

MAIZE CROP QUALITY REPORT



SOUTH AFRICAN

2002/03

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SOUTH AFRICAN

COMMERCIAL MAIZE QUALITY

2002/2003

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Introduction

The final production estimate for maize for the 2002/2003 season by the National Crop Estimates Committee was 9 391 450 tons. This is 3,5% lower than the previous season's 9 731 830 tons, but higher than the previous five years' average. The average production from 1997/98 to 2001/02 was 8,18 million tons. The major maize-producing region was the Free State (3 336 500 tons), followed by the North West (2 601 000 tons). White maize contributed 68% to the total production, which is 10% higher than the previous year.

900 samples, proportionally representing white and yellow maize of each production region, were analysed for quality. All samples were graded according to RSA and USA grading regulations, and 100 kernel weight, kernel size, breakage susceptibility, stress cracks, milling index, and fat, protein, starch and whiteness index were determined. Mycotoxin analyses as well as testing for GM maize were performed on 90 randomly selected samples representative of white and yellow maize produced per region.

The 900 samples analysed consisted of 517 white maize samples and 383 yellow maize samples. Of the 517 white maize samples analysed, 89% were WM1, 9% WM2, 1% WM3 and 1% was of the Class Other Maize white. Of the 383 yellow maize samples analysed, 82% were YM1, 17% YM2, 0,3% YM3 and 0,7% were of the Class Other Maize yellow.

Crop quality

The quality of this crop was markedly better than the year before as well as other previous seasons. 86% of the crop graded as maize grade 1. The production of white maize increased to 68% from 57% of the previous season.

The average hectolitre mass was 77,7 kg/hl (77,0 during 2001/2002). The average hectolitre mass from 1993/94 was 75,8 kg/hl. The total percentage of defective kernels was 4,3, which is lower than the previous year (7,2) and lower than the previous five years' average of 6,8. The percentage total deviation was 4,7, which is the lowest in the past nine years.

The fat content was 4,1% (db), starch content 75,6% (db) and protein 9,2% (db). The fat content was average in comparison with previous years (4,1% db), the starch content was the highest during the last ten seasons and the protein was higher than the average of the previous five years, namely 8,8% (db). The five-year average for starch was 73,5%.

Although the kernel size averaged the same as the previous year, the 100 kernel weight average increased with about 2%. The kernels this season were less breakable and had less stress cracks than during the 2001/2002 season.

The milling index as well as whiteness index has improved against the previous season. The Bt-gene (GMO) was present in 25% of the samples. The mycotoxin Fumonisin averaged 0,73 ppm.

Production regions

The RSA is divided into 36 grain-production regions. Regions one to nine are winter rainfall areas (Western Cape), as well as the Eastern Cape and Karoo where no commercial maize is being produced.

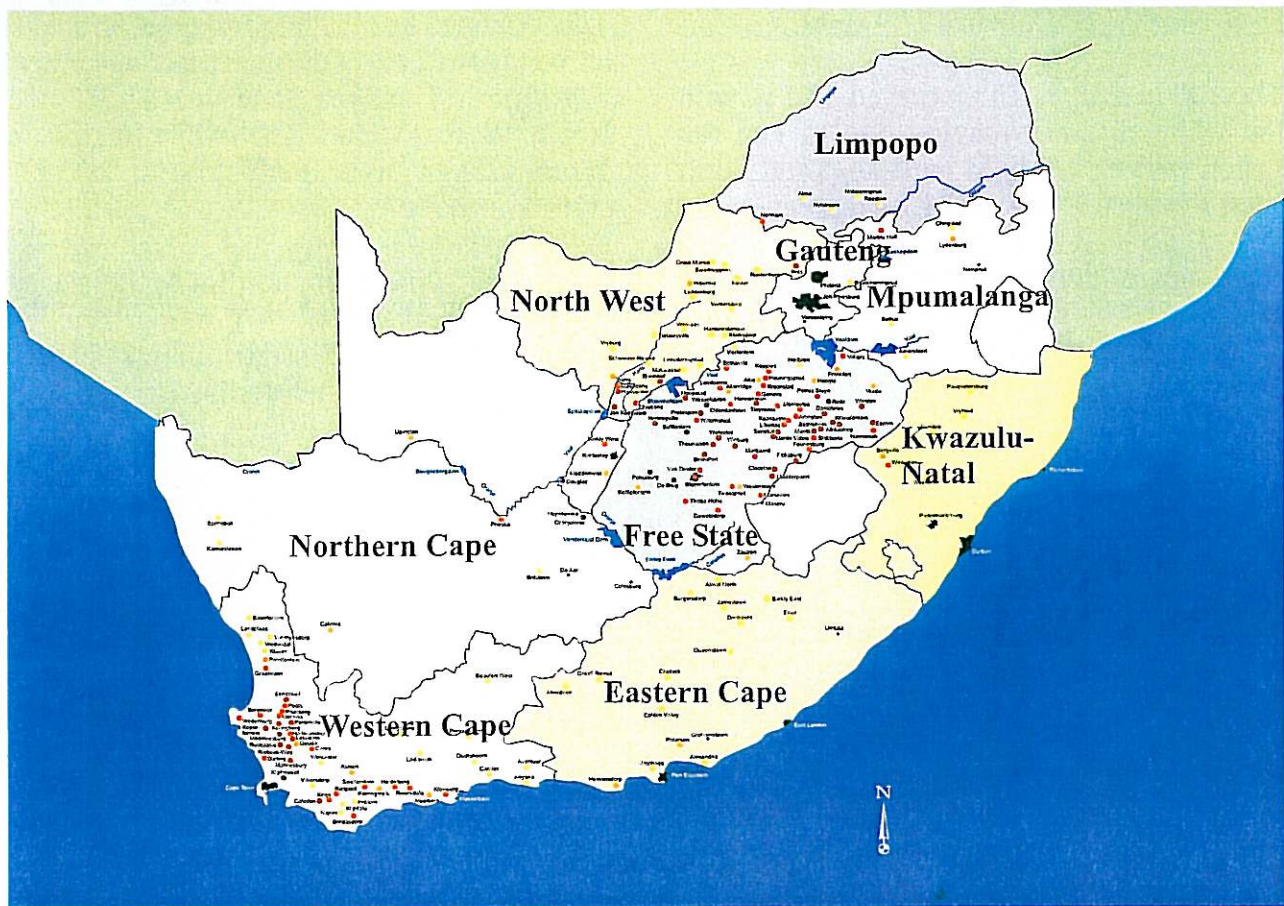
Region 10 is Griqualand West and region 11 Vaalharts in the North West. Regions 12 to 20 are all within the North West.

Regions 21 to 28 are in the Free State. The Free State and North West contributed 63% of the total maize production in the RSA.

Regions 29 to 33 are within Mpumalanga, which is the third largest maize-producing province (1 882 500 tons). Region 34 falls within Gauteng, region 35 within the Limpopo Province and region 36 within Kwazulu-Natal.



South African Provinces



Maize quality (summary)

The maize quality of the three main maize-producing provinces was, more or less the same. The physical characteristics of the white maize were overall better than those of the yellow maize.

Free State

This province produced 35% of all the commercial maize in South Africa, of which 75% was white maize and 25% yellow maize.

The average percentage total defective kernels was the lowest with 4,1% (followed by Mpumalanga with 4,3% and North West with 4,4%).

The maize produced in the Free State had the highest average hectolitre mass of 78,2 kg/hl. (North West was 77,5 kg/hl and Mpumalanga 77,4 kg/hl.) The white maize averaged 78,3 kg/hl and the yellow maize 77,9 kg/hl.

The 100 kernel weight averaged 33,1 g, with the white maize averaging 33,9 g and the yellow maize 31,8 g. (Mpumalanga and North West averaged 31,8 g and 31,2 g respectively.)

Stress cracks averaged the same in the three provinces.

There was no significant difference between the milling indexes of the three provinces.

The Free State and Mpumalanga averaged 0,2% higher fat content than the North West.

North West

This province produced 28% of all the commercial maize grown in South Africa, of which 82% was white maize and 18% yellow maize.

Although the North West had the same average hectolitre weight and 100 kernel weight as

Mpumalanga, the average percentage kernels > 10 mm was only 15,1 g. (Mpumalanga 21 g and Free State 18,3 g.)

The North West produced maize with an average of 9,4% protein (db). (The Free State gave an average protein of 9,2% (db) and Mpumalanga 8,9% (db).)

The white maize from the North West gave the highest average whiteness index of 19.5 (sifted 87:13). (The Free State had an average of 18,6 and Mpumalanga 17,3.)

Mpumalanga

This province produced 20% of the total commercial maize production in South Africa, of which 52% was white maize and 48% yellow maize.

This province had the largest kernel size with an average of 21% of the maize having kernels > 10 mm. (The Free State was 18,3% and North West 15,1%.) The white maize in Mpumalanga averaged 25,4% kernels > 10 mm.

The maize kernels produced in Mpumalanga were less breakable (1,1%) during handling and storage. (Free State maize had a breakability of 1,6% and North West 1,5%.)

In all three provinces the yellow maize starch content averaged about 0,7% higher than the white maize.

Mpumalanga had the lowest average Fumonisin present of 0,46 ppm. (The North West averaged 0,93 ppm followed by the Free State with 0,70 ppm.)

Genetically modified maize was present in all three of these provinces. See Table 23.

Grain Production Regions

With each region is given the different Grain Handlers with specific silos.

Region 10: Griqualand West Region

<i>GWK</i>	Douglas	<i>GWK</i>	Prieska
<i>GWK</i>	Rietrivier	<i>GWK</i>	Marydale
<i>GWK</i>	Modderivier	<i>KOLK</i>	Oranjerivierstasie
<i>KOLK</i>	Britstown	<i>Oranje</i>	Upington

Region 11: Vaalharts Region

<i>Senwes</i>	Hartswater	<i>Senwes</i>	Jan Kemp
<i>Senwes</i>	Magogong	<i>Senwes</i>	Taung
<i>GWK</i>	Barkly-Wes		

Region 12: North West Western Region

<i>NWK</i>	Blaauwbank	<i>NWK</i>	Buhrmannsdrif
<i>NWK</i>	Kameel	<i>NWK</i>	Madibogo
<i>NWK</i>	Mafikeng	<i>NWK</i>	Mareetsane
<i>NWK</i>	Piet Plessis	<i>NWK</i>	Vergelegen
<i>NWK</i>	Gemsbokvlakte	<i>Suidwes Landbou</i>	Vryburg
<i>Suidwes Landbou</i>	Kameel		Springbokpan
	Kraaipan		
	Vryhof		

Region 13: North West Central Region (Sannieshof)

<i>NWK</i>	Biesiesvlei	<i>NWK</i>	Bossies
<i>NWK</i>	Gerdau	<i>NWK</i>	Oppaslaagte
<i>NWK</i>	Sannieshof		

Region 14: North West Southern Region

<i>NWK</i>	Barberspan	<i>NWK</i>	Delareyville
<i>NWK</i>	Excelsior	<i>NWK</i>	Geysdorp
<i>NWK</i>	Migdol	<i>NWK</i>	Nooitgedacht
<i>NWK</i>	Taaibospan	<i>Suidwes Landbou</i>	Amalia
<i>Suidwes Landbou</i>	Hallat's Hope	<i>Suidwes Landbou</i>	Migdol
<i>Suidwes Landbou</i>	Schweizer-Reneke		

Region 15: North West South Eastern Region

<i>Suidwes Landbou</i>	Bloemhof	<i>Suidwes Landbou</i>	Christiana
<i>Suidwes Landbou</i>	Hertzogville	<i>Suidwes Landbou</i>	Hoopstad
<i>Suidwes Landbou</i>	Kingswood		

Region 16: North West Central Eastern Region

<i>Senwes</i>	Regina	<i>Senwes</i>	Klerksdorp
<i>Suidwes Landbou</i>	Bamboesspruit	<i>Suidwes Landbou</i>	Leeudoringstad
<i>Suidwes Landbou</i>	Makwassie	<i>Suidwes Landbou</i>	Strydpoort
<i>Suidwes Landbou</i>	Wolmaranstad		

Grain Production Regions (continue)

With each region is given the different Grain Handlers with specific silos.

Region 17: North West Central Northern Region (Ottosdal)

NWK
NWK
NWK
Senwes

Bospoort
Ottosdal
Vermaas
Melliodora

NWK
NWK
Senwes
Senwes

Rostrataville
Kleinharts
Hartbeesfontein
Werda

Region 18: North West Central Region (Ventersdorp)

NWK
Senwes
Senwes
Senwes

Bodenstein
Buckingham
Ventersdorp
Potchefstroom

NWK
Senwes
Senwes

Coligny
Makokskraal
Enselspruit

Region 19: North West Central Region (Lichtenburg)

NWK
NWK
NWK

Grootpan
Hibernia
Lottielhalte

NWK
NWK
NWK

Halfpad
Lichtenburg
Lusthof

Region 20: North West Eastern Region

MGK
MGK
NWK
NWK
NWK

Battery
Rustenburg
Derby
Swartruggens
Groot Marico

MGK
NWK
NWK
NWK

Brits
Boons
Koster
Syferbult

Region 21: Free State North Western Region (Viljoenskroon)

Senwes
Senwes
Senwes
Senwes
Senwes

Attie
Heuningspruit
Rooiwal
Viljoenskroon
Weiveld

Senwes
Senwes
Senwes
Senwes

Groenebloem
Koppies
Vierfontein
Vredefort

Region 22: Free State North Western Region (Bothaville)

Senwes
Senwes
Senwes

Allanrigde
Mirage
Schoonspruit

Senwes
Senwes
Senwes

Bothaville
Odendaalsrus
Schuttendraai

Region 23: Free State North Western Region (Bultfontein)

Senwes
Senwes
Senwes

Bultfontein
Protespan
Wesselsbron

Senwes
Senwes
Senwes

Losdoorns
Tierfontein
Willemsrust

Region 24: Free State Central Region

Senwes
Senwes
Senwes

Bloemfontein
De Brug
Hennenman

Senwes
Senwes
Senwes

Brandfort
Geneva
Koffiefontein

Grain Production Regions (continue)

With each region is given the different Grain Handlers with specific silos.

Region 24: Free State Central Region (continue)

<i>Senwes</i>	Kroonstad	<i>Senwes</i>	Petrusburg
<i>Senwes</i>	Theunissen	<i>Senwes</i>	Van Tonder
<i>Senwes</i>	Welgeleë	<i>Senwes</i>	Winburg

Region 25: Free State South Western Region

<i>OVK</i>	Marseilles	<i>OVK</i>	Modderpoort
<i>OVK</i>	Tweespruit	<i>OVK</i>	Westminster
<i>OVK</i>	Zastron	<i>OVK</i>	Clocolan
<i>OVK</i>	Ficksburg	<i>OVK</i>	Fouriesburg
<i>Senwes</i>	De Wetsdorp	<i>OTK</i>	Bethlehem
<i>OTK</i>	Slabberts		

Region 26: Free State South Eastern Region

<i>Senwes</i>	Arlington	<i>Senwes</i>	Steynsrus
<i>OTK</i>	Libertas	<i>OTK</i>	Marquard
<i>OTK</i>	Monte Video	<i>OTK</i>	Senekal
<i>OTK</i>	Kaallaagte	<i>OTK</i>	Meets

Region 27: Free State Northern Region

<i>Senwes</i>	Gottenburg	<i>Senwes</i>	Heilbron
<i>Senwes</i>	Hoogte	<i>Senwes</i>	Mooigeleë
<i>Senwes</i>	Wolwehoek	<i>VKB</i>	Petrus Steyn

Region 28: Free State Eastern Region

<i>OTK</i>	Afrikaskop	<i>OTK</i>	Eeram
<i>OTK</i>	Harrismith	<i>OTK</i>	Kransfontein
<i>VKB</i>	Cornelia	<i>VKB</i>	Daniëlsrus
<i>VKB</i>	Frankfort	<i>VKB</i>	Jim Fouché
<i>VKB</i>	Reitz	<i>VKB</i>	Tweeling
<i>VKB</i>	Villiers	<i>VKB</i>	Warden
<i>VKB</i>	Windfield	<i>VKB</i>	Ascent
<i>VKB</i>	Memel	<i>VKB</i>	Vrede

Region 29: Mpumalanga Southern Region

<i>OTK</i>	Balfour	<i>OTK</i>	Greylingstad
<i>OTK</i>	Grootvlei	<i>OTK</i>	Harvard
<i>OTK</i>	Holmdene	<i>OTK</i>	Leeuspruit
<i>OTK</i>	Platrand	<i>OTK</i>	Standerton
<i>OTK</i>	Val		

Region 30: Mpumalanga Eastern Region

<i>OTK</i>	Amersfoort	<i>OTK</i>	Badplaas
<i>OTK</i>	Carolina	<i>OTK</i>	Davel

Grain Production Regions (continue)

With each region is given the different Grain Handlers with specific silos.

Region 30: Mpumalanga Eastern Region (continue)

OTK	Ermefo	OTK	Estancia
OTK	Lothair	OTK	Maizefield
OTK	Morgenzon	OTK	Overvaal
TWK	Mkondo	TWK	Panbult

Region 31: Mpumalanga Central Region

OTK	Bethal	OTK	Devon
OTK	Kinross	OTK	Leslie
OTK	Trichardt		

Region 32: Mpumalanga Western Region

OTK	Argent	OTK	Dryden
OTK	Endicott	OTK	Eloff
OTK	Hawerklip	OTK	Kendal
OTK	Ogies		

Region 33: Mpumalanga Northern Region

OTK	Driefontein	OTK	Lydenburg
OTK	Marble Hall	OTK	Middelburg
OTK	Stoffberg	OTK	Pan
OTK	Arnot	OTK	Wonderfontein

Region 34: Gauteng Region

OTK	Bloekomspruit	OTK	Glenroy
OTK	Goeie Hoek	OTK	Kaalfontein
OTK	Nigel	OTK	Bronkhorstspuit
Senwes	Middelvlei	Senwes	Oberholzer
Senwes	Raathsvlei		

Region 35: Limpopo Region

MGK	Northam	NTK	Alma
NTK	Crecy	NTK	Immerpan
NTK	Lehau	NTK	Naboomspruit
NTK	Nylstroom	NTK	Pienaarsrivier
NTK	Pietersburg	NTK	Potgietersrus
NTK	Roedtan	NTK	Settlers
NTK	Tzaneen	NTK	Vaalwater
NTK	Warmbad	NTK	Nutfield

Region 36: Kwazulu-Natal Region

Natalagri	Bergville	Natalagri	Bloedrivier
Natalagri	Dannhauser	Natalagri	Dundee
Natalagri	Mizpah	Natalagri	Paulpietersburg
Natalagri	Vryheid	Natalagri	Winterton
Natalagri	New Amalfi		

**TABLE 1: COMMERCIAL WHITE AND YELLOW MAIZE -
FINAL PRODUCTION ESTIMATES FOR THE 2002/03 SEASON
COMPARED TO THE 2001/02 SEASON**

PROVINCES	FINAL ESTIMATE 2002/03			% difference to 2001/02	FINAL ESTIMATE 2001/02		
	White Tons	Yellow Tons	Total Tons		White Tons	Yellow Tons	Total Tons
Western Cape	300	20 400	20 700	+43	480	14 000	14 480
Northern Cape	113 050	421 500	534 550	+4,7	37 000	473 500	510 500
Free State	2 515 000	821 500	3 336 500	+3,7	2 064 000	1 153 000	3 217 000
Eastern Cape	14 700	35 800	50 500	+13,2	11 000	33 600	44 600
Kwazulu-Natal	207 500	177 600	385 100	-4,3	147 500	255 000	402 500
Mpumalanga	975 000	907 500	1 882 500	-8,9	905 000	1 162 500	2 067 500
Limpopo	140 000	22 100	162 100	+52,2	90 000	16 500	106 500
Gauteng	265 000	153 500	418 500	-13,4	236 000	247 500	483 500
North West	2 135 000	466 000	2 601 000	-9,9	2 046 500	838 750	2 885 250
Total RSA	6 365 550	3 025 900	9 391 450	-3,5	5 537 480	4 194 350	9 731 830
% of crop	68	32					

Figures obtained from the National Crop Estimates Committee

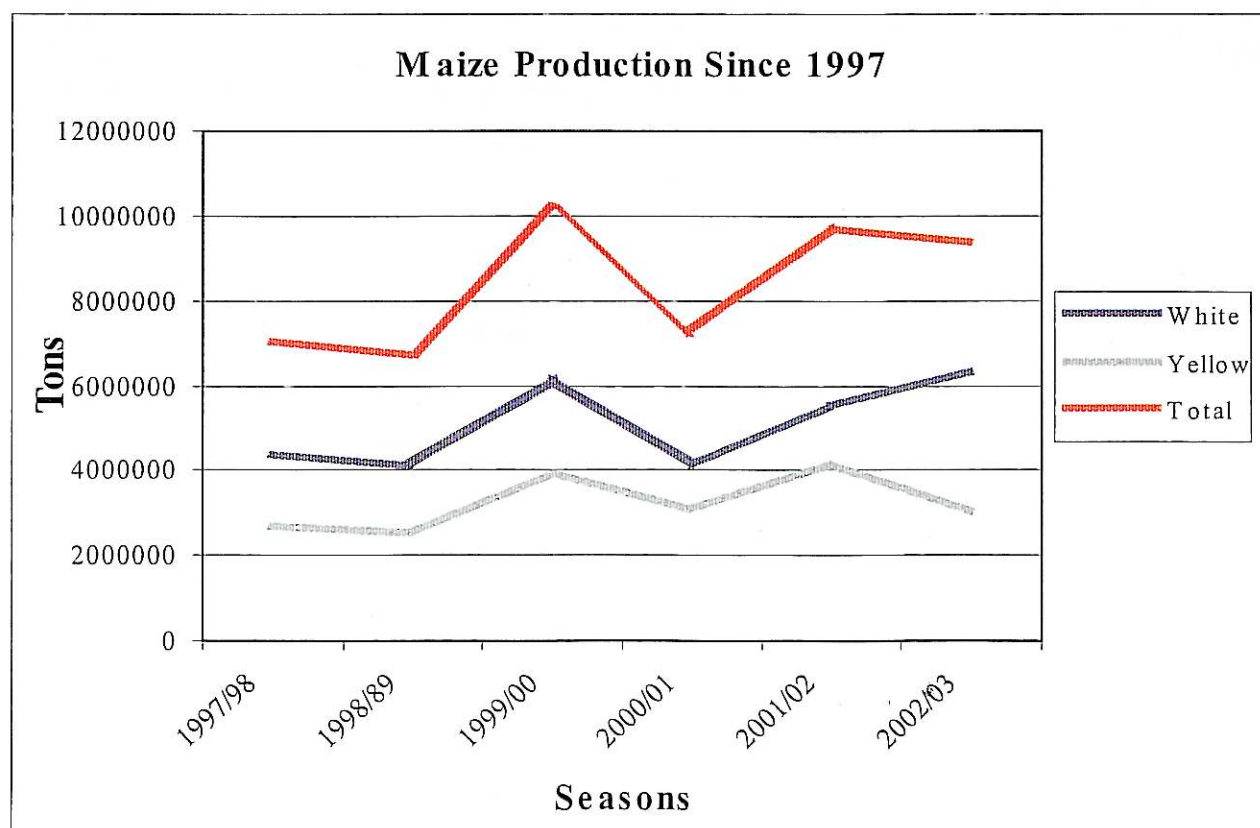


TABLE 2: RSA GRADING OF WHITE MAIZE (2002/2003)

