REPORT ON THE INVESTIGATION INTO THE SOUTH AFRICAN SORGHUM INDUSTRY

A REPORT BY THE SORGHUM SECTION 7 COMMITTEE

APPOINTED BY THE

NATIONAL AGRICULTURAL MARKETING COUNCIL

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ABBREVIATIONS

AFMA – Animal Feed Manufacturers Association

ARC – Agricultural Research Council

CEC – Crop Estimates Committee

CELC – Crop Estimates Liaison Committee

CSIR – Centre for Science and Industrial Research

DoA – Department of Agriculture

FAO – Food and Agriculture Organisation

GMO – Genetically Modified Organisms

GSA – Grain South Africa

GSI – Grain Silo Industry (PTY) LTD

JSE- Johannesburg Securities Exchange (formerly SAFEX)

NAFU – National African Farmers Union

NAMC – National Agricultural Marketing Council

NGO – Non- Governmental Organisation

PDA – Provincial Departments of Agriculture

PDI – Previously disadvantaged individual

PPECB - Perishable Products Export Control Board

R & D – Research and Development

SACOTA – South African Cereal and Oilseeds Traders Association

SADC – Southern African Development Community

SAFEX – South African Futures Exchange

SAGIS – South African Grains Information Service

SAGL – South African Grain Laboratory

SANCU - South African National Consumer Union

SPA - Sorghum Processors Association of South Africa

SARS - South African Revenue services

EXECUTIVE SUMMARY

Sorghum is a tropical cereal grass that has been cultivated in Southern Africa for over 3 000 years. Today, sorghum is cultivated across the world in the warmer climatic areas. In terms of volume it is the world's fifth most important grain crop, after wheat, maize, rice and barley. Sorghum is still largely a subsistence food crop, but is increasingly becoming the foundation for successful food and beverage industries (Taylor, 2003).

In 2005 the NAMC decided to establish a Committee, in terms of section 7 of the Marketing of Agricultural Products Act, 1996, (MAP Act), to conduct an investigation into the South African sorghum industry. The Committee held its first meeting on 7 September 2005.

The Committee's terms of reference were to investigate the South African sorghum industry and to identify problems and opportunities for sustainable growth and development in the industry. Issues specific to the sorghum industry issues were to be addressed with a view to making recommendations that would increase efficiencies, market access and industry competitiveness through the unrestricted participation of all stakeholders.

Although sorghum is, after maize and wheat, the most important grain crop produced in South Africa it contributes only a small percentage to the total domestic grain crop. For the past five seasons South Africa has produced on average 225 000 tons of sorghum per annum, which is only about 3% and 12% of the size of the average domestic maize and wheat crops, respectively.

The market for sorghum consists of the food market, the animal feed market and exports. South Africa processes commercially on average 200 000 tons of sorghum per annum (five-year average). Virtually all sorghum processed is purchased from the commercial farming sector. About 90% is used for food production and 10% for animal feed.

Sorghum is used mainly for food and beverage consumption (e.g. malt and sorghum meal). Malt is used for manufacturing sorghum beer (traditional African beer) (between 52% and 62% of total domestic demand is for malting/brewing). Sorghum meal, also known as "*mabele*", competes directly with maize meal and is served as a breakfast cereal or as soured porridge. "*Ting*", sorghum rice, sometimes also called "corn rice", is whole sorghum that has had the outer bran layers removed and is served instead of rice. For the past five years approximately 65 000 tons has been milled and sold annually as sorghum meal. Processors of sorghum products for the end-consumer market operate in an extremely competitive environment in which consumers can easily switch to substitutes such as maize meal, rice and lager beer. Western culture and the economic climate are important influences**.** The sorghum malt market (industrial malt consumption and commercial malt consumption) has shown a declining trend for the past ten years.

The overview of the sorghum industry highlights the historically dualistic nature of the sorghum industry and the skewed participation in it. As indicated in the *Strategic plan for South African agriculture*, the challenge to improve participation and correct the skewed distribution of land, capital and economic opportunities remains important across all sectors.

The basis for competitiveness is sustainable production. Costs need to be contained by means of relevant research, training, applied extension, efficient input and infrastructure markets, economies of scale where possible, and the efficient use of the value chain. Income needs to be increased by means of product differentiation, new export markets and efficient processing infrastructure.

The grain industry is an important partner in the government's continuous effort to achieve food security for all households in South Africa. The industry plays a vital role in providing sufficient quantities of the grains necessary for basic staple food requirements. Government therefore has an interest in ensuring that the industry remains competitive and viable.

Sorghum is crucially important to household food security in Africa as it is uniquely drought tolerant among grain crops, can withstand periods of high temperatures and has excellent nutritional qualities. Average yields remain below 1t/ha because sorghum cultivation in Africa is still mainly characterised by traditional farming practices with low inputs (no inorganic fertilisers or pesticides) and traditional varieties. Such low yields mean that there is often no surplus sorghum, without which processing industries cannot be created. However, where intensive agriculture is practised with improved varieties or hybrids, yields are much higher and become comparable to other major cereals. For example, in South Africa the average commercial yield in 2003/04 was 2,87t/ha for sorghum compared to 2,97t/ha for maize.

The following recommendations were made by the Section 7 Committee:

A. ***To ensure a viable and sustainable broadening participation in the sorghum industry at farm level, extension services and development programmes should be based solely on sound economic principals.***

B. ***Government should intensify its endeavours to convince the Minister of Finance of the importance of agricultural research in order to secure additional funding of research.***

C. ***Producers should be assisted to become more competitive by applying improved cultivation practices and cultivars. Government research and extension services should be carried out in partnership with the private sector to supply the most efficient services and relevant, high quality products.***

D. ***Provincial Departments of Agriculture should accept the primary responsibility for disseminating information to subsistence farmers.***

E. ***The NAMC should facilitate the establishment and coordination of marketing development programmes and schemes to enable subsistence producers to develop into commercial producers. It should, further, facilitate the establishment of a database on black producers.***

F. ***Government should change its attitude towards sorghum and accept the fact that it is an important agricultural product. The Agricultural Sector Report to the June 27 2006 meeting of the Presidential Working Group on Commercial Agriculture classified***

sorghum as "not attractive, competitive or large" and stated that the industry would not, therefore, receive any dedicated resources for development.

G. Government should enforce its Acts and regulations and should promote a dispensation that provides for a safe and fair socio-economic environment within which the sorghum industry and the agricultural sector at large can develop and thrive.

H. The VAT on sorghum meal should be discussed with the Minister of Finance.

I. Spoornet should formally recognise the Transport Working Group of the grain industry as a forum with which to discuss logistical problems.

J. Spoornet should expedite the establishment of a Standing Committee on grain logistics involving all role-players and service providers (including silo owners).

K. The Department of Agriculture should provide continuous funding for a credible crop estimating process.

L. In order to differentiate between sweet and bitter sorghum production in crop estimates, the Sorghum Forum should supply the Crop Estimates Committee with a detailed address list of all sorghum producers

M. Government should support and continue the promotion of indigenous produce and assist in enhancing the status of indigenous foods.

N. The Sorghum Forum should take the lead in examining ways of establishing generic promotion of sorghum intended for the domestic market

O. Provincial governments should recognise the nutritional value of sorghum and include sorghum in school feeding schemes and other initiatives.

STRUCTURE OF THE REPORT

The remainder of this report is structured as follows:

Chapter 1 sets out the Committee's composition and terms of reference with regard to the status of the sorghum industry.
Chapter 2 summarises the history of the South African sorghum industry, industry structures and interventions since deregulation and gives an overview of the market for sorghum and the developing sorghum industry..
Chapter 3 covers the problem statement and challenges. It provides a SWOT analysis and summarises the key challenges faced by the sorghum industry.
Chapter 4 contains the Committee's conclusions and recommendations.

1. INTRODUCTION

The National Agricultural Marketing Council (NAMC) is a statutory body and functions primarily as an advisory body to the Minister for Agriculture and Land Affairs. During 2005 the NAMC decided to establish a Committee (in terms of section 7 of the MAP Act, 1996) to conduct an investigation into the sorghum industry. The Committee held its first meeting on 7 September 2005.

Composition of the Sorghum Section 7 Committee

The Sorghum Section 7 Committee comprised the following members:

Mr Zolile Duze – Chairperson	NAMC
Ms Rona Beukes	DoA
Dr Dries Booyens	Seed producer
Mr Koos du Plessis	Grain SA
Mr Paul du Plessis	AFMA
Ms Anna Enslin	SAGIS
Mr Nico Fouché	Sorghum Forum
Ms Aletta Geldenhuys	SANCU
Mr John Gordon	SACOTA)
Mr Piet Louw	GSI
Mr Balfour Makhetha	Sorghum beer distributors
Ms Lizette Mellet	NAMC
Ms Lillibeth Moolman	NAMC
Mr Gideon Morule	NAFU
Mr Eric Platt	Sorghum Processors Association
Mr Rajiv Shrivastava	United National Breweries (SA) Limited
Prof John Taylor	Sorghum researcher, University of Pretoria
Dr Piet van der Merwe	ARC, Grain Crops Institute
Mr Sakkie van Zyl	Grain SA

Terms of reference

The Committee's terms of reference were to investigate the South African sorghum industry and to identify problems and opportunities for sustainable growth and development in the industry. Issues specific to the sorghum industry were to be addressed with a view to making recommendations that will increase efficiencies, market access and industry competitiveness through the unrestricted participation of all stakeholders.

2. CONTEXT AND OVERVIEW OF THE SORGHUM INDUSTRY

2.1 Sorghum

Sorghum (*Sorghum bicolor* (L.) Moench) is also known as sorghum (internationally); *mabele* (Pedi, Sotho, Ndebele); *amabele* (Zulu) and *amazimba* (Xhosa).

This tropical cereal grass has been cultivated in Southern Africa for over 3 000 years. Today, sorghum is cultivated across the world in the warmer climatic areas. In terms of volume it is the world's fifth most important cereal grain, after wheat, maize, rice and barley. Sorghum is still largely a subsistence food crop, but is increasingly becoming the foundation for successful food and beverage industries (Taylor, 2003).

In South Africa sorghum cultivars are divided into three classes:

- Class GM: sorghum with a low tannin content, known as sweet sorghum, which is especially suitable for malting and milling purposes
- Class GL: sorghum with a low tannin content, known as sweet sorghum, which is especially suitable for milling and animal feed purposes
- Class GH: sorghum with a high tannin content (bird resistant), known as bitter sorghum, which is used for industrial malting[1]

For the purpose of this study, sorghum is regarded as a cereal. Cereals are annual plants that yield grains used for food, feed, seed and industrial purposes (e.g. ethanol, although currently not in South Africa). It has been recommended that the denomination of "cereal crops" be reserved for crops harvested for dry grain and sweet stem sorghum, thereby excluding crops harvested or used green for forage, silage, grazing, et cetera.

