

**SOJABOON  
KULTIVARAANBEVELINGS VIR  
2004/2005**

G de Beer, AJ Pretorius & H Fourie

LNR Instituut vir Graangewasse  
Potchefstroom

Hoewel sojabone 'n gewas is wat bykans wêreldwyd verbou word, het individuele kultivars 'n beperkte gebiedsaanpassing. Gevolglik sal die sojaboonkultivar wat die beste aangepas is vir 'n gegewe plaas of boerdery, dié een wees wat oor 'n aantal jare die hoogste opbrengs en saadkwaliteit lewer vir dié spesifieke plaas. Normaalweg is die aangewese lengte van die groeiseisoen vir 'n kultivar wat goed aangepas is, in die omgewing van 120 dae van plant tot oesryp. In die keuse van 'n kultivar is dit dus van groot belang om te kyk na kultivarproefresultate vir vergelykbare toestande en aan die hand van sulke proewe alle kultivars uit te soek met die ideale groeiseisoen. Die Nasionale Sojaboonkultivarproewe van die LNR-Instituut vir Graangewasse lewer in die opsig waardevolle inligting.

**BELANGRIKE INLIGTING VIR  
KULTIVARKEUSE**

Die belangrikste inligting waarna gekyk moet word vir kultivarkeuse by sojabone, is **lengte van groeiseisoen**. Anders as by die meeste algemeen verbonde gewasse, is sojabone gevoelig vir daglengte (fotoperiode) en sal 'n gegewe kultivar al hoe later ryp word hoe verder suid dit in Suider Afrika geplant word. Vir dieselfde rede sal plantdatum ook die lengte

**SOYBEAN CULTIVAR  
RECOMMENDATIONS FOR  
2004/2005**

G de Beer, AJ Pretorius & H  
Fourie,

ARC-Grain Crops Institute,  
Potchefstroom

In contrast to the fact that soybeans as a crop is grown world wide, individual cultivars or genotypes demonstrate a very limited adaptation due to it's sensitivity to photoperiod as affected by latitude and planting date. The best-adapted cultivar is therefore the one that will give, over the long term, the best yield and quality for a specific site. The National Soybean Cultivar Trials conducted by the ARC-Grain Crops Institute render a valuable service in identifying such cultivars for different growing areas in South Africa.

**IMPORTANT CHARACTERISTICS  
FOR CULTIVAR CHOICE**

The **length of the growing season** is the most important characteristic for soybeans to take into consideration for cultivar choice for soybeans. Unlike the other most commonly cultivated crops, soybeans are sensitive to day length (photo period) and a given cultivar will ripen later and demonstrate a lengthening growing season the further south it is planted in Southern Africa. Planting dates will therefore also affect the length of the growing season and a given cultivar will flower much earlier should it be planted at a later planting date. Prevailing temperature also has an affect and soybeans grow much slower on the Highveld compared to the warmer Lowveld. Table 1

van die groeiseisoen beïnvloed en sal 'n gegewe kultivar heelwat gouer blom by 'n later plantdatum. Heersende temperatuur (veral nagtemperatuur) het ook 'n invloed en sojabone groei heelwat stadiger op die hoëveld, vergeleke met die warmer laeveld. Tabel 1 illustreer die lengte van groeiseisoen tussen kultivars en ook vir 'n spesifieke kultivar oor verbouingsgebiede. Dit is belangrik om te onthou dat vroeë en later plantdatums binne dieselfde gebied ook die groeiseisoenlengte van 'n kultivar affekteer.

Vir sojaboonprodusente met ondervinding kan die gevoeligheid vir daglengte en die genetiese variasie vir relatiewe lengte van groeiseisoen, met vrug gebruik word vir byvoorbeeld hooiproduksie (gebruik van lang groeiseisoen kultivars), stroopskedulering (plant kultivars met verskillende rypword-datums) en vir droogte-ontwyking of noodaanplantings (kultivars met 'n relatief kort groeiseisoen). Vir produsente wat nie ondervinding het van sojaboonproduksie nie kan dié eienskap ook by wyse van verkeerde kultivarkeuse tot gevolg hê dat die sojabone a) nie wil ryp word nie waar 'n kultivar met 'n te lang groeiseisoen vir 'n gebied aangeplant is, b) reeds oesgereed is terwyl reën en hoë temperature stroop bemoeilik en kwaliteit benadeel waar 'n kultivar met 'n te kort groeiseisoen vir 'n gebied gekies is en c) onstroopbaar is as gevolg van 'n te lae peulhoogte.