Number of samples	Region	% Defective Kernels						% Total defective			% Foreign matter			% Another Colour			% Total Deviation			% Pinked Kernels			% Diplodia Kernels			% Fusarium Kernels			% Cobrot Kernels		
		Above 6.35mm sieve			Below 6.35mm sieve			ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.			
		ave.	min.	max.	ave.	min.	max.																								
GRADE WM 1																															
7	Region 10	1.8	0.7	3.1	1.4	0.4	2.1	3.1	1.1	4.9	0.1	0.1	0.1	0.3	0.0	0.9	3.5	1.5	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.5	0.0	0.0	0.0
13	Region 11	2.1	1.0	3.0	1.2	0.6	2.8	3.3	1.7	5.2	0.1	0.1	0.2	0.9	0.0	2.2	4.4	2.7	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.5	0.0	0.0	0.0
15	Region 12	2.3	0.7	4.0	1.4	0.5	3.0	3.7	1.5	6.4	0.1	0.0	0.2	0.3	0.0	1.1	4.1	1.5	7.3	0.0	0.0	0.6	0.0	0.3	0.1	0.0	0.6 ³	0.0	0.0	0.0	0.0
6	Region 13	1.9	0.8	3.2	1.2	0.9	1.8	3.2	1.7	5.0	0.1	0.0	0.3	0.1	0.0	0.6	3.3	1.8	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.0	0.0	0.0
30	Region 14	2.0	0.7	4.2	1.4	0.6	2.8	3.4	1.8	7.0	0.1	0.1	0.3	0.1	0.0	0.6	3.6	1.9	7.3	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.6	0.0	0.0	0.3	0.0
15	Region 15	2.2	0.7	3.8	1.6	0.4	3.3	3.8	1.0	6.7	0.1	0.0	0.3	0.2	0.0	0.7	4.1	1.1	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.4	0.0	0.0	0.0
18	Region 16	2.0	0.4	4.6	1.5	0.2	3.5	3.5	0.7	7.0	0.1	0.0	0.3	0.2	0.0	0.8	3.8	1.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.5	0.0	0.0	0.0
21	Region 17	1.9	0.8	3.8	1.2	0.4	2.0	3.1	1.4	5.8	0.1	0.1	0.2	0.1	0.0	0.6	3.3	1.4	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.8	0.0	0.0	0.0
34	Region 18	2.1	0.8	4.5	1.3	0.6	2.6	3.4	1.7	5.7	0.1	0.1	0.3	0.1	0.0	0.8	3.7	1.8	5.9	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.6	0.0	0.0	0.3	0.0
10	Region 19	2.2	0.9	3.9	1.3	0.7	2.9	3.6	1.6	5.8	0.1	0.1	0.2	0.4	0.0	2.4	4.0	1.7	7.6	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.5	0.0	0.0	0.0	0.0
7	Region 20	1.7	0.7	3.4	1.1	0.4	2.1	2.7	1.4	5.4	0.1	0.1	0.1	0.4	0.0	1.5	3.2	1.5	5.5	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.0	0.0	0.0	0.0
32	Region 21	2.0	0.8	3.6	1.2	0.7	3.3	3.3	1.9	6.9	0.1	0.1	0.2	0.1	0.0	0.6	3.5	2.2	6.9	0.0	0.0	0.5	0.0	0.3	0.2	0.0	0.8	0.0	0.0	0.0	0.0
37	Region 22	2.6	1.1	4.6	1.6	0.9	3.0	4.3	2.0	7.0	0.1	0.0	0.3	0.1	0.0	0.6	4.5	2.1	7.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	1.0	0.0	0.0	0.3	0.0
31	Region 23	2.2	0.7	4.8	1.4	0.6	3.7	3.7	1.4	6.3	0.1	0.0	0.2	0.2	0.0	1.0	4.0	1.5	6.5	0.0	0.0	0.3	0.0	0.4	0.2	0.0	0.9	0.0	0.0	0.3	0.0
26	Region 24	2.3	1.1	3.4	1.1	0.0	1.8	3.5	2.1	5.0	0.1	0.1	0.2	0.2	0.0	0.6	3.8	2.2	5.7	0.0	0.0	0.3	0.0	0.3	0.1	0.0	0.6	0.0	0.0	0.0	0.0
15	Region 25	2.0	0.7	3.5	1.6	0.4	3.5	3.6	1.1	5.9	0.1	0.0	0.2	0.3	0.0	1.1	4.0	1.2	6.1	0.0	0.0	0.3	0.0	0.0	0.2	0.0	0.8	0.0	0.0	0.0	0.0
16	Region 26	2.8	1.4	4.8	1.6	0.8	2.8	4.4	2.4	7.0	0.1	0.1	0.2	0.4	0.0	1.8	5.0	2.5	8.0	0.0	0.0	0.0	0.0	0.5	0.2	0.0	0.6	0.0	0.0	0.0	0.0
8	Region 27	2.4	0.7	4.6	1.2	0.6	2.3	3.7	1.3	6.9	0.1	0.0	0.3	0.2	0.0	1.1	4.0	1.3	7.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.6	0.1	0.0	0.3	0.0
19	Region 28	2.2	0.8	3.6	1.2	0.4	2.1	3.5	1.3	5.6	0.2	0.0	0.3	0.4	0.0	2.0	4.1	1.9	6.8	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.3	0.0	0.0	0.0	0.0
12	Region 29	2.1	0.5	4.0	1.6	0.3	3.0	3.7	0.8	5.4	0.1	0.0	0.2	0.6	0.0	2.5	4.5	2.1	6.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.8	0.0	0.0	0.0	0.0
20	Region 30	2.2	0.8	4.4	1.5	0.4	2.5	3.7	1.1	6.9	0.2	0.1	0.3	0.2	0.0	1.1	4.0	1.2	7.1	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.3	0.0	0.0	0.6	0.0
10	Region 31	1.8	1.0	2.9	1.9	0.6	3.7	3.7	1.7	5.4	0.2	0.1	0.3	0.8	0.0	2.2	4.6	2.3	6.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.6	0.0	0.0	0.0	0.0
10	Region 32	2.2	1.0	3.3	1.6	0.8	3.0	3.8	2.0	5.7	0.2	0.1	0.2	0.8	0.0	2.5	4.8	2.6	6.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.0	0.0	0.0	0.0
14	Region 33	1.9	0.4	3.6	1.7	0.3	3.0	3.6	0.7	6.6	0.2	0.1	0.2	0.2	0.0	1.5	4.0	1.1	6.7	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.0	0.0	0.0	0.0
17	Region 34	1.8	0.8	3.4	1.3	0.6	3.4	3.1	1.4	5.1	0.1	0.0	0.2	0.3	0.0	1.7	3.4	1.5	5.6	0.0	0.0	0.0	0.0	0.0	0.1	0.0	1.1	0.0	0.0	0.0	0.0
8	Region 35	2.1	1.1	3.5	1.3	1.1	1.7	3.5	2.7	5.2	0.1	0.1	0.1	0.2	0.0	0.6	3.8	2.9	5.3	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.5	0.0	0.0	0.0	0.0
10	Region 36	2.2	1.7	2.9	1.7	0.9	2.7	3.9	2.7	5.0	0.1	0.1	0.3	0.1	0.0	0.9	4.1	2.8	5.3	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.7	0.0	0.0	0.0	0.0
461	Mean WM1	2.1			1.4			3.6			0.1			0.3			3.9			0.0			0.0		0.1				0.0		
	Min WM1	0.4			0.0			0.7			0.0			0.0			1.0			0.0			0.0		0.0				0.0		0.6
	Max WM1			4.8			3.7		7.0			0.3		2.5			8.0			0.6			0.5		1.1						

TABLE 2: RSA GRADING OF WHITE MAIZE (2002/2003) (continue)

Number of samples	Region	% Defective Kernels						% Total defective			% Foreign matter			% Another Colour			% Total Deviation			% Pinked Kernels			% Diplodia Kernels			% Fusarium Kernels			% Cobrot Kernels		
		Above 6.35mm sieve			Below 6.35mm sieve			ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.			
		ave.	min.	max.	ave.	min.	max.																								
GRADE WM2																															
1	Region 11	2.4	2.4	2.4	1.2	1.2	1.2	3.6	3.6	3.6	0.2	0.2	0.2	3.3	3.3	3.3	7.0	7.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Region 13	5.0	4.4	5.4	2.7	2.2	3.2	7.7	6.6	8.6	0.2	0.1	0.2	0.7	0.0	1.5	8.6	8.4	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.6	0.0	0.0	
3	Region 14	4.1	3.4	4.9	3.4	2.6	5.1	7.5	6.7	8.4	0.2	0.1	0.2	0.6	0.0	1.1	8.4	7.7	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.5	0.0	0.0	
1	Region 15	6.0	6.0	6.0	4.0	4.0	4.0	10.0	10.0	10.0	0.2	0.2	0.2	0.8	0.8	0.8	11.0	11.0	11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.0	0.0	
4	Region 16	5.7	3.3	7.4	3.0	2.5	3.5	8.6	6.8	9.9	0.2	0.2	0.2	0.5	0.0	1.3	9.4	8.3	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.5	0.0	0.0	
2	Region 17	6.0	5.4	6.6	3.3	3.2	3.5	9.3	8.6	10.1	0.1	0.1	0.1	0.3	0.0	0.5	9.7	8.7	10.7	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.5	0.0	0.0	
6	Region 18	5.2	2.2	9.2	3.3	1.7	5.1	8.4	6.6	12.9	0.3	0.1	0.5	0.7	0.0	2.9	9.4	7.1	14.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.9	0.0	0.0	
6	Region 19	5.7	4.4	8.4	2.7	1.7	4.1	8.5	7.0	12.5	0.1	0.1	0.2	0.6	0.0	1.7	9.2	7.9	12.7	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	1.2	0.0	0.0	
2	Region 20	5.8	5.2	6.3	3.3	3.2	3.5	9.1	8.7	9.5	0.2	0.2	0.2	0.2	0.0	0.3	9.4	9.2	9.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.0	0.0	
2	Region 23	3.6	1.8	5.3	4.4	2.7	6.0	7.9	7.8	8.0	0.3	0.2	0.3	0.4	0.0	0.8	8.6	8.3	8.8	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.9	0.0	0.0	
3	Region 24	4.9	2.4	6.3	3.4	2.4	4.9	8.3	7.3	8.9	0.2	0.2	0.3	0.2	0.0	0.3	8.7	7.4	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.6	0.0	0.0	
3	Region 25	3.7	2.6	5.5	4.4	1.7	6.6	8.2	7.1	9.7	0.2	0.0	0.2	0.0	0.0	0.0	8.4	7.3	9.8	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.8	0.0	0.0	
1	Region 26	5.9	5.9	5.9	2.8	2.8	2.8	8.7	8.7	8.7	0.2	0.2	0.2	1.1	1.1	1.1	9.9	9.9	9.9	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.0	0.0	
1	Region 27	3.5	3.5	3.5	3.5	3.5	3.5	7.0	7.0	7.0	0.2	0.2	0.2	0.0	0.0	0.0	7.2	7.2	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.0	0.0	
1	Region 28	5.3	5.3	5.3	2.7	2.7	2.7	8.0	8.0	8.0	0.2	0.2	0.2	0.0	0.0	0.0	8.2	8.2	8.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	Region 29	4.1	1.5	6.8	1.3	1.2	1.4	5.4	2.8	7.9	0.2	0.2	0.2	2.2	0.8	3.7	7.8	6.7	8.9	0.0	0.0	0.0	0.0	0.3	0.2	0.3	0.1	0.0	0.2	0.0	
2	Region 30	5.0	4.0	6.0	2.9	1.8	4.0	7.9	7.8	8.0	0.2	0.2	0.2	0.4	0.0	0.9	8.5	8.2	8.8	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.3	0.0	0.0	
1	Region 31	4.3	4.3	4.3	2.9	2.9	2.9	7.2	7.2	7.2	0.2	0.2	0.2	2.1	2.1	2.1	9.6	9.6	9.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	Region 32	1.2	1.0	1.3	1.0	0.7	1.2	2.1	2.0	2.3	0.1	0.1	0.1	5.3	4.9	5.6	7.5	7.3	7.7	0.3	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	Region 34	4.7	4.7	4.7	3.9	3.9	3.9	8.6	8.6	8.6	0.3	0.3	0.3	0.0	0.0	0.0	8.9	8.9	8.9	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.0	0.0	
47	Méan WM2	4.8			3.0			7.8			0.2			0.8			8.8			0.0			0.1			0.3			0.0		
	Min WM2		1.0			0.7	6.6	2.0			0.0			0.0			6.7			0.0			0.0			0.0			0.0		
	Max WM2			9.2				12.9			0.5			5.6			14.2			0.5			0.6			1.2			0.0		

TABLE 2: RSA GRADING OF WHITE MAIZE (2002/2003) (continue)

Number of samples	Region	% Defective Kernels						% Total defective			% Foreign matter			% Another Colour			% Total Deviation			% Pinked Kernels			% Diplodia Kernels			% Fusarium Kernels			% Cobrot Kernels		
		Above 6.35mm sieve			Below 6.35mm sieve			ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.			
		ave.	min.	max.	ave.	min.	max.																								
GRADE: WM 3																															
1	Region 12	2.1	2.1	2.1	0.9	0.9	0.9	3.0	3.0	3.0	0.1	0.1	0.1	9.2	9.2	9.2	12.4	12.4	12.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	Region 14	6.3	2.2	10.5	4.3	1.6	7.0	10.6	3.8	17.5	0.2	0.1	0.3	4.1	0.7	7.6	14.9	11.5	18.4	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	1.2	0.0	0.0	
2	Region 23	8.2	3.4	12.9	4.6	1.7	7.5	12.7	5.1	20.4	0.5	0.4	0.6	0.7	0.0	1.4	13.9	5.7	22.2	0.0	0.0	0.0	0.2	0.0	0.4	0.4	0.3	0.6	0.0	0.0	
5	Mean WM3	6.2			3.7			9.9			0.3			3.8			14.0			0.0			0.1			0.4			0.0		
	Min WM3	2.1		12.9		0.9		3.0		20.4	0.1		0.6	0.0		9.2	5.7		22.2	0.0		0.0	0.0		0.0	0.0			0.0	0.0	
	Max WM3						7.5																			1.2					
GRADE: COM																															
1	Region 11	6.2	6.2	6.2	3.1	3.1	3.1	9.3	9.3	9.3	2.0	2.0	2.0	0.9	0.9	0.9	12.1	12.1	12.1	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.0	0.0	
1	Region 16	1.6	1.6	1.6	1.2	1.2	1.2	2.7	2.7	2.7	1.2	1.2	1.2	0.0	0.0	0.0	4.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.0	0.0	
1	Region 20	0.8	0.8	0.8	0.4	0.4	0.4	1.2	1.2	1.2	0.1	0.1	0.1	12.7	12.7	12.7	13.9	13.9	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	Region 29	3.3	3.3	3.3	2.5	2.5	2.5	5.8	5.8	5.8	1.6	1.6	1.6	0.5	0.5	0.5	6.4	6.4	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Mean COM	3.0			1.8			4.7			1.2			3.5			9.1			0.0			0.0			0.3			0.0		
	Min COM		0.8			0.4		1.2		9.3	0.1		2.0	0.0		12.7	4.0		13.9	0.0		0.0	0.0		0.0	0.0			0.0	0.0	
	Max COM			6.2			3.1																			0.6					
517	Mean white maize	12.9			1.6			4.0			0.1			0.4			4.5			0.0			0.0			0.1			0.0		
	Min white maize		0.4			0.0		0.7		20.4	0.0		2.0	0.0		12.7	1.0		22.2	0.0		0.0	0.0		0.6	0.0			0.0	0.0	
	Max white maize			2.4			7.5													0.6						1.2					
900	Mean maize	2.3			2.0			4.3			0.2			0.3			4.7			0.2			0.0			0.1			0.0		
	Min maize		0.2			0.0		0.7		20.4	0.0		2.1	0.0		12.7	0.0		22.2	0.0		0.0	0.0		0.6	0.0			0.0	0.0	
	Max maize			12.9			10.8													12.2						1.2					

TABLE 3: RSA GRADING OF YELLOW MAIZE (2002/2003)

Number of samples	Region	% Defective Kernels						% Total defective			% Foreign matter			% Another Colour			% Total Deviation			% Pinked Kernels			% Diplodia Kernels			% Fusarium Kernels			% Cobrot Kernels			
		Above 6.35mm sieve			Below 6.35mm sieve			ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.				
		ave.	min.	max.	ave.	min.	max.																									
GRADE: YM 1																																
14	Region 10	1.5	0.5	3.1	2.0	0.7	3.1	3.6	1.3	5.3	0.1	0.0	0.2	0.1	0.0	0.9	3.6	0.0	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17	Region 11	1.9	0.7	5.6	2.8	1.3	4.0	4.7	2.6	8.1	0.1	0.1	0.2	0.1	0.0	0.6	4.9	2.7	8.3	0.2	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Region 12	1.7	0.3	3.4	2.0	0.5	3.1	3.7	0.8	5.4	0.1	0.1	0.2	0.3	0.0	1.6	4.2	2.5	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	Region 13	1.9	1.0	3.0	1.7	0.7	3.0	3.5	2.3	4.5	0.1	0.1	0.2	0.0	0.0	0.0	3.6	2.3	4.7	0.2	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17	Region 14	2.2	0.4	5.3	2.3	1.0	3.3	4.5	1.8	8.2	0.1	0.1	0.3	0.1	0.0	1.2	4.7	1.9	8.7	0.4	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
11	Region 15	1.7	0.4	3.6	1.6	0.4	2.4	3.2	0.7	5.6	0.1	0.1	0.2	0.5	0.0	1.7	3.9	1.4	7.3	0.9	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
11	Region 16	2.5	0.3	5.7	1.6	0.1	3.0	4.1	2.0	8.6	0.1	0.0	0.3	0.3	0.0	1.9	4.6	2.2	8.9	0.3	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8	Region 17	1.2	0.4	2.8	1.4	0.4	2.7	2.6	0.8	4.1	0.1	0.1	0.3	0.2	0.0	1.1	2.9	0.9	5.4	0.2	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
20	Region 18	1.5	0.5	4.2	1.6	0.5	3.1	3.0	1.2	7.3	0.1	0.0	0.3	0.2	0.0	1.2	3.4	1.3	7.5	0.2	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Region 19	1.9	0.7	3.3	2.4	1.0	3.9	4.2	1.1	7.2	0.1	0.1	0.2	0.1	0.0	0.6	4.4	1.2	7.4	0.1	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Region 20	3.2	0.5	6.9	1.5	0.8	3.0	4.7	1.6	8.5	0.1	0.1	0.3	0.3	0.0	0.9	5.1	2.2	8.7	0.7	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Region 21	1.6	0.6	2.4	2.2	1.5	3.2	3.7	2.8	5.1	0.1	0.0	0.3	0.3	0.0	1.2	4.2	3.3	6.2	0.2	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Region 22	2.5	1.1	4.6	3.3	2.2	4.0	5.8	4.1	8.6	0.1	0.1	0.2	0.1	0.0	0.8	6.0	4.3	8.7	1.2	0.0	2.8	0.0	0.0	0.0	0.1	0.0	0.6	0.0	0.0	0.0	0.0
15	Region 23	1.3	0.9	2.4	2.1	1.0	3.4	3.4	1.9	4.7	0.1	0.1	0.2	0.3	0.0	0.9	3.7	2.0	4.9	0.4	0.0	1.3	0.0	0.0	0.6	0.1	0.0	0.9	0.0	0.0	0.0	0.0
13	Region 24	1.3	0.8	2.1	2.2	1.0	3.8	3.6	1.7	5.6	0.1	0.1	0.2	0.2	0.0	0.9	3.9	2.3	5.8	0.4	0.0	1.5	0.0	0.0	0.0	0.1	0.0	0.9	0.0	0.0	0.0	0.0
17	Region 25	1.7	0.9	3.2	2.0	1.1	3.4	3.8	2.1	5.8	0.1	0.1	0.2	0.1	0.0	0.6	4.0	2.1	6.0	0.4	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0
14	Region 26	2.0	0.7	5.6	2.0	0.6	3.8	4.0	2.2	8.3	0.1	0.1	0.2	0.1	0.0	0.5	5.3	3.4	9.0	0.8	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
7	Region 27	2.4	0.9	6.3	2.7	1.4	3.7	5.1	2.8	8.8	0.2	0.1	0.3	0.1	0.0	0.5	5.3	3.4	9.0	0.8	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0
26	Region 28	1.3	0.4	5.0	1.8	0.6	3.8	3.1	1.0	7.2	0.2	0.0	0.3	0.1	0.0	0.9	3.4	1.0	7.4	0.3	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.3	0.3
12	Region 29	1.8	0.5	4.4	1.7	0.5	2.7	3.5	1.3	5.3	0.1	0.0	0.2	0.0	0.0	0.3	3.7	1.3	5.5	0.5	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.3	0.3
18	Region 30	2.1	0.4	5.6	2.4	1.5	3.5	4.5	1.9	7.9	0.2	0.0	0.2	0.0	0.0	0.3	4.7	2.3	8.1	0.3	0.0	1.7	0.0	0.0	0.3	0.1	0.0	0.6	0.0	0.0	0.0	0.0
10	Region 31	2.1	0.6	4.1	2.2	1.8	3.4	4.2	2.4	6.6	0.2	0.1	0.3	0.1	0.0	0.6	4.7	2.7	7.4	0.6	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
9	Region 32	2.9	0.8	5.2	2.1	0.8	3.6	5.0	1.6	8.3	0.2	0.1	0.3	0.0	0.0	0.3	5.2	1.7	8.6	0.3	0.0	1.8	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Region 33	2.0	0.8	3.7	1.9	1.4	2.4	3.8	2.2	5.7	0.2	0.1	0.2	0.1	0.0	0.7	4.1	2.3	5.9	0.7	0.0	2.8	0.0	0.0	0.3	0.1	0.0	0.6	0.0	0.0	0.0	0.0
9	Region 34	1.8	0.7	3.8	2.3	0.8	3.1	4.2	2.0	6.7	0.1	0.1	0.2	0.4	0.0	1.8	4.7	2.0	8.7	0.3	0.0	0.8	0.0	0.0	0.3	0.1	0.0	0.8	0.0	0.0	0.0	0.0
1	Region 35	1.0	1.0	1.0	1.8	1.8	1.8	2.9	2.9	2.9	0.1	0.1	0.1	0.0	0.0	0.0	2.9	2.9	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Region 36	1.0	0.5	2.3	2.2	1.1	3.3	3.2	2.2	4.3	0.1	0.1	0.2	0.1	0.0	0.7	3.5	2.3	5.0	2.3	0.0	10.2	0.0	0.0	0.0	0.1	0.0	0.6	0.0	0.0	0.0	0.0
314	Mean YM 1	1.8			2.1			3.9			0.1			0.2			4.2			0.4			0.0			0.0			0.0		0.0	0.0
	Min YM 1	0.3		6.9		0.1		0.7		8.8				0.0		1.9	0.0		9.0	0.0		10.2	0.0		0.6	0.0		0.9		0.0	0.3	
	Max YM 1				4.0						0.3																					

TABLE 3: RSA GRADING OF YELLOW MAIZE (2002/2003) (continue)

Number of samples	Region	% Defective Kernels						% Total defective			% Foreign matter			% Another Colour			% Total Deviation			% Pinked Kernels			% Diplodia Kernels			% Fusarium Kernels			% Cobrot Kernels		
		Above 6.35mm sieve			Below 6.35mm sieve			ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.			
		ave.	min.	max.	ave.	min.	max.																								
GRADE YM2																															
2	Region 10	3.4	0.8	6.0	2.2	1.4	3.0	5.6	2.2	9.0	0.2	0.1	0.2	1.7	0.0	3.3	7.4	5.6	9.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11	Region 11	2.4	1.0	6.6	5.8	2.6	9.5	8.2	5.6	12.0	0.2	0.1	0.4	0.3	0.0	1.9	8.6	6.0	12.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Region 12	1.4	1.2	1.5	4.1	1.2	6.9	5.5	2.3	8.4	0.2	0.1	0.4	0.0	0.0	0.0	5.7	2.7	8.5	0.3	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Region 13	3.8	2.3	5.9	4.8	3.1	7.0	8.7	6.8	10.2	0.2	0.1	0.3	0.0	0.0	0.0	8.8	6.8	10.3	0.2	0.0	0.7	0.2	0.0	0.6	0.0	0.0	0.0	0.0	0.0	
8	Region 14	5.6	0.4	9.0	4.7	2.9	8.3	10.3	5.7	13.2	0.2	0.1	0.3	0.1	0.0	0.6	10.5	6.5	13.5	0.6	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.6	
3	Region 16	4.5	0.2	7.0	2.4	1.0	3.3	7.0	1.3	10.0	0.2	0.1	0.3	0.0	0.0	0.0	7.2	1.6	10.1	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Region 17	2.3	1.7	3.2	5.8	2.1	8.1	8.1	3.8	11.3	0.1	0.1	0.2	1.3	0.0	2.6	9.6	6.4	11.5	0.8	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	Region 18	7.7	7.7	7.7	3.4	3.4	3.4	11.1	11.1	11.1	0.1	0.1	0.1	1.0	1.0	1.0	12.2	12.2	12.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	Region 19	1.2	0.9	1.5	5.4	4.1	6.6	6.6	5.0	8.2	0.3	0.2	0.4	0.0	0.0	0.0	6.9	5.4	8.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	Region 20	7.9	7.9	7.9	2.4	2.4	2.4	10.3	10.3	10.3	0.3	0.3	0.3	0.0	0.0	0.0	10.6	10.6	10.6	0.0	0.0	0.0	0.6	0.6	0.6	0.0	0.0	0.0	0.6	0.6	
1	Region 21	1.1	1.1	1.1	3.9	3.9	3.9	5.0	5.0	5.0	0.2	0.2	0.2	2.1	2.1	2.1	7.4	7.4	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Region 22	2.3	1.4	4.0	5.1	4.1	6.9	7.4	5.5	10.9	0.1	0.1	0.2	0.0	0.0	0.0	7.5	5.6	11.0	0.1	0.0	0.4	0.0	0.0	0.0	0.1	0.0	0.3	0.0	0.0	
2	Region 23	2.6	1.2	4.0	5.4	5.0	5.9	8.0	7.1	9.0	0.2	0.2	0.2	0.0	0.0	0.0	8.2	7.3	9.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	Region 24	1.1	1.1	1.1	4.8	4.4	5.2	5.9	5.5	6.3	0.2	0.1	0.2	0.0	0.0	0.0	6.1	5.7	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Region 25	3.4	2.8	3.7	4.5	4.1	4.9	7.9	6.9	8.6	0.2	0.1	0.2	0.0	0.0	0.0	8.1	7.1	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	
1	Region 26	2.8	2.8	2.8	4.3	4.3	4.3	7.1	7.1	7.1	0.2	0.2	0.2	0.0	0.0	0.0	7.3	7.3	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	Region 28	0.9	0.6	1.2	4.5	4.4	4.6	5.4	5.3	5.6	0.1	0.1	0.1	0.0	0.0	0.0	5.6	5.4	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	Region 29	9.6	9.2	10.0	3.3	3.0	3.5	12.8	12.2	13.5	0.2	0.2	0.2	0.0	0.0	0.0	13.1	12.4	13.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Region 30	2.2	0.6	4.6	4.6	2.6	6.2	6.8	3.2	9.7	0.2	0.0	0.3	0.6	0.0	2.8	7.5	5.4	9.9	0.2	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	Region 31	9.1	9.1	9.1	6.4	6.4	6.4	15.5	15.5	15.5	0.2	0.2	0.2	0.0	0.0	0.0	15.7	15.7	15.7	4.4	4.4	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	Region 33	2.1	2.1	2.1	5.1	5.1	5.1	7.2	7.2	7.2	0.2	0.2	0.2	0.0	0.0	0.0	7.4	7.4	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	Region 34	9.6	9.6	9.6	3.5	3.5	3.5	13.0	13.0	13.0	0.1	0.1	0.1	0.0	0.0	0.0	13.2	13.2	13.2	1.1	1.1	1.1	0.0	0.0	0.0	0.7	0.7	0.7	0.0	0.0	
2	Region 35	1.1	1.0	1.1	7.7	6.0	9.4	8.8	7.1	10.4	0.2	0.1	0.2	0.9	0.6	1.1	9.8	7.8	11.7	0.3	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
64	Mean YM2	3.4			4.8			8.2			0.2			0.3			8.6			0.3			0.0			0.0			0.0		
	Min YM2	0.2			1.0			1.3			0.0			0.0			1.6			0.0			0.0			0.0			0.0	0.0	
	Max YM2			10.0			9.5	15.5			0.4			3.3			15.7			4.4			0.6			0.7			0.0	0.0	