Description: Sorghum is a cane-like grass, the modern cultivars being up to 2m tall with large branched clusters of ears. The individual kernels are 3 to 4mm in diameter, similar to other grains such as wheat and barley, and vary in colour from white to dark brown depending on the cultivar.

Distribution and habitat: *Sorghum bicolor* originated in Africa and is widely distributed throughout the world. Different cultivars are found in different regions, depending on climate. It is adapted to a wide range of ecological conditions. It is essentially a plant of hot, dry regions although it survives in cool weather as well as in waterlogged habitats.

Growing sorghum: Sorghum grows in a wide variety of soils and is more drought resistant than other summer grains, but it does better when the soil is enriched with compost or fertilisers prior to planting. Cultivars have also been bred to suit different soil and climate conditions.

[1] Industrial malt is used in the manufacturing of sorghum beer by means of an industrial process, as opposed to commercial malt which is used for home-brew sorghum beer.

Sorghum is prone to damage by various pests, including birds and, in some parts of Africa, the parasitic witch weed (Striga). Resistant cultivars, crop rotation and early weeding help combat the latter.

Uses and cultural aspects: Sorghum is processed into a wide variety of nutritious traditional foods, such as semi-leavened bread, couscous, dumplings and fermented and non-fermented porridges. It is the grain of choice for brewing traditional African beers. New products, such as instant soft porridge and non-alcoholic malt beverages, are great successes. In the competitive environment of multinational enterprises, sorghum has been proven to be the best alternative to barley for lager beer brewing.

Nutritional value: The nutritional values of unprocessed sorghum compared to maize are as follows:

	Protein	Sugars	Fat
Sorghum	11,6%	2,1%	0%
Whole kernel maize	9,1%	1,9%	4,4%

The nutritional values per 100g of sorghum porridge (*mabele*) are compared with those for 100g of Super maize meal in the table below:

	Protein	Fat	Carbohydrates	Energy
Mabele	9,7%	1,6%	76,5g	1448kj
Super maize meal	7,4%	1,0%	73,0g	1337kj

2.2 Historical overview of the South African sorghum industry

The sorghum industry was managed and controlled as follows during the period 1946 to 1997:

1946/47 – 1985/86 by the Maize Board
1986/87 – 1996/97 by the Sorghum Board

Until 1997, the Sorghum Board administered various arrangements relating to the marketing of sorghum. The Sorghum Board performed functions such as furnishing market information, market and product development and managing a voluntary pool system by acting as a buyer of last resort. Research was coordinated by the Sorghum Board and financed by a statutory levy. Market forces determined prices. Limited quantities of sorghum were exported, and an import tariff of 3% is still in place. Imports and exports of sorghum were subject to quantitative control.

On 30 November 1997, the Sorghum Board terminated its functions. All assets of the Sorghum Board were transferred to the Sorghum Trust to be used for the benefit of the whole sorghum industry.

Statutory levies were introduced in terms of the MAP Act to enable the Sorghum Trust to finance research and development projects and information functions.

The South African Grains Information Service (SAGIS), a section 21 company funded by, among others, the Sorghum Trust, carries out the information function and provides information

on imports, exports, local consumption, stocks, manufacturing figures, et cetera. Research projects proposed by the Sorghum Forum are financed by the statutory levy administered by the Sorghum Trust, and are undertaken by appropriate research institutions.

2.3 Industry structures and interventions

2.3.1 Sorghum Trust

After the termination of the Sorghum Board in 1997, all assets of the Sorghum Board were transferred to the Sorghum Trust, which was established in February 1999. The main objective of the Trust is to maximise the income of the Trust and to provide funding for the following:

- Sorghum research and development projects in the interest of the sorghum industry
- The maintenance and improvement of sorghum quality standards
- The maintenance of information required by the sorghum industry
- Sorghum promotion projects that further the interests of the sorghum industry

2.3.2 Statutory levies

Statutory levies imposed on sorghum are summarised in Table 1.

Table 1: The statutory levy on sorghum since deregulation

Levy promulgated on sorghum (VAT excl)	Date of implementation	Lapsing date
R3,10/t	8 May 1998	31 July 2000
R3,10/t	21 July 2000	28 February 2001
R3,10/t	26 April 2001	28 February 2002
R5,00/t	5 March 2002	28 February 2003
R6,00/t	1 March 2003	28 February 2006
R7,70/t	24 February 2006	28 February 2010

Source: NAMC Nov 2006

Table 2 summarises the rate of levy collection since 1998/99.

Table 2: Rate of levy collection

Marketing year	Levies collected (equivalent tons)	Processed sorghum plus whole sorghum exported (leviable tons)	% collected
1998/1999	234 961	296 669	79%
1999/2000	181 195	255 400	71%
2000/2001	258 928	289 500	89%
2001/2002	116 217	251 600	46%*
2002/2003	232 551	270 000	86%
2003/2004	195 389	222 900	88%
2004/2005	208 816	222 200	94%

*The levy regulations were published too late to collect a year's levy

Source: NAMC Nov 2006

2.3.3 Sorghum Forum

The Sorghum Forum, which has a formal constitution, was established on 30 April 1997 by directly affected groups in the sorghum industry to act as mouthpiece for the sorghum industry in South Africa and to obtain transparent consensus on matters of mutual concern to all stakeholders in the sorghum industry. The Forum is representative of all its members and is open to participation by any directly affected group as defined in the MAP Act. The Sorghum Forum meets a minimum of twice a year.

2.3.4 South African Grain Information Service

Timely information is essential in order to survive in a free market system. With the demise of the Sorghum Board, the sorghum industry joined hands with the maize, winter cereal and oilseeds industries in 1997 to establish the South African Grain Information Service (SAGIS).

SAGIS is an independent section 21 company (completely financed by the four grain trusts) that collects, collates and publishes reliable sorghum market information according to the needs of the industry.

Statutory measures for registration, records and returns were implemented on 9 April 1998 and reviewed and extended in 2002, and are still in place.

The purpose and aims of these statutory measures are to:

- Compel parties to keep records and render returns
- Ensure that continuous, timely and accurate information is available to all role-players

Processors and purchasers of sorghum are compelled to register with SAGIS, and every exporter, importer, processor, purchaser and commercial storer must keep records and furnish monthly returns to SAGIS. In 2005, sorghum returns were submitted by 31 traders, 11 storers, 91 processors and 3 exporters/importers.

Information on individuals is dealt with in a confidential manner and no sensitive or potentially sensitive client-specific information is made available to any party without the prior approval of the party or parties whose rights may be affected.

SAGIS's monthly bulletin (SMB) is available on its website and is also distributed by means of e-mail, faxes and surface mail. The market information (stocks, imports, exports, consumption and producer deliveries) is deemed essential for informed decision making.

In order to make the market information available to members of the developing sector and PDIs, as far as possible, SAGIS:

- Negotiates with and relies on parties directly involved in that sector (e.g. NAFU, GSA, ARC) to share the information with them
- Has published the SMB in Zulu and Tswana as well as English and Afrikaans since May 2004.

2.3.5 Southern African Grain Laboratory

The Southern African Grain Laboratory (SAGL) is incorporated under section 21 of the Companies Act (association not for gain). The SAGL was established on request of the South African grain industry in 1997 after the disbandment of the Boards. SAGL provides grain analysis and related services and is regarded as a market leader in Southern Africa. The Directors of SAGL are nominated by the grain industry associations.

2.3.6 Crop Estimates Committee

Accurate crop estimates play an important role in providing real-time market information on which important decisions and actions can be based, for example negotiating the best possible price or deciding what and when to plant. The crop estimates and forecasts derive from collated inputs provided and consensus reached by the various member organisations of the Crop Estimates Committee (CEC), namely national and provincial Departments of Agriculture, the Agricultural Research Council (ARC) and Stats SA.

Table 3: CEC sorghum information ('000t)

	Marketing year								
(Apr - Mar)	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06 (Oct 2005)
Crop estimates for sorghum	355.0	264.6	156.0	352.5	175.6	197.3	219.5	373.0	260.0

Source: CEC Oct 2005

2.3.7 Crop Estimates Liaison Committee

The Crop Estimates Liaison Committee (CELC) is an official committee of the NAMC. This committee monitors the crop estimates process of the CEC. The grain forums in particular regard it as a very important platform for resolving problems regarding crop estimates – information that is vital in a free market environment and also affects market prices. Since its inception in October 1998, the CELC has focused on the following:

- Establishment of a completely independent and objective Crop Estimates Committee (CEC), free of commercial bias
- Promoting understanding and acceptance on the part of the CEC of what is required of it by the industry and why
- Compilation of an accurate, timely and credible crop estimate as well as the finalisation of the production figures per crop at the end of the production season
- Monitoring of CEC's performance and evaluating projects related to the crop estimating process

The Committee meets three to four times a year and is chaired by the NAMC member responsible for the grains portfolio. Market participants are members of the Committee.

2.3.8 Research

The ARC has the vision to be a nationally and internationally recognised centre of excellence in agricultural science and innovation. Sorghum is a mandated crop of the ARC Grain Crops Institute at Potchefstroom. Research projects are jointly sponsored by government and external funders such as the Sorghum Trust. Research projects are grouped under the following five strategic goals:

- Increased access to the agricultural sector by resource poor farmers
- Sustainable use of the natural resource base
- A globally competitive agricultural sector
- High quality and safe food
- Support an informed society (ARC Strategic Plan 2005–2008)

The funding of research is becoming more and more problematic as government reduces its contribution, industry funds become limited and the generation of new funds from the industry becomes more difficult. Government's contribution was 100% some years ago but is now on a sliding scale. No industry can survive in a globally competitive market unless supported by a world-class research and development (R&D) programme. According to the ARC, developed and industrialised countries typically invest approximately 3% of the industries' GDP in R&D, whereas South Africa's investment is in the region of 1%. This has an impact on service delivery, especially to the previously disadvantaged agricultural sector which is in a great need of appropriate technologies to improve its situation.

Many agricultural industries and non-governmental organisations (NGOs) have recognised their responsibility towards technology development and have, within their means, contributed towards the funding of agri-science. The Sorghum Trust makes contributions to the ARC Grain Crops Institute and other beneficiaries such as Grain SA, universities and NGOs.

Since the Sorghum Trust does not have sufficient funds to support even a basic R&D programme, a levy is absolutely essential to ensure a viable, needs-driven R&D programme. The levy funds assist in maintaining the critical expertise and scientific capacity that has been developed over many years in the industry.