**Prosedure vir kultivarkeuse op grond van groeiseisoenlengte** is dan as volg: Die lokaliteite waar die sojaboonkultivarproewe uitgevoer is is groepeer om warm-, matig- en koel gebiede aan te dui (Tabel 2).

illustrates the dramatic variances for length of growing season between cultivars as well as different production areas.

Producers well experienced in soybean cultivation can utilize the photo-period sensitivity of soybeans, along with the genetic variances for relative length of the growing season with great success, for example, for hay production (a cultivar with a long growing season can be used), for scheduling of harvest (planting cultivars with differing ripening dates of) and for drought avoidance or emergency planting (using cultivars with relatively short growing seasons). For producers with little or no experience in soybean cultivation, this characteristic could prove to be hazardous when the wrong cultivar choice is made and the yield is not realised because it a) does not ripen (a too long grower has been planted for the area), b) is ready for harvesting while rain and high temperatures hamper harvesting and impairs quality (a too short grower has been planted for the area), and c) is unable to be harvested because of a too low pod height (possibly a good cultivar planted too far to the north).

**Cultivar choice using length of growing season** – Localities where soybean trials were conducted during the past season were divided into warm-, moderate- and cool production areas (Table 2). It is important for a soybean producer to determine whether the area that will be used for soybean production is similar to the grouping of localities indicated by the warm-, moderate- and cool production areas. It is generally accepted that cultivars with a longer growing

Dit is belangrik dat u moet bepaal of die gebied waar u sojabone produseer 'n klimaat soortgelyk aan die warm, matig of koel groepering van lokaliteite het. As algemene reël word aanvaar dat kultivars met 'n langer groeiseisoen die beste sal doen in gebiede met 'n warmer klimaat, medium groeiseisoen kultivars die beste sal vaar in gebiede met 'n gematigde klimaat en korter groeiseisoen kultivars die beste sal vaar in gebiede met 'n koeler klimaat. Dit is egter belangrik om te onthou dat daar ook uitsonderings op die reël is en daarom word aanbeveel dat die opbrengs en aanpassingsvermoë van kultivars soos aangedui in Tabela 4 tot 12 saam met groeiseisoenlengte gebruik sal word om 'n kultivarkeuse te maak.

**Plantdatum** beïnvloed sojabone se aanpassing en gevolglik kultivarkeuse. Die optimale plantdatum is normaalweg November. In warmer gebiede kan egter tot die eerste week in Januarie nog geplant word, maar dan sal nouer rywydte, hoër plantpopulasie en 'n vinniger kultivar aanbeveel word. Waar grond- en lugtemperatuur aanvaarbare vlakke vroeg in die seisoen bereik, is 'n Oktober-plantdatum, veral op die hoërliggende gebiede aan te beveel. Dit is belangrik om te onthou dat 'n vroeër of 'n later plantdatum in 'n gebied kultivarkeuse kan beïnvloed.

**Peul- en planthoogte** beïnvloed die stroopbaarheid en die staanvermoë van 'n sojaboonaanplanting en is faktore wat in ag geneem moet word by kultivarkeuse. Oor die algemeen is daar 'n verband tussen peul- en

season will perform better in the warmer growing areas, cultivars with a medium growing season will perform better in the moderate growing areas and cultivars with a shorter growing season perform better in the cooler production areas. There are however exceptions to the rule and it is therefore recommended to also use yield performance and adaptation presented in Tables 4 to 12 with length of growing season in cultivar selection for a specific area.

**Planting date** influences soybean's adaptation and therefore cultivar choice. The optimum planting date is usually in November. In warmer areas though, soybeans can be planted until the first week of January. With later planting dates narrow rows, higher plant populations and cultivars with shorter growing seasons are recommended. A planting date in October, especially on the higher lying areas, will be recommended where soil and air temperatures reach acceptable levels early in the growing season. Planting at an earlier or later planting date will affect cultivar choice.

**Pod- and plant height** have an impact on the ability to harvest the crop, and are characteristics that should be taken into account with cultivar choice. A relationship exists between pod- and plant height and relative length of the growing season. Cultivars with a shorter growing season tend to have lower plant- and pod heights compared to longer growing season cultivars under similar growing conditions.

Both characteristics are also affected by production practices.

planthoogte en relatiewe lengte van die groeiseisoen. Relatief kort groeiseisoenkultivars het gewoonlik 'n laer peul- en planthoogte as langgroeiseisoenkultivars onder vergelykbare toestande. Beide eienskappe word egter ook deur produksiepraktyke beïnvloed. 'n Nouer tussenry- en binneryspasiëring sal peulhoogte betekenisvol verhoog. In die Nasionale Kultivarproewe word onder gestandaardiseerde toestande geëvalueer vir peulhoogte en kan kultivars met aanvaarbare peulhoogtes gekies word. Peulhoogte word aangedui in Tabel 3.