TABLE 3: RSA GRADING OF YELLOW MAIZE (2002/2003) (continue)

Number of samples	Region	% Defective Kernels						% Total defective			% Foreign matter			% Another Colour			% Total Deviation			% Pinked Kernels			% Diplodia Kernels			% Fusarium Kernels			% Cobrot Kernels		
		Above 6.35mm sieve			Below 6.35mm sieve			ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.
		ave.	min.	max.	ave.	min.	max.																								
1	GRADE YM3 Region 10	2.8	2.8	2.8	10.8	10.8	10.8	13.6	13.6	13.6	0.2	0.2	0.2	0.0	0.0	0.0	13.8	13.8	13.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Mean YM3	2.8			10.8			13.6			0.2			0.0			13.8			0.0			0.0			0.0			0.0		
	Min YM3		2.8		10.8			13.6			0.2			0.0			13.8			0.0			0.0			0.0			0.0		
	Max YM3			2.8		10.8		13.6			0.2			0.0			13.8			0.0			0.0			0.0			0.0		
1	GRADE COM Region 27	0.8	0.8	0.8	6.8	6.8	6.8	7.6	7.6	7.6	1.0	1.0	1.0	0.0	0.0	0.0	8.5	8.5	8.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Region 28	0.8	0.8	0.8	1.1	1.1	1.1	2.0	2.0	2.0	2.1	2.1	2.1	0.0	0.0	0.0	4.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	Region 33	0.5	0.5	0.5	0.9	0.9	0.9	1.4	1.4	1.4	1.4	1.4	1.4	1.0	1.0	1.0	3.8	3.8	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.0	0.0	0.0
1	Region 36	2.3	2.3	2.3	1.2	1.2	1.2	3.5	3.5	3.5	0.2	0.2	0.2	0.3	0.3	0.3	4.0	4.0	4.0	12.2	12.2	12.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Mean COM	1.1			2.5			3.6			1.2			0.3			5.1			3.0			0.0			0.1			0.0		
	Min COM		0.5		0.9			1.4			0.2			0.0			3.8			0.0			0.0			0.0			0.0		
	Max COM			2.3	6.8			7.6			2.1			1.0			8.5			12.2			0.0			0.3			0.0		
383	Mean yellow maize	2.1			2.5			4.6			0.2			0.2			5.0			0.4			0.0			0.0			0.0		
	Min yellow maize		0.2		0.1			0.7			0.0			0.0			0.0			0.0			0.0			0.0			0.0		
	Max yellow maize			10.0	10.8			15.5			2.1			3.3			15.7			12.2			0.6			0.9			0.6		
900	Mean maize	2.3			2.0			4.3			0.2			0.3			4.7			0.2			0.0			0.1			0.0		
	Min maize		0.2		0.0			0.7			0.0			0.0			0.0			0.0			0.0			0.0			0.0		
	Max maize			12.9	10.8			20.4			2.1			12.7			22.2			12.2			0.6			0.2			0.6		

**TABLE 4: GRADING QUALITY OF SOUTH AFRICAN WHITE
MAIZE 1993/94-2002/03**

Season	Number of samples	RSA GRADING AVERAGES				
		% Defective kernels		%	%	%
		Above 6.35mm sieve	Below 6.35mm sieve	Foreign matter	Other colour	Total deviation
1993/94	178	5.0	1.3	0.1	0.3	6.7
1994/95	164	5.1	1.9	0.0	0.5	7.5
1995/96	142	6.3	1.9	0.0	0.3	8.5
1996/97	178	4.7	1.5	0.0	0.5	6.7
1997/98	470	5.9	1.8	0.1	0.4	8.1
1998/99	256	3.4	2.0	0.1	0.2	5.6
1999/00	493	6.0	1.7	0.0	0.4	8.1
2000/01	522	3.6	1.5	0.1	0.3	5.5
2001/02	471	5.0	1.4	0.0	0.3	6.7
2002/03	517	2.4	1.6	0.1	0.4	4.5
Mean white maize 1993-2003		4.7	1.7	0.1	0.4	6.8

**TABLE 5: GRADING QUALITY OF SOUTH AFRICAN YELLOW
MAIZE 1993/94-2002/03**

Season	Number of samples	RSA GRADING AVERAGES				
		% Defective kernels		%	%	%
		Above 6.35mm sieve	Below 6.35mm sieve	Foreign matter	Other colour	Total deviation
1993/94	183	6.4	2.0	0.0	0.3	8.7
1994/95	175	5.6	2.4	0.1	0.3	8.3
1995/96	151	6.8	2.4	0.1	0.2	9.5
1996/97	166	4.9	1.9	0.0	0.2	7.0
1997/98	267	6.0	2.4	0.1	0.4	8.9
1998/99	189	2.6	2.7	0.0	0.1	5.5
1999/00	407	6.5	2.1	0.0	0.2	8.8
2000/01	378	3.7	2.1	0.1	0.4	6.2
2001/02	429	6.3	1.9	0.1	0.3	8.6
2002/03	383	2.1	2.5	0.2	0.2	5.0
Mean yellow maize 1993-2003		5.1	2.2	0.1	0.3	7.7

TABLE 6: GRADING QUALITY OF SOUTH AFRICAN
MAIZE 1993/94-2002/03

Season	Number of samples	RSA GRADING AVERAGES				
		% Defective kernels		%	%	%
		Above 6.35mm sieve	Below 6.35mm sieve	Foreign matter	Other colour	Total deviation
1993/94	361	5.7	1.7	0.1	0.3	7.7
1994/95	339	5.4	2.2	0.1	0.4	7.9
1995/96	293	6.6	2.2	0.1	0.2	9.0
1996/97	344	4.8	1.7	0.0	0.4	6.9
1997/98	737	5.9	2.0	0.1	0.4	8.4
1998/99	445	3.1	2.3	0.0	0.1	5.5
1999/00	900	6.2	1.8	0	0.3	8.4
2000/01	900	3.6	1.8	0.1	0.3	5.8
2001/02	900	5.6	1.6	0.1	0.3	7.6
2002/03	900	2.3	2.0	0.2	0.3	4.7
Mean maize 1993/94-2002/03		34.9				

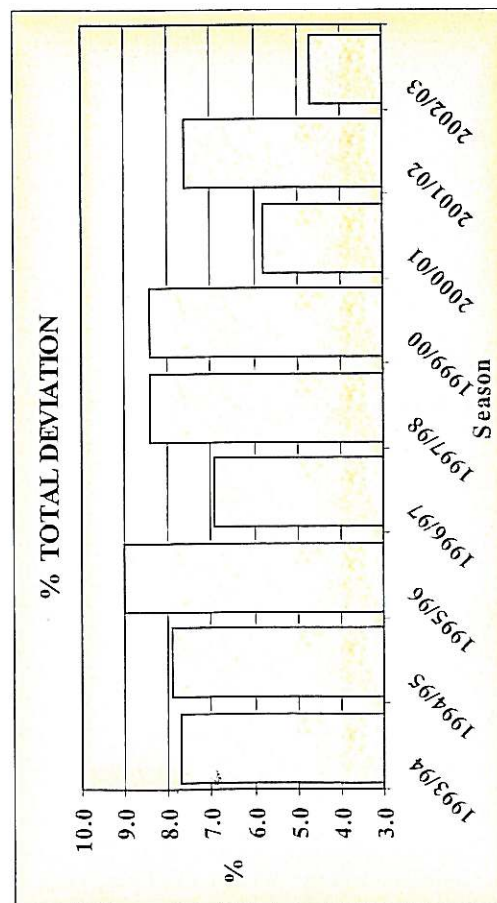


TABLE 7: HECTOLITRE MASS (KG/HL) OF SOUTH AFRICAN
MAIZE 1993/94 - 2002/03

Season	White maize		Yellow maize		Mean Maize	
	Number of samples	Hectolitre mass (kg/hl)	Number of samples	Hectolitre mass (kg/hl)	Number of samples	Hectolitre mass (kg/hl)
1993/94	361	5.7	1.7	0.1	0.3	7.7
1994/95	339	5.4	2.2	0.1	0.4	7.9
1995/96	293	6.6	2.2	0.1	0.2	9.0
1996/97	344	4.8	1.7	0.0	0.4	6.9
1997/98	737	5.9	2.0	0.1	0.4	8.4
1998/99	445	3.1	2.3	0.0	0.1	5.5
1999/00	900	6.2	1.8	0	0.3	8.4
2000/01	900	3.6	1.8	0.1	0.3	5.8
2001/02	900	5.6	1.6	0.1	0.3	7.6
2002/03	517	78.1	383	77.2	900	77.7

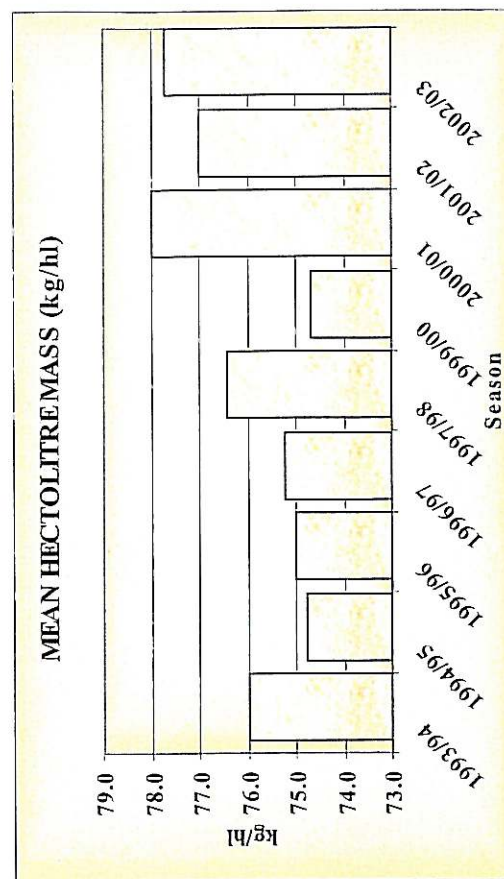


TABLE 8: USA GRADING OF WHITE MAIZE (2002/2003)

Number of samples	Region	Damaged kernels						% Broken corn and foreign material			Bushel weight kg/hl			Other colour %			
		% Heat damaged			% Total damaged			ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	
		ave.	min.	max.	ave.	min.	max.										
GRADE: US1																	
6	Region 10	0.0	0.0	0.0	1.3	0.9	1.5	0.5	0.1	0.8	80.7	79.0	82.0	0.3	0.0	0.9	
11	Region 11	0.0	0.0	0.0	1.7	1.0	2.6	0.9	0.5	1.4	80.5	78.7	82.6	0.7	0.0	1.8	
11	Region 12	0.0	0.0	0.0	1.4	0.4	2.4	0.6	0.2	1.2	77.5	75.9	79.6	0.2	0.0	0.6	
6	Region 13	0.0	0.0	0.0	1.4	0.7	3.0	0.9	0.5	1.9	77.6	76.6	78.4	0.1	0.0	0.6	
27	Region 14	0.0	0.0	0.0	1.7	0.8	3.0	0.7	0.3	1.2	78.5	74.9	80.2	0.1	0.0	0.6	
12	Region 15	0.0	0.0	0.0	1.7	0.7	2.9	0.6	0.2	1.1	79.4	78.8	80.6	0.2	0.0	0.7	
17	Region 16	0.0	0.0	0.0	1.8	0.6	3.0	0.7	0.1	1.6	78.2	76.5	80.6	0.3	0.0	1.2	
17	Region 17	0.0	0.0	0.0	1.4	0.7	3.0	0.6	0.3	1.6	77.6	75.7	79.2	0.1	0.0	0.6	
32	Region 18	0.0	0.0	0.0	1.9	0.8	3.0	0.7	0.3	1.8	78.2	72.9	79.8	0.2	0.0	0.8	
8	Region 19	0.0	0.0	0.0	1.6	0.8	2.8	0.9	0.3	1.7	76.6	73.4	80.7	0.2	0.0	1.2	
7	Region 20	0.0	0.0	0.0	1.1	0.4	1.8	0.5	0.3	0.6	77.6	76.7	78.3	0.4	0.0	1.5	
30	Region 21	0.0	0.0	0.0	1.8	1.2	2.9	0.6	0.1	1.6	78.1	76.1	81.1	0.1	0.0	0.6	
27	Region 22	0.0	0.0	0.0	2.3	1.3	2.9	0.7	0.2	1.2	78.3	76.8	79.7	0.1	0.0	0.6	
23	Region 23	0.0	0.0	0.0	1.8	1.0	2.8	0.6	0.2	1.3	78.6	76.6	80.5	0.2	0.0	1.0	
24	Region 24	0.0	0.0	0.0	1.9	1.0	3.0	0.7	0.2	1.6	78.6	75.7	80.5	0.1	0.0	0.6	
13	Region 25	0.0	0.0	0.0	2.0	0.7	2.8	0.9	0.3	1.7	77.8	74.3	79.4	0.3	0.0	1.1	
9	Region 26	0.0	0.0	0.0	1.9	1.4	2.5	0.7	0.3	1.0	79.0	77.9	80.2	0.2	0.0	0.8	
6	Region 27	0.0	0.0	0.0	1.5	0.6	2.5	0.4	0.1	0.7	78.7	76.7	80.1	0.3	0.0	1.1	
17	Region 28	0.0	0.0	0.0	1.7	0.9	2.9	0.6	0.1	1.7	78.4	75.9	80.3	0.4	0.0	2.0	
9	Region 29	0.0	0.0	0.0	1.8	0.8	2.8	0.9	0.1	1.3	78.0	76.2	79.6	0.5	0.0	1.1	
15	Region 30	0.0	0.0	0.0	1.9	0.9	3.0	0.7	0.1	1.1	78.1	76.2	79.7	0.3	0.0	1.1	
9	Region 31	0.0	0.0	0.0	1.8	0.7	2.8	0.9	0.3	1.4	78.1	76.3	79.2	0.7	0.0	1.5	
5	Region 32	0.0	0.0	0.0	1.7	0.9	3.0	0.7	0.2	1.3	78.9	78.4	79.7	0.7	0.0	1.4	
11	Region 33	0.0	0.0	0.0	1.8	0.7	2.8	0.6	0.2	0.9	79.0	77.5	80.8	0.3	0.0	1.5	
14	Region 34	0.0	0.0	0.0	1.5	0.7	2.9	0.7	0.3	1.9	78.3	77.0	80.6	0.3	0.0	1.7	
8	Region 35	0.0	0.0	0.0	1.5	0.7	2.5	0.9	0.5	1.4	77.4	75.4	79.3	0.2	0.0	0.6	
10	Region 36	0.0	0.0	0.0	1.7	1.0	2.7	0.8	0.3	1.1	77.3	74.9	78.4	0.1	0.0	0.9	
384	Mean US1	0.0			1.8			0.7			78.3			0.2			
	Min US1		0.0			0.4			0.1			72.9			0.0		
	Max US1			0.0		3.0			1.9			82.6			2.0		
GRADE: US2																	
1	Region 10	0.0	0.0	0.0	3.2	3.2	3.2	0.4	0.4	0.4	79.6	79.6	79.6	0.0	0.0	0.0	
4	Region 12	0.0	0.0	0.0	4.1	3.7	4.3	1.0	0.9	1.3	77.8	77.0	78.4	0.5	0.0	1.1	
2	Region 13	0.0	0.0	0.0	4.2	3.9	4.5	1.6	0.9	2.4	76.2	75.2	77.2	0.3	0.0	0.5	
5	Region 14	0.0	0.0	0.0	4.1	3.1	4.8	1.0	0.6	1.6	78.3	77.1	79.6	0.2	0.0	1.1	
3	Region 15	0.0	0.0	0.0	3.7	3.3	4.0	1.0	1.0	1.1	79.4	79.0	79.7	0.2	0.0	0.5	
4	Region 16	0.0	0.0	0.0	3.5	2.8	4.0	1.5	0.7	2.8	77.9	75.8	78.8	0.4	0.0	1.3	
5	Region 17	0.0	0.0	0.0	1.7	0.9	3.9	2.5	2.2	2.8	77.4	75.9	78.0	0.2	0.0	0.5	
2	Region 18	0.0	0.0	0.0	2.5	2.0	3.1	1.4	0.7	2.2	78.5	77.0	79.9	0.0	0.0	0.0	
2	Region 19	0.0	0.0	0.0	2.9	1.3	4.5	1.8	1.8	1.8	73.4	71.4	75.4	0.0	0.0	0.0	
1	Region 21	0.0	0.0	0.0	3.1	3.1	3.1	0.7	0.7	0.7	76.7	76.7	76.7	0.0	0.0	0.0	
10	Region 22	0.0	0.0	0.0	3.9	3.1	4.9	0.8	0.4	1.0	79.1	77.4	80.6	0.1	0.0	0.6	
10	Region 23	0.0	0.0	0.0	3.4	2.3	4.6	1.2	0.6	2.8	79.1	77.2	81.0	0.3	0.0	0.8	
3	Region 24	0.0	0.0	0.0	2.9	2.3	3.4	1.9	0.7	2.7	78.0	76.6	79.4	0.4	0.0	0.6	
4	Region 25	0.0	0.0	0.0	2.9	1.7	3.7	1.5	0.5	2.9	76.4	72.0	79.8	0.1	0.0	0.4	
5	Region 26	0.0	0.0	0.0	4.0	3.4	4.4	0.9	0.5	1.3	78.4	77.5	79.4	1.1	0.6	1.8	
3	Region 28	0.0	0.0	0.0	1.8	1.5	2.1	2.0	1.0	2.7	75.1	70.4	78.1	0.5	0.0	1.0	
2	Region 29	0.0	0.0	0.0	2.5	0.7	4.4	1.6	0.7	2.5	78.4	77.5	79.3	0.3	0.0	0.5	
6	Region 30	0.0	0.0	0.0	3.5	1.7	4.7	1.0	0.7	2.0	75.9	69.9	78.5	0.0	0.0	0.0	
4	Region 32	0.0	0.0	0.0	2.7	1.0	3.5	1.2	0.7	2.3	78.6	78.1	79.3	0.4	0.0	1.0	
1	Region 33	0.0	0.0	0.0	4.6	4.6	4.6	0.9	0.9	0.9	72.6	72.6	72.6	0.0	0.0	0.0	
3	Region 34	0.0	0.0	0.0	3.2	3.1	3.5	1.0	0.6	1.3	79.0	78.4	79.8	0.0	0.0	0.0	
80	Mean US2	0.0			3.3			1.3			77.8			0.3			
	Min US2		0.0			0.7			0.4			69.9			0.0		
	Max US2			0.0		4.9			2.9			81.0			1.8		

TABLE 8: USA GRADING OF WHITE MAIZE (2002/2003) (continue)

24	Mean US3	0.0			5.1				1.6				77.2			0.4
	Min US3	0.0			0.8				0.5				68.9			0.0
	Max US3		0.5		7.0				3.8				79.8			1.7
GRADE: US4																
1	Region 11	0.0	0.0	0.0	2.3	2.3	2.3	4.4	4.4	4.4	79.0	79.0	79.0	0.9	0.9	0.9
1	Region 16	0.0	0.0	0.0	8.6	8.6	8.6	0.7	0.7	0.7	77.6	77.6	77.6	0.5	0.5	0.5
1	Region 18	0.0	0.0	0.0	0.0	0.0	0.0	4.8	4.8	4.8	78.7	78.7	78.7	0.0	0.0	0.0
1	Region 20	0.0	0.0	0.0	7.2	7.2	7.2	0.7	0.7	0.7	74.4	74.4	74.4	0.3	0.3	0.3
1	Region 24	0.0	0.0	0.0	7.1	7.1	7.1	1.0	1.0	1.0	77.8	77.8	77.8	0.3	0.3	0.3
2	Region 27	0.0	0.0	0.0	1.5	1.5	1.5	4.4	4.3	4.6	80.1	79.4	80.8	0.0	0.0	0.0
2	Region 33	0.0	0.0	0.0	3.2	3.1	3.2	0.7	0.7	0.7	65.4	65.3	65.5	0.0	0.0	0.0
9	Mean US4	0.0			3.8				2.4				75.4			0.2
	Min US4	0.0			0.0				0.7				65.3			0.0
	Max US4		0.0		8.6				4.8				80.8			0.9
GRADE: US5																
1	Region 14	0.0	0.0	0.0	13.6	13.6	13.6	0.5	0.5	0.5	72.3	72.3	72.3	0.7	0.7	0.7
1	Region 18	0.0	0.0	0.0	10.6	10.6	10.6	1.6	1.6	1.6	74.8	74.8	74.8	1.2	1.2	1.2
1	Region 19	1.2	1.2	1.2	2.0	2.0	2.0	2.9	2.9	2.9	75.8	75.8	75.8	0.0	0.0	0.0
1	Region 23	0.0	0.0	0.0	11.2	11.2	11.2	2.5	2.5	2.5	68.6	68.6	68.6	1.4	1.4	1.4
1	Region 29	2.1	2.1	2.1	3.3	3.3	3.3	0.0	0.0	0.0	77.2	77.2	77.2	0.5	0.5	0.5
5	Mean US5	0.6			8.1				1.5				73.7			0.8
	Min US5	0.0			2.0				0.0				68.6			0.0
	Max US5		2.1		13.6				2.9				77.2			1.4
GRADE: MIXED GRADE																
3	Region 11	0.0	0.0	0.0	1.3	0.9	1.5	0.8	0.3	1.4	80.5	79.1	83.2	2.5	2.1	3.3
1	Region 12	0.0	0.0	0.0	1.4	1.4	1.4	1.0	1.0	1.0	78.1	78.1	78.1	9.2	9.2	9.2
1	Region 14	0.0	0.0	0.0	1.4	1.4	1.4	1.4	1.4	1.4	73.9	73.9	73.9	7.6	7.6	7.6
1	Region 18	0.0	0.0	0.0	5.4	5.4	5.4	0.6	0.6	0.6	75.3	75.3	75.3	2.9	2.9	2.9
1	Region 19	0.0	0.0	0.0	3.4	3.4	3.4	0.7	0.7	0.7	74.9	74.9	74.9	2.4	2.4	2.4
1	Region 20	0.0	0.0	0.0	0.8	0.8	0.8	0.3	0.3	0.3	76.1	76.1	76.1	12.7	12.7	12.7
2	Region 29	0.0	0.0	0.0	1.3	0.8	1.8	0.4	0.1	0.7	77.8	76.6	79.0	3.1	2.5	3.7
2	Region 31	0.0	0.0	0.0	3.9	3.1	4.6	1.0	0.6	1.5	77.5	76.7	78.3	2.2	2.1	2.2
3	Region 32	0.0	0.0	0.0	1.1	1.0	1.2	0.6	0.3	0.8	78.8	78.0	79.4	3.8	2.5	5.6
15	Mean Mixed Grade	0.0			2.0				0.7				77.8			4.3
	Min Mixed Grade	0.0			0.8				0.1				73.9			2.1
	Max Mixed Grade		0.0		5.4				1.5				83.2			12.7
517	Mean white maize	0.0			2.3				0.9				78.1			0.4
	Min white maize	0.0			0.0				0.0				65.3			0.0
	Max white maize		2.1		13.6				4.8				83.2			12.7
900	Mean maize	0.0			2.3				1.0				77.7			0.3
	Min maize	0.0			0.0				0.0				65.3			0.0
	Max maize		2.1		13.6				6.0				83.2			12.7