The Sorghum Forum annually invites all relevant research institutions, such as the ARC, CSIR and universities, to submit research proposals to the Forum. The Forum's Research Projects Evaluation Committee (RPEC) meets once a year to evaluate and prioritise the projects in terms of norms and criteria accepted by the Forum. Researchers are given an opportunity to explain certain aspects to the RPEC during meetings, whereafter the RPEC meets in camera. The RPEC's recommendations are tabled for approval at the Forum meeting in November each year, and are then submitted to the Sorghum Trust for funding. The Trust meets and considers these projects for funding in terms of the Trust Deed and the relevant statutory regulations as well as the availability of Trust funds. If the cost of the projects exceeds the available funds, the projects are selected based on the priorities linked to each project, up to the cumulative value that equals the available funds. The Trustees may also invite researchers to explain certain aspects to them and may change the priority list at their discretion.

For the four years 2001/02 to 2004/05, an average of 22% of levy funds was appropriated for projects aimed directly at previously disadvantaged individuals. These projects are primarily aimed at empowering black people and have focused on the cultivation of sorghum cultivars for emerging farmers, technology transfer and dissemination of information. The Sorghum Trust terminated certain unsuccessful projects which resulted in a reduced expenditure on transformation projects. Research projects considered and funded by the Sorghum Trust are listed in Annexure1.

2.4. The sorghum market

2.4.1 The importance of sorghum in the grain market

Gross farm income from all agricultural products amounted to R67 103 million (see Table 4) for the year ended 30 June 2005, which is 2% lower than the previous year. This decrease can be attributed mainly to a decrease of 9,8% in the gross income of field crops (see Table 5). The gross income from field crops amounted to R15 082 million in 2005 (a decrease of R1 633 million from 2004). Income from maize decreased by 12,5% and that of sorghum and sunflower seed by 64,7% and 17,5% respectively.

Table 4: Economic indicators of the SA agriculture sector

	July 03 to June 04*	July 04 to June 05*	% change
Total gross farm income	68 430	67 103	-2
Intermediate expenditure	37 930	40 157	5,5
Total farm cost	54 320	57 229	5
Net farm income	15 689	12 188	-22
Terms of trade	1,03	0,9	-12,6

*R' million at current prices

Source: DoA Nov 2006

Table 5: Gross income from major products at current prices

Field crops	2004*	2005*	% change
Maize	7 893	6 903	-12,5
Wheat	1 983	2 008	+1,3
Sorghum	403	142	-64,7
Sugar cane	2 600	3 033	+16,6
Sunflower seed	1 237	1 021	-17,5
Tobacco	431	226	-47,6
All field crops	16 715	15 082	-9,8

* R' million
Source: DoA Nov 2006

On average, prices received by farmers for all agricultural products decreased by 8,4% between 2004 and 2005. The weighted average price of field crops decreased by 18,4%, mainly because of decreases in the prices of maize, sorghum and sunflower seed which dropped by 7,3, 28,2, and 20,9%, respectively (DoA Economic Review of SA Agriculture: 2004/05).

Sorghum prices

Sorghum prices are highly volatile. In a year when local sorghum production exceeds consumption for food and beverage, the sorghum price is determined by the lowest price of competing grains. Currently the sorghum price is discounted against the cheapest of white and yellow maize.

When sorghum demand exceeds production, the price for sorghum depends on the import parity price and a premium is paid for malting quality (see Table 6).

Local sorghum prices dropped dramatically during 2004 as a result of a bumper local crop. Producer prices were in the region of R1 350/t from the end of 2003 to the middle of 2004, but dropped below the level of yellow maize (R970/t) by the end of 2004 because the excess sorghum was consumed by the feed market.

Table 6: Indicative import parity prices of sorghum (VAT excluded)

NOTE:
This is only an example of how an import parity price can be calculated – it may vary according to need and negotiations.

Prices for forward contracts	**USA Sorghum (Gulf)/ 2005/11/04 (2005/11)**
FOB Gulf value ($/t) (Source: IGC)	101.00
Freight rate (20-30000 t) ($/t)	40.00
Insurance ($/t)	0.30
Cost , insurance and freight ($/t)	141.30
Converted to R/t	946.53
Financing costs (R/t) (10.50% - Prime rate)	8.17
Discharging costs: Durban (R/t)	110.82
Import tariff (R/t) (**3% of FOB price**)	20.30
F.O.R. at Durban harbour (R/t)	**1085.82**
Transport costs to Randfontein (R/t)	*280*
Delivered price (R/t)	**1365.82**
Exchange rate (1$=) 2005/11/04	6.6987

Spoornet and market participants do not submit transport costs due to confidentiality.

Source: SAGIS Nov 2006

2.4.2 Sorghum production in South Africa

Although sorghum is, after maize and wheat, the most important grain crop produced in South Africa, it contributes only a small percentage to the total domestic grain crop. For the past five seasons South Africa produced on average 225 000 tons of sorghum per annum, which is only about 3% and 12% of the average domestic maize and wheat crops, respectively.

The Free State Province is South Africa's largest sorghum producing area and produces on average 54% of the total domestic sorghum crop. Mpumalanga is the second largest sorghum

producing province (28%), followed by Limpopo (7%), North West Province (5.8%) and Gauteng (5%).

Sorghum production in South Africa is summarised in Table 7.

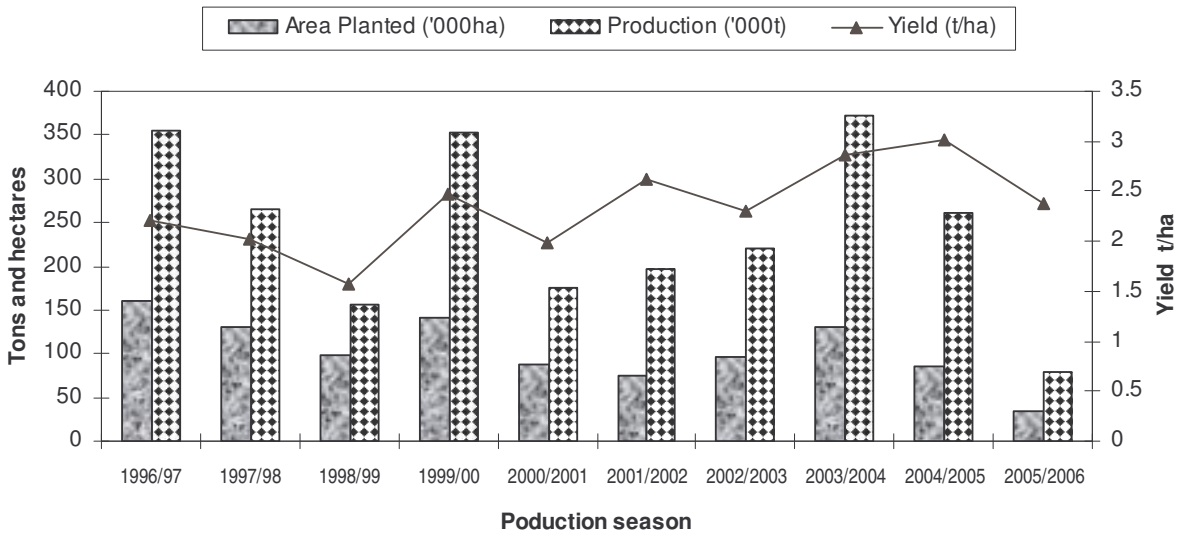
Table 7: Sorghum production in South Africa (tons)

Production season	Free State	Mpumalanga	North West	Limpopo	Gauteng	Other	Total production
2001/02	0.00	0.00	0.00	0.00	0.00	0.00	197 275
2002/03	126 050	63 706	9 725	12 461	7 239	333	219 514
2003/04	187 250	115 780	22 650	21 950	24 670	700	373 000
2004/05	162 950	56 840	12 000	14 500	13 150	560	260 000
2005/06*	35 200	22 400	4 600	16 000	1 360	330	79 890
5-year ave	**122 290**	**63 265**	**12 545**	**16 762**	**10 584**	**490**	**225 936**
% of total	**54%**	**28%**	**5.8%**	**7%**	**5%**	**0.2%**	**100%**

* CEC's sixth production forecast
Source: National Crop Estimate Committee Oct 2005

During the past decade, the total quantity of sorghum produced annually fluctuated between 450 000 and 150 000 tons, depending on the total area planted to sorghum and the yields obtained (see Figure 1). Although a downward trend in the total area planted is noted, the yield per hectare increased significantly, which can be attributed to the utilisation of more efficient cultivation practices and new cultivars.

Figure 1 Domestic total sorghum area planted, production and yields



Source: Grain SA Website Oct 2006

In 2005 and at the beginning of 2006, sorghum producers experienced a severe cost-price squeeze. Producer prices declined drastically over the past two seasons, mainly due to the domestic oversupply situation and the strengthening of the exchange rate, while input cost, especially of imported inputs like fuel, chemicals and fertiliser, kept rising because of higher international prices. At current market conditions, profitable sorghum production is questionable and many producers will be forced to reduce sorghum plantings. The extent to which sorghum will be produced domestically in future will depend entirely on the profitability of sorghum production.

2.4.3 Sorghum quality and grading

Sorghum is graded according to standardised quality norms, as validated under the Agricultural Products Standards Act, No 119 of 1990, for phyto-sanitary measures and the Foodstuff, Cosmetics and Disinfectants Act, No 54 of 1972, for safety measures.

Standards regarding food hygiene and food safety of regulated food products of plant origin intended for export have also been promulgated under the Agricultural Products Standards Act, 1990.

2.4.4 Storage of sorghum

Commercial storage providers of sorghum operate in the following framework:

- Storage and handling services like cleaning and grading are managed in such a way as to add value to the products of the owners of sorghum.
- Effective grain silo services are rendered at market-related costs and on sound business principles and are available to similar users of grain silo facilities on an equal basis**.**
- Sorghum is graded according to the grading regulations of the Directorate: Food Safety and Quality Assurance of the Department of Agriculture. (Specific requirements such as no siftings can be arranged.)
- Any quantity of sorghum that complies with the requirements of the National Department of Health will be handled and stored subject to practical arrangements.
- The quality and quantity of sorghum is guaranteed during storage and agreed arrangements are adhered to.
- The market mechanisms that enhance the trading of sorghum are supported and used, and their requirements adhered to.
- Silo certificates are made available to the owners of sorghum for trading purposes.
- The sorghum specified on a silo certificate will, on presentation of the silo certificate, be supplied to the holder after all relevant costs have been paid.
- Grain silo service tariffs are available at the beginning of a marketing period at head offices and grain silos.

In addition to these services, storage facilities to previously disadvantaged individuals include the following:

- The storers of sorghum provide a means whereby previously disadvantaged individuals get access to mainstream marketing opportunities.

- Any quantity of sorghum (however small) delivered in bags or bulk will be received and stored in silos and/or marketed through silos as long as it complies with the sanitary and phyto-sanitary requirements.
- A full range of marketing tools/possibilities is available from silo owners.
- Storers inform emerging producers on an ad hoc basis of quality regulations, prices, price structures, marketing opportunities and storage services that are available.
- Extension services are generally available to assist farmers with advice.

