cape	500	2 000	2 500	3 500	16 000	19 500
N Cape	2 000	51 000	53 000	23 000	599 250	622 250
Free State	690 000	466 000	1 156 000	3 174 000	2 003 800	5 177 800
E Cape	3 200	13 200	16 400	14 400	66 000	80 400
KZN	46 000	42 000	88 000	271 400	258 300	529 700
Mpumalanga	232 000	250 000	482 000	1 368 800	1 450 000	2 818 800
Limpopo	26 000	18 500	44 500	124 800	83 250	208 050
Gauteng	85 000	40 000	125 000	493 000	212 000	705 000
North West	635 000	140 000	775 000	2 349 500	532 000	2 881 500
Total	1 719 700	1 022 700	2 742 400	7 822 400	5 220 600	13 043 000

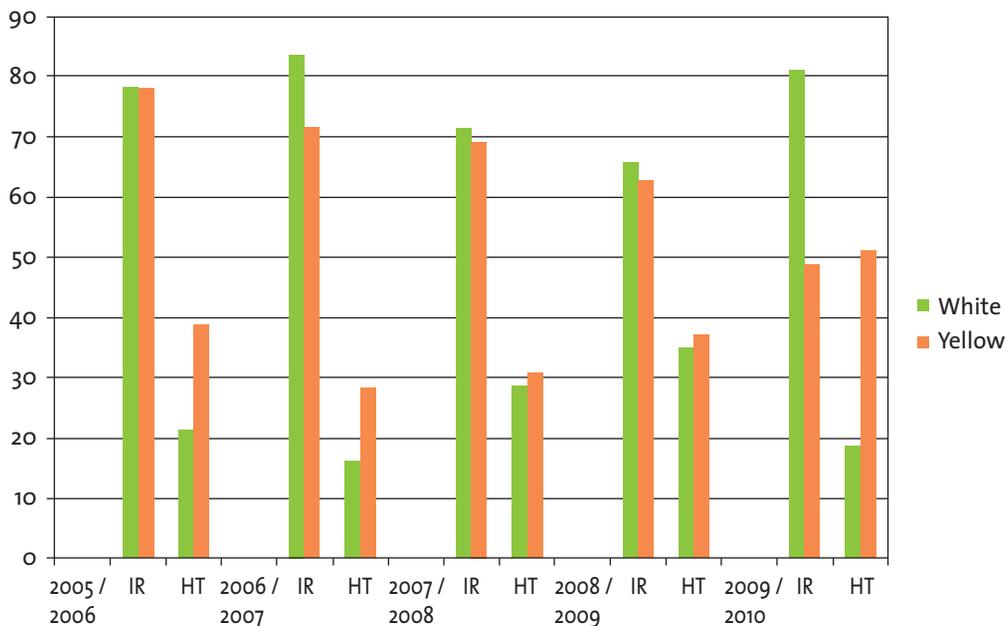
Source: Crop Estimates Committee

Annexure 3: Area planted (ha) to white / yellow maize in South Africa's main maize production areas

	Free State			North West			Mpumalanga		
	White	Yellow	Ratio	White	Yellow	Ratio	White	Yellow	Ratio
2010 / 2011*	646,000	435,000	60 / 40	550,000	110,000	83 / 17	185,000	245,000	43 / 57
2009 / 2010	690,000	466,000	60 / 40	635,000	140,000	82 / 18	232,000	250,000	48 / 52
2008 / 2009	565,000	390,000	59 / 41	560,000	135,000	81 / 19	215,000	262,000	45 / 55
2007 / 2008	690,000	480,000	59 / 41	610,000	170,000	78 / 22	268,000	250,000	52 / 48
2006 / 2007	640,000	380,000	62 / 38	620,000	150,000	81 / 19	220,000	250,000	47 / 52
2005 / 2006	345,000	190,000	64 / 36	420,000	107,000	80 / 20	156,000	180,000	46 / 54
2004 / 2005	660,000	385,000	63 / 37	680,000	215,000	76 / 24	224,000	336,000	40 / 60

Source: Crop Estimates Committee

Annexure 4: % GM maize planted with insect resistance or herbicide tolerance in South Africa, 2005 - 2010



Source: Esterhuizen, 2010.