**Staanvermoë** kan beïnvloed word deur 'n aantal bewolkte dae. Dit kan tot gevolg hê dat kultivars wat normaalweg goed staan hoër groei en dus die risiko van omval verhoog.

**Groeiwyse** onderskei tussen bepaald en onbepaald. Kultivars met 'n bepaalde groeiwyse word verkieslik onder besproeiing geplant, terwyl kultivars met 'n onbepaalde groeiwyse (wat nie lengtegroei staak tydens blom nie) verkies word onder droëland- en koelweergroei-toestande. Die groeiwyse van geregistreerde kultivars word aangedui in Tabel 3.

Genetiese **weerstand teen siektes en insekte** kan goed gebruik word waar die siektes en insekte die oes kan verlaag. Kultivars met weerstand teen sojaboon mosaïekvirus is PAN 565 en Ibis, teen "frogeye" is Roan, en teen paranocheta is SCS 1. Inligting oor vatbaarheid van kultivars vir aalwurms word aangedui in Tabel 3.

More narrow inter- and intra row spacing will increase pod height significantly. Pod clearance is reported in Table 3.

**Standability** is affected by the number of overcast days. Plant height tends to increase under overcast weather and could result in a higher lodging percentage lodging.

**Growth habit** distinguishes between determinate and indeterminate genotypes. Cultivars with a determinate growth habit are preferably planted under irrigation conditions, while indeterminate cultivars (that do not cease vertical growth during flowering) are preferred under dry land and cool weather growing conditions. Growth habit for registered cultivars is indicated in Table 3.

**Genetic resistance against diseases and pests** are characteristics that are relevant where the probability of such risks increases. Cultivars with known resistance against soybean mosaic virus are PAN 565 and Ibis, against frogeye and against paranocheta SCS1. Root knot nematode sensitivity is reported in Table 3.

**Row width** will also affects cultivar selection as a significant relation exists between cultivars and row width. Cultivars producing more side branches and leaves are better adapted to wider rows and cultivars with less side branches and leaves are better adapted to more narrow rows.

**Rywydte** kan ook kultivarkeuse beïnvloed aangesien daar 'n betekenisvolle interaksie bestaan. Kultivars wat geneig is tot sytakvorming en 'n digte blaredak, is beter aangepas in wye rye, terwyl kultivars met 'n oop blaredak en min sytakke, beter aangepas is by relatief nouer rywydtes.

**Weerstand teen oopspring** kan 'n belangrike rol speel tydens ongunstige oestoestande. Volgens inligting uit die Nasionale Kultivarproewe is dit duidelik dat relatief kort groeiseisoenkultivars die grootste risiko van oopspring het en relatief lang groeiseisoenkultivars die minste. Dit was egter nog nie moontlik om 'n aanduiding van genetiese weerstand tussen kultivars van dieselfde groeiseisoenlengte te kry nie. Kultivars word evalueer op 'n skaal van 1 (goed) tot 5 (swak) en die resultate word aangebied in Tabel 3.

**Gevoeligheid vir onkruidodder** kan in sommige gevalle kultivarkeuse beïnvloed. Geen sojaboonkultivar is bestand teen die atrazine-tipe onkruidodders nie en die volle wagperiode moet nagekom word voordat die plant van sojabone oorweeg word. Sommige kultivars soos Dumela, Ibis, Komatie en Edgar is besonder gevoelig vir metribusin. In alle gevalle moet seker gemaak word dat aanwysings op die etiket voorsiening maak vir die kultivar wat aangeplant gaan word.

**Saadgrootte, hilumkleur, proteïengehalte en GMO-status** is eienskappe wat 'n premieprys kan beding. Saadgrootte is geneties, maar word sterk beïnvloed deur omgewing.

**Resistance against seed shattering** can play an important role during unfavourable harvesting conditions. Information from the National Soybean Cultivar Trials indicates that cultivars with a relative short growing season tend to shatter more than cultivars with a longer growing season. Rating of cultivars on a scale from 1 (good) to 5 (poor) is presented in Table 3.

**Sensitivity to herbicides** can, in some cases, influence the choice of a cultivar. No soybean is resistant to the atrazine type herbicides and the full waiting period will have to be maintained before soybeans can be considered. Some cultivars, such as Dumela, Ibis, Komatie and Edgar, are extremely sensitive to metribusin and this should under no circumstances be used with the aforementioned cultivars.