2.4.5 Sorghum consumption

The market for sorghum consists of the food market, the animal feed market and exports. The sorghum market is summarised in Table 8.

Table 8: The market for sorghum

Marketing years	Total sorghum available (production, stock, & imports)	Exports	Industrial malt	Commercial malt	Meal	Rice, grits and other	Total food	Total feed	Total consumption
1997/1998	419 900	57 100	36 270	87 286	53 373	2 410	179 339	63 727	**243 066**
1998/1999	407 700	58 100	38 901	81 514	52 800	3 300	176 500	58 200	**234 700**
1999/2000	304 100	23 500	28 300	85 900	56 700	3 000	173 900	36 400	**210 300**
2000/2001	419 100	39 900	32 800	90 400	61 200	1 800	186 200	23 300	**209 500**
2001/2002	302 100	48 200	28 700	84 300	75 800	1 100	189 900	16 200	**206 100**
2002/2003	319 000	66 200	20 500	74 900	77 900	1 100	174 400	21 900	**196 300**
2003/2004	288 000	48 800	21 100	73 900	73 700	200	168 900	10 100	**179 000**
2004/2005	422 700	37 600	25 600	76 400	76 800	200	179 000	10 000	**189 000**
2005/2006	437 400	38 200	24 600	78 300	87 900	100	190 900	12 000	**202 900**

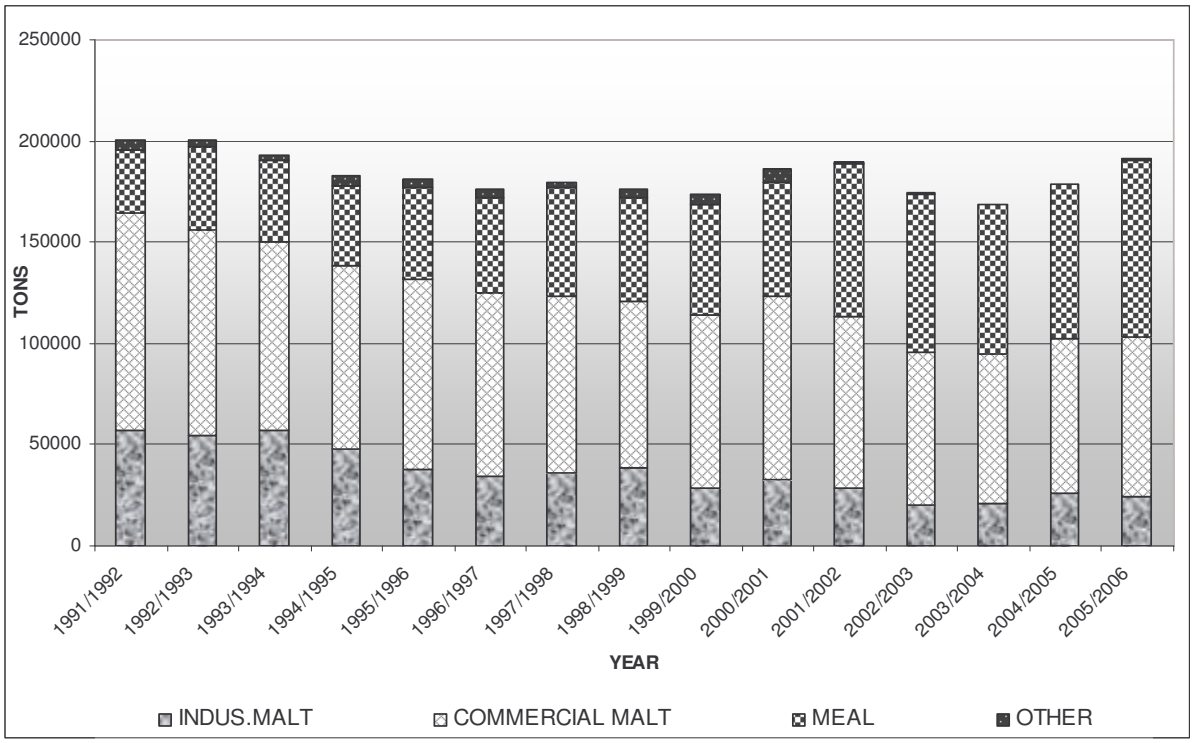
Source: SAGIS Oct 2006

The animal feed market comprises sorghum processed for pet food, poultry and livestock. The utilisation of sorghum in the feed market is inconsistent and opportunistic.

The food market comprises sorghum processed for malt, meal and other food such as rice and grits (mostly for brewing). The average share of the food market in total sorghum consumption over the past nine years is 86,5%. VAT on sorghum meal is still in place after the failure of various requests to the Departments of Finance and Agriculture for exemption.

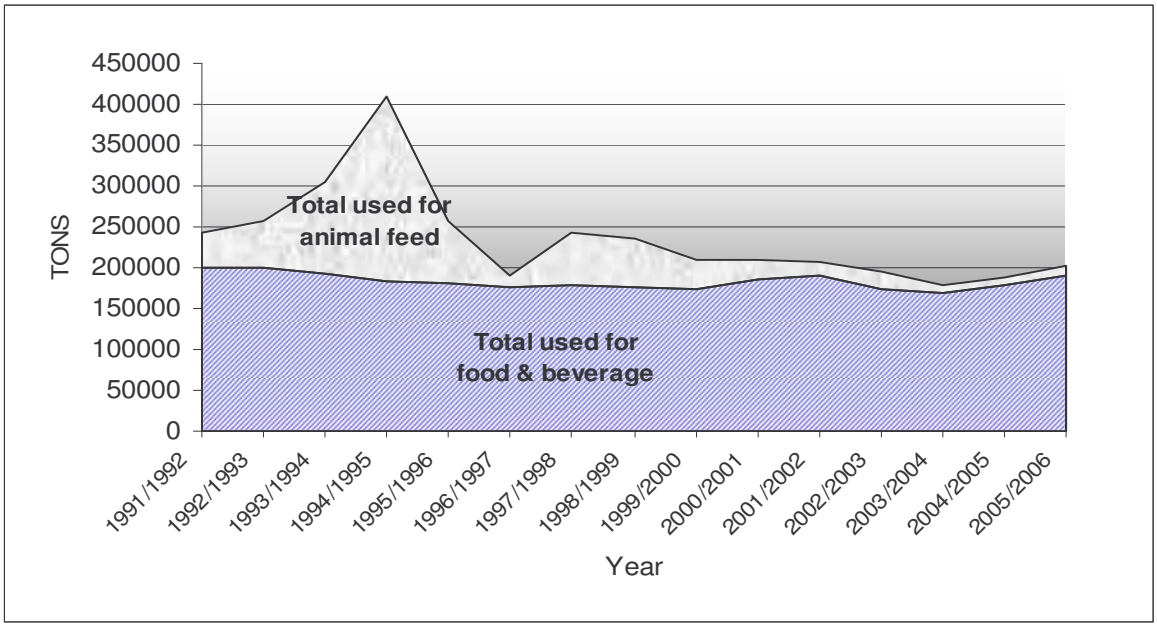
The average share of sorghum processed for animal feed over the past nine years is 13,5%, and this shows a decreasing trend.

Figure 2 Total consumption of South African sorghum in the food and beverage markets



Source: SAGIS Oct 2006

Figure 3. Total consumption of South African sorghum in the animal feed and food & beverage markets



Source: SAGIS Oct 2006

As may be seen in Figures 2 and 3, industrial and commercial malt consumption has decreased since 1991, while consumption of sorghum meal increased from 31 565t in 1991/92 to 87 900t in 2005/06. Sorghum used in the animal feed market has decreased drastically since 1996, from 147 545t to 12 000t in 2005/06.

Sorghum is used mainly for foods and beverages, such as malt and sorghum meal. Malt is used for manufacturing sorghum beer (traditional African beer). Between 52% and 62% of total domestic demand is for malting/brewing. Sorghum meal, also known as "*mabele*", competes directly with maize meal and is served as a breakfast cereal or as soured porridge. "*Ting*", or sorghum rice, sometimes also called "corn rice", is whole sorghum that has had the outer bran layers removed and is served instead of rice. For the past five years an average of 78 420t per year has been milled and sold as sorghum meal.

Processors of sorghum products operate in an extremely competitive environment in which consumers can easily switch to substitutes such as maize meal, rice and lager beer. The economic climate and influences from western culture are important determinants of demand.

The use of sorghum as an animal feed has been well researched and documented over the years. Price is the main determinant of whether maize or sorghum is used for animal feed. For ruminants, the combination of sorghum with other grain sources and the use of steam flaked sorghum gives a product with a similar nutritional value to maize. Feed manufacturers are, however, sometimes reluctant to use sorghum because locality and season can affect the nutritional value of the sorghum (larger variation in nutrient composition than maize), and because of the possibility of tannins in the sorghum. The combination of problems of grain availability, bin space, cleaning and processing, along with uncertainty regarding consumer demand, place sorghum at a disadvantage relative to maize.

2.4.6 The beer market

Sorghum processed for malt comprises the biggest share of the market for sorghum.

In the 1930s the government prohibited any private companies or individuals from brewing and selling sorghum beer (today officially referred to as traditional African beer). All sorghum brewing companies that were not part of government were declared illegal. This brewing right was then passed on to municipalities on condition that all income from sorghum breweries should be allocated to the development of black townships and villages. The municipalities then assigned this responsibility to the Industrial Development Corporation.

South Africans consume well over 5 billion litres of alcoholic beverages per year. This figure could be closer to 6 billion litres, depending on one's estimate of the amount of total sorghum beer consumed. Roughly two-thirds of the alcohol consumed in South Africa is lager beer (officially referred to as malt beer) and sorghum beer. Malt beer consumption, at about 56 litres per capita per annum, is not especially high compared to, for example, the Czech Republic, where per capita consumption is more than 150 litres per annum.

According to a 2004 research report on the liquor industry, market share per alcoholic category was as follows:

Sorghum beer	23,6 %
Malt beer	42,6 %
Wine	17,4 %
Spirits	13,3 %
Other	3,1 %
	100 %

When a clear beer is manufactured from sorghum malt, the excise duty on this beer is the same as for beer brewed from barley malt. The National Treasury has promulgated regulations whereby sorghum beer and sorghum beer powder are known as "Traditional African Beer" and "Traditional African Beer Powder".

Commercially, traditional African beer is brewed with malted sorghum and maize meal. It has a shelf live of only four to six days, depending on the season. It is a product that has to be manufactured, distributed and consumed in less than a week.