Annexure 5: Maize varieties owned by Monsanto in South Africa

Yellow	Yellow gm	White	White gm
CRN 3604	DKC 61-25 B	CG 4141	CRN 4549 B
DKC 61 - 24	DKC 62-72 BR	CRN 3505	DKC 74-85 R
DKC 63-20	DKC 62-74 R	CRN 3549	DKC 75-79 R
DKC 73 - 72	DKC 62-80 BR	DK 8031	DKC 76-81 R
DKC 80-10	DKC 62-84 R	DKC 80-33	DKC 77-61 B
SNK 2472	DKC 63-28 R	SNK 2147	DKC 77-71 R
SNK 2682	DKC 63-42 BR	SNK 2551	DKC 77-87 R
SNK 2778	DKC 63-16 B	SNK 2911	DKC 78-15 B
SNK 2942	DKC 64-78 BR		DKC 78-35 R
SNK 2972	DKC 65-60 B		DKC 78-45 BR
	DKC 65-62 R		DKC 78-49 BR
	DKC 66-32 B		DKC 78-83 R
	DKC 66-36 R		
	DKC 66-60 BR		
	DKC 73-74 BR		
	DKC 73-76 R		
	DKC 80-12 B		
	DKC 80-30 R		
	DKC 80-40 BR		

Annexure 6: Other varieties owned by Monsanto in South Africa

onion	10
cauliflower	5
broccoli	11
cabbage	4
sweet pepper	9
watermelon	3
sweet melon	1
cucumber	2
pumpkin & squash	5
carrot	3
gm cotton	13
sunflower	2
barley	1
narrow leaf lupin	1
tomato	12
runner bean	1
garden bean dwarf	9
garden pea	4
wheat	41

Annexure 7: Monsanto's seed dealer network

Locations in Brits, Endicott, Fourways (HQ), Klerksdorp, Lichtenburg, Paarl, Petit, Springs
 Seed representatives divided into 5 regions: (1) Mpumalanga, (2) North West / Limpopo / Lichtenburg, (3) Western Free State, (4) Central, (5) Eastern Free State / Eastern Cape & KwaZulu Natal.

- (1) **Mpumalanga** – Bronkhorstspuit, Delmas / Bethal / Middleburg / Standerton / Underberg / Middleburg – North / Ermelo, Amersfoort / Springbokvlakte
- (2) **North West / Limpopo / Lichtenburg** – Lichtenburg West / Koster, Derby / Lichtenburg East, Colingny / Verntersdorp / Delaraville / Brits / Sannieshof / Mareetsane
- (3) **Western Free State** – Christiana, Bloemhof, Hoopstad / Bulfontein / Wolmaransstad, Leeudoringstad / Kimberly, Jacobsdal, Prieska, Douglas / Schweizer – Reneke / Bloemfontein / Wesselsbron / Hopetown, Luckhoff, Van der Kloof / Hartswater, Jan Kempdorp, Barkley West
- (4) **Central** – Viljoenskroon / Kroonstad, Hennenman / Potchefstroom, Verneeniging / Koppies, Parys / Hartbeesfontein, Ottosdal / Bothaville, Odendaalsrus / Helibron / Bothaville North
- (5) **Eastern Free State / Eastern Cape & KwaZulu Natal** – Petrus Stein, Reitz / Harrismith / Villiers, Frankfort / Heidleberg / Vrede / Senekal, Winburg / Bethlehem, Fouriesburg / Clocolan, Ficksburg / Bergville, Winterton

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PO Box 29170, Melville 2109, South Africa
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