**Seed size, hilum colour, protein qualities and GMO status** are characteristics that can negotiate a premium price. Seed size is genetically regulated, but is greatly influenced by the environment. Favourable conditions during the seed filling period will positively influence seed size. The protein content of the seed is also genetically regulated and can adversely be affected by the environment (rainfall, temperature, stress) and crops management (poor or no nodulating, acidic soil and low soil fertility). Protein contents below 36 % are unsatisfactory and above 40%, on a moisture free basis, excellent.

**Seed yield** indicates the genetic adaptation and the suitability of a cultivar to be planted in a specific area. In the 2003/2004 season 30

Gunstige toestande tydens saadvulperiode sal saadgrootte positief beïnvloed. Proteïeninhoud van die saad is ook geneties maar kan nadelig beïnvloed word deur omgewing (reënval, temperatuur en stress) en bestuur (swak of geen nodulering, suur grond en lae grondvrugbaarheid).

Proteïeninhoud (vogvrye basis) onder 36% is onbevredigend en bokant 40% is uitstekend.

**Saadopbrengs** gee 'n aanduiding van 'n kultivar se genetiese aanpassing en geskiktheid vir 'n bepaalde omgewing. Vir die 2003/2004 seisoen is 30 cultivars aangeplant en was die data van 33 proewe aanvaarbaar vir statistiese analises. Die oeskerheidswaardes van die 30 cultivars vir die drie verbouingsgebiede (warm, matig en koud) word aangebied in Tabelle 4-6, 7-9 en 10-12. Tabelle 4, 7 en 10; 5, 8 en 11 en 6, 9 en 12 bevat inligting oor cultivars wat vir onederskeidelik drie, twee en een jaar in die proewe ingesluit was. Dit is belangrik dat u die verdeling van lokaliteite in Tabel 2 gebruik om te bepaal in watter gebied u plaas sal val. Vergelyk dan die cultivars in die oeskerheidstabel wat u gekies het met mekaar by die realistiese opbrengsmikpunt vir u plaas.

### VERDERE INLIGTING

Volledige inligting oor die Nasionale Sojaboon Kultivarproewe en twee nuttige bronne van inligting oor sojaboonproduksie nl Jou Gids tot Suksesvolle Sojaboonproduksie en Sojaboonsiektes en -plae is beskikbaar by:

cultivars were included in the National Soybean Cultivar Trials and data of 33 localities were acceptable for statistical analyses. The yield reliability values of the 30 cultivars for the three production areas (warm, moderate and cool) are presented in Tables 4-6, 7-9 and 10-12. It is also important to use the information in Table 2 to determine whether the area to be planted corresponds with the warm, moderate or cool localities. Use selected the yield reliability table (warm, moderate or cool) to select cultivars for the yield potential of the specific field/farm.

### FURTHER INFORMATION

Information on the National Soybean Cultivar Trials and two useful guides: Your Guide to Successful Soybean Production and Soybean Diseases and Pests, are available at:

ARC-Grain Crops Institute  
P/Bag X1251  
Potchefstroom

Tel.: (018) 299 6100  
Fax: (018) 294 7146

**\* The cultivars in this report are the only cultivars tested and recommended by the ARC.**

### ACKNOWLEDGEMENT

The execution of the trials were made possible through the financial support of the Agricultural Research Council, Protein Research Foundation, Seed Companies and a large number of co-operators who conducted trials.

LNR-Instituut vir Graangewasse  
Privaatsak X1251  
Potchefstroom

Tel.: (018) 299 6100  
Faks: (018) 294 7146

**\* Cultivars wat in die verslag opgeneem is, is die enigste cultivars wat deur die LNR getoets en aanbeveel word.**

### **ERKENNING**

Die uitvoer van die proewe is moontlik gemaak deur die finansiële ondersteuning van die Landbounavorsingsraad, Proteïennavorsingstigting, Saadmaatskappye en 'n groot aantal medewerkers wat proewe uitgevoer het.