There are two categories of sorghum beer:

- Industrial sorghum beer is produced and packed under health hygiene and quality standards as stipulated by SABS.
- Home brew sorghum beer is produced at home from commercial sorghum malt and other ingredients (quality not controlled by the authorities) or from instant beer powder, where all the ingredients are included and only the addition of water is required.

Sorghum beer (*umqombothi*) is rich in B vitamins. It is regarded more as a food than an alcoholic beverage, and the sour taste is highly refreshing.

In February 2005 excise duties on alcoholic beverages were increased by between 9.4% and 20%. Traditional African beer (sorghum-based) was not subject to any duty hikes. Malt beer was set for a duty increase of 9,5% in nominal terms (5,3% real), to R33,65 per litre of absolute alcohol from R30,73 previously. This represented a rise to about 57,2 cents per average 340ml can from 52,24 cents.

The excise duty payable on clear sorghum beer manufactured from sorghum malt is having a negative effect on the sorghum industry, as it impedes the development of a new market for sorghum malt. The sorghum malt market (industrial malt consumption and commercial malt consumption) has shown a declining trend for the past ten years.

2.4.7 Sorghum stock position and exports

Table 9: Sorghum stock position

(Apr - Mar)	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
Opening stock	36.3	87.6	73.3	24.0	130.5	25.2	43.4	49.4	182.5
Producer deliveries	381.3	300.6	177.8	392.6	171.2	214.0	215.8	367.9	249.9
Imports	2.3	0.0	53.0	0.0	0.4	75.1	28.8	5.4	5.0
Surplus	0.0	19.5	0.0	2.5	0.0	4.7	0.0	0.0	0.0
Available	**419.9**	**407.7**	**304.1**	**419.1**	**302.1**	**319.0**	**288.0**	**422.7**	**437.4**
Processed	243.1	234.6	210.3	209.5	206.1	196.3	179.0	189.0	208.7
Net receipts(-)/dispatch(+)	23.4	41.7	14.8	0.7	3.8	1.6	2.0	3.1	5.2
Deficit	0.0	0.0	0.1	0.0	0.7	0.0	3.5	2.4	0.0
Exports	57.1	58.1	23.5	39.9	48.2	66.2	48.8	37.6	38.2
Utilised:	**323.6**	**334.4**	**282.2**	**288.6**	**276.9**	**275.6**	**238.6**	**240.2**	**252.1**
Stock on hand	**96.3**	**73.3**	**21.9**	**130.5**	**25.2**	**43.4**	**49.4**	**182.5**	**185.3**

Source: SAGIS Oct 2006

South Africa is a net exporter of sorghum. Trade with other African countries has, however, remained low compared to other grains, probably because the other African countries produce more sorghum than South Africa. Exports in 2004 and 2005 were mainly to African countries, particularly Botswana, where quality specifications are a limiting factor. To maintain exports to Botswana it is of great importance to comply with the prescribed specifications.

2.4.8 Future marketing prospects for bio-fuels

The possible manufacture of renewable fuels, such as ethanol, is receiving a great deal of attention, and sorghum could benefit from future developments in this regard. Some market participants are of the opinion that this could stabilise the grain industry, while also benefiting new entrants to the industry and stimulating rural development. Over the longer term the manufacture of bio-ethanol from grains could offer a solution to the problem of surplus production and could create an expanded market for the increased production of grains such as maize, sorghum and oilseeds. Issues to be addressed before large-scale processing of maize and sorghum can proceed include the following:

- Impact on food security and food prices
- Acceptability of by-products to the feed industry
- Government participation and legislation

The availability of sorghum for specific products could be a problem.

2.4.9 The developing market for sorghum

In 2003 the NAMC appointed a Working Group to conduct a study to determine the status of grain trading with specific reference to the developing black sector. The Working Group concluded that it is unfortunate that, except for maize, there is no statistical information on the production of grains by this sector. The availability of data on developing black producers is one of the major challenges to be addressed by government.

Apart from a large number of producers who have produced grain for the commercial market, black farmers' share of total production of maize and sunflower seed (assuming their deliveries were largely for maize and sunflower seed) was 0,5% in 2003 (according to the GSI in 2003).

The Working Group met with developing black producers in Taung and Zeerust (North-West), Odendaalsrus and Thabanchu (Free State), and Schoornoord, Nebo and Rietfontein in Limpopo and Mpumalanga provinces. During these meetings a total of 142 questionnaires were filled in. Table 10 indicates the total volumes of grain produced, traded and milled between 1999 and 2002, as indicated by the respondents.

Table10: Total volumes of grain produced, traded or milled by black producers (1999 – 2002)

	No of responses	White maize	Yellow maize	Wheat	Sorghum	Groundnuts	Sunflower	Soya
MILLERS (CONSUMERS) (Metric ton)								
Vlakpoort Roller Mills	1	4 587						
Topstar Milling	1	"small quantities"						
Progress Milling	1	60 000	800		800			
PRODUCERS (Metric ton)								
Western Cape	1	-	-	523	-	-	-	-
Free State	5	-	-	-	-	-	33	-
North West	19	53	-	8	71	556	5	2
Limpopo	111	1 350	102		1 120	116	11	4
Gauteng	2	-	-	-	-	-	-	-
Eastern Cape	1	-	-	-	-	-	-	-
TOTAL	**142**	**1 403**	**102**	**531**	**1 191**	**673**	**49**	**6**

Source: NAMC 2003

This study showed that sorghum is produced mainly by the developing farmers in Limpopo Province. Sorghum is the main crop planted in the arid area of Sekhukhune, where there are approximately 10 000 emerging farmers. They produce mainly for their own consumption and are not keen to commercialise. They deliver to Progress Milling in Polokwane, where farmers can store in the silos until price prospects are better, but sorghum is usually exchanged for sorghum meal or maize meal.

These producers experience the following problems:

- Lack of price information
- Lack of grading
- Lack of finance
- Lack of equipment such as tractors
- Lack of government support
- Late approval of funding
- No processing facilities

Grain South Africa's involvement in the developing sector

Grain SA's mission is to empower developing grain producers to enhance sustainable profitability. Grain SA has formed study groups and has organised various training sessions from production to maintenance of farming equipment, information days, tractor contractor courses, and financial planning and management courses. Grain SA is also involved in the weekly programme on Motsweding FM (a radio station that broadcasts in Setswana), where training, market trends and other information are broadcast. A monthly multilingual newsletter (*Pula*) containing relevant information on agriculture and the latest market and commodity information is also distributed.

Grain SA has also produced development aids, such as a planting measuring stick. Input stores have also been established to ensure that quality seeds, fertiliser, and so on are available for farmers at competitive prices. The organisation has also forged partnerships with the ARC, input suppliers, NDA, mentor farmers, Land Bank and other commercial banks, New Holland, John Deere and others.

Apart from the problems listed above, a database for black developing producers is not in existence, and Grain SA has started to develop such a database. Some areas do not have extension officers, and in some communities there is no support for small-scale farmers, and theft and many other problems are experienced.

Grain SA has a number of new projects under way to meet the needs of the developing black sector with regard to production machinery, input insurance, finance, inputs and training.

Sorghum Trust's involvement in the developing sector

The research conducted by the ARC Grain Crops Institute (GCI), funded by statutory levies administered by the Sorghum Trust, has definitely been beneficial to the emerging sector. However, GCI does not have information on the number of small-scale farmers. Several GCI projects are aimed at smallholder sorghum farmers to improve the situation. The seed of OPV cultivars will be available to emerging farmers in the near future. Four OPV improved varieties have been released and the GCI is in the process of multiplying breeder seed for release to farmers.

Current projects aimed at the smallholder farmers include the following:

M171/04- Participatory evaluation of sorghum cultivars for smallholder farmers
M191/02- Breeding of sorghum cultivars and OPVs
M191/31-Develop nutritionally enhanced sorghum varieties for semi-arid areas of Africa

M191/03- Identification of sweet sorghum varieties for ethanol production
M102/10- Determine processing quality of sorghum cultivars
M107/01- Improved sorghum for food security and livestock feeding.

A more collaborative approach is necessary amongst NGOs and the PDAs on technology transfer to smallholder farmers. The GCI has developed a production manual for sorghum, which should be launched in the near future, and the possibility of a "service desk" should be considered.

Conclusion

It should be borne in mind that a large share of surplus production from black farmers is still channelled through the informal market and is sold unrecorded. The result is that we might never have the full picture of the extent of commercial production by black farmers. Improvement in the levels of participation by black farmers in the formal supply chain remains our main challenge.

The availability of data on developing black producers is one of the major challenges to be addressed by government. The information is probably in the hands of a number of participants and all in different forms depending on the nature of their involvement. It should, however, be borne in mind that a large share of surplus production from black farmers is still channelled through the informal market and is sold unrecorded. The result is that we might never have the full picture of the extent of commercial production by black farmers. Improvement in the levels of participation by black farmers in the formal supply chain remains our main challenge.

3. PROBLEM STATEMENT AND CHALLENGES

3.1 SWOT ANALYSIS

In determining the current circumstances and challenges in the sorghum industry, a SWOT analysis of the markets for sorghum was carried out. The findings from this analysis are summarised below.

3.1.1 Industrial malt and commercial malt

Strengths

- Well-established product: sorghum beer is a traditional drink and is closely associated with the culture and heritage of many South Africans. Almost all malt beer consumed in South Africa is produced in the country.
- Nutritious food product: industrially brewed sorghum beer has a low alcohol content (3,2%), high nutritional value and a rich source of nutrients, namely proteins, carbohydrates, complex starches, energy, vitamins and minerals.
- Healthy product: when used in moderation, it can make a substantial contribution to the consumer's diet.

Weaknesses

- Shrinking market: the trend among African consumers is towards drinking clear beer as they move up the income scale.
- Promotion: promotional drive is low; not much is spent on promotion of malt.
- Distribution: either by own fleet, by contracted fleet or, in rare cases, by distributors/retailers using their transport to collect from the brewery, depot or distributor. The distribution system has to be very reliable and flexible in order to make drinkable sorghum beer available to consumers within the shortest time to avoid spoilage.
- Image: unless perceptions can be changed, declining consumption could continue.
- Quality: can sometimes be poor. Poor quality of sorghum malt has resulted in traditional African beer brewers partially substituting industrial enzymes for sorghum malt, thereby reducing the demand for the malt.

Opportunities

- Capacity in the market – sorghum is the best alternative to barley for lager beer brewing.
- A marketing campaign could promote consumption.
- New entrants ensure more exposure, to the benefit of the entire market.
- Dietary features: these are considerably better than in other alcoholic drinks.
- Lager beer brewing where the starch component is sorghum may boost demand.
- Government's perception on sorghum should be changed.