TABLE 9: USA GRADING OF YELLOW MAIZE (2002/2003)

ber ples	Region	Damaged kernels						% Broken corn and foreign material			Bushel weight kg/hl			Other colour %			
		% Heat damaged			% Total damaged			ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	
		ave.	min.	max.	ave.	min.	max.										
GRADE: US1																	
13	Region 10	0.0	0.0	0.0	1.6	0.7	2.8	0.5	0.0	1.3	76.8	72.2	78.9	0.3	0.0	3.3	
17	Region 11	0.0	0.0	0.0	1.7	0.9	2.9	1.1	0.4	2.0	78.5	77.2	80.3	0.3	0.0	1.9	
10	Region 12	0.0	0.0	0.0	1.6	0.4	2.8	0.9	0.4	1.9	76.1	72.9	79.3	0.4	0.0	1.6	
5	Region 13	0.0	0.0	0.0	1.7	1.3	2.5	0.7	0.3	1.3	76.1	75.4	76.7	0.1	0.0	0.5	
11	Region 14	0.0	0.0	0.0	1.2	0.4	2.4	1.0	0.2	2.0	77.4	74.9	80.3	0.3	0.0	0.7	
7	Region 15	0.0	0.0	0.0	0.7	0.4	1.0	0.5	0.2	1.1	78.4	77.1	79.7	0.8	0.0	0.3	
9	Region 16	0.0	0.0	0.0	1.7	0.6	3.0	0.8	0.2	1.9	78.0	75.6	81.2	0.4	0.0	2.0	
10	Region 17	0.0	0.0	0.0	1.4	0.4	3.0	0.9	0.4	1.8	76.3	73.2	78.3	0.7	0.0	2.8	
19	Region 18	0.0	0.0	0.0	1.6	0.5	2.9	0.6	0.2	1.0	76.9	73.5	79.2	0.3	0.0	1.2	
6	Region 19	0.0	0.0	0.0	1.7	0.8	2.7	0.9	0.6	1.2	74.9	72.2	76.3	0.1	0.0	0.6	
4	Region 20	0.0	0.0	0.0	1.2	0.5	2.1	0.6	0.4	0.9	78.6	77.1	80.5	0.4	0.0	1.0	
10	Region 21	0.0	0.0	0.0	2.0	1.2	2.7	1.0	0.4	1.9	77.3	74.4	80.3	0.5	0.0	2.1	
4	Region 22	0.0	0.0	0.0	2.2	1.6	2.8	1.3	0.7	1.9	77.2	76.5	78.0	0.3	0.0	0.8	
14	Region 23	0.0	0.0	0.0	1.5	1.0	2.7	0.9	0.3	1.7	77.5	75.3	79.6	0.3	0.0	1.2	
15	Region 24	0.0	0.0	0.0	1.7	1.1	2.4	1.0	0.3	2.0	77.6	72.9	79.6	0.3	0.0	0.9	
14	Region 25	0.0	0.0	0.0	1.8	1.0	2.7	0.9	0.4	1.9	78.0	74.8	80.8	0.1	0.0	0.7	
11	Region 26	0.0	0.0	0.0	1.9	1.0	2.9	0.9	0.5	1.6	79.0	77.0	80.6	0.2	0.0	0.7	
6	Region 27	0.0	0.0	0.0	1.4	1.1	2.0	0.9	0.4	1.7	77.6	76.3	79.4	0.2	0.0	0.7	
24	Region 28	0.0	0.0	0.0	1.2	0.4	2.6	0.7	0.2	1.4	78.3	75.9	80.6	0.2	0.0	0.9	
9	Region 29	0.0	0.0	0.0	1.7	0.5	2.9	0.8	0.1	1.1	75.9	72.6	78.8	0.2	0.0	0.6	
15	Region 30	0.0	0.0	0.0	1.5	0.6	2.9	1.0	0.4	2.0	77.2	75.4	80.3	0.3	0.0	2.8	
7	Region 31	0.0	0.0	0.0	1.7	0.6	2.8	0.8	0.4	1.2	77.9	76.5	78.7	0.2	0.0	1.0	
4	Region 32	0.0	0.0	0.0	1.1	0.9	1.6	0.8	0.5	1.4	78.3	78.1	78.8	0.1	0.0	0.3	
10	Region 33	0.0	0.0	0.0	1.9	0.8	3.0	0.8	0.1	1.8	78.4	77.0	80.7	0.4	0.0	1.0	
8	Region 34	0.0	0.0	0.0	1.8	0.7	2.8	0.9	0.3	1.2	78.4	76.7	81.9	0.2	0.0	0.7	
8	Region 36	0.0	0.0	0.0	1.5	0.8	2.6	0.8	0.6	1.4	76.2	75.0	77.2	1.0	0.0	2.5	
270	Mean US1	0.0			1.6			0.8			77.5			0.3			
	Min US1		0.0			0.4		0.0				72.2		0.0			
	Max US1			0.0		3.0		2.0				81.9			3.3		
GRADE: US2																	
1	Region 10	0.0	0.0	0.0	3.5	3.5	3.5	0.7	0.7	0.7	78.4	78.4	78.4	0.0	0.0	0.0	
2	Region 11	0.0	0.0	0.0	2.5	2.5	2.6	2.7	2.5	2.9	76.2	75.3	77.0	0.0	0.0	0.0	
2	Region 12	0.0	0.0	0.0	3.6	3.5	3.7	0.9	0.9	1.0	75.1	73.5	76.6	0.0	0.0	0.0	
3	Region 13	0.0	0.0	0.0	3.5	3.2	4.1	1.4	1.1	2.0	75.0	72.3	77.9	0.1	0.0	0.4	
4	Region 14	0.0	0.0	0.0	3.5	3.1	4.5	0.9	0.7	1.2	78.1	76.2	79.4	0.4	0.0	1.0	
4	Region 15	0.0	0.0	0.0	3.9	3.7	4.0	0.9	0.9	0.9	77.5	76.2	78.3	0.9	0.0	1.7	
2	Region 16	0.0	0.0	0.0	4.5	4.0	4.9	1.1	1.0	1.1	77.1	76.6	77.5	0.0	0.0	0.0	
1	Region 18	0.0	0.0	0.0	4.5	4.5	4.5	1.0	1.0	1.0	76.1	76.1	76.1	0.0	0.0	0.0	
3	Region 19	0.0	0.0	0.0	2.9	1.1	4.4	2.1	0.9	3.0	72.1	70.7	73.5	0.2	0.0	0.5	
1	Region 20	0.0	0.0	0.0	4.1	4.1	4.1	0.4	0.4	0.4	76.6	76.6	76.6	0.0	0.0	0.0	
5	Region 22	0.0	0.0	0.0	2.8	1.3	4.6	2.4	2.1	2.8	77.3	76.6	77.9	0.5	0.0	1.4	
1	Region 23	0.0	0.0	0.0	1.6	1.6	1.6	3.0	3.0	3.0	78.5	78.5	78.5	0.0	0.0	0.0	
5	Region 25	0.0	0.0	0.0	3.8	3.1	4.6	1.6	0.6	2.4	78.7	78.1	79.3	0.0	0.0	0.0	
2	Region 26	0.0	0.0	0.0	3.8	3.5	4.2	0.6	0.3	0.9	77.7	77.2	78.1	0.2	0.0	0.4	
1	Region 27	0.0	0.0	0.0	4.8	4.8	4.8	1.9	1.9	1.9	77.8	77.8	77.8	0.6	0.6	0.6	
4	Region 28	0.0	0.0	0.0	2.5	0.9	3.2	1.3	0.8	2.5	76.2	70.5	79.6	0.2	0.0	0.8	
3	Region 29	0.0	0.0	0.0	2.9	0.8	4.1	0.4	0.0	1.0	74.8	71.4	77.1	0.0	0.0	0.0	
6	Region 30	0.0	0.0	0.0	3.6	2.3	4.9	1.7	0.9	2.8	77.3	73.8	79.7	0.2	0.0	0.6	
3	Region 31	0.0	0.0	0.0	3.6	3.2	4.2	0.8	0.6	1.1	76.6	75.4	77.8	0.4	0.0	1.1	
4	Region 32	0.0	0.0	0.0	4.4	3.9	5.0	0.8	0.7	1.2	77.5	77.2	77.9	0.2	0.0	0.9	
1	Region 33	0.0	0.0	0.0	4.0	4.0	4.0	0.7	0.7	0.7	75.9	75.9	75.9	0.0	0.0	0.0	
1	Region 34	0.0	0.0	0.0	4.1	4.1	4.1	1.8	1.8	1.8	75.7	75.7	75.7	1.8	1.8	1.8	
3	Region 35	0.0	0.0	0.0	1.5	1.1	2.1	2.0	1.3	2.5	73.1	71.3	75.4	0.6	0.0	1.1	
1	Region 36	0.0	0.0	0.0	1.0	1.0	1.0	0.9	0.9	0.9	69.6	69.6	69.6	0.0	0.0	0.0	
63	Mean US2	0.0			3.4			1.4			76.4			0.3			
	Min US2		0.0			0.8		0.0				69.6		0.0			
	Max US2			0.0		5.0		3.0				79.7			1.8		

TABLE 9: USA GRADING OF YELLOW MAIZE (2002/2003) (continue)

Number of samples	Region	Damaged kernels						%			Bushel weight			Other colour		
		% Heat damaged			% Total damaged			Broken corn and foreign material			kg/hl			%		
		ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.
GRADE: US3																
1	Region 10	0.0	0.0	0.0	6.4	6.4	6.4	1.0	1.0	1.0	76.2	76.2	76.2	0.0	0.0	0.0
7	Region 11	0.0	0.0	0.0	3.8	2.1	6.9	3.0	0.9	4.0	77.5	75.8	78.5	0.2	0.0	1.0
1	Region 12	0.0	0.0	0.0	2.6	2.6	2.6	3.7	3.7	3.7	77.8	77.8	77.8	0.0	0.0	0.0
1	Region 13	0.0	0.0	0.0	6.5	6.5	6.5	1.8	1.8	1.8	75.2	75.2	75.2	0.0	0.0	0.0
5	Region 14	0.0	0.0	0.0	6.1	5.4	7.0	1.1	1.0	1.1	76.8	74.5	79.4	0.4	0.0	1.2
2	Region 16	0.0	0.0	0.0	6.5	6.1	6.9	1.0	1.0	1.1	79.2	79.0	79.4	0.0	0.0	0.0
1	Region 19	0.0	0.0	0.0	1.8	1.8	1.8	3.9	3.9	3.9	72.2	72.2	72.2	0.0	0.0	0.0
1	Region 23	0.0	0.0	0.0	5.8	5.8	5.8	1.6	1.6	1.6	77.4	77.4	77.4	0.0	0.0	0.0
1	Region 26	0.0	0.0	0.0	5.9	5.9	5.9	1.0	1.0	1.0	77.8	77.8	77.8	0.0	0.0	0.0
1	Region 27	0.0	0.0	0.0	6.4	6.4	6.4	1.7	1.7	1.7	77.9	77.9	77.9	0.0	0.0	0.0
1	Region 28	0.0	0.0	0.0	5.2	5.2	5.2	0.7	0.7	0.7	78.1	78.1	78.1	0.6	0.6	0.6
2	Region 30	0.0	0.0	0.0	5.6	5.3	5.9	1.1	1.0	1.1	77.5	76.5	78.5	0.0	0.0	0.0
1	Region 32	0.0	0.0	0.0	5.6	5.6	5.6	0.8	0.8	0.8	77.2	77.2	77.2	0.0	0.0	0.0
25	Mean US3	0.0			5.1			1.9			77.2			0.2		
	Min US3		0.0			1.8		0.7			72.2			0.0		
	Max US3			0.0		7.0		4.0			79.4				1.2	
GRADE: US4																
1	Region 11	0.0	0.0	0.0	2.3	2.3	2.3	4.2	4.2	4.2	77.5	77.5	77.5	0.0	0.0	0.0
4	Region 14	0.0	0.0	0.0	6.9	1.9	9.4	2.3	1.0	4.1	75.4	70.5	77.9	0.0	0.0	0.0
1	Region 16	0.0	0.0	0.0	7.2	7.2	7.2	1.0	1.0	1.0	78.8	78.8	78.8	0.0	0.0	0.0
1	Region 18	0.0	0.0	0.0	8.4	8.4	8.4	1.6	1.6	1.6	74.8	74.8	74.8	1.0	1.0	1.0
3	Region 20	0.0	0.0	0.0	7.6	7.2	8.5	0.9	0.4	1.3	72.4	72.3	72.7	0.4	0.0	1.2
1	Region 22	0.0	0.0	0.0	4.3	4.3	4.3	4.9	4.9	4.9	77.9	77.9	77.9	0.0	0.0	0.0
1	Region 23	0.9	0.9	0.9	1.0	1.0	1.0	0.6	0.6	0.6	77.2	77.2	77.2	1.0	1.0	1.0
1	Region 25	0.9	0.9	0.9	1.8	1.8	1.8	0.7	0.7	0.7	77.0	77.0	77.0	0.8	0.8	0.8
1	Region 26	0.8	0.8	0.8	3.2	3.2	3.2	1.2	1.2	1.2	77.1	77.1	77.1	0.7	0.7	0.7
1	Region 29	0.0	0.0	0.0	9.5	9.5	9.5	1.5	1.5	1.5	76.2	76.2	76.2	0.0	0.0	0.0
1	Region 31	0.0	0.0	0.0	9.4	9.4	9.4	2.9	2.9	2.9	73.8	73.8	73.8	2.2	2.2	2.2
16	Mean US4	0.2			6.1			1.9			75.6			0.4		
	Min US4		0.0			1.0		0.4			70.5			0.0		
	Max US4			0.9		9.5		4.9			78.8				2.2	
GRADE: US 5																
2	Region 10	0.6	0.0	1.2	2.7	1.6	3.7	3.3	1.3	5.3	79.0	78.1	79.9	0.4	0.0	0.7
1	Region 11	0.0	0.0	0.0	2.7	2.7	2.7	5.2	5.2	5.2	77.5	77.5	77.5	0.0	0.0	0.0
1	Region 14	0.0	0.0	0.0	5.3	5.3	5.3	6.0	6.0	6.0	76.3	76.3	76.3	1.0	1.0	1.0
1	Region 17	0.0	0.0	0.0	4.1	4.1	4.1	5.4	5.4	5.4	68.6	68.6	68.6	0.0	0.0	0.0
1	Region 25	1.1	1.1	1.1	3.1	3.1	3.1	2.6	2.6	2.6	78.3	78.3	78.3	0.0	0.0	0.0
1	Region 29	0.0	0.0	0.0	10.3	10.3	10.3	1.8	1.8	1.8	73.9	73.9	73.9	0.0	0.0	0.0
1	Region 34	0.0	0.0	0.0	10.2	10.2	10.2	2.1	2.1	2.1	73.8	73.8	73.8	0.4	0.4	0.4
8	Mean US5	0.3			5.1			3.7			75.8			0.3		
	Min US5		0.0			1.6		1.3			68.6			0.0		
	Max US5			1.2		10.3		6.0			79.9				1.0	
GRADE: MIXED GRADE																
1	Region 36	0.0	0.0	0.0	0.7	0.7	0.7	1.1	1.1	1.1	75.3	75.3	75.3	5.1	5.1	5.1
1	Mean Mixed Grade	0.0			0.7			1.1			75.3			5.1		
	Min Mixed Grade		0.0			0.7		1.1			75.3			5.1		
	Max Mixed Grade			0.0		0.7		1.1			75.3				5.1	
383	Mean yellow maize	0.0			2.4			1.1			77.2			0.3		
	Min yellow maize		0.0			0.4		0.0			68.6			0.0		
	Max yellow maize			1.2		10.3		6.0			81.9				5.1	
900	Mean maize	0.0			2.3			1.0			77.7			0.3		
	Min maize		0.0			0.0		0.0			65.3			0.0		
	Max maize			2.1		13.6		6.0			83.2				12.7	

**TABLE 10: GRADES AND GRADE REQUIREMENTS FOR MAIZE
ACCORDING TO RSA GRADING REGULATIONS**

Description of deviation		Maximum percentage of deviation allowed (m/m)					
		White maize			Yellow maize		
		Grade					
		WM1	WM2	WM3	YM1	YM2	YM3
I	Defective maize kernels	7	13	30	-	-	-
	above 6,35 grading sieve	-	-	-	9	20	30
	below 6,35 mm grading sieve	-	-	-	4	10	30
II	Maize kernels of another colour	3	6	10	2	5	5
III	Foreign matter (excluding stone, pieces of coal or glass and dung)	0,3	0,5	0,75	0,3	0,5	0,75
IV	Total deviations in terms I, II and III collectively, provided such deviations are individually within the limits specified above	8	16	30	9	20	30
V	Pinked maize kernels	12	12	12	12	12	12

If the maize does not comply with the standards for Class White Maize or Class Yellow Maize
it shall be classified as Class Other Maize.

**TABLE 11: GRADES AND GRADE REQUIREMENTS FOR MAIZE
ACCORDING TO USDA GRADING REGULATIONS.**

			Maximum limits of -		
			Damaged kernels		Broken corn and foreign material (percent)
			Heat damaged Kernels (percent)	Total (percent)	
Grade	Minimum test weight per bushel (pounds)				
U.S. No. 1	56.0	72.1 kg/hl	0.1	3.0	2.0
U.S. No. 2	54.0	69.5 kg/hl	0.2	5.0	3.0
U.S. No. 3	52.0	66.9 kg/hl	0.5	7.0	4.0
U.S. No. 4	49.0	63.1 kg/hl	1.0	10.0	5.0
U.S. No. 5	46.0	59.2 kg/hl	3.0	15.0	7.0

U.S. Sample grade

U.S. Sample grade is corn that:

- Does not meet the requirements for the grades U.S. Nos. 1, 2, 3, 4 or 5; or
- Contains 8 or more stones which have an aggregate weight in excess of 0.20 percent of the sample weight, 2 or more pieces of glass, 3 or more crotalaria seeds (*Crotalaria* spp.), 2 or more castor beans (*Ricinus communis* L.), 4 or more particles of an unknown foreign substance(s) or a commonly reconized harmful or toxic substance(s), 8 or more cockleburrs (*Xanthium* spp.) or similar seeds singly or in combination, or animal filth in excess of 0.20 ssp.) or similar seeds singly or in combination, or animal filth in excess of 0.20 percent in 1000 grams; or
- Has a musty, sour, or commercially foreign odor; or
- Is heating or otherwise of distinctly low quality.

Source: Offical United States Standard of Grain (excluding metric conversions.)

TABLE 12: NUTRITIONAL VALUES OF WHITE MAIZE ACCORDING TO GRADE 2002/2003											TABLE 13: NUTRITIONAL VALUES OF YELLOW MAIZE ACCORDING TO GRADE 2002/2003										
Number of samples	Region	% (db) Fat			% (db) Protein			% (db) Starch			Number of samples	Region	% (db) Fat			% (db) Protein			% (db) Starch		
		ave.	min.	max.	ave.	min.	max.	ave.	min.	max.			ave.	min.	max.	ave.	min.	max.	ave.	min.	max.
GRADE: WMI																					
7	Region 10	3.8	3.3	4.3	8.7	7.9	9.2	75.1	73.9	76.4	14	Region 10	3.7	3.3	4.1	8.2	7.4	8.9	76.9	75.7	78.3
13	Region 11	4.1	3.4	4.8	9.7	8.6	10.4	75.0	73.5	77.1	17	Region 11	3.6	3.3	4.1	9.1	8.2	10.1	76.6	74.4	78.2
15	Region 12	4.2	3.7	5.4	9.3	8.6	10.8	75.3	73.6	76.8	10	Region 12	4.1	3.7	4.9	9.3	8.6	9.9	75.5	73.3	78.2
6	Region 13	3.8	3.3	4.1	9.5	9.2	9.8	75.4	74.0	76.8	6	Region 13	3.9	3.6	4.1	9.6	9.1	10.3	76.4	75.5	77.4
30	Region 14	4.1	3.5	4.6	9.5	8.4	10.9	75.8	73.0	77.7	17	Region 14	4.3	3.6	4.9	9.7	8.4	11.3	75.4	70.0	78.7
15	Region 15	4.1	3.6	4.4	9.3	8.6	10.2	75.9	72.7	77.3	11	Region 15	4.1	3.6	4.7	9.4	8.0	11.5	76.8	75.3	78.0
18	Region 16	4.4	3.9	4.9	9.4	8.3	10.1	75.8	74.4	77.9	11	Region 16	4.3	3.7	5.0	9.6	9.2	9.9	76.1	73.8	77.9
21	Region 17	4.0	3.2	4.6	9.5	8.7	11.1	75.3	72.5	77.8	8	Region 17	4.0	3.1	4.3	9.2	8.5	10.3	76.1	73.9	78.4
34	Region 18	4.2	3.5	5.3	9.7	8.6	11.6	75.2	66.5	79.7	20	Region 18	4.2	3.4	4.8	9.5	8.6	10.2	75.8	73.5	79.1
10	Region 19	3.7	3.3	4.3	9.0	8.2	9.6	74.5	72.5	77.2	8	Region 19	3.8	3.6	4.1	9.3	8.6	10.3	75.5	74.4	76.5
7	Region 20	3.7	3.5	3.9	8.6	7.8	9.0	74.8	73.0	77.7	7	Region 20	4.0	3.8	4.2	9.2	8.4	9.8	75.3	72.8	77.4
32	Region 21	4.2	3.8	4.7	9.4	8.2	11.4	75.0	72.5	77.2	9	Region 21	4.3	4.0	4.9	9.8	8.7	10.8	75.8	73.5	77.8
37	Region 22	4.3	3.8	4.9	9.3	8.4	11.3	75.4	73.5	76.8	7	Region 22	4.3	3.5	4.7	9.3	8.6	10.8	76.4	75.0	78.0
31	Region 23	4.2	3.6	5.0	9.5	8.1	11.3	74.9	71.8	77.2	15	Region 23	4.2	3.4	5.1	9.2	7.9	10.4	75.9	74.3	77.7
26	Region 24	4.2	3.7	5.0	9.4	7.9	11.7	75.0	70.1	77.7	13	Region 24	4.2	3.7	4.8	9.6	8.3	11.1	75.5	73.9	78.0
15	Region 25	4.1	3.7	4.6	8.4	7.3	9.7	75.5	73.5	77.3	17	Region 25	4.1	3.4	5.1	8.7	7.2	9.7	75.7	72.5	77.6
16	Region 26	4.1	3.5	4.6	9.0	8.2	10.5	75.3	71.9	79.0	14	Region 26	4.4	3.8	5.0	8.6	7.9	9.3	75.4	73.1	79.9
8	Region 27	4.2	3.9	4.6	9.8	8.5	11.1	74.9	73.8	76.7	7	Region 27	4.3	3.8	4.6	9.2	8.3	10.1	75.5	72.9	77.6
19	Region 28	4.2	3.7	4.6	8.7	7.9	9.4	75.7	73.7	77.5	26	Region 28	4.2	3.7	4.8	8.8	8.1	10.8	76.2	73.6	78.3
12	Region 29	4.2	3.9	4.7	8.6	7.5	9.7	76.0	73.4	77.4	12	Region 29	4.0	3.3	4.5	9.0	8.2	10.4	76.7	74.9	78.6
20	Region 30	4.2	3.6	4.6	8.6	7.8	9.7	75.5	73.7	77.6	18	Region 30	4.2	3.4	5.0	8.9	8.1	9.8	75.6	72.4	77.7
10	Region 31	4.4	3.7	4.6	9.1	8.3	10.5	75.6	74.4	76.7	10	Region 31	4.2	3.7	4.8	8.9	8.0	9.9	76.3	73.7	77.9
10	Region 32	4.4	4.0	5.0	9.2	8.1	11.3	75.6	74.6	77.6	9	Region 32	4.3	3.9	4.8	9.0	7.7	9.6	76.5	74.7	77.7
14	Region 33	4.2	3.8	4.4	9.1	8.3	10.3	75.5	72.7	78.0	9	Region 33	4.4	4.0	4.7	9.5	8.6	10.6	75.8	74.1	79.2
17	Region 34	4.0	3.6	4.5	8.9	7.6	10.0	75.7	73.5	77.9	9	Region 34	4.3	3.8	5.0	9.8	9.1	10.9	75.3	73.4	76.8
8	Region 35	3.8	3.5	4.1	9.1	8.1	11.4	75.0	72.9	76.6	1	Region 35	3.7	3.7	3.7	9.5	9.5	9.5	76.5	76.5	76.5
10	Region 36	3.9	3.3	4.3	8.5	7.6	9.0	75.0	73.1	76.5	9	Region 36	3.7	3.1	4.2	8.4	7.4	9.0	75.0	73.7	75.9
461	Mean WMI	4.1			9.2			75.3			314	Mean YMI	4.1			9.1			75.9		
	Min WMI	3.2			7.3			66.5				Min YMI	3.1			7.2			70.0		
	Max WMI	5.4			11.7			79.7				Max YMI	5.1			11.5			79.9		

TABLE 12: NUTRITIONAL VALUES OF WHITE MAIZE ACCORDING TO GRADE 2002/2003 (continue)											TABLE 13: NUTRITIONAL VALUES OF YELLOW MAIZE ACCORDING TO GRADE 2002/2003 (continue)																												
Number of samples	Region	% (db) Fat			% (db) Protein			% (db) Starch			Number of samples	Region	% (db) Fat			% (db) Protein			% (db) Starch																				
		ave.	min.	max.	ave.	min.	max.	ave.	min.	max.			ave.	min.	max.	ave.	min.	max.	ave.	min.	max.																		
GRADE: WM2																				GRADE: YM2																			
1	Region 11	3.8	3.8	3.8	9.2	9.2	9.2	76.2	76.2	76.2	2	Region 10	3.9	3.5	4.3	8.2	8.0	8.4	77.8	77.6	78.0																		
3	Region 13	3.5	3.4	3.7	9.6	9.3	10.0	75.8	74.6	77.1	11	Region 11	3.7	3.4	4.1	9.3	8.7	10.1	76.1	73.8	78.1																		
3	Region 14	3.8	3.6	4.1	9.3	8.6	9.8	75.4	73.9	76.2	3	Region 12	3.8	3.5	4.0	9.7	9.1	10.3	76.2	74.7	78.3																		
1	Region 15	4.1	4.1	4.1	9.8	9.8	9.8	75.3	75.3	75.3	3	Region 13	3.9	3.6	4.1	9.8	9.7	9.8	76.5	75.6	77.3																		
4	Region 16	4.1	3.6	4.9	9.3	8.7	10.1	76.2	75.4	76.9	8	Region 14	4.4	3.8	5.0	9.7	8.4	10.5	76.3	75.1	77.5																		
2	Region 17	3.7	3.5	3.8	9.6	9.4	9.7	74.6	74.5	74.6	3	Region 16	4.7	4.4	4.9	9.9	9.6	10.1	75.3	74.3	76.3																		
6	Region 18	4.1	3.5	4.9	8.8	7.6	9.8	75.1	73.3	77.0	3	Region 17	4.0	3.9	4.3	10.0	9.4	11.1	75.0	73.7	76.0																		
6	Region 19	3.6	3.1	3.9	9.5	8.8	10.4	75.4	74.8	76.1	1	Region 18	4.0	4.0	4.0	10.4	10.4	10.4	76.2	76.2	76.2																		
2	Region 20	3.5	3.4	3.6	8.6	8.3	8.8	74.3	74.2	74.3	2	Region 19	3.6	3.4	3.7	9.9	9.6	10.2	75.2	74.1	76.2																		
2	Region 23	4.2	3.9	4.5	10.0	9.4	10.5	74.5	74.2	74.7	1	Region 20	3.9	3.9	3.9	9.4	9.4	9.4	75.8	75.8	75.8																		
3	Region 24	4.0	3.5	4.3	9.1	8.5	9.8	76.4	75.9	77.2	1	Region 21	4.5	4.5	4.5	9.1	9.1	9.1	77.5	77.5	77.5																		
3	Region 25	4.6	4.4	4.8	9.1	9.0	9.1	75.6	75.2	76.0	3	Region 22	4.1	3.7	4.5	9.6	9.0	10.4	76.2	75.8	76.7																		
1	Region 26	4.1	4.1	4.1	8.6	8.6	8.6	76.7	76.7	76.7	2	Region 23	4.1	3.7	4.4	9.9	9.7	10.0	75.6	74.7	76.4																		
1	Region 27	3.9	3.9	3.9	9.8	9.8	9.8	76.8	76.8	76.8	2	Region 24	3.6	3.5	3.6	8.9	8.4	9.3	75.7	75.5	75.8																		
1	Region 28	4.3	4.3	4.3	9.3	9.3	9.3	75.7	75.7	75.7	4	Region 25	3.9	3.5	4.4	8.8	9.0	9.3	76.2	75.7	76.9																		
2	Region 29	4.6	4.5	4.7	9.5	9.4	9.5	76.1	75.5	76.6	1	Region 26	4.1	4.1	4.1	8.9	8.9	8.9	74.8	74.8	74.8																		
2	Region 30	4.3	4.0	4.6	9.2	8.5	9.8	75.1	74.1	76.1	2	Region 28	4.2	3.9	4.5	9.7	8.8	10.6	75.8	75.7	75.8																		
1	Region 31	4.6	4.6	4.6	8.4	8.4	8.4	76.2	76.2	76.2	2	Region 29	4.8	4.6	5.0	9.6	9.6	9.6	76.5	74.9	78.1																		
2	Region 32	4.2	4.0	4.4	8.3	8.2	8.3	76.1	75.8	76.4	5	Region 30	4.2	3.7	4.5	8.9	8.4	9.6	76.1	74.8	77.6																		
1	Region 34	3.9	3.9	3.9	9.3	9.3	9.3	77.5	77.5	77.5	1	Region 31	3.9	3.9	3.9	8.9	8.9	8.9	76.8	76.8	76.8																		
											1	Region 33	3.6	3.6	3.6	9.2	9.2	9.2	77.4	77.4	77.4																		
											1	Region 34	4.0	4.0	4.0	9.2	9.2	9.2	74.6	74.6	74.6																		
											2	Region 35	3.5	3.3	3.6	9.3	9.1	9.4	76.4	76.3	76.4																		
47	Mean WM2	4.0			9.2			75.6			64	Mean YM2	4.0			9.4			76.1																				
	Min WM2		3.1	4.9		7.6	10.5		73.3	77.5		Min YM2		3.3	5.0		8.0	11.1		73.7	78.3																		
	Max WM2											Max YM2																											