Threats

- Enzymes (industrial enzymes used in the place of sorghum malt)
- Price
- Substitutes
- Image

- Westernisation aspirations and branding
- HIV/Aids
- Germination/climatological conditions (not possible to import as it must germinate in South Africa)
- Availability of sorghum
- Competition with other consumer needs/expenses for the consumer rand
- Malt beer legislation
- The DoA's perception of sorghum as not competitive and unattractive and its unwillingness to spend resources on the sorghum industry (according to the presentation made at the Presidential Working Group meeting on agriculture on 27 June 2006)

3.1.2 Sorghum meal

Strengths

- Familiar African product
- Nutritious and healthy product: sorghum is processed into a variety of attractive and nutritious traditional foods
- Capacity for market expansion
- Growing market: consumption is increasing
- Not genetically modified
- Non-allergenic and gluten free

Weaknesses

- VAT on sorghum meal
- Unknown by some consumers
- Price fluctuations: generally high processing costs
- Promotional drive: difficult to change into a symbol of prosperity while being associated with poor and marginal areas

Opportunities

- Government and institutional markets: feeding schemes; research is essential to unleash sorghum's capacity to be the cornerstone of food security.
- Requests for the removal of VAT continue to be made.
- Promotion: sorghum's anti-oxidant benefits are currently being investigated.
- Fortification: the CSIR is developing a "super sorghum "with improved nutritional traits. This research project aims to develop more nutritious and easily digestible sorghum varieties that contain increased levels of pro-vitamin A, vitamin E, iron, zinc, amino acids and protein. Major sorghum food processing technologies will also be optimised for the new cultivars.
- Value-added products, such as Morvite (instant soft porridge), that are attractive to both manufacturers and consumers. Value addition to by-products of sorghum processing, such as edible coatings for fruits and nuts, wallboards for housing and biodegradable packaging materials.
- Exports: a dependable supply and good quality of sorghum can gain export markets.
- Gluten free.
- Government's perception on sorghum should be changed.

Threats
- Substitutes
- HIV/Aids
- Excluded from school feeding schemes in some provinces
- The DoA's perception of sorghum as not competitive and unattractive and its unwillingness to spend resources on the sorghum industry (according to the presentation made at the Presidential Working Group meeting on agriculture on 27 June 2006)

3.1.3 Sorghum in animal feed

Strengths
- Attractive in mixed fowl foods
- Non-GM: non-GM animal feed possibly important in future
- Non-allergenic and gluten free

Weaknesses
- VAT on sorghum
- Not listed on Safex – cannot hedge on Safex
- Large differential in price between food and feed value
- Lower energy value than maize

Opportunities
- Continued requests for the removal of VAT
- Multigrain animal feeds for niche market animal products

Threats
- Erratic supply of sorghum
- Lack of additional silo bins at feed mills to handle sorghum
- Animal producers' perceptions of feeding value of sorghum

3.2 Key challenges

The previous sections illustrate the *status quo* in the sorghum industry. Taking this into consideration, the following three key challenges need to be addressed in order to improve the efficiency of the sorghum industry:

- Skewed participation
- Constrained competitiveness and profitability
- Food security

These are discussed in the sections that follow.

3.2.1 Skewed participation

Although sorghum is a traditional crop of Africa, it was never extensively cultivated in South Africa (South Africa produced 1,79% of Africa's total sorghum production in 2004). However, sorghum is a suitable crop for subsistence farmers. In a review of statutory levies by the NAMC it was noted that the emerging sector's contribution to total sorghum production was only 0,5% (1 100 tons by approximately 500 emerging farmers) over the past two years.

The overview of the sorghum industry provided above clearly illustrates the historical dualism and skewed participation in the sorghum industry. As indicated in the *Strategic plan for South African agriculture*, the challenge to improve participation and correct the skewed distribution of land, capital and economic opportunities remains important across all sectors. The sorghum industry has made a firm commitment to the principle of black economic empowerment in the industry, the details of which are still to be negotiated in terms of the BEE Charter. Despite some commendable efforts, however, the task of comprehensive and full-scale empowerment remains incomplete and this therefore remains one of the main challenges facing the industry at all levels of the value chain.

3.2.2 Constrained competitiveness and profitability

According to a study by Dirk Esterhuizen in 2005 of the University of the Free State, the value chain for sorghum is marginal in terms of international competitiveness.

At a workshop on competitiveness held by the NAMC on 29 June 2005, participants agreed that the basis for competitiveness is sustainable production and a consolidated agricultural industry plan. Costs need to be contained by means of relevant research, training, applied extension, efficient input and infrastructure markets, economies of scale where possible, and efficient use of the value chain. Income needs to be increased by means of product differentiation, new export markets and efficient processing infrastructure.

There is a common acceptance of a range of factors constraining performance in the grain industry which also affect competitiveness and profitability in the sorghum industry. These factors include the following:

- Extension and support services
- New and proposed legislation that constrains competitiveness, such as property tax, etc.
- High production costs
- Labour productivity and costs (quality of unskilled labour)
- Funding of research infrastructure and capacity
- Quality concerns in the value chain (quality of inputs, grain, grain products, imported grain)
- Restricted access to affordable finance
- Lack of access to timely, relevant and accurate market information
- Infrastructure and logistical issues
- International agricultural policies distorting grain markets

- Surplus production
- Deficit production
- Volatile currencies
- Crime factors (at all points of the value chain)
- Sustainable environmental management
- Low and variable rainfall and limited good arable land

3.2.3 Food security

Section 27 of the Constitution of South Africa states that every citizen has the right to have access to sufficient food and water and that the State must, by legislation and other measures within its available resources, endeavour to achieve the progressive realisation of the right to sufficient food (Constitution, Act 108 of 1996, Section 27: Right of access to health care, food, water and social security).

The grain industry is one of the largest and most strategic industries in South African agriculture. Former Minister for Agriculture and Land Affairs, Ms Thoko Didiza, observed at the Grain SA Congress of 10 March 2004, that South Africa has a large food insecure population and that this places a responsibility on both government and civil society to ensure food security for the majority of the population, even though there is no overall shortage of grains in the country.

South Africa faces the following key food security challenges:

- Ensuring that enough affordable food is available to all, now and in the future
- Empowering citizens to make optimal choices for nutritious and safe food
- Ensuring that there are adequate safety nets and food emergency systems
- Possessing adequate and relevant information to ensure analysis, communication, monitoring, evaluation and reporting on the impact of food security programmes on the target population

The Minister also referred to the following issues:

- The supply and availability of food continues to be a concern for some SADC countries as well.
- A precise means of addressing this food security problem in the region has not yet been finalised.
- Government has committed itself to regional and continental agreements relating to the creation of a food reserve system (FAO Conference, 2003). This matter is being investigated by the DoA and SADC.

Another aspect of the food security challenge is the negative impact of food aid on the South African commercial and emerging agricultural sector. This would also have to be taken into account in considering a regional food security system. Particular concerns of member countries would also have to be considered in finding the most appropriate solutions for all in accordance with their specific domestic needs. Other external factors such as exchange rates, regional and local supply and demand factors, climatic conditions and world commodity prices can influence

the availability and pricing of grain commodities and can have major impacts on the affordability of food for poor households.

The grain industry is an important partner in the government's ongoing effort to achieve food security for all households in South Africa. The industry plays a vital role in providing sufficient quantities of the grains necessary for basic staple food requirements. Government therefore has an interest in ensuring that the industry remains competitive and viable.

Sorghum is crucially important to food security in Africa as it is uniquely drought tolerant among cereals, can withstand periods of high temperature and has excellent nutritional qualities. However, average yields remain below 1t/ha because sorghum cultivation in Africa is still mainly characterised by traditional farming practices with low inputs (no inorganic fertilisers or pesticides) and traditional varieties. Such low yields mean that there is often no surplus sorghum, without which processing industries cannot be created. However, where intensive agriculture is practised with improved varieties or hybrids, yields are much higher and comparable with other major cereals. For example, in South Africa the average commercial yield in 2003/04 was 2,87t/ha for sorghum compared to 2,97t/ha for maize.

In 2004, the Department of Science and Technology and the Council for Scientific and Industrial Research (CSIR) produced a recipe book called *South African indigenous foods*, which reflects the rich traditions of generations of South African women. The book was the result of a poverty alleviation project and was selected as a gift for guests at the inauguration of President Thabo Mbeki on 27 April 2004. Dishes such as *morogo* (an indigenous green leafy vegetable), mealie bread, *polokwe* (fresh mealie balls), *semphemphe* pudding (wild melon pudding), *mabele* porridge (sorghum porridge), *masonja* (mopani worms and ground peanut dish), and *isigwampa* (a vegetable and mealie dish) are featured. The recipes were collected as part of a project aimed at commercialising and promoting South African indigenous foods, and was funded by the Department of Science and Technology and implemented by CSIR Food, Biological and Chemical Technologies. While some dishes and beverages were the starting point for new products that are being commercialised, the recipe book contains a broader range of dishes prepared by generations of women. Copyright of the book has been ceded to IndiZAFoods, a Section 21 Company created to facilitate the commercialisation of indigenous food products. Proceeds from the sale of the book will be reinvested in community initiatives.

4. RECOMMENDATIONS

4.1 Broadening participation in the sorghum industry

The successful entrance and establishment of new sorghum producers depends largely on three key areas, which are discussed below.

4.1.1 Long-term profitability of sorghum production

As in any business operation, long-term profitability is of critical importance for sustainable production. Sorghum producers who are unable to cover their input costs in the long run will be forced to reduce their sorghum plantings and to switch to alternative crops that are more profitable. Furthermore, if commercial sorghum producers are unable to cover their expenses under prevailing market conditions, it is doubted if developing producers will survive without substantial government assistance.

4.1.2 Successful knowledge transfer to new entrants

A significant constraint that is observed in developing agriculture in general is the lack of knowledge and technical know-how of subsistence farmers. The commercialisation of developing sorghum producers will only succeed if information about all aspects of the production and marketing of the crop, as well as about financial management, is successfully transferred to and applied by new entrants.

4.1.3 Availability of adequate financial resources to new entrants

The redistribution of land in potential sorghum producing areas and the provision of start-up capital to developing sorghum producers alone will not assure the broadening of participation in the sorghum production sector. Development programmes should encompass financial assistance to new farmers for an extended period to ensure that they build up enough financial reserves to survive difficult market conditions.

Recommendations:

A. To ensure a viable and sustainable broadening participation in the sorghum industry at farm level, extension services and development programmes should be based on sound economic principles.

B. Government should intensify its endeavours to convince the Minister of Finance of the importance of agricultural research in order to secure additional funding of research.

C. Producers should be assisted to become more competitive by applying improved cultivation practices and cultivars. Government research and extension services should

be carried out in partnership with the private sector to supply the most efficient services and relevant, high quality products.

D. Provincial Departments of Agriculture should accept the primary responsibility for disseminating information to subsistence farmers.

E. The NAMC should facilitate the establishment and coordination of marketing development programmes/schemes to enable subsistent producers to develop into commercial producers. It should, further, facilitate the establishment of a database on black producers.

F. Government should change its attitude towards sorghum and accept the fact that it is an important agricultural product. The Agricultural Sector Report to the June 27 2006 meeting of the Presidential Working Group on Commercial Agriculture classified sorghum as "not attractive, competitive or large" and stated that the industry would not, therefore, receive any dedicated resources for development.

G. Government should enforce its Acts and regulations and should promote a dispensation that provides for a safe and fair socio-economic environment within which the sorghum industry and the agricultural sector at large can develop and thrive.

4.2 Improving competitiveness and profitability

The competitiveness and profitability of sorghum production and marketing depends on the following factors:

4.2.1 Expanding the market for sorghum

- The production of bio-ethanol from sorghum (industrial use of sorghum)
- The inclusion of more sorghum products in food aid schemes
- The exploitation of niche markets such as clear sorghum beer, health food, breakfast cereals and indigenous foods

4.2.2 International market access and trade policy

- Ensuring that South African sorghum export regulations are in line with the minimum export standards required by countries that import sorghum from South Africa, with particular reference to health and safety
- Ensuring that imported sorghum meets the regulations and standards with which locally produced sorghum must comply
- Identifying possible new export markets for sorghum and sorghum products, especially in neighbouring countries

4.2.3 Information and communication

- Accurate and timely information regarding sorghum acreage planted and production – at national, provincial and regional levels
- Reliable information about projected sorghum consumption, exports and imports

4.2.4 Technology innovation and transfer

- The following research are necessary to address specific needs of producers and processors, to enhance the profitability of sorghum production and to increase the demand for sorghum

First economy:
- Improved hybrid cultivars
- Improved malting quality
- Improved production practices such as precision farming and bio-farming
- Ethanol production
- Adopt production systems that reduce production costs and increase profitability
- Develop alternative products and add value to products
- Exploit niche markets

Second economy:
- Improved open pollinated varieties (OPVs)
- Improved malting qualities of OPV cultivars
- Develop conservation farming principles
- Low-cost pest control
- Improve nutrition of sorghum
- Develop and propagate on-farm storage and processing technologies

4.2.5 Technical standards

Ensure that the current regulations and standards that are in force are still in touch with the needs of the sorghum sector.

4.2.6 Food safety and hygiene

The *Standards regarding food hygiene and food safety of regulated agricultural food products of plant origin intended for export* was promulgated by the DoA on 13 May 2005. These standards require that food products are handled under hygienic conditions through all stages of the supply chain, from primary production to the point of export. All off-farm food business operators (FBOs) will be required to comply with the principles of HACCP (hazard analysis and critical control point) along the entire food supply chain. These standards and regulations also require

record keeping, and that FBOs are able to recall or withdraw product from anywhere in the trade chain, should it pose a health risk.

The sorghum industry is committed to compliance with all food safety and hygiene regulations, namely to ensure that all sorghum and sorghum products during production, handling, storage, processing and distribution are safe, wholesome and fit for human consumption, and further to conform to safety requirements and that all products are labelled as prescribed by law. Food safety refers to the assurance that food will not cause harm to the consumer when it is prepared and/or consumed according to its intended use.

Programmes such as traceability–recall procedures and efficient management of chemical, physical and biological hazards are implemented and maintained in the sorghum industry.

The preparation and handling of foodstuffs as well as the facility in which the foodstuffs are prepared and handled, must comply with the relevant legislation as well as with certain company standards. Among others, it is a requirement in terms of the legislation that a Certificate of Acceptability be issued for the food premises. The legislation details that no person shall handle food or permit food to be handled on food premises in respect of which a valid Certificate of Acceptability has not been issued or is not in force.

The amount of artificial pesticides applied to foodstuffs and their residue allowed to be present in products at market level are regulated by various sets of legislation and are inspected by the Department of Health and the Department of Agriculture respectively.

Recommendations:

H. The VAT on sorghum meal should be discussed with the Minister of Finance.

I. Spoornet should formally recognise the Transport Working Group of the grain industry as a forum with which to discuss logistical problems.

J. Spoornet should expedite the establishment of a Standing Committee on grain logistics involving all role-players and service providers (including silo owners).

K. The Department of Agriculture should provide continuous funding for a credible crop estimating process.

L. In order to differentiate between sweet and bitter sorghum production in crop estimates, the sorghum industry should supply the Crop Estimates Committee with a detailed address list of all sorghum producers

M. Government should support and continue the promotion of indigenous produce and assist in enhancing the status of indigenous foods.

N. The Sorghum Forum should take the lead in examining ways to establish generic promotion of sorghum intended for the domestic market

4.3 Ensuring food security

Hunger and malnutrition are not caused solely by a shortage of food. The primary causes of hunger in some countries have been political unrest and corrupt governments, poor transportation and infrastructure and, of course, poverty. All of these problems must be addressed if we are to ensure real worldwide food security.

With regard to food security in South Africa, it is necessary to make a distinction between food security on a national level and household food security. During the past decade South Africa has not experienced problems with food security on a national level. At the current level of domestic agriculture production and international trade, no problems are foreseen in the near future. However, a point of concern is food security at household level, and a major factor contributing to lack of food security here is inadequate household income. The levels of unemployment and poverty are also significant contributors to this problem.

To address household food insecurity, vulnerable communities should first be identified and a comprehensive assessment of the factors contributing to food insecurity in those communities should then be done and appropriate actions implemented. Sorghum production does have the potential to play a positive role in ensuring household food security in certain rural areas. These areas and the needs of the community should be identified and appropriate extension programmes launched if subsistence sorghum production is found to be a viable option in that area.

Rural women have always made an active contribution to agricultural production and family subsistence. In sub-Saharan Africa, 70% of the population depends on agriculture as the sole source of income, and women and children contribute between 60% and 80% of the labour, mainly in small-scale farming with manual labour: ploughing, planting, weeding, spraying, harvesting and processing. After all these efforts, 30% to 90% of crops are lost to drought, disease, pests, weeds and poor storage.

Lately the HIV/Aids pandemic has more than decimated the farm labour so badly needed to increase food production, thus exacerbating dependency, conflicts, ill health and malnutrition, and leading to the resurgence of communicable diseases such as tuberculosis and hepatitis (Karembu, 2006).

While the governments of developing countries are becoming more aware of the role of women in food production and food security, macroeconomic and agricultural policies and programmes in many countries have not succeeded in helping rural women to make use of resources.

According to Chana Majake, Chief Executive Officer, Commission on Gender Equality, South Africa, “governments’ policy support must include improving rural women’s access to agricultural, financial and social services such as education, health, sanitation and clean water supply. Moreover, women’s access to land needs to be regarded as the foundation of all

economic activities and social development. Awareness of the benefits resulting from women's access to land in terms of family and national food security must be fostered among policy makers, planners, village heads and male farmers. "

"With the above in mind, research should be directed at identifying possibilities for surplus food production by subsistence farmers and marketing opportunities for non-officially priced agricultural produce. Furthermore, decision makers in peasant organisations, marketing bodies and parastatal organisations supporting grassroots associations need to be gender-sensitised to increase their awareness of existing gender biases in marketing infrastructures. This should lead to measures that will correct existing marketing imbalances and should also open up marketing opportunities for food and tradable crops, thereby improving food security at both household and national levels."

The Committee agrees with these statements

Recommendation:

O. Provincial governments should recognise the nutritional value of sorghum and include sorghum in school feeding schemes and other initiatives.

6. REFERENCES

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ANNEXURE 1

CONTRIBUTION OF THE SORGHUM TRUST TO RESEARCH PROJECTS: 1998/1999 TO 2005/2006

1998 / 1999

PROJECTS	INSTITUTION	VALUE (RAND)
Cultivar evaluation		
Evaluation of sorghum cultivars		
Evaluation of new and commercially viable sorghum cultivars (G06/01)	ARC-GCI	106 607
Quality studies on sorghum		
Malt quality of sorghum cultivars (GM07/01)	ARC-GCI	70 344
Determination of processing qualities of sorghum cultivars (GM07/02)	ARC-GCI	49 379
Crop protection		
Stem borers in sorghum		
The role of plant resistance in integrated pest management of stem borers on sorghum (GM 23/02)	ARC-GCI	96 669
Identification of molecular markers (QTLs) for stem borer resistance in sorghum (GM 23/05)	ARC-GCI	37 239
Root and stem rot in sorghum		
The effect of root rot pathogens on sorghum (GM 26/01)	ARC-GCI	28 234
Quantification of host x pathogen interactions (GM 26/03)	ARC-GCI	51 485
Quantification of factors that predisposition sorghum genotypes (GM 26/04)	ARC-GCI	36 743
Development of modern molecular identification analysis for root rot pathogens (GM26/05)	ARC-GCI	38 004
Evaluation of sorghum lines and emerging farmer varieties for resistance against economically important leaf diseases (GM 28/01)	ARC-GCI	28 931
Panicle diseases in sorghum		
Ratio between genetical, sito plasmic and induced sterility (GM 26/05)	ARC-GCI	56 431
Plant improvement		
Breeding for disease resistance in sorghum		
Breeding for resistance to ergot, root rot and seedling wilt disease (GM 35/04)	ARC-GCI	21 142
Breeding for insect resistance in sorghum		
Breeding for resistance to stem borers and aphids	ARC-GCI	59 610
Breeding for improved agronomical characteristics in sorghum		
Breeding for malting quality in sorghum (GM 37/02)	ARC-GCI	34 690
Breeding for combine ability in sorghum (GM 37/03)	ARC-GCI	58 318
SUBTOTAL (30% of ARC Budget)	ARC-GCI	787 205
Enzyme peeling (dehulling / decortication) of sorghum grain	CSIR	85 000
TOTAL EXPENDITURE		**872 205**

1999 / 2000

	INSTITUTION	VALUE (RAND)
Cultivar evaluation		
Evaluation of maize and sorghum cultivars and varieties		
Evaluation of maize and sorghum cultivars and varieties for different production systems	ARC-GCI	99 111

(M101/01)		
Grain quality of maize and sorghum		
Determine the malting and processing quality of sorghum cultivars and varieties (M102/10)	ARC-GCI	116 146
Weed science		
Effect of temperature stress and herbicides on sorghum seed germination and seedling vigour (M112/01)	ARC-GCI	61 613
Plant nutrition		
Soil fertility optimisation		
N and P Norms as related to soil analysis	ARC-GCI	94 773
Crop protection		
Insect pests of maize and sorghum		
Management of aphids in sorghum (M131/01)	ARC-GCI	52 561
The role of host plant resistance in integrated management of sorghum stem borers (M131/02)	ARC-GCI	55 036
Diseases of maize and sorghum		
Integrated control of sorghum ergot (M141/01)	ARC-GCI	65 188
Integrated control of stress related diseases in sorghum (M141/02)	ARC-GCI	67 144
Control of leaf diseases in sorghum (M141/03)	ARC-GCI	64 405
Integrated control of grain moulds (M141/04)	ARC-GCI	45 071
TOTAL EXPENDITURE (40% of ARC budget)		**721 048**