TABLE 12: NUTRITIONAL VALUES OF WHITE MAIZE ACCORDING TO GRADE 2002/2003(continue)													TABLE 13: NUTRITIONAL VALUES OF YELLOW MAIZE ACCORDING TO GRADE 2002/2003 (continue)												
Number of samples	Region	% (db) Fat			% (db) Protein			% (db) Starch			Number of samples	Region	% (db) Fat			% (db) Protein			% (db) Starch						
		ave.	min.	max.	ave.	min.	max.	ave.	min.	max.			ave.	min.	max.	ave.	min.	max.	ave.	min.	max.				
GRADE: WM3																									
1	Region 12	4.0	4.0	4.0	8.8	8.8	8.8	73.7	73.7	73.7	1	Region 10	3.1	3.1	3.1	9.6	9.6	9.6	77.1	77.1	77.1				
2	Region 14	3.1	3.0	3.2	9.9	9.3	10.4	73.6	72.5	74.6															
2	Region 23	4.1	4.0	4.2	10.5	9.7	11.3	75.0	74.5	75.5															
5	Mean WM3	3.7			9.9			74.2			1	Mean YM3	3.1			9.6			77.1						
	Min WM3		3.0		8.8			72.5				Min YM3				9.6			77.1						
	Max WM3			4.2			11.3			75.5		Max YM3		3.1			9.6			77.1					
GRADE: COM																									
1	Region 11	3.9	3.9	3.9	9.6	9.6	9.6	77.7	77.7	77.7	1	Region 27	3.3	3.3	3.3	10.0	10.0	10.0	76.4	76.4	76.4				
1	Region 16	4.7	4.7	4.7	10.6	10.6	10.6	73.0	73.0	73.0	1	Region 28	3.4	3.4	3.4	7.4	7.4	7.4	77.3	77.3	77.3				
1	Region 20	3.7	3.7	3.7	8.8	8.8	8.8	75.7	75.7	75.7	1	Region 33	4.1	4.1	4.1	8.6	8.6	8.6	77.6	77.6	77.6				
1	Region 29	4.1	4.1	4.1	7.9	7.9	7.9	76.9	76.9	76.9	1	Region 36	4.5	4.5	4.5	9.3	9.3	9.3	73.5	73.5	73.5				
4	Mean COM	4.1			9.2			75.8			4	Mean COM	3.8			8.8			76.2						
	Min COM		3.7		7.9			73.0				Min COM	3.3			7.4			73.5						
	Max COM			4.7			10.6			77.7		Max COM		4.5			10.0			77.6					

**TABLE 14: NUTRITIONAL VALUES OF WHITE AND YELLOW
MAIZE 2002/2003**

Number of samples	Region	% (db) Fat			% (db) Protein			% (db) Starch		
		ave.	min.	max.	ave.	min.	max.	ave.	min.	max.
WHITE										
7	Region 10	3.8	3.3	4.3	8.7	7.9	9.2	75.1	73.9	76.4
15	Region 11	4.1	3.4	4.8	9.7	8.6	10.4	75.2	73.5	77.7
16	Region 12	4.2	3.7	5.4	9.3	8.6	10.8	75.2	73.6	76.8
9	Region 13	3.7	3.3	4.1	9.5	9.2	10.0	75.6	74.0	77.1
35	Region 14	4.0	3.0	4.6	9.5	8.4	10.9	75.7	72.5	77.7
16	Region 15	4.1	3.6	4.4	9.3	8.6	10.2	75.9	72.7	77.3
23	Region 16	4.3	3.6	4.9	9.4	8.3	10.6	75.8	73.0	77.9
23	Region 17	3.9	3.2	4.6	9.5	8.7	11.1	75.2	72.5	77.8
40	Region 18	4.2	3.5	5.3	9.6	7.6	11.6	75.2	66.5	79.7
16	Region 19	3.7	3.1	4.3	9.2	8.2	10.4	74.8	72.5	77.2
10	Region 20	3.7	3.4	3.9	8.6	7.8	9.0	74.8	73.0	77.7
32	Region 21	4.2	3.8	4.7	9.4	8.2	11.4	75.0	72.5	77.2
37	Region 22	4.3	3.8	4.9	9.3	8.4	11.3	75.4	73.5	76.8
35	Region 23	4.2	3.6	5.0	9.6	8.1	11.3	74.9	71.8	77.2
29	Region 24	4.2	3.5	5.0	9.4	7.9	11.7	75.1	70.1	77.7
18	Region 25	4.2	3.7	4.8	8.6	7.3	9.7	75.5	73.5	77.3
17	Region 26	4.1	3.5	4.6	9.0	8.2	10.5	75.4	71.9	79.0
9	Region 27	4.1	3.9	4.6	9.8	8.5	11.1	75.1	73.8	76.8
20	Region 28	4.2	3.7	4.6	8.7	7.9	9.4	75.7	73.7	77.5
15	Region 29	4.3	3.9	4.7	8.7	7.5	9.7	76.0	73.4	77.4
22	Region 30	4.2	3.6	4.6	8.6	7.8	9.8	75.5	73.7	77.6
11	Region 31	4.4	3.7	4.6	9.1	8.3	10.5	75.6	74.4	76.7
12	Region 32	4.4	4.0	5.0	9.0	8.1	11.3	75.7	74.6	77.6
14	Region 33	4.2	3.8	4.4	9.1	8.3	10.3	75.5	72.7	78.0
18	Region 34	4.0	3.6	4.5	8.9	7.6	10.0	75.8	73.5	77.9
8	Region 35	3.8	3.5	4.1	9.1	8.1	11.4	75.0	72.9	76.6
10	Region 36	3.8	3.3	4.3	8.5	7.6	9.0	75.0	73.1	76.5
517	Mean white	4.1			9.2			75.4		
	Min white		3.0			7.3			66.5	
	Max white			5.4			11.7			79.7
YELLOW										
17	Region 10	3.7	3.1	4.3	8.2	7.4	9.6	77.1	75.7	78.3
28	Region 11	3.6	3.3	4.1	9.2	8.2	10.1	76.4	73.8	78.2
13	Region 12	4.0	3.5	4.9	9.4	8.6	10.3	75.6	73.3	78.3
9	Region 13	3.9	3.6	4.1	9.7	9.1	10.3	76.4	75.5	77.4
25	Region 14	4.3	3.6	5.0	9.7	8.4	11.3	75.7	70.0	78.7
11	Region 15	4.1	3.6	4.7	9.4	8.0	11.5	76.8	75.3	78.0
14	Region 16	4.4	3.7	5.0	9.6	9.2	10.1	76.0	73.8	77.9
11	Region 17	4.0	3.1	4.3	9.4	8.5	11.1	75.8	73.7	78.4
21	Region 18	4.2	3.4	4.8	9.5	8.6	10.4	75.8	73.5	79.1
10	Region 19	3.7	3.4	4.1	9.4	8.6	10.3	75.5	74.1	76.5
8	Region 20	4.0	3.8	4.2	9.2	8.4	9.8	75.3	72.8	77.4
10	Region 21	4.4	4.0	4.9	9.8	8.7	10.8	76.0	73.5	77.8
10	Region 22	4.2	3.5	4.7	9.4	8.6	10.8	76.3	75.0	78.0
17	Region 23	4.2	3.4	5.1	9.3	7.9	10.4	75.9	74.3	77.7
15	Region 24	4.1	3.5	4.8	9.5	8.3	11.1	75.6	73.9	78.0
21	Region 25	4.0	3.4	5.1	8.7	7.2	9.7	75.8	72.5	77.6
15	Region 26	4.4	3.8	5.0	8.6	7.9	9.3	75.4	73.1	79.9
8	Region 27	4.2	3.3	4.6	9.3	8.3	10.1	75.6	72.9	77.6
29	Region 28	4.1	3.4	4.8	8.8	7.4	10.8	76.2	73.6	78.3
14	Region 29	4.1	3.3	5.0	9.1	8.2	10.4	76.7	74.9	78.6

**TABLE 14: NUTRITIONAL VALUES OF WHITE AND YELLOW
MAIZE 2002/2003 (continue)**

Number of samples	Region	% (db) Fat			% (db) Protein			% (db) Starch		
		ave.	min.	max.	ave.	min.	max.	ave.	min.	max.
YELLOW										
11	Region 31	4.2	3.7	4.8	8.9	8.0	9.9	76.4	73.7	77.9
9	Region 32	4.3	3.9	4.8	9.0	7.7	9.6	76.5	74.7	77.7
11	Region 33	4.3	3.6	4.7	9.4	8.6	10.6	76.1	74.1	79.2
10	Region 34	4.3	3.8	5.0	9.7	9.1	10.9	75.2	73.4	76.8
3	Region 35	3.5	3.3	3.7	9.3	9.1	9.5	76.4	76.3	76.5
10	Region 36	3.8	3.1	4.5	8.5	7.4	9.3	74.9	73.5	75.9
383	Mean yellow	4.1			9.2			76.0		
	Min yellow		3.1			7.2			70.0	
	Max yellow			5.1			11.5			79.9
WHITE AND YELLOW										
24	Region 10	3.7	3.1	4.3	8.4	7.4	9.6	76.5	73.9	78.3
43	Region 11	3.8	3.3	4.8	9.3	8.2	10.4	76.0	73.5	78.2
29	Region 12	4.1	3.5	5.4	9.3	8.6	10.8	75.4	73.3	78.3
18	Region 13	3.8	3.3	4.1	9.6	9.1	10.3	76.0	74.0	77.4
60	Region 14	4.1	3.0	5.0	9.6	8.4	11.3	75.7	70.0	78.7
27	Region 15	4.1	3.6	4.7	9.4	8.0	11.5	76.2	72.7	78.0
37	Region 16	4.4	3.6	5.0	9.5	8.3	10.6	75.8	73.0	77.9
34	Region 17	3.9	3.1	4.6	9.5	8.5	11.1	75.4	72.5	78.4
61	Region 18	4.2	3.4	5.3	9.5	7.6	11.6	75.4	66.5	79.7
26	Region 19	3.7	3.1	4.3	9.3	8.2	10.4	75.1	72.5	77.2
18	Region 20	3.8	3.4	4.2	8.9	7.8	9.8	75.0	72.8	77.7
42	Region 21	4.2	3.8	4.9	9.5	8.2	11.4	75.3	72.5	77.8
47	Region 22	4.3	3.5	4.9	9.3	8.4	11.3	75.6	73.5	78.0
52	Region 23	4.2	3.4	5.1	9.5	7.9	11.3	75.2	71.8	77.7
44	Region 24	4.2	3.5	5.0	9.4	7.9	11.7	75.3	70.1	78.0
39	Region 25	4.1	3.4	5.1	8.6	7.2	9.7	75.6	72.5	77.6
32	Region 26	4.2	3.5	5.0	8.8	7.9	10.5	75.4	71.9	79.9
17	Region 27	4.1	3.3	4.6	9.5	8.3	11.1	75.3	72.9	77.6
49	Region 28	4.2	3.4	4.8	8.8	7.4	10.8	76.0	73.6	78.3
29	Region 29	4.2	3.3	5.0	8.9	7.5	10.4	76.4	73.4	78.6
45	Region 30	4.2	3.4	5.0	8.8	7.8	9.8	75.6	72.4	77.7
22	Region 31	4.3	3.7	4.8	9.0	8.0	10.5	76.0	73.7	77.9
21	Region 32	4.3	3.9	5.0	9.0	7.7	11.3	76.1	74.6	77.7
25	Region 33	4.2	3.6	4.7	9.2	8.3	10.6	75.8	72.7	79.2
28	Region 34	4.1	3.6	5.0	9.2	7.6	10.9	75.6	73.4	77.9
11	Region 35	3.8	3.3	4.1	9.1	8.1	11.4	75.4	72.9	76.6
20	Region 36	3.8	3.1	4.5	8.5	7.4	9.3	74.9	73.1	76.5
900	Mean white & yellow	4.1			9.2			75.6		
	Min white & yellow		3.0			7.2			66.5	
	Max white & yellow			5.4			11.7			79.9

**TABLE 15: MEAN NUTRITIONAL VALUES OF SOUTH AFRICAN
MAIZE OVER THE PAST TEN MARKETING SEASONS
(PERCENTAGE ON A DRY BASIS)**

Season	White maize			Yellow maize		
	Fat	* Protein	Starch	Fat	Protein	Starch
1993/94	4.0	9.8	73.2	4.4	10.0	71.6
1994/95	4.1	8.6	74.5	4.4	8.8	73.8
1995/96	3.8	9.9	73.6	4.2	9.9	73.2
1996/97	3.9	8.7	74.1	4.2	8.7	71.8
1997/98	4.0	8.9	73.6	4.1	9.0	74.2
1998/99	4.1	9.2	71.8	4.2	9.5	72.1
1999/00	4.0	8.1	71.9	4.1	8.0	72.0
2000/01	4.2	8.8	74.2	4.2	8.7	74.5
2001/02	4.2	8.9	75.4	4.1	8.9	75.7
2002/03	4.1	9.2	75.4	4.1	9.2	76
Mean	4.0	9.0	73.8	4.2	9.1	73.5

**TABLE 16: MEAN NUTRITIONAL VALUES OF SOUTH AFRICAN
MAIZE (1993/94-2002/03)**

Season	Fat %	Protein %	Starch %
1993/94	4.2	9.9	72.3
1994/95	4.3	8.7	74.2
1995/96	4.0	9.9	73.4
1996/97	4.1	8.7	73.1
1997/98	4.0	9.0	73.8
1998/99	4.2	9.3	71.9
1999/00	4.0	8.1	71.9
2000/01	4.2	8.8	74.3
2001/02	4.2	8.9	75.5
2002/03	4.1	9.2	75.6

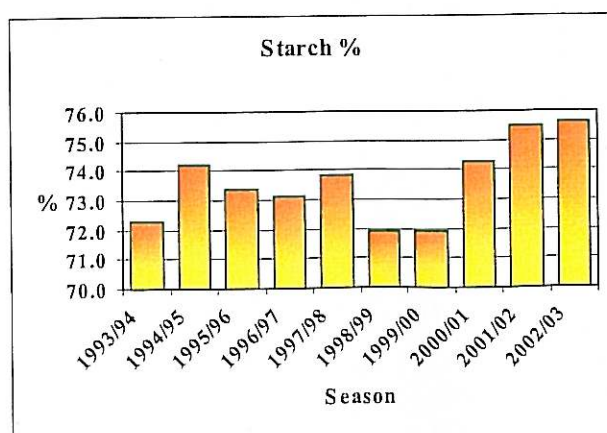
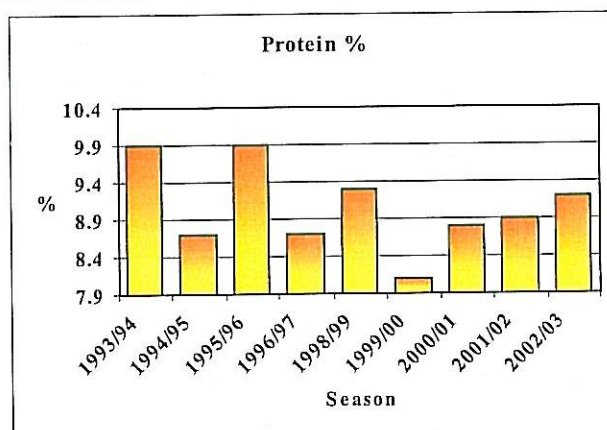
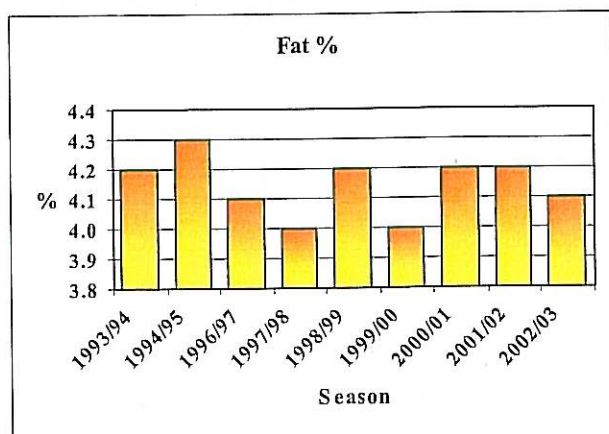


TABLE 17: PHYSICAL QUALITY FACTORS OF WHITE MAIZE ACCORDING TO GRADE 2002/2003

Number of samples	Region	Hectolitre mass			100			Kernel size (%)						Breakability (g)						Stress cracks (%)					
		kg/hl			kernel mass (g)			Above 10mm sieve			Above 8mm sieve			Below 8mm sieve			< 6.3mm sieve			< 4.75mm sieve			ave.	min.	max.
		ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.						
GRADE WM1																									
7	Region 10	80.5	79.0	82.0	31.7	28.7	35.3	3.7	1.1	8.2	52.3	36.5	71.2	44.0	26.7	58.9	0.7	0.3	1.1	0.5	0.3	0.8	3	0	5
13	Region 11	80.6	78.7	83.2	32.6	29.3	35.4	16.4	0.3	28.3	55.0	34.1	67.5	28.6	10.6	65.6	1.9	0.2	3.8	1.4	0.1	2.3	7	0	23
15	Region 12	77.6	75.9	79.6	33.0	26.3	41.3	23.7	10.7	44.2	62.6	51.6	69.3	13.8	4.2	23.3	1.1	0.4	2.2	0.8	0.2	1.3	6	0	11
6	Region 13	77.6	76.6	78.4	30.8	27.6	33.9	16.1	9.5	19.7	66.2	64.1	69.7	17.7	14.8	21.3	0.8	0.4	1.8	0.6	0.3	1.1	2	0	6
30	Region 14	78.5	74.9	80.2	32.6	25.9	36.6	21.0	9.8	32.7	64.6	56.6	70.8	14.4	5.3	28.2	0.8	0.1	3.0	0.6	0.0	2.1	3	1	15
15	Region 15	79.4	78.8	80.6	33.3	29.0	37.3	12.7	1.9	28.0	60.9	50.9	71.9	26.3	12.5	47.2	1.1	0.3	4.0	1.0	0.3	4.0	5	0	15
18	Region 16	78.3	77.1	80.6	33.3	29.7	36.0	21.7	6.3	38.1	65.0	51.6	75.4	13.4	7.3	26.3	1.6	0.4	5.3	1.2	0.2	3.0	5	0	15
21	Region 17	77.6	75.7	79.2	30.4	24.7	36.0	18.1	10.3	38.2	63.8	51.8	71.1	18.1	8.6	30.4	1.5	0.3	11.0	1.3	0.2	11.0	4	0	11
34	Region 18	78.2	72.9	79.9	32.9	29.8	38.1	21.1	11.7	40.2	64.6	51.9	72.1	14.3	7.5	20.4	1.5	0.6	4.6	1.1	0.2	2.5	4	0	28
10	Region 19	75.5	68.9	80.7	30.0	25.8	35.5	13.7	3.0	21.6	65.1	58.9	68.3	21.1	14.5	38.1	0.9	0.4	1.3	0.6	0.3	1.0	3	0	5
7	Region 20	77.6	76.7	79.3	31.7	28.1	33.9	22.0	11.1	34.5	65.1	58.5	68.9	12.9	7.0	20.0	1.1	0.3	2.0	0.9	0.1	1.7	4	2	6
32	Region 21	78.1	76.1	81.1	33.0	29.1	39.8	19.0	6.4	30.5	65.6	58.7	71.5	15.4	6.8	34.9	1.3	0.0	3.5	1.0	0.0	2.5	3	0	10
37	Region 22	78.5	76.8	80.6	34.7	31.5	38.9	24.7	11.5	32.7	63.4	54.4	69.7	11.9	5.7	21.1	1.4	0.2	10.1	1.1	0.2	9.8	4	0	11
31	Region 23	78.9	76.6	81.0	34.3	28.7	37.4	19.4	2.3	37.4	64.2	45.8	72.6	16.4	6.7	46.6	1.3	0.3	2.8	1.0	0.0	1.9	4	0	15
26	Region 24	78.6	75.7	80.5	34.2	28.4	37.6	20.9	6.5	46.0	62.7	47.4	73.8	16.4	4.1	45.7	1.6	0.4	3.5	1.2	0.3	2.9	5	1	17
15	Region 25	77.5	72.0	79.8	33.0	27.3	37.9	17.5	3.1	37.9	65.1	54.5	71.7	17.4	7.3	42.4	2.0	0.7	6.4	1.4	0.6	4.6	5	1	13
16	Region 26	78.7	77.5	80.2	33.8	31.3	37.4	17.7	9.5	22.5	66.5	57.5	71.2	15.8	11.5	24.8	2.7	0.7	21.4	2.3	0.2	21.0	4	0	9
8	Region 27	79.1	76.7	80.8	33.5	29.5	38.9	19.6	5.9	36.6	62.6	55.2	69.5	17.8	8.2	29.8	1.3	0.4	2.5	1.0	0.2	1.5	6	0	20
19	Region 28	78.0	70.4	80.3	34.7	29.2	39.8	27.2	4.0	41.0	59.4	48.1	73.3	13.4	7.3	22.7	1.3	0.3	3.5	0.8	0.1	1.5	7	0	24
12	Region 29	77.9	76.2	79.6	31.8	28.6	35.8	23.3	11.8	54.2	61.0	39.9	67.1	15.8	5.9	26.8	1.1	0.1	2.7	0.8	0.0	1.7	5	1	11
20	Region 30	77.5	69.9	79.7	32.5	27.8	44.0	25.3	10.9	60.1	60.8	38.9	69.7	13.9	1.0	30.6	1.1	0.1	2.7	0.7	0.0	1.8	7	0	27
10	Region 31	78.0	76.3	79.2	33.2	30.8	36.7	24.6	8.6	37.9	58.7	52.5	66.6	16.7	7.3	25.8	0.9	0.3	1.8	0.7	0.3	1.4	4	1	11
10	Region 32	78.8	78.1	79.7	33.9	30.1	41.1	25.8	15.9	39.6	61.0	53.5	66.6	13.1	6.3	21.3	0.9	0.1	2.0	0.7	0.0	1.3	4	1	9
14	Region 33	76.6	65.3	80.8	33.6	28.2	42.0	26.9	7.9	69.4	60.7	29.4	73.7	12.5	1.2	18.8	0.8	0.1	1.6	0.6	0.0	1.2	4	0	14
17	Region 34	78.5	77.0	80.6	34.0	28.9	39.3	20.9	6.6	39.1	63.8	52.4	72.1	15.3	6.7	35.8	1.6	0.1	3.8	1.2	0.0	2.7	5	0	14
8	Region 35	77.4	75.4	79.3	29.8	25.7	34.4	12.4	2.5	24.5	60.0	41.5	68.9	27.6	9.3	54.8	1.0	0.1	1.6	0.8	0.1	1.4	3	0	5
10	Region 36	77.3	74.9	78.4	35.1	29.4	44.4	20.9	4.6	37.6	62.0	53.2	65.8	17.1	5.5	37.9	2.1	0.4	6.1	1.6	0.3	5.0	10	1	34
459	Mean WM1	78.2			33.1	24.7	44.4	20.6	0.3	69.4	62.9	29.4	75.4	16.5	1.0	65.6	1.3	0.0	21.4	1.0	0.0	21.0	5		
	Min WM1		65.3	83.2																			0		34
	Max WM1																								

TABLE 17: PHYSICAL QUALITY FACTORS OF WHITE MAIZE ACCORDING TO GRADE 2002/2003 (continue)