2000 / 2001

	INSTITUTION	**VALUE (RAND)**
Cultivar evaluation		
Evaluation of maize and sorghum cultivars and varieties		
Evaluation of sorghum cultivars and varieties for different production systems (M101/01)	ARC-GCI	112 135
Grain quality of maize and sorghum		
Determine the malting and processing quality of sorghum cultivars and varieties (M102/01)	ARC-GCI	148 344
Weed Science		
Seed quality		
Effect of temperature stress and herbicides on sorghum seed germination and seedling vigour (M112/01)	ARC-GCI	109 302
Plant nutrition		
Soil fertility optimisation		
N and P Norms as related to soil analysis (M121/01)	ARC-GCI	149 644
Crop protection		
Insect pests of maize and sorghum		
Management of aphids in sorghum (131/01)	ARC-GCI	89 372
The role of host plant resistance in integrated management of sorghum stem borers (M131/02)	ARC-GCI	101 070
Diseases of maize and sorghum		
Integrated control of sorghum ergot (M141/01)	ARC-GCI	107 621
Integrated control of stress related diseases in sorghum (M141/02)	ARC-GCI	105 572
Control of leaf diseases in sorghum (M141/03)	ARC-GCI	15 146
Integrated control of grain moulds (M141/04)	ARC-GCI	67 510
TOTAL EXPENDITURE (50% of ARC budget)		**1 005 716**

2001/ 2002

	INSTITUTION	**VALUE (RAND)**
Cultivar evaluation		

Evaluation of maize and sorghum cultivars and varieties		
Evaluation: Cultivars & Varieties for different production systems (M101/01)	ARC-GCI	111 728
Evaluation: Cultivars & Varieties: Small-holder farmers (M101/81)	ARC-GCI	34 673
Grain quality of maize and sorghum		
Determine the Malting & Processing Quality of cultivars & Varieties (M102/01)	ARC-GCI	143 623
Diseases of maize and sorghum		
Integrated control of sorghum ergot (M141/01)	ARC-GCI	106 042
Drought resistance in maize and sorghum		
Participatory evaluation & Identification of sorghum varieties for small-holder farmers (M161/81)	ARC-GCI	93 423
TOTAL EXPENDITURE (50% of ARC Budget)		**489 489**

2002 / 2003

	INSTITUTION	**VALUE (RAND)**
Cultivar evaluation		
Evaluation of sorghum cultivars and varieties for different production systems (M101/01)	ARC-GCI	59 589
Evaluation of sorghum cultivars and varieties for small-holder farmers (M101/81)	ARC-GCI	57 283
Grain quality		
Determine the malting and processing quality of sorghum cultivars and varieties (M102/01)	ARC-GCI	96 230
Seed quality		
Effect of temperature stress and herbicides on sorghum seed germination and seedling vigour	ARC-GCI	66 299
Soil fertility optimisation		
N & P norms of sorghum as related to soil analysis (M121/01)	ARC-GCI	118 690
Crop protection (plant pathology)		
Integrated management of sorghum diseases (M141/05)	ARC-GCI	134 597
Crop protection (drought)		
Participatory evaluation and identification of sorghum varieties for small-holder farmers in the Northern Province (M161/81)	ARC-GCI	181 505
SUBTOTAL (50% of ARC budget)		714 193
Farmer Development: Commercialisation of emerging farmers	Grain SA	20 000
TOTAL EXPENDITURE		**734 193**

2003/ 2004

	INSTITUTION	**VALUE (RAND)**
Crop Science		
Evaluation of sorghum cultivars and varieties for different production systems (M101/01)	ARC-GCI	66 007
Determine the malting and processing quality of sorghum cultivars and varieties (M102/01)	ARC-GCI	104 848
Production systems		
Phytotoxicity resulting from pre-emergence herbicides in sorghum (M111/01)	ARC-GCI	60 164
N & P norms of sorghum as related to soil analysis (M121/01)	ARC-GCI	131 276
Crop protection (plant pathology)		
Screening of SA sorghum cultivars for aphids (M131/03)	ARC-GCI	63 539
Integrated management of sorghum diseases (M141/05)	ARC-GCI	148 536
Integrated management of grain moulds of sorghum (M141/06)	ARC-GCI	75 883
Developing agriculture		
Evaluation of sorghum cultivars & varieties for small-holder farmers	ARC-GCI	59 728
Participatory evaluation and identification of sorghum varieties for small-holder farmers in the Northern Province (M161/81)	ARC-GCI	191 284

SUBTOTAL (50% of ARC budget)		*901 265
Farmer Development: Commercialisation of emerging farmers	Grain SA	20 000
TOTAL EXPENDITURE		**921 265**

* R128 430,26 of this amount (R901 265) was paid on 21 July 2004, in the following financial year.

2004 / 2005

	INSTITUTION	**VALUE (RAND)**
CROP SCIENCE		
M101/01 - Evaluation of Cultivars & Varieties for different production systems	ARC-GCI	101 460
M101/81 - Evaluation of sorghum cultivars & varieties for small-holder farmers	ARC-GCI	0
M102/01 - Determine the malting & processing quality of sorghum cultivars & varieties	ARC-GCI	125 036
PRODUCTION SYSTEMS		
M111/01 - Phytotoxicity resulting from pre-emergence herbicides in sorghum	ARC-GCI	24 090
M121/01 - N+P Norms for Sorghum as related to soil analysis	ARC-GCI	35 427
CROP PROTECTION		
M131/03 - Screening of SA sorghum cultivars for aphids	ARC-GCI	88 492
M141/05 - Integrated management of sorghum diseases	ARC-GCI	157 207
M 141/06 - Integrated management of grain moulds of sorghum	ARC-GCI	99 177
M161/81 – Participatory evaluation and identification of sorghum varieties for small-holder farmers in the Northern Province	ARC-GCI	66 741
SUBTOTAL (50% of ARC budget)		**697 630**
Farmer Development: Commercialisation of emerging farmers	Grain SA	22 000
Identification & Evaluation of Sorghum Cultivars and Varieties for small-holder farmers	Grain SA	71 124
Sorghum Forum / Intsormil White Sorghum Workshop	UP	29 250
TOTAL EXPENDITURE		**820 004**

2005 / 2006

	INSTITUTION	**VALUE (RAND)**
Crop Science		
M101/01 - Evaluation of Cultivars & Varieties for different production systems	ARC-GCI	110 636
M102/01 - Determine the malting & processing quality of sorghum cultivars & varieties	ARC-GCI	138 142
Crop Protection		
M131/03 - Screening of SA sorghum cultivars for aphids	ARC-GCI	103 228
Weed / Seed Control		
M111/01 - Phytotoxicity resulting from pre-emergence herbicides in sorghum	ARC-GCI	24 626
SUBTOTAL (50% of ARC budget)		***376 632**
Integrated management of sorghum diseases	UFS	*98 520
Integrated management of grain moulds of sorghum	UFS	*91 900
Identification & Evaluation of Sorghum Cultivars and Varieties for small-holder farmers	Grain SA	137 647
TOTAL EXPENDITURE		**704 699**

*50% of these amounts were paid in the next financial year (2006/7)

Annexure 2:

Major sorghum-producing countries (top 20)

		Sorghum production (tons)	
1	United States of America	11,731,710	
2	Nigeria	8,028,000	F
3	India	6,500,000	*
4	Mexico	6,300,000	*
5	China	3,090,000	F
6	Sudan	2,600,000	*
7	Argentina	2,160,000	
8	Brazil	2,103,450	
9	Australia	1,900,000	
10	Ethiopia	1,784,282	F
11	Burkina Faso	1,481,212	*
12	Egypt	950,000	F
13	United Republic of Tanzania	650,000	F
14	Mali	650,000	F
15	Venezuela	600,000	F
16	Niger	580,000	*
17	Chad	560,000	F
18	Cameroon	550,000	F
19	Uganda	420,000	
20	Ghana	399,300	F

F = FAO estimate | * = unofficial figure

Note: South Africa 373,000

Source FAO 2004 data

Annexure 3:

World production, trade, consumption and stock position of sorghum

Period	WORLD - Production ('000 t) (a)	WORLD - Trade ('000 t) (a)	WORLD - Consumption ('000 t) (a)	WORLD - Stock ('000 t) (a)
1996/97	69549	6189	67667	4594
1997/98	58947	6820	59039	4502
1998/99	59905	6561	59070	5416
1999/00	59083	8143	60409	4881
2000/01	53377	7627	54642	3748
2001/02	58312	7256	57273	4795
2002/03	52743	5912	53661	3879
2003/04	58924	6206	58111	4692
2004/05	58148	5364	58357	4483
2005/06	58879	5780	58470	4892
2006/07	57342	5520	57983	4251

Footnotes

a) - 2006/2007 Forecast
b) - 2005/2006 Average for the period Jul 2005 - Jun 2006.
* International Season: Jul - Jun

Source: International Grains Council
USDA - Unites States Department of Agriculture

Source: SAGIS Oct 2006

Annexure 4:

African countries' production of sorghum (2004 data)

Country	Production (tons)	Percentage of Africa's sorghum production
Algeria	700	0.003
Benin	190 000	0.910
Botswana	32 000	0.153
Burkina Faso	1 481 212	7.094
Burundi	74 171	0.355
Cameroon	550 000	2.634
Central African Republic	42480	0.203
Chad	560 000	2.682
Congo	54 000	0.259
Cote d'lvoire	70 000	0.335
Egypt	950 000	4.550
Eritrea	56 743	0.272
Ethiopia	1 784 282	8.545
Gambia	25 000	0.120
Ghana	399 300	1.912
Guinea	6 000	0.029
Guinea-Bissau	15 000	0.072
Kenya	120 000	0.575
Lesotho	46 000	0.220
Madagascar	1 000	0.005
Malawi	45 000	0.216
Mali	650 000	3.113
Mauritania	68 000	0.326
Morocco	14 000	0.067
Mozambique	314 000	1.504
Namibia	6 000	0.029
Niger	580 000	2.778
Nigeria	8 028 000	38.449
Rwanda	163 772	0.784
Senegal	132 400	0.634
Sierra Leone	21 000	0.101
South Africa	373 000	1.793
Sudan	2 600 000	12.452
Swaziland	600	0.003
Tanzania	650 000	3.113
Togo	180 000	0.862
Tunisia	1 000	0.005
Uganda	420 000	2.012
Zambia	19 000	0.091
Zimbabwe	80 000	0.383
	20 803 660	**100.00**

Source: FAO 2004 data