Number of samples	Region	Hectolitre kg/hl			100 kernel mass (g)			Kernel size (%)						Breakability (g)						Stress cracks (%)			
								Above 10mm sieve			Above 8mm sieve			Below 8mm sieve			< 6.3mm sieve						< 4.75mm sieve
		ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	
GRADE WM 2																							
1	Region 11	79.1	79.1	79.1	31.8	31.8	31.8	15.6	15.6	62.0	62.0	62.0	22.4	22.4	2.4	2.4	2.4	2.4	2.4	2	2	2	
3	Region 13	76.7	75.2	77.6	28.1	25.8	30.9	12.9	11.9	69.0	69.0	69.0	18.7	17.7	1.4	0.8	2.0	0.8	0.6	3	1	4	
3	Region 14	78.0	77.2	78.4	34.0	32.3	36.3	20.2	17.4	69.9	69.9	69.9	15.1	12.7	1.63	0.8	2.1	1.2	0.7	3	1	5	
1	Region 15	77.9	77.9	77.9	33.3	33.3	33.3	20.9	20.9	66.3	66.3	66.3	12.8	12.8	1.1	1.1	1.1	0.9	0.9	2	2	2	
4	Region 16	77.5	75.8	78.8	31.2	27.7	34.8	16.3	7.0	69.1	66.9	63.5	16.8	10.5	2.2	0.9	5.6	1.4	0.4	7	3	15	
2	Region 17	77.2	75.9	78.5	29.4	28.7	30.1	14.0	10.1	70.0	66.6	63.1	19.5	19.1	0.6	0.6	0.7	0.4	0.4	6	2	9	
6	Region 18	75.9	74.7	78.6	32.1	28.0	34.8	23.8	18.2	69.2	63.4	58.9	12.8	7.1	19.6	2.7	0.7	4.9	1.8	0.0	9	3	18
6	Region 19	75.1	73.4	76.8	28.4	22.5	33.8	13.3	3.2	70.1	61.6	51.3	25.1	12.2	45.5	1.0	0.3	1.6	0.8	0.3	4	1	9
2	Region 20	74.3	74.1	74.4	29.0	28.2	29.7	14.0	10.7	66.6	66.6	66.5	19.5	16.1	22.8	1.1	0.6	1.5	0.7	0.6	3	2	4
2	Region 23	78.6	77.9	79.3	35.0	34.7	35.3	18.9	11.5	66.3	63.8	60.8	17.4	12.9	21.8	1.3	1.1	1.5	0.7	0.7	9	8	9
3	Region 24	77.8	76.6	79.0	35.2	28.9	41.2	21.6	1.3	51.8	54.3	43.9	24.1	4.3	46.7	1.9	0.8	3.3	1.6	0.8	8	0	20
3	Region 25	77.8	76.8	79.8	29.1	26.7	33.1	6.9	1.7	14.6	58.0	51.8	35.1	18.9	46.5	1.4	1.0	1.8	1.0	0.7	4	0	8
1	Region 26	79.0	79.0	79.0	37.9	37.9	37.9	38.5	38.5	38.5	51.6	51.6	9.9	9.9	9.9	1.8	1.8	1.8	1.3	1.3	0	0	0
1	Region 27	78.8	78.8	78.8	30.2	30.2	30.2	8.5	8.5	8.5	64.6	64.6	26.9	26.9	26.9	1.4	1.4	1.4	1.0	1.0	5	5	5
1	Region 28	76.7	76.7	76.7	28.5	28.5	28.5	14.4	14.4	14.4	52.9	52.9	32.7	32.7	32.7	1.0	1.0	1.0	0.5	0.5	1	1	1
2	Region 29	78.7	78.4	79.0	34.9	33.5	36.2	31.8	20.3	43.2	59.5	51.0	8.8	5.8	11.7	1.9	0.7	3.1	1.4	0.6	9	3	14
2	Region 30	77.6	77.2	78.0	31.6	29.7	33.4	27.5	22.2	32.7	62.6	59.1	10.0	8.2	11.8	1.9	1.7	2.0	1.4	1.3	10	7	12
1	Region 31	78.3	78.3	78.3	31.8	31.8	31.8	15.9	15.9	15.9	65.4	65.4	18.7	18.7	18.7	1.7	1.7	1.7	1.5	1.5	5	5	5
2	Region 32	78.7	78.0	79.4	33.8	33.4	34.2	24.8	19.3	30.3	66.2	62.0	9.0	7.7	10.3	2.0	1.3	2.7	1.6	0.8	14	5	23
1	Region 34	78.8	78.8	78.8	24.3	24.3	24.3	10.2	10.2	10.2	65.7	65.7	24.1	24.1	24.1	4.3	4.3	4.3	3.3	3.3	0	0	0
47	Mean WM 2	77.1			31.3			18.3		62.8			18.9			1.7			1.2		6		
	Min WM 2	73.4			22.5			1.3		43.9			4.3			0.3			0.0		0		
	Max WM 2	79.8			41.2			51.8		70.4			46.7			5.6			3.8		23		

TABEL 17: PHYSICAL QUALITY FACTORS OF WHITE MAIZE ACCORDING TO GRADE 2002/2003 (continue)

Number of samples	Region	Hectolitre kg/hl			100 kernel mass (g)			Kernel size (%)						Breakability (g)						Stress cracks (%)							
		ave.	min.	max.	kernel mass (g)			Above 10mm sieve			Above 8mm sieve			Below 8mm sieve			< 6.3mm sieve			< 4.75mm sieve			ave.	min.	max.		
					ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.					
GRADE: WM 3																											
1	Region 12	78.1	78.1	78.1	36.1	36.1	36.1	24.7	24.7	24.7	63.6	63.6	63.6	11.7	11.7	11.7	2.0	2.0	2.0	1.2	1.2	1.2	7	7	7		
2	Region 14	73.1	72.3	73.9	28.9	24.5	33.2	19.1	8.8	29.3	66.6	63.6	69.6	14.4	7.1	21.6	1.2	0.9	1.4	0.8	0.6	1.0	2	2	2		
2	Region 23	72.9	68.6	77.2	33.1	32.1	34.1	18.3	9.0	27.6	62.7	57.5	0.8	19.1	14.9	23.2	3.7	1.0	6.4	3.0	1.0	4.9	3	1	5		
5	Mean WM 3	74.0			32.0			19.9	8.8		64.4	57.5		15.7	7.1		2.3	0.9	6.4	1.7	0.6		3	1			
	Min WM 3	68.6			24.5		36.1									23.2									7		
	Max WM 3			78.1					29.3			69.6															
GRADE: COM																											
1	Region 11	79.0	79.0	79.0	35.9	35.9	35.9	18.7	18.7	18.7	55.2	55.2	55.2	26.1	26.1	26.1	3.5	3.5	3.5	2.9	2.9	2.9	8	8	8		
1	Region 16	76.5	76.5	76.5	36.1	36.1	36.1	26.7	26.7	26.7	62.6	62.6	62.6	10.7	10.7	10.7	1.4	1.4	1.4	0.9	0.9	0.9	5	5	5		
1	Region 20	76.1	76.1	76.1	29.6	29.6	29.6	16.9	16.9	16.9	66.8	66.8	66.8	16.3	16.3	16.3	0.7	0.7	0.7	0.4	0.4	0.4	4	4	4		
1	Region 29	77.5	77.5	77.5	36.0	36.0	36.0	33.5	33.5	33.5	59.0	59.0	59.0	7.5	7.5	7.5	2.3	2.3	2.3	1.7	1.7	1.7	4	4	4		
4	Mean COM	77.3			34.4			24.0	16.9		60.9	55.2		15.2	7.5		2.0	0.7		1.5	0.4		5				
	Min COM	76.1			29.6		36.1									26.1							4		8		
	Max COM			79.0					33.5			66.8															
517	Mean white	78.1	65.3		33.0	22.5		20.4	0.3		62.9	29.4		16.7	1.0		1.4	0.0		1.0	0.0		5	0			
	Min white						44.4						75.4			65.6									34		
	Max white			83.2					69.4																		
900	Mean maize	77.7	65.3		32.1	19.9		17.5	0.0		63.2	16.9		19.3	1.0		1.5	0.0		1.1	0.0		5	0			
	Min maize						46.0						77.7			77.2									38		
	Max maize			83.2					72.7																		

TABLE 18: PHYSICAL QUALITY FACTORS OF YELLOW MAIZE ACCORDING TO GRADE 2002/2003

Number of samples	Region	Hectolitre mass			100 kernel mass (g)			Kernel size (%)						Breakability (g)						Stress cracks (%)					
		kg/hl			kernel mass (g)			Above 10mm sieve			Above 8mm sieve			Below 8mm sieve			< 6.3mm sieve						< 4.75mm sieve		
		ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.
GRADE YM1																									
14	Region 10	76.8	72.2	78.9	32.8	30.3	34.4	5.6	2.4	15.6	69.5	60.7	77.5	24.9	14.4	34.3	2.1	1.1	3.8	1.7	1.1	3.4	5	2	10
17	Region 11	78.4	75.3	80.3	32.0	25.9	37.1	5.6	0.8	11.7	66.2	58.3	74.6	28.2	20.7	36.3	2.6	1.1	4.4	2.0	1.0	3.6	10	2	37
10	Region 12	76.0	72.9	79.3	28.0	22.0	32.1	8.1	4.0	12.4	63.9	58.2	70.4	27.9	18.0	35.3	1.5	0.6	2.2	1.1	0.3	1.8	5	0	15
6	Region 13	76.2	74.9	77.9	28.2	24.1	36.3	8.7	4.7	16.8	63.1	61.0	65.1	28.3	21.3	34.2	0.9	0.4	1.3	0.7	0.3	1.0	2	0	4
17	Region 14	77.1	74.5	80.3	29.0	21.6	32.8	10.9	3.3	19.0	67.0	45.0	73.9	22.0	7.1	51.7	1.5	0.7	2.9	1.2	0.5	2.5	4	0	12
11	Region 15	78.1	76.2	79.7	32.5	24.4	36.6	13.5	5.7	21.4	67.7	61.5	71.6	18.8	11.5	32.8	1.5	0.5	3.2	1.1	0.3	2.4	5	0	10
11	Region 16	77.6	75.6	79.0	31.1	28.9	33.4	16.9	12.4	24.1	66.5	61.6	71.1	16.6	9.9	25.4	1.1	0.2	2.4	0.8	0.0	1.7	6	2	14
8	Region 17	76.2	73.2	78.3	28.7	25.2	36.1	12.8	8.0	18.9	67.8	65.4	72.0	19.4	9.1	24.1	1.4	0.8	3.2	0.9	0.4	2.1	5	0	10
20	Region 18	76.8	73.5	79.2	30.5	21.8	35.3	14.2	0.5	25.3	64.5	30.7	70.5	21.3	10.3	68.8	2.1	0.6	4.3	1.6	0.4	3.2	5	0	9
8	Region 19	74.0	70.7	76.3	27.1	24.7	30.5	12.1	5.9	18.5	62.6	57.6	67.0	25.3	20.1	32.7	1.3	0.3	2.2	0.9	0.2	1.8	3	0	5
7	Region 20	76.6	72.3	80.5	30.1	27.0	34.5	16.8	2.0	35.8	63.1	50.9	70.9	20.1	9.6	47.1	1.4	0.5	3.3	1.0	0.2	2.3	3	1	5
9	Region 21	77.6	76.1	80.3	30.9	24.6	35.9	14.5	2.5	22.2	61.6	45.4	71.3	24.4	12.0	51.6	1.7	0.5	3.2	1.4	0.4	2.7	5	0	9
7	Region 22	77.2	76.5	78.0	32.4	30.3	34.7	15.4	5.1	29.7	67.1	57.5	74.4	17.5	8.5	37.4	1.9	1.1	2.8	1.5	0.8	2.3	5	0	13
15	Region 23	77.5	75.3	79.6	31.6	27.5	35.5	10.9	1.1	29.9	64.3	53.8	72.5	24.8	12.4	44.4	2.0	0.6	4.0	1.6	0.5	3.0	5	1	21
13	Region 24	77.5	72.9	79.6	31.6	24.5	36.5	13.2	3.4	21.6	65.6	56.5	71.7	21.2	12.8	36.0	1.6	0.3	3.0	1.1	0.3	2.5	4	1	7
17	Region 25	78.0	74.8	80.8	31.4	25.7	36.9	13.2	1.3	27.2	63.5	56.7	69.8	23.3	9.9	42.0	2.0	0.6	4.2	1.4	0.5	2.5	8	2	38
14	Region 26	78.7	77.0	80.6	32.2	29.5	34.3	16.2	9.4	24.5	64.1	57.3	71.7	19.8	9.3	25.6	1.3	0.5	2.2	1.1	0.5	1.6	4	2	6
7	Region 27	77.8	76.3	79.4	30.6	27.4	32.2	12.0	7.5	19.3	65.7	59.0	70.0	22.3	15.6	28.3	1.7	1.1	2.1	1.3	1.0	1.7	4	0	11
26	Region 28	78.0	70.5	80.6	33.7	28.4	46.0	19.6	5.7	34.4	62.0	16.9	77.7	18.3	5.3	67.1	1.5	0.5	3.3	1.0	0.3	2.3	6	1	33
12	Region 29	75.6	71.4	78.8	29.5	25.5	31.9	11.6	1.2	26.6	62.5	45.5	72.2	25.9	13.7	53.2	1.3	0.4	3.3	0.9	0.2	1.9	6	3	18
18	Region 30	77.5	75.4	80.3	30.3	25.9	35.5	16.6	2.6	34.5	61.3	53.3	65.3	22.1	9.0	44.1	0.9	0.0	1.9	0.6	0.0	1.3	5	0	11
10	Region 31	77.5	75.4	78.7	31.1	29.5	33.0	19.3	10.9	27.2	62.5	54.7	68.7	18.2	8.9	34.4	1.1	0.1	1.7	0.9	0.1	1.3	5	0	8
9	Region 32	77.8	77.2	78.8	32.1	27.8	35.1	21.2	9.7	36.1	63.1	56.8	69.0	15.7	7.1	27.0	1.0	0.2	2.2	0.8	0.2	1.5	5	1	10
9	Region 33	78.4	75.9	80.7	30.7	28.3	33.8	17.8	10.2	32.1	64.8	55.5	70.6	17.4	11.2	23.3	1.0	0.6	2.0	0.6	0.3	1.7	5	1	10
9	Region 34	78.1	75.7	81.9	30.6	26.6	33.4	16.7	6.5	27.3	65.8	61.1	70.0	17.5	10.2	27.1	1.5	0.5	4.3	1.2	0.4	3.6	4	1	10
1	Region 35	71.3	71.3	71.3	26.0	26.0	26.0	8.4	8.4	8.4	65.3	65.3	65.3	26.3	26.3	26.3	3.1	3.1	3.1	2.1	2.1	2.1	2	2	2
9	Region 36	75.2	69.6	77.2	33.1	25.6	42.5	26.9	6.8	72.7	53.0	23.4	67.4	20.1	3.6	40.6	0.6	0.0	1.7	0.4	0.0	1.5	5	2	8
314	Mean YM1	77.3			31.1		21.6	14.1			64.2			21.7			1.5			1.2			5		
	Min YM1	69.6						0.5			16.9			3.6			0.0			0.0			0		
	Max YM1	81.9					46.0	72.7			77.7			68.8			4.4			3.6			38		

TABLE 18: PHYSICAL QUALITY FACTORS OF YELLOW MAIZE ACCORDING TO GRADE 2002/2003 (continue)

Number of samples	Region	Hectolitre			100			Kernel size (%)						Breakability (g)						Stress cracks (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		kg/hl			kernel mass (g)			Above 10mm sieve			Above 8mm sieve			Below 8mm sieve			<6.3mm sieve			<4.75mm sieve			ave.	min.	max																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
		ave.	min.	max.	ave.	min.	max	ave.	min.	max	ave.	min.	max	ave.	min.	max	ave.	min.	max																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
GRADE YM2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									</

TABEL 18: PHYSICAL QUALITY FACTORS OF YELLOW MAIZE ACCORDING TO GRADE 2002/2003 (continue)

Number of samples	Region	Hectolitre kg/hl			100 kernel mass (g)			Kernel size (%)						Breakability (g)						Stress cracks (%)					
		ave.	min.	max.	ave.	min.	max.	Above 10mm sieve			Above 8mm sieve			< 6.3mm sieve			< 4.75mm sieve			ave.	min.	max.			
								ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.						
GRADE: YM3																									
1	Region 10	79.9	79.9	79.9	32.7	32.7	32.7	3.6	3.6	3.6	66.1	66.1	66.1	30.3	30.3	30.3	3.7	3.7	3.7	2.1	2.1	2.1	19	19	19
1	Mean YM3	79.9			32.7			3.6			66.1			30.3			3.7			2.1			19		
	Min YM3	79.9																							
	Max YM3	79.9			32.7			3.6			66.1			30.3			3.7			2.1			19		
GRADE: COM																									
1	Region 27	76.3	76.3	76.3	22.1	22.1	22.1	0.5	0.5	0.5	22.3	22.3	22.3	77.2	77.2	77.2	1.9	1.9	1.9	0.8	0.8	0.8	3	3	3
1	Region 28	75.4	75.4	75.4	30.7	30.7	30.7	2.1	2.1	2.1	75.6	75.6	75.6	22.3	22.3	22.3	2.9	2.9	2.9	2.1	2.1	2.1	9	9	9
1	Region 33	77.0	77.0	77.0	31.5	31.5	31.5	14.9	14.9	14.9	60.8	60.8	60.8	24.3	24.3	24.3	0.9	0.9	0.9	0.9	0.9	0.9	3	3	3
1	Region 36	77.0	77.0	77.0	43.4	43.4	43.4	70.1	70.1	70.1	28.6	28.6	28.6	1.3	1.3	1.3	0.8	0.8	0.8	0.4	0.4	0.4	4	4	4
4	Mean COM	76.4			31.9			21.9	0.5		46.8	22.3		31.3	1.3		1.6	0.8		1.1	0.4		5		
	Min COM	75.4			22.1																	3			
	Max COM	77.0			43.4			70.1			75.6			77.2				2.9			2.1			9	
383	Mean Yellow	77.2			30.8			13.5	0.0		63.6	16.9		22.9	1.3		1.6	0.0		1.2	0.0		5	0	
	Min Yellow	68.6			19.9																				
	Max Yellow	81.9			46.0			72.7			77.7			77.2				5.5			4.4			38	
900	Mean maize	77.7			32.1			17.5	0.0		63.2	16.9		19.3	1.0		1.5	0.0		1.1	0.0		5	0	
	Min maize	65.3			19.9																				
	Max maize	83.2			46.0			72.7			77.7			77.2				21.4			21.0			38	

TABLE 19: PHYSICAL QUALITY FACTORS OF YELLOW AND WHITE MAIZE 2002/2003

Number of samples	Region	Hectolitre mass			100			Kernel size (%)						Breakability (g)						Stress cracks (%)											
		kg/hl			kernel mass (g)			Above 10mm sieve			Above 8mm sieve			Below 8mm sieve			< 6.3mm sieve			< 4.75mm sieve			ave.			min.			max		
		ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.			
WHITE																															
7	Region 10	80.5	79.0	82.0	31.7	28.7	35.3	3.7	1.1	8.2	52.3	36.5	71.2	44.0	26.7	58.9	0.7	0.3	1.1	0.5	0.3	0.8	3	0	5						
15	Region 11	80.4	78.7	83.2	32.7	29.3	35.9	16.5	0.3	28.3	55.5	34.1	67.5	28.0	10.6	65.6	2.1	0.2	3.8	1.6	0.1	2.9	7	0	23						
16	Region 12	77.6	75.9	79.6	33.2	26.3	41.3	23.7	10.7	44.2	62.6	51.6	69.3	13.7	4.2	23.3	1.2	0.4	2.2	0.9	0.2	1.3	6	0	11						
9	Region 13	77.3	75.2	78.4	29.9	25.8	33.9	15.1	9.5	19.7	66.9	64.1	69.7	18.0	14.8	21.3	1.0	0.4	2.0	0.6	0.3	1.1	2	0	6						
35	Region 14	78.1	72.3	80.2	32.5	24.5	36.6	20.8	8.8	32.7	64.7	56.6	70.8	14.4	5.3	28.2	0.9	0.1	3.0	0.6	0.0	2.1	3	1	15						
16	Region 15	79.3	77.9	80.6	33.3	29.0	37.3	13.2	1.9	28.0	61.3	50.9	71.9	25.5	12.5	47.2	1.1	0.3	4.0	1.0	0.3	4.0	5	0	15						
23	Region 16	78.1	75.8	80.6	33.0	27.7	36.1	20.9	6.3	38.1	65.2	51.6	75.4	13.8	7.3	26.3	1.7	0.4	5.6	1.2	0.2	3.7	5	0	15						
23	Region 17	77.6	75.7	79.2	30.3	24.7	36.0	17.8	10.1	38.2	64.0	51.8	71.1	18.2	8.6	30.4	1.4	0.3	11.0	1.2	0.2	11.0	4	0	11						
40	Region 18	77.9	72.9	79.9	32.7	28.0	38.1	21.5	11.7	40.2	64.4	51.9	72.1	14.0	7.1	20.4	1.7	0.6	4.9	1.2	0.0	3.8	5	0	28						
16	Region 19	75.3	68.9	80.7	29.4	22.5	35.5	13.6	3.0	25.0	63.8	51.3	70.1	22.6	12.2	45.5	0.9	0.3	1.6	0.7	0.3	1.3	3	0	9						
10	Region 20	76.8	74.1	78.3	30.9	28.1	33.9	19.9	10.7	34.5	65.5	58.5	68.9	14.6	7.0	22.8	1.0	0.3	2.0	0.8	0.1	1.7	4	2	6						
32	Region 21	78.1	76.1	81.1	33.0	29.1	39.8	19.0	6.4	30.5	65.6	58.7	71.5	15.4	6.8	34.9	1.3	0.0	3.5	1.0	0.0	2.5	3	0	10						
37	Region 22	78.5	76.8	80.6	34.7	31.5	38.9	24.7	11.5	32.7	63.4	54.4	69.7	11.9	5.7	21.1	1.4	0.2	10.1	1.1	0.2	9.8	4	0	11						
35	Region 23	78.5	68.6	81.0	34.3	28.7	37.4	19.3	2.3	37.4	64.1	45.8	72.6	16.6	6.7	46.6	1.7	0.3	6.4	1.1	0.0	4.9	4	0	15						
29	Region 24	78.5	75.7	80.5	34.3	28.4	41.2	21.0	1.3	51.8	61.8	43.9	73.8	117.2	4.1	46.7	1.6	0.4	3.5	1.2	0.3	2.9	5	0	20						
18	Region 25	77.6	72.0	79.8	32.4	26.7	37.9	15.8	1.7	37.9	63.9	51.8	71.7	20.3	7.3	46.5	1.9	0.7	6.4	1.4	0.6	4.6	5	0	13						
17	Region 26	78.7	77.5	80.2	34.0	31.3	37.9	18.9	9.5	38.5	65.6	51.6	71.2	15.5	9.9	24.8	2.6	0.7	21.4	2.3	0.2	21.0	4	0	9						
9	Region 27	79.0	76.7	80.8	33.2	29.5	38.9	18.4	5.9	36.6	62.8	55.2	69.5	18.8	8.2	29.8	1.3	0.4	2.5	1.0	0.2	1.5	6	0	20						
20	Region 28	77.9	70.4	80.3	34.4	28.5	39.8	26.5	4.0	41.0	59.1	48.1	73.3	14.4	7.3	32.7	1.3	0.3	3.5	0.7	0.1	1.5	7	0	24						
15	Region 29	78.0	76.2	79.6	32.5	28.6	36.2	25.1	11.8	54.2	60.6	39.9	68.0	14.3	5.8	26.8	1.3	0.1	3.1	0.9	0.0	2.1	5	1	14						
22	Region 30	77.5	69.9	79.7	32.5	27.8	44.0	25.5	10.9	60.1	61.0	38.9	69.7	13.5	1.0	30.6	1.2	0.1	2.7	0.8	0.0	1.8	7	0	27						
11	Region 31	78.0	76.3	79.2	33.1	30.8	36.7	23.8	8.6	37.9	59.3	52.5	66.6	16.9	7.3	25.8	1.0	0.3	1.8	0.8	0.3	1.5	4	1	11						
12	Region 32	78.8	78.0	79.7	33.9	30.1	41.1	25.7	15.9	39.6	61.9	53.5	70.4	12.5	6.3	21.3	1.1	0.1	2.7	0.8	0.0	2.4	6	1	23						
14	Region 33	76.6	65.3	80.8	33.6	28.2	42.0	26.9	7.9	69.4	60.7	29.4	73.7	12.5	1.2	18.8	0.8	0.1	1.6	0.6	0.0	1.2	4	0	14						
18	Region 34	78.5	77.0	80.6	33.5	24.3	39.3	20.3	6.6	39.1	63.9	52.4	72.1	15.8	6.7	35.8	1.7	0.1	4.3	1.3	0.0	3.3	5	0	14						
8	Region 35	77.4	75.4	78.3	29.8	25.7	34.4	12.4	2.5	24.5	60.0	41.5	68.9	27.6	9.3	54.8	1.0	0.1	1.6	0.8	0.1	1.4	3	0	5						
10	Region 36	77.3	74.9	78.4	35.1	29.4	44.4	20.9	4.6	37.6	62.0	53.2	65.8	17.1	5.5	37.9	2.1	0.4	6.1	1.6	0.3	5.0	10	1	34						
517	Mean white	78.1			33.0			20.4			62.9			16.7			1.4			1.0			5								
	Min white	65.3			22.5			0.3			29.4			1.0			0.0			0.0			0								
	Max white	83.2			44.4			69.4			75.4			65.6			21.4			21.0			34								

TABLE 19: PHYSICAL QUALITY FACTORS OF YELLOW AND WHITE MAIZE 2002/2003 (continue)

Number of samples	Region	Hectolitre kg/hl			100 kernel mass (g)			Kernel size (%)						Breakability (g)						Stress cracks (%)					
		ave.	min.	max.	kernel mass (g)			Above 10mm sieve			Above 8mm sieve			Below 8mm sieve			< 6.3mm sieve			< 4.75mm sieve			ave.	min.	max.
					ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.	ave.	min.	max.			
YELLOW																									
17	Region 10	77.1	72.2	79.9	32.9	30.3	34.7	5.8	2.4	15.6	69.7	60.7	77.5	24.5	14.4	34.3	2.2	0.5	3.9	1.8	0.5	3.4	6	2	19
28	Region 11	78.0	75.3	80.3	31.8	25.9	37.1	5.5	0.8	20.4	65.4	51.5	74.6	29.0	12.2	45.6	2.8	0.8	4.5	2.1	0.4	3.6	10	0	37
13	Region 12	76.0	72.9	79.3	28.8	22.0	37.7	8.9	4.0	12.7	65.0	58.2	71.2	26.0	16.1	35.3	1.7	0.6	5.3	1.2	0.3	3.5	7	0	25
9	Region 13	75.6	72.3	77.9	26.7	20.5	36.3	7.9	0.0	17.4	60.0	38.3	67.8	32.1	14.8	61.7	1.1	0.4	2.7	0.8	0.3	1.3	2	0	4
25	Region 14	77.0	70.5	80.3	29.5	21.6	32.9	11.5	3.2	19.0	67.6	45.0	74.7	20.8	7.1	51.7	1.5	0.7	5.5	1.2	0.5	4.0	4	0	12
11	Region 15	78.1	76.2	79.7	32.5	24.4	36.6	13.5	5.7	21.4	67.7	61.5	71.6	18.8	11.5	32.8	1.5	0.5	3.2	1.1	0.3	2.4	5	0	10
14	Region 16	78.1	75.6	81.2	31.1	28.9	34.3	17.5	12.4	29.5	66.7	61.6	71.1	15.9	4.9	25.4	1.0	0.2	2.4	0.7	0.0	1.7	6	2	14
11	Region 17	75.6	68.6	78.3	27.8	19.9	36.1	11.5	2.6	18.9	65.5	47.9	72.0	23.0	9.1	49.5	1.4	0.8	3.2	1.0	0.4	2.1	4	0	10
21	Region 18	76.7	73.5	79.2	30.5	21.8	35.3	13.9	0.5	25.3	64.7	30.7	70.5	21.4	10.3	68.8	2.1	0.6	4.3	1.6	0.4	3.2	5	0	9
10	Region 19	73.8	70.7	76.3	26.5	23.0	30.5	10.8	2.8	18.5	60.7	48.2	67.0	28.5	20.1	49.0	1.3	0.3	2.2	1.0	0.2	1.8	3	0	5
8	Region 20	76.0	72.3	80.5	29.8	27.0	34.5	16.4	2.0	35.8	62.7	50.9	70.9	20.9	9.6	47.1	1.6	0.5	3.3	1.1	0.2	2.3	3	1	5
10	Region 21	77.3	74.4	80.3	30.7	24.6	35.9	14.7	2.5	22.2	61.9	45.4	71.3	23.3	12.0	51.6	1.8	0.5	3.2	1.5	0.4	2.7	5	0	9
10	Region 22	77.3	76.5	78.0	32.8	29.7	36.4	17.0	5.1	31.4	65.3	56.7	74.4	17.7	8.5	37.4	2.0	1.1	3.5	1.6	0.6	3.0	6	0	16
17	Region 23	77.6	75.3	79.6	31.4	27.5	35.5	10.6	1.1	29.9	64.4	53.8	72.5	25.0	12.4	44.4	1.9	0.6	4.0	1.5	0.5	3.0	5	0	21
15	Region 24	77.6	72.9	79.6	31.5	24.5	36.5	12.0	3.4	21.6	65.3	56.5	71.7	22.7	12.8	36.0	1.7	0.3	3.0	1.2	0.3	2.5	5	1	9
21	Region 25	78.1	74.8	80.8	31.1	25.7	36.9	12.2	1.3	27.2	62.3	48.9	69.8	25.5	9.9	49.1	1.9	0.6	4.2	1.3	0.5	2.5	7	2	38
15	Region 26	78.6	77.0	80.6	31.5	22.5	34.3	15.1	0.6	24.5	63.2	50.8	71.7	21.7	9.3	48.6	1.3	0.5	2.2	1.0	0.4	1.6	4	2	6
8	Region 27	77.7	76.3	79.4	29.6	22.1	32.2	10.6	0.5	19.3	60.3	22.3	70.0	29.2	15.6	77.2	1.7	1.1	2.1	1.2	0.8	1.7	4	0	11
29	Region 28	78.0	70.5	80.6	33.4	28.4	46.0	18.6	2.1	34.4	62.4	16.9	77.7	19.0	5.3	67.1	1.5	0.5	3.3	1.0	0.3	2.3	6	1	33
14	Region 29	75.5	71.4	78.8	29.3	25.5	31.9	11.1	1.2	26.6	62.1	45.5	72.2	26.8	13.7	53.2	1.6	0.4	3.9	1.1	0.2	2.8	7	3	18
23	Region 30	77.3	73.8	80.3	30.1	24.0	35.5	16.3	1.7	34.5	60.0	39.1	66.4	23.7	9.0	59.2	1.0	0.0	1.9	0.7	0.0	1.3	6	0	17
11	Region 31	77.2	73.8	78.7	30.7	26.2	33.0	17.6	0.5	27.2	61.7	53.8	68.7	20.7	8.9	45.7	1.3	0.1	3.0	1.0	0.1	2.0	6	0	10
9	Region 32	77.8	77.2	78.8	32.1	27.8	35.1	21.2	9.7	36.1	63.1	56.8	69.0	15.7	7.1	27.0	1.0	0.2	2.2	0.8	0.2	1.5	5	1	10
11	Region 33	78.2	75.9	80.7	30.8	28.3	33.8	16.3	4.0	32.1	64.4	55.5	70.6	19.3	11.2	31.3	1.4	0.6	5.4	1.0	0.3	4.4	5	1	13
10	Region 34	77.7	73.8	81.9	30.6	26.6	33.4	17.0	6.5	27.3	65.7	61.1	70.0	17.3	10.2	27.1	1.7	0.5	4.3	1.3	0.4	3.6	4	1	10
3	Region 35	73.1	71.3	75.4	23.5	20.2	26.0	3.7	0.6	8.4	49.7	36.7	65.3	46.6	26.3	62.7	2.3	1.9	3.1	1.4	0.8	2.1	3	2	4
10	Region 36	75.4	69.6	77.2	34.1	25.6	43.4	31.2	6.8	72.7	50.6	23.4	67.4	18.2	1.3	40.6	0.6	0.0	1.7	0.4	0.0	1.5	5	2	8
383	Mean YM 2	77.2	68.6	81.9	30.8	19.9	46.0	13.5	0.0	72.7	63.6	16.9	77.7	22.9	1.3	77.2	1.6	0.0	5.5	1.2	0.0	4.4	5	0	38
	Min YM 2																								
	Max YM 2																								

TABEL 19: PHYSICAL QUALITY FACTORS OF YELLOW AND WHITE MAIZE 2002/2003 (continue)

Number of samples	Region	Hectolitre			100			Kernel size (%)						Breakability (g)						Stress cracks (%)											
		kg/hl			kernel mass (g)			Above 10mm sieve			Above 8mm sieve			Below 8mm sieve			< 6.3mm sieve			< 4.75mm sieve			ave.			min.			max		
		ave.	min.	max	ave.	min.	max	ave.	min.	max	ave.	min.	max	ave.	min.	max	ave.	min.	max	ave.	min.	max	ave.	min.	max	ave.	min.	max			
WHITE AND YELLOW																															
24	Region 10	78.1	72.2	82.0	32.6	28.7	35.3	5.2	1.1	15.6	64.7	36.5	77.5	30.2	14.4	58.9	1.8	0.3	3.9	1.4	0.3	3.4	5	0	19						
43	Region 11	78.9	75.3	83.2	32.1	25.9	37.1	9.4	0.3	28.3	62.0	34.1	74.6	28.7	10.6	65.6	2.5	0.2	4.5	1.9	0.1	3.6	9	0	37						
29	Region 12	76.9	72.9	79.6	31.3	22.0	41.3	17.1	4.0	44.2	63.7	51.6	71.2	19.2	4.2	35.3	1.4	0.4	5.3	1.0	0.2	3.5	6	0	25						
18	Region 13	76.5	72.3	78.4	28.3	20.5	36.3	11.5	0.0	19.7	63.5	38.3	69.7	25.0	14.8	61.7	1.1	0.4	2.7	0.7	0.3	1.3	2	0	6						
60	Region 14	77.7	70.5	80.3	31.3	21.6	36.6	16.9	3.2	32.7	65.9	45.0	74.7	17.1	5.3	51.7	1.1	0.1	5.5	0.9	0.0	4.0	3	0	15						
27	Region 15	78.8	76.2	80.6	33.0	24.4	37.3	13.3	1.9	28.0	63.9	50.9	71.9	22.8	11.5	47.2	1.3	0.3	4.0	1.0	0.3	4.0	5	0	15						
37	Region 16	78.1	75.6	81.2	32.3	27.7	36.1	19.6	6.3	38.1	65.8	51.6	75.4	14.6	4.9	26.3	1.4	0.2	5.6	1.0	0.0	3.7	6	0	15						
34	Region 17	77.0	68.6	79.2	29.5	19.9	36.1	15.8	2.6	38.2	64.5	47.9	72.0	19.8	8.6	49.5	1.4	0.3	11.0	1.2	0.2	11.0	4	0	11						
61	Region 18	77.5	72.9	79.9	32.0	21.8	38.1	18.9	0.5	40.2	64.5	30.7	72.1	16.6	7.1	68.8	1.8	0.6	4.9	1.3	0.0	3.8	5	0	28						
26	Region 19	74.7	68.9	80.7	28.3	22.5	35.5	12.5	2.8	25.0	62.6	48.2	70.1	24.9	12.2	49.0	1.1	0.3	2.2	0.8	0.2	1.8	3	0	9						
18	Region 20	76.5	72.3	80.5	30.4	27.0	34.5	18.3	2.0	35.8	64.3	50.9	70.9	17.4	7.0	47.1	1.3	0.3	3.3	0.9	0.1	2.3	3	1	6						
42	Region 21	77.9	74.4	81.1	32.4	24.6	39.8	18.0	2.5	30.5	64.7	45.4	71.5	17.3	6.8	51.6	1.4	0.0	3.5	1.1	0.0	2.7	3	0	10						
47	Region 22	78.3	76.5	80.6	34.3	29.7	38.9	23.1	5.1	32.7	63.8	54.4	74.4	13.1	5.7	37.4	1.5	0.2	10.1	1.2	0.2	9.8	4	0	16						
52	Region 23	78.2	68.6	81.0	33.4	27.5	37.4	16.5	1.1	37.4	64.2	45.8	72.6	19.4	9.7	46.6	1.6	0.3	6.4	1.2	0.0	4.9	5	0	21						
44	Region 24	78.2	72.9	80.5	33.3	24.5	41.2	17.9	1.3	51.8	63.0	43.9	73.8	19.1	4.1	46.7	1.7	0.3	3.5	1.2	0.3	2.9	5	0	20						
39	Region 25	77.9	72.0	80.8	31.7	25.7	37.9	13.8	1.3	37.9	63.0	48.9	71.7	23.1	7.3	49.1	1.9	0.6	6.4	1.3	0.5	4.6	6	0	38						
32	Region 26	78.7	77.0	80.6	32.9	22.5	37.9	17.2	0.6	38.5	64.5	50.8	71.7	18.4	9.3	48.6	2.0	0.5	21.4	1.7	0.2	21.0	4	0	9						
17	Region 27	78.4	76.3	80.8	31.5	22.1	38.9	14.7	0.5	36.6	61.6	22.3	70.0	23.7	8.2	77.2	1.5	0.4	2.5	1.1	0.2	1.7	5	0	20						
49	Region 28	78.0	70.4	80.6	33.8	28.4	46.0	21.9	2.1	41.0	61.0	16.9	77.7	17.1	5.3	67.1	1.4	0.3	3.5	0.9	0.1	2.3	6	0	33						
29	Region 29	76.8	71.4	79.6	31.0	25.5	36.2	18.3	1.2	54.2	61.4	39.9	72.2	20.3	5.8	53.2	1.4	0.1	3.9	1.0	0.0	2.8	6	1	18						
45	Region 30	77.4	69.9	80.3	31.3	24.0	44.0	20.8	1.7	60.1	60.5	38.9	69.7	18.7	1.0	59.2	1.1	0.0	2.7	0.7	0.0	1.8	7	0	27						
22	Region 31	77.6	73.8	79.2	31.9	26.2	36.7	20.7	0.5	37.9	60.5	52.5	68.7	18.8	7.3	45.7	1.1	0.1	3.0	0.9	0.1	2.0	5	0	11						
21	Region 32	78.4	77.2	79.7	33.1	27.8	41.1	23.8	9.7	39.6	62.4	53.5	70.4	13.9	6.3	27.0	1.0	0.1	2.7	0.8	0.0	2.4	6	1	23						
25	Region 33	77.3	65.3	80.8	32.4	28.2	42.0	22.2	4.0	69.4	62.3	29.4	73.7	15.5	1.2	31.3	1.1	0.1	5.4	0.8	0.0	4.4	5	0	14						
27	Region 34	78.2	73.8	81.9	32.6	24.3	39.3	19.6	6.5	39.1	64.8	52.4	72.1	15.6	6.7	27.1	1.7	0.1	4.3	1.3	0.0	3.6	4	0	14						
11	Region 35	76.2	71.3	78.3	28.1	20.2	34.4	10.0	0.6	24.5	57.2	36.7	68.9	32.8	9.3	62.7	1.4	0.1	3.1	1.0	0.1	2.1	3	0	5						
20	Region 36	76.4	69.6	78.4	34.6	25.6	44.4	26.0	4.6	72.7	56.3	23.4	67.4	17.7	1.3	40.6	1.3	0.0	6.1	1.0	0.0	5.0	7	1	34						
984	Mean white & yellow	77.7			32.1			17.5			63.2			19.3			1.1						5								
	Min white & yellow	65.3			19.9			0.0			16.9			1.0			0.0			21.4			0								
	Max white & yellow	83.2			46.0			72.7			77.7			77.2			77.2			21.0			38								

TABLE 20: MILLING- AND WHITENESS INDEX OF WHITE MAIZE ACCORDING TO GRADE (2002/2003)

Number of samples	Region	Milling index			Whiteness index unsifted			Whiteness index sifted 87:13			Number of samples	Region	Milling index			Whiteness index unsifted			Whiteness index sifted 87:13		
		ave.	min.	max.	ave.	min.	max.	ave.	min.	max.			ave.	min.	max.	ave.	min.	max.	ave.	min.	max.
GRADE: WHITE																					
7	Region 10	114.7	105.0	120.7	23.3	13.7	26.7	16.1	4.6	21.3	7	Region 10	114.7	105.0	120.7	23.3	13.7	26.7	16.1	4.6	21.3
15	Region 11	115.7	108.2	122.8	25.9	20.4	30.5	17.3	9.2	23.6	13	Region 11	114.9	108.2	122.8	26.2	20.4	30.5	17.3	9.2	23.6
16	Region 12	110.2	101.4	116.6	28.1	24.6	31.8	20.1	13.2	26.3	15	Region 12	110.2	101.4	116.6	28.3	24.6	31.8	20.6	14.3	26.3
9	Region 13	107.4	100.1	113.3	29.8	26.8	33.2	21.5	18.1	24.1	6	Region 13	109.0	100.5	113.3	29.9	26.8	33.2	21.7	18.1	24.1
35	Region 14	110.2	97.8	118.5	26.4	18.7	33.0	19.1	10.3	23.6	30	Region 14	110.8	97.8	118.5	26.8	20.7	33.0	19.4	15.0	23.6
16	Region 15	110.2	104.0	126.0	25.2	19.2	32.5	18.1	13.8	23.3	15	Region 15	110.6	104.6	126.0	25.6	21.3	32.5	17.9	13.8	23.3
23	Region 16	110.7	100.4	119.1	24.1	19.3	33.6	17.9	9.4	26.5	18	Region 16	110.3	100.4	118.9	23.8	19.6	32.6	17.8	12.8	26.5
23	Region 17	110.3	102.8	117.3	28.4	24.2	33.3	20.2	16.5	22.8	21	Region 17	110.5	102.8	117.3	28.6	24.2	33.3	20.3	16.9	22.8
40	Region 18	110.4	99.8	120.6	28.9	22.7	34.3	20.4	10.2	24.7	34	Region 18	111.0	102.5	120.6	28.7	22.7	34.3	20.3	10.2	24.7
16	Region 19	109.2	99.7	116.3	30.3	24.2	34.8	21.2	16.7	24.7	10	Region 19	108.1	99.7	114.3	31.3	28.6	34.8	22.1	17.4	24.7
10	Region 20	106.4	98.7	113.2	29.9	16.3	33.6	22.4	20.8	24.0	7	Region 20	108.3	102.3	113.2	31.4	28.4	33.6	22.6	20.8	24.0
32	Region 21	110.3	102.1	119.2	27.2	23.6	30.6	19.7	14.2	27.7	32	Region 21	110.3	102.1	119.2	27.2	23.6	30.6	19.7	14.2	27.7
37	Region 22	109.5	102.9	120.3	26.9	16.7	31.4	19.4	13.0	24.1	37	Region 22	109.5	102.9	120.3	26.9	16.7	31.4	19.4	13.0	24.1
35	Region 23	108.8	93.0	118.4	26.8	12.4	32.2	18.9	14.7	25.5	31	Region 23	108.9	93.0	118.4	27.5	23.3	32.2	19.2	14.7	25.5
29	Region 24	109.1	98.2	117.4	27.1	22.1	33.0	17.9	11.7	22.4	26	Region 24	109.4	98.2	117.4	27.5	23.7	33.0	18.1	11.7	22.4
18	Region 25	102.7	75.4	113.8	26.7	17.0	33.6	18.2	9.5	25.4	15	Region 25	102.1	75.4	111.4	26.7	17.0	33.6	17.9	9.5	25.4
17	Region 26	111.2	99.9	117.3	26.1	21.6	30.9	18.0	14.5	22.4	16	Region 26	111.2	99.9	117.3	26.4	21.6	30.9	18.2	14.5	22.4
9	Region 27	112.7	104.3	117.9	27.2	17.3	30.0	19.3	9.6	23.4	8	Region 27	112.0	104.3	117.4	26.8	17.3	30.0	19.1	9.6	23.4
20	Region 28	108.3	101.0	115.5	25.4	20.6	30.3	16.8	11.5	21.9	19	Region 28	108.2	101.0	115.5	25.5	20.6	30.3	16.9	11.5	21.9
15	Region 29	108.0	97.5	117.7	26.5	19.2	34.0	15.1	4.6	23.1	12	Region 29	108.4	97.5	117.7	26.9	21.3	34.0	15.4	4.6	23.1
22	Region 30	103.7	94.0	113.0	29.7	24.2	36.8	19.8	14.8	24.9	20	Region 30	103.2	94.0	113.0	29.5	24.2	36.8	19.7	14.8	24.9
11	Region 31	107.0	99.7	112.9	27.7	22.4	34.7	18.3	11.7	24.8	10	Region 31	106.9	99.7	112.9	27.5	22.4	34.7	18.7	11.7	24.8
12	Region 32	113.2	102.3	128.2	24.4	13.5	32.1	14.6	2.2	21.8	10	Region 32	112.6	102.3	128.2	26.2	14.6	32.1	16.8	6.9	21.8
14	Region 33	104.4	81.1	120.8	27.9	19.6	32.0	17.5	6.7	22.4	14	Region 33	104.4	81.1	120.8	27.9	19.6	32.0	17.5	6.7	22.4
18	Region 34	108.4	83.4	117.9	28.1	23.1	33.1	19.1	15.8	23.9	17	Region 34	109.9	103.5	117.9	27.8	23.1	33.1	18.8	15.8	22.2
8	Region 35	108.4	101.9	115.8	30.8	27.0	34.7	22.7	19.4	26.5	8	Region 35	108.4	101.9	115.8	30.8	27.0	34.7	22.7	19.4	26.5
10	Region 36	106.5	101.8	110.4	31.9	28.5	34.3	22.3	19.4	24.6	10	Region 36	106.5	101.8	110.4	31.9	28.5	34.3	22.3	19.4	24.6
601	Mean white	109.2	75.4	128.2	27.3	12.4	36.8	19.0	2.2	27.7	461	Mean WMI	109.3	75.4	128.2	27.5	13.7	36.8	19.1	4.6	27.7
	Min white											Min WMI									
	Max white											Max WMI									

**TABLE 20: MILLING- AND WHITENESS INDEX OF WHITE MAIZE ACCORDING
TO GRADE (2002/2003) (continue)**

Number of samples	Region	Milling index			Whiteness index unsifted			Whiteness index sifted 87:13			Number of samples	Milling index			Whiteness index unsifted			Whiteness index sifted 87:13				
		ave.	min.	max.	ave.	min.	max.	ave.	min.	max.		ave.	min.	max.	ave.	min.	max.	ave.	min.	max.		
GRADE: WM2																						
1	Region 11	121.4	121.4	121.4	24.3	24.3	24.3	14.9	14.9	14.9	GRADE: WM3	1	Region 12	111.5	111.5	111.5	25.6	25.6	25.6	13.2	13.2	13.2
3	Region 13	104.1	100.1	107.2	29.6	27.5	32.1	21.1	19.2	23.6		2	Region 14	102.8	101.8	103.8	21.6	18.7	24.5	14.2	10.3	18.0
3	Region 14	108.9	104.3	112.8	26.1	24.0	28.5	19.9	16.4	23.4		2	Region 23	103.4	93.3	113.4	18.0	12.4	23.5	15.7	15.7	15.7
1	Region 15	104.0	104.0	104.0	19.2	19.2	19.2	19.9	9.9	9.9		5	Mean WM3	104.8	93.3	113.4	20.9	12.4	25.6	14.3	10.3	18.0
4	Region 16	110.6	101.9	119.1	24.4	19.3	33.6	17.1	9.4	23.9		Min WM3										
2	Region 17	108.7	107.4	109.9	27.0	26.1	27.8	18.8	16.5	21.1		Max WM3										
6	Region 18	107.0	99.8	111.8	30.1	27.5	32.0	21.1	16.7	23.3	GRADE: COM	1	Region 11	120.5	120.5	120.5	24.8	24.8	24.8	19.1	19.1	19.1
6	Region 19	111.1	108.2	116.3	28.7	24.2	32.1	19.8	16.7	22.1		1	Region 16	118.2	118.2	118.2	28.0	28.0	28.0	21.1	21.1	21.1
2	Region 20	100.2	98.7	101.7	31.3	30.0	32.7	21.7	21.3	22.0		1	Region 20	105.9	105.9	105.9	16.3	16.3	16.3	0.0	0.0	0.0
2	Region 23	113.7	109.1	118.2	24.1	24.0	24.1	15.9	15.8	16.0		1	Region 29	103.6	103.6	103.6	28.8	28.8	28.8	17.9	17.9	17.9
3	Region 24	106.6	101.9	109.1	24.2	22.1	28.5	15.7	13.6	19.1	4	Mean COM	112.1	103.6	120.5	24.5	16.3	28.8	19.4	17.9	21.1	
3	Region 25	105.6	99.7	113.8	26.6	22.3	30.9	19.9	17.3	22.1		Min COM										
1	Region 26	112.5	112.5	112.5	21.7	21.7	21.7	15.4	15.4	15.4		Max COM										
1	Region 27	117.9	117.9	117.9	30.0	30.0	30.0	21.3	21.3	21.3	Mean white maize Min white maize Max white maize	517	Mean white maize	109.2	75.4	128.2	27.3	12.4	36.8	19.0	2.2	27.7
1	Region 28	110.1	110.1	110.1	24.4	24.4	24.4	15.4	15.4	15.4			Min white maize									
2	Region 29	108.1	105.4	110.8	23.6	19.2	27.9	11.6	8.6	14.6			Max white maize									
2	Region 30	108.7	108.1	109.2	31.5	26.3	36.8	21.0	17.8	24.2												
1	Region 31	107.3	107.3	107.3	29.5	29.5	29.5	14.2	14.2	14.2												
2	Region 32	116.3	111.0	121.5	15.9	13.5	18.3	3.6	2.2	5.0												
1	Region 34	83.4	83.4	83.4	32.4	32.4	32.4	23.9	23.9	23.9												
47	Mean WM2	108.4			26.8			18.2														
	Min WM2		83.4		13.5			2.2														
	Max WM2			121.5		36.8				24.2												

TABLE 21: MILLING INDEX OF YELLOW MAIZE ACCORDING TO GRADE (2002/2003) (continue)

Number of samples	Region	Milling index			Number of samples	Region	Milling index			Number of samples	Region	Milling index			Number of samples	Region	Milling index		
		ave.	min.	max.			ave.	min.	max.			ave.	min.	max.			ave.	min.	max.
GRADE YM1																			
14	Region 10	84.9	70.7	97.0	2	Region 10	83.4	66.8	99.9	1	Region 10	115.0	115.0	115.0	1	Region 27	102.2	102.2	102.2
17	Region 11	100.5	71.3	107.1	11	Region 11	99.7	85.7	112.6						1	Region 28	86.3	86.3	86.3
10	Region 12	104.4	89.4	112.2	3	Region 12	99.5	93.6	105.7						1	Region 33	92.0	92.0	92.0
6	Region 13	104.2	93.5	111.3	3	Region 13	95.6	90.1	99.8						1	Region 36	107.7	107.7	107.7
17	Region 14	109.9	104.2	129.2	8	Region 14	104.3	70.2	113.2										
11	Region 15	104.4	88.8	125.3	3	Region 16	116.8	115.1	119.1										
11	Region 16	109.0	96.6	117.2	3	Region 17	105.9	105.1	106.3										
8	Region 17	105.8	96.4	116.9	1	Region 18	107.2	107.2	107.2										
20	Region 18	105.9	91.2	116.0	2	Region 19	104.3	98.9	109.6										
8	Region 19	97.1	70.2	109.9	1	Region 20	73.9	73.9	73.9										
7	Region 20	101.5	70.4	124.0	1	Region 21	107.2	107.2	107.2										
9	Region 21	109.1	99.6	121.3	3	Region 22	112.9	102.0	118.5										
7	Region 22	103.2	92.0	115.7	2	Region 23	102.7	97.3	108.1										
15	Region 23	103.5	92.5	117.9	2	Region 24	97.3	93.5	101.1										
13	Region 24	103.1	81.7	114.0	4	Region 25	103.6	98.1	108.0										
17	Region 25	101.9	86.7	113.7	1	Region 26	104.1	104.1	104.1										
14	Region 26	107.2	100.8	115.3	2	Region 28	112.9	107.1	118.7										
7	Region 27	105.5	87.1	116.9	2	Region 29	95.4	88.6	102.1										
26	Region 28	105.2	85.1	115.4	5	Region 30	100.9	81.3	112.7										
12	Region 29	97.7	86.3	104.0	1	Region 31	83.8	83.8	83.8										
18	Region 30	101.3	85.8	114.1	1	Region 33	91.1	91.1	91.1										
10	Region 31	104.7	95.7	110.0	1	Region 34	97.7	97.7	97.7										
9	Region 32	103.9	98.7	111.7	2	Region 35	94.7	87.7	101.7										
9	Region 33	105.9	94.9	124.9															
9	Region 34	107.6	100.1	117.7															
1	Region 35	79.8	79.8	79.8															
9	Region 36	94.2	55.8	104.4															
314	Mean YM1	103.1			64	Mean YM2	101.4			1	Mean YM3	115.0			4	Mean COM	97.1		
	Min YM1	55.8				Min YM2	66.8				Min YM3	115.0				Min COM	86.3		
	Max YM1	129.2				Max YM2	119.1				Max YM3	115.0				Max COM	107.7		

TABLE 22: MILLING INDEX OF WHITE AND YELLOW MAIZE (2002/2003) (continue)

Number of samples	Region	Milling index			Number of samples	Region	Milling index			Number of samples	Region	Milling index		
		ave.	min.	max.			ave.	min.	max.			ave.	min.	max.
White														
7	Region 10	114.7	105.0	120.7	Yellow	Region 10	86.5	66.8	115.0	24	Region 10	94.7	66.8	120.7
15	Region 11	115.7	108.2	122.8		Region 11	100.2	71.3	112.6	43	Region 11	105.6	71.3	122.8
16	Region 12	110.2	101.4	116.6		Region 12	103.3	89.4	112.2	29	Region 12	107.1	89.4	116.6
9	Region 13	107.4	100.1	113.3		Region 13	101.3	90.1	111.3	18	Region 13	104.4	90.1	113.3
35	Region 14	110.2	97.8	118.5		Region 14	108.1	70.2	129.2	60	Region 14	109.3	70.2	129.2
16	Region 15	110.2	104.0	126.0		Region 15	104.4	88.8	125.3	27	Region 15	107.8 ₄	88.8	126.0
23	Region 16	110.7	100.4	119.1		Region 16	110.7	96.6	119.1	37	Region 16	110.7	96.6	119.1
23	Region 17	110.3	102.8	117.3		Region 17	105.8	96.4	116.9	34	Region 17	108.9	96.4	117.3
40	Region 18	110.4	99.8	120.6		Region 18	106.0	91.2	116.0	61	Region 18	108.9	91.2	120.6
16	Region 19	109.2	99.7	116.3		Region 19	98.5	70.2	109.9	26	Region 19	105.1	70.2	116.3
10	Region 20	106.4	98.7	113.2	Region 20	98.1	70.4	124.0	18	Region 20	102.7	70.4	124.0	
32	Region 21	110.3	102.1	119.2	Region 21	108.9	99.6	121.3	42	Region 21	110.0	99.6	121.3	
37	Region 22	109.5	102.9	120.3	Region 22	106.1	92.0	118.5	47	Region 22	108.7	92.0	120.3	
35	Region 23	108.8	93.0	118.4	Region 23	103.4	92.5	117.9	52	Region 23	107.1	92.5	118.4	
29	Region 24	109.1	98.2	117.4	Region 24	102.4	81.7	114.0	44	Region 24	106.8	81.7	117.4	
18	Region 25	102.7	75.4	113.8	Region 25	102.2	86.7	113.7	39	Region 25	102.4	75.4	113.8	
17	Region 26	111.2	99.9	117.3	Region 26	107.0	100.8	115.3	32	Region 26	109.3	99.9	117.3	
9	Region 27	112.7	104.3	117.9	Region 27	105.1	87.1	116.9	17	Region 27	109.1	87.1	117.9	
20	Region 28	108.3	101.0	115.5	Region 28	105.1	85.1	118.7	49	Region 28	106.4	85.1	118.7	
15	Region 29	108.0	97.5	117.7	Region 29	97.4	86.3	104.0	29	Region 29	102.9	86.3	117.7	
22	Region 30	103.7	94.0	113.0	Region 30	101.2	81.3	114.1	45	Region 30	102.4	81.3	114.1	
41	Region 31	107.0	99.7	112.9	Region 31	102.8	83.8	110.0	22	Region 31	104.9	83.8	112.9	
12	Region 32	113.2	102.3	128.2	Region 32	103.9	98.7	111.7	21	Region 32	109.2	98.7	128.2	
14	Region 33	104.4	81.1	120.8	Region 33	103.3	91.1	124.9	25	Region 33	103.9	81.1	124.9	
18	Region 34	108.4	83.4	117.9	Region 34	106.6	97.7	117.7	28	Region 34	107.8	83.4	117.9	
8	Region 35	108.4	101.9	115.8	Region 35	89.7	79.8	101.7	11	Region 35	103.3	79.8	115.8	
10	Region 36	106.5	101.8	110.4	Region 36	95.5	55.8	107.7	20	Region 36	101.0	55.8	110.4	
517	Mean white	109.2			383	Mean yellow	102.8			900	Mean w & y	106.5		
	Min white	75.4				Min yellow	55.8				Min w & y	55.8		
	Max white			128.2		Max yellow			129.2		Max w & y			129.2

Genetically modification

Ten percent of this crop survey samples (90 samples) randomly selected were tested for the presence of the Cry9C protein (Bt gene). The samples that have tested positive with

the Strip Test were quantitatively analysed using the ELISA Method. Twenty-five percent of the samples tested positive with the percentage varing from > 3,80% to > 9,93%.

TABLE 23: PRESENCE OF Bt MODIFIED MAIZE

Region	Grade	% Bt gene	Region	Grade	% Bt gene
10	WM1	0	22	WM1	0
10	YM1	0	22	YM2	>9,22
10	YM1	>8,00	23	WM1	0
11	WM1	0	23	WM1	0
11	WM1	0	23	WM1	0
11	YM1	>8,86	23	WM3	0
11	YM1	>3,80	23	YM1	>9,53
11	YM2	>9,14	23	YM1	>9,32
12	WM1	0	24	WM1	0
12	WM1	0	24	WM1	0
12	YM1	>8,54	24	WM1	0
13	WM1	0	24	YM1	0
13	YM1	>4,60	25	WM1	0
14	WM1	0	25	WM1	0
14	WM1	0	25	YM1	>8,74
14	WM1	0	25	YM1	>4,83
14	WM1	0	26	WM1	0
14	YM2	0	26	WM1	0
14	YM2	0	26	YM1	>5,53
15	WM1	0	27	WM1	0
15	WM2	0	27	YM1	0
15	YM1	0	28	WM1	0
16	WM1	>4,33	28	WM1	>7,55
16	WM2	0	28	YM1	>5,46
16	YM1	>4,23	28	YM1	0
17	WM1	0	28	YM1	>7,78
17	WM2	0	29	WM1	0
17	YM1	0	29	WM1	0
18	WM1	0	29	YM2	0
18	WM1	0	30	WM1	0
18	WM2	0	30	WM1	0
18	YM1	0	30	YM1	0
18	YM1	>9,93	30	YM1	0
19	WM1	0	31	WM1	0
19	WM2	0	31	YM2	0
19	YM1	0	32	WM1	0
20	WM1	0	32	YM1	0
20	YM1	0	33	WM1	0
21	WM1	0	33	YM1	>7,92
21	WM1	0	34	WM1	0
21	WM1	0	34	WM1	0
21	YM1	>5,26	34	YM2	0
22	WM1	>5,50	35	WM1	>7,23
22	WM1	0	36	WM1	0
22	WM1	0	36	YM1	>8,43

TABLE 24: MYCOTOXIN RESULTS 2002/2003

Region	Grade	Aflatoxin ppb	Fumonisin ppm	Deoxynivalenol ppm	Zearalenone ppm	T-2 ppm	Ochratoxin ppb
10	WM1	0	0.34	2.2	<0.1	<0.15	<2.0
10	YM1	0	0.65	0	<0.1	0	<2.0
10	YM1	0	3.2	<0.50	<0.1	0	<2.0
11	WM1	0	0.77	0	0	0	<2.0
11	WM1	0	0	0	<0.1	0	0
11	YM1	0	0.96	0.51	<0.1	0	<2.0
11	YM1	0	0.51	0	<0.1	0	0
11	YM2	0	0.93	1.5	0	0	<2.0
12	WM1	0	0.95	0.97	0	0	0
12	WM1	0	1.5	0	0	0	<2.0
12	YM1	0	0.38	0	<0.1	0	<2.0
13	WM1	0	2.3	0	<0.1	0	0
13	YM1	0	0.52	0.85	0	0	<2.0
14	WM1	0	0.54	0	0.13	0	<2.0
14	WM1	0	1.8	<0.50	<0.1	0	0
14	WM1	0	0	1.2	0	0	2.0
14	WM1	0	1.1	<0.50	0	0	<2.0
14	YM2	0	1.0	0	<0.1	0	<2.0
14	YM2	0	1.5	0	0	0	<2.0
15	WM1	0	0.48	<0.50	<0.1	0	<2.0
15	WM2	0	1.7	0	0	0	<2.0
15	YM1	0	0.50	0.61	<0.1	0	<2.0
16	WM1	0	0.47	<0.50	<0.1	0	<2.0
16	WM2	0	0.48	0	<0.1	0	0
16	YM1	0	0.52	0	<0.1	0	<2.0
17	WM1	0	0.53	0	<0.1	0	<2.0
17	WM2	0	0.93	0	0	0	0
17	YM1	0	0.36	0	<0.1	0	<2.0
18	WM1	0	<0.25	0	<0.1	0	<2.0
18	WM1	0	<0.25	0	0	0	<2.0
18	WM2	0	<0.25	0	<0.1	0	<2.0
18	YM1	0	1.7	1.2	<0.1	0	0
18	YM1	0	0.44	0	<0.1	0	<2.0
19	WM1	0	<0.25	0	<0.1	0	<2.0
19	WM2	0	3.9	4.3	<0.1	0	0
19	YM1	0	2.4	<0.50	<0.1	0	<2.0
20	WM1	0	<0.25	0	<0.1	0	0
20	YM1	0	0.78	<0.50	<0.1	0	<2.0
21	WM1	0	0	0.70	<0.1	0	<2.0
21	WM1	0	0.37	0	<0.1	0	<2.0
21	WM1	0	0.77	0	<0.1	0	<2.0
21	YM1	0	0.71	0	<0.1	0	<2.0
22	WM1	0	1.7	<0.50	<0.1	0	0
22	WM1	0	1.4	0	<0.1	0	<2.0
22	WM1	0	0.27	0	0	0	<2.0
22	WM1	0	0.46	0	0	0	<2.0

TABLE 24: MYCOTOXIN RESULTS 2002/2003 (continue)

Region	Grade	Aflatoxin ppb	Fumonisin ppm	Deoxynivalenol ppm	Zearalenone ppm	T-2 ppm	Ochratoxin ppb
22	YM2	0	0.53	<0.50	<0.1	0	<2.0
23	WM1	0	0.34	0	<0.1	0.19	0
23	WM1	0	1.2	0	<0.1	0	<2.0
23	WM1	0	<0.25	0.90	0	0	<2.0
23	WM3	0	1.9	1.3	0	0	<2.0
23	YM1	0	0.37	<0.50	<0.1	0	<2.0
23	YM1	0	0.65	0	<0.1	0	<2.0
24	WM1	0	1.6	<0.50	<0.1	<0.15	<2.0
24	WM1	0	0.66	0	0	0	0
24	WM1	0	0.36	0	0	0	<2.0
24	YM1	0	2.1	0	<0.1	0	0
25	WM1	0	0.40	0	<0.1	0	<2.0
25	WM1	0	<0.25	0	0	0	<2.0
25	YM1	0	0	<0.50	<0.1	<0.15	<2.0
25	YM1	0	0.74	0	<0.1	0	0
26	WM1	0	1.00	0	0	0	0
26	WM1	0	0.72	0	<0.1	0.29	<2.0
26	YM1	0	0.53	0	<0.1	0	<2.0
27	WM1	0	0.52	0	0.14	0	0
27	YM1	0	0.98	0	<0.1	0	<2.0
28	WM1	0	1.2	0	<0.1	0	0
28	WM1	0	<0.25	2.2	<0.1	0	<2.0
28	YM1	0	0.53	0.55	<0.1	0	<2.0
28	YM1	0	<0.25	0	0	0	<2.0
28	YM1	0	<0.25	0	0	0	<2.0
29	WM1	0	0.43	0	<0.1	0	0
29	WM1	0	0.30	<0.50	0	0	<2.0
29	YM2	0	<0.25	0	<0.1	0	<2.0
30	WM1	0	0	0	<0.1	0	<2.0
30	WM1	0	<0.25	0	0	0	<2.0
30	YM1	0	0	0.92	0	0	<2.0
30	YM1	0	<0.25	0	0	0	<2.0
31	WM1	0	0.26	0	0	0	<2.0
31	YM2	0	0.52	0	<0.1	<0.15	<2.0
32	WM1	0	<0.25	0	0	0	<2.0
32	YM1	0	<0.25	0	0.11	0	<2.0
33	WM1	0	<0.25	0	<0.1	0	<2.0
33	YM1	0	1.2	0	<0.1	0	<2.0
34	WM1	0	0	0	<0.1	0	<2.0
34	WM1	0	0.64	0	<0.1	0	<2.0
34	YM2	0	1.1	0	<0.1	0	<2.0
35	WM1	0	2.0	0	<0.1	0	<2.0
36	WM1	0	0	0	<0.1	0	<2.0
36	YM1	0	0.81	0	<0.1	0	0
N=90	Average	0	0.73	<0.5	<0.1	<0.15	<2.0

Methods

1. Grading

1.1 RSA grading

RSA grading was done in accordance with the Grading Regulations for maize, as published in the Government Gazette No. 19131 of 14 August 1998, regulation No. R.905.

Description of deviations relating to RSA grading

a. Defective maize kernels

The term "defective kernels" means all maize kernels and pieces of maize kernels which are shrivelled, obviously immature, frost-damaged, heat-damaged, mouldy or discoloured, have sprouted (including kernels whose growing point in the germ is visibly discoloured), have cavities in the germ or endosperm caused by insects or rodents, are visibly contaminated by smut, soil, smoke or coal-dust, can pass through the 6.35 mm round-hole sieve, are clearly of inferior quality and of subspecies other than *Zea mays indentata* or *Zea Mays indurata*.

b. Foreign matter

The term "foreign matter" means all matter other than maize, glass, stone, coal, dung or metal.

c. Other colour

The term "other colour" means maize kernels of a colour other than white or yellow but excludes pinked maize kernels.

d. Total deviation

The term "total deviation" means the total defective kernels plus foreign matter plus other colour kernels.

e. Pinked kernels

The term "pinked kernels" means maize kernels whose endosperm is white or yellow and whose pericarp or part thereof is red or pink in colour.

The specification, according to the Grading

Regulations for classes 1 to 3 of white and yellow maize is a maximum of 12%.

Fungal infection

All samples were inspected for the visual symptoms of *Diplodia* and *Fusarium cobrot*. There are four fungi which cause cobrot in South Africa namely *Stenocarpella maydis* (*Diplodia maydis*), *Fusarium moniliforme*, *Fusarium graminearum* and *Stenocarpella macrospora* (*Diplodia Macrospora*). *Fusarium* spp infections are localized on the cob and discoloured maize kernels, which become reddish (light pink to lilac). *Diplodia maydis* normally rots the entire maize cob and infected maize kernels are recognized by a light ash colour to black colour that appears at the germ and can infest the whole kernel.

1.2 USA grading

USA grading was determined in accordance with the method of the American Grading Regulations (United States Department of Agriculture).

There are seven grades or standards in US grading, Grades nos. 1 through 5 and sample grade and mixed grade. No.1 is the most desirable followed by no. 2 down to sample grade and mixed grade.

Description of deviations relating to USA grading

a. Damaged kernels

Kernels and pieces of corn kernels that are badly ground-damaged, badly weather-damaged, diseased, frost-damaged, germ-damaged, heat-damaged, insect-bored, mould-damaged, sprout-damaged, or otherwise materially damaged.

b. Heat-damaged kernels

Kernels and pieces of kernels which are materially discoloured by excessive respiration, with the dark discoloration extending out of the germ through the sides and into the back of the kernel as well as kernels and pieces of kernels which are

puffed or swollen and materially discoloured by external heat caused by artificial drying methods.

b. Broken corn and foreign material

Broken corn is all matter that passes readily through a 12/64-inch (4.76 mm) round-hole sieve and over a 6/64-inch (2.38 mm) round-hole sieve

Foreign material is all matter that passes readily through a 2.38 mm round-hole sieve and all matter other than corn that remains on top of the 4.76 mm round-hole sieve after sieving.

Broken corn and foreign material is all matter that passes readily through a 4.76 mm round-hole sieve and all matter other than corn that remains in the sieved sample.

c. Bushel weight

Test weight per bushel is the weight of grain required to fill a level Winchester bushel. Bushel weight is multiplied by the factor 1.2872 to get the hectolitre mass.

Bushel weight is done according to the Federal Grain Inspection Services' (FGIS) Grain Inspection Handbook II, Chapter 1, Section 1.11.

d. Other colour

Maize samples are deemed to be mixed grade when maize kernels of another colour for white maize exceeds 2% and for yellow maize exceeds 5%.

2. Nutritional value

The Technicon InfraAlyzer (Near Infrared (NIR)) was calibrated against the different international chemical methods for determining nutritional values.

The chemical methods used to establish a set of calibration samples were:

- a) for fat, the petroleum ether extraction (Soxhlet) method (AACC 30-25, 1999),
- b) for protein, the Dumas (Leco) method (AACC 46-30, 1999), and
- c) for starch, the Hydrochloric Acid dissolution method (Polarimeter) (ICC

standard no. 123, 1976 - Revised 1994).

These sets of calibration samples were used to calibrate the Technicon InfraAlyzer (NIR).

3. Physical characteristics

Hectolitre mass

Hectolitre mass (grain density or bushel weight) means the mass in kilogram per hectolitre.

100 kernel mass - Industry accepted method 001

100 kernel mass is the weight in grams of one hundred whole maize kernels and provides a measure of grain size and density.

Kernel size - Industry accepted method 017

Kernel size is important to the sophisticated starch manufacturing industry as well as to the dry milling industry. Kernels that are too small hamper the separation of kernel fractions in the wet milling process. The result is a lower starch yield. A mixture of small and large kernels causes additional problems, as homogeneous steeping cannot be achieved. On the other hand, very large kernels can also cause problems since the ratio between volume and mass is unfavourable to proper steeping.

The dry milling industry also prefers fairly larger maize kernels. However, a uniform kernel size is of particular importance to this industry, as kernels that are too large create problems especially when mixed with smaller kernels.

Kernel size is less important to the animal feed manufacturing industry. Larger kernels are nevertheless preferred, as small kernels are easily lost during the screening stage of processing.

The determination of kernel size comprises the sieving of a 100 g representative whole maize kernels for each sample through both

8 mm and 10 mm round-hole grading sieves, normally used in the seed industry.

Breakability - Industry accepted method 007

Maize is normally cleaned before processing. In the cleaning process, broken kernels are removed with other impurities, causing losses. Broken kernels are further broken during handling, resulting in much grain dust being generated. This creates the potential for dust explosions, health hazards, hygiene problems and so forth. Maize containing a high percentage of broken kernels tends to become insect infected more easily and is subject to general deterioration.

In the modern dry milling industry, maize is first cleaned and then conditioned by dampening before the germ is removed. Broken kernels cause many problems during these stages of processing. Broken kernels can also lead to a lower extraction of the so-called high-quality products, like samp and maize grits. The presence of many broken kernels cause problems with the fibre and fat content of other maize products, like the various grades of maize meal, because the quantity of germ required to be returned to the milled endosperm cannot be accurately determined.

In the wet milling process broken kernels steep more rapidly than whole kernels and by the time the whole kernels have been sufficiently steeped, the broken kernels have been over-steeped, causing an ineffective separation of protein and starch.

In the livestock feed industry breakability is not an important quality characteristic, except for dust and hygiene problems.

Every sample was subjected to a breakage susceptibility test. After the sample of whole maize kernels was propelled in a Stein Breakage tester for 4 minutes, the fraction below the 6.3 mm and 4.75 mm sieve was

collected and the percentage broken kernels < 6.35 mm and < 4.75 mm was determined.

Stress cracks - Industry accepted method 006

Stress cracks are determined by visual inspection of a certain amount of whole maize kernels examined on top of a light box for small internal cracks in the endosperm. Some kernels may even have two or more internal cracks. Any form of stress may cause internal cracks, for example rapid moisture loss on the land, during harvest or during drying. Stress cracks are genetic and different cultivars will differ.

Milling index - Industry accepted method 015

Milling index is an indication of the milling abilities and milling quality of maize kernels where a higher milling index means a higher extraction of the high-grade and most profitable products like samp, maize rice and maize grits (degermed products) that are manufactured from the corneous part of the endosperm. The milling index is an indication of the relative differences between samples tested. The milling index is measured with the Infratec 1241 Grain Analyzer. The SAGL uses the calibration of the Grain Crops Institute of the ARC at Potchefstroom and will be updated only by the ARC-GCI.

Whiteness index - Industry accepted method 004

Whiteness index of white maize meal was determined with the Hunterlab colorflex 45°/0°. Whiteness is associated with a region or volume in colour space in which objects are recognized as white. The degree of whiteness is measured by the degree of departure of the object from a perfect white. The higher the whiteness index value the whiter the meal.

Milling of maize on Roff maize mill - Industry accepted method 013

The Roff 150 Series maize mill is used to mill representative samples of 500 g. The mill should be pre-set to the following specifications: Break 1 roll nip - 0.3 mm, Break 2 roll nip - 0.18 mm and Break roll nip - 0.08 mm. These settings are to be verified by the ARC Grain Crops Institute (GCI) in Potchefstroom. Every mill has three separations, namely germ, grits and maize meal. The grits from Break 1 are transferred to the Break 2 rolls and the grits from Break 2 are transferred to Break 3 rolls.

The following fractions are weighed and determined as percentage:

Break 1 meal

Break 2 meal

Break 3 meal

Break 3 grits

Break 1, 2 and 3 germ are combined and then

weighed

Break 1, 2 and 3 meal are combined to get the % extraction total meal.

4. Mycotoxin analyses

The pathogenic nature of certain species of fungi to plants has been observed virtually since the beginning of agriculture. These plant pathogens can produce metabolites (mycotoxins) that show toxic effects when they are ingested.

The mycotoxin analyses were carried out in accordance with the Vicam immunoaffinity column technique using the different Vicam Instruction Manuals for the different mycotoxins. Detection of the toxins was done on a Fluorometer. 90 samples of the 900 maize crop samples were tested for Aflatoxin, Fumonisin, Deoxynivalenol, Zearalenone, T-2 Toxin and Ochratoxin.

Fungi	Toxin	Method reference
<i>Aspergillus flavus</i>	Aflatoxin	Vicam Aflatest Instruction Manual May 5, 1999
<i>Aspergillus ochraceus</i> and several species of <i>Penicillium sp.</i>	Ochratoxin	Vicam Ochratest Instruction Manual May 4, 1999
<i>Fusarium moniliforme</i>	Fumonisin	Vicam Fumonitest Instruction Manual Nov 15, 2002
<i>Fusarium graminearum</i>	Zearalenone	Vicam Zearalatest Instruction Manual Nov 19, 1998
<i>Fusarium graminearum</i>	Deoxynivalenol (DON)	Vicam DONtest TAG Instruction Manual Apr 4, 2000
<i>Fusarium sporotrichioides</i> <i>Fusarium poae</i> <i>Fusarium tricinctum</i>	T-2	Vicam T-2 TAG Instruction Manual Apr 25, 2000

5. GMO (Genetically Modified Organisms)

90 samples of the 900 maize crop samples were tested for Bt Modified maize. The presence of the Bt gene was determined using the Agri-Screen Cry9C Strip Test. Quantitative analyses were done using the ELISA Method, AACC Method 11 - 10 November 8, 2000. Cry 1 Ab protein in corn is produced from a

gene derived from *Bacillus thuringiensis* (Bt). This method is a quantitative enzyme-linked immunosorbent assay (ELISA) test for the determination of Bt modified corn in corn flour. Proprietary antibodies specific for Cry 1 Ab protein are used.



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Reference: S.A. Maize Crop Quality Report 2002/03 – Table 7
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ERRATUM

The SAGL would like to apologise for a "printers error" on page 16 of the South African Maize Crop Quality Report 2002/03. Please replace "Table 7: Hectolitre mass (kg/hl) of South African maize 1993/94 – 2002/03" with the following:

Season	White maize		Yellow maize		Mean Maize	
	Number of samples	Hectolitre mass (kg/hl)	Number of samples	Hectolitre mass (kg/hl)	Number of samples	Hectolitre mass (kg/hl)
1993/94	178	76.4	183	75.7	361	76.0
1994/95	164	74.7	175	74.9	339	74.8
1995/96	142	75.3	151	74.8	293	75.0
1996/97	178	75.2	166	75.2	344	75.2
1997/98	470	76.6	267	76.0	737	76.4
1998/99	256	75.2	189	74.8	445	75.0
1999/00	493	74.8	407	74.6	900	74.7
2000/01	522	78.2	378	77.8	900	78.0
2001/02	471	77.3	429	76.7	900	77.0
2002/03	517	78.1	383	77.2	900	77.7