Tabel 1 Gemiddelde aantal dae tot 50% blom en oesryp vir warm, matig en koue gebiede 2003/2004  
 Table 1 Average number of days to 50% flower and harvest for warm, moderate and cool areas  
 2003/04

Kultivar/ Cultivar	Dae tot 50% blom/Days to 50% flower			Dae tot oesryp/Days to harvest		
	Warm/Warm <sup>1</sup>	Matig/Moderate <sup>2</sup>	Koud/Cool <sup>3</sup>	Warm/Warm <sup>4</sup>	Matig/Moderate <sup>5</sup>	Koud/Cool <sup>6</sup>
PAN 421 RR			53			
LS 444	50	56	57	131	130	-
PAN 520 RR	54	62	59	134	137	-
Prima 2000	57	65	60	135	142	-
Wenner	56	66	56	137	143	-
Sonop	55	63	59	135	141	-
Highveld	57	67	59	137	145	-
Top	58	67	54	133	143	-
CRN 5550	56	65	62	135	143	-
PAN 564	58	70	56	138	146	-
LS 555	56	66	65	136	141	-
PAN 626	59	71	56	140	148	-
Marula	58	68	59	138	149	-
PAN 660	57	65	64	139	145	-
LS 677	59	67	65	143	150	-
Knap	58	67	61	137	160	-
A 5409 RG	58	68	61	136	144	-
SNK 500	58	73	62	145	152	-
AG 5601	58	68	64	145	150	-
LS 580	60	72	73	142	149	-
LS 678	61	74	62	144	147	-
LS 666	58	67	57	143	150	-
AG 5603	55	66	69	138	148	-
AG 6101	58	71	65	149	153	-
Dumela	60	75	71	139	149	-
Egret	61	73	68	145	156	-
PAN 809	58	72	73	146	154	-
Stork	62	76	67	145	156	-
LS 599	58	72	73	140	150	-
PAN 522 RR	61	74	67	153	155	-
SCS 1	62	85		152	160	-

<sup>1</sup> - Gemiddeld van 6 lokaliteite, average of 6 localities      <sup>2</sup> - Gemiddeld van 8 lokaliteite, average of 8 localites  
<sup>3</sup> - Gemiddeld van 1 lokaliteit, average of 1 locality      <sup>4</sup> - Gemiddeld van 8 lokaliteite,

a  
v  
e  
r  
a  
g  
e  
  
o  
f  
  
8  
  
l  
o  
c  
a  
l  
i  
t  
i  
e  
s

<sup>5</sup> - Gemiddeld van 6 lokaliteite, average of 6 localities      <sup>6</sup> - Geen data/No data



Tabel 2 Groepering van lokaliteite volgens warm, matig en koue gebiede 2003/04  
Table 2 Grouping of localities according to warm, moderate and cool areas 2003/04

Warm/Warm	Matig/Moderate	Koud/Cool
Brits MGK (B/I) Brits (B/I) Groblersdal Bespr (B/I) Groblersdal Droog (D) Koedoeskop (B/I) Naboomspruit (B/I) Rietrivier (B/I) Rustenburg (B/I) Vaalharts (B/I) Vryheid (D) Warmbad (D)	Cradock (B/I) Dundee (D) George (D) Glen Besproeiing (B/I) Glen Droëland (D) Greytown (D) Greytown Kranskop (D) Hopetown (B/I) Lichtenburg (D) Newcastle (D) Potchefstroom PD1 (B/I) Potchefstroom PD2 (B/I) Potchefstroom Droog (D) Viljoenskroon (D)	Aliwal Noord (D) Delmas Pannar (D) Ficksburg (D) Kinross (D) Maclear (D) Reitz (D) Vrede (D) Wonderfontein (D)

B - Besproeiing/I - Irrigation

D - Droëland/Dry land

P - Plantdatum/Planting date

Tabel 3 Algemene inligting van sojaboonkultivars 2003/04  
Table 3 General information on soybean cultivars 2003/04

Kultivar/ Cultivar	Groei- wyse/ Growth habit <sup>1</sup>	Hilum- kleur/ Hilum colour <sup>2</sup>	Blom- kleur/ Flower colour <sup>3</sup>	Haar- kleur/ Hair colour <sup>4</sup>	Aalwurm gasheerstatus/ Nematode host status <sup>5</sup>		Peul- hoogte/Po d height <sup>6</sup>	Oopsporing / Shatter <sup>7</sup>	Verskaffer/ Supplier
					<i>M</i> <i>Incognita</i>	<i>M</i> <i>Javanica</i>			
PAN 421 RR					4.06	-			Pannar
LS 444	D	LB	W	G	118	-	7	1.62	Link Seed
PAN 520 RR	D	B	P	B	5.6	-	8	1.69	Pannar
Prima 2000	D	LB	W	G	31.30	35.00	9	2.15	Pannar
Wenner	I	KL	P	B	6.50	3.90	10	1.46	GJ Bohrman
Sonop	D	B	W	G	31.90	4.90	7	1.77	GW Bührmann
Highveld	I	B	P	B	9.40	6.20	12	1.38	GW Bührmann
Top	I	BL	P	B	4.60	0.40	9	2.38	Monsanto
CRN 5550	I	BL	P	B	2.10	0.20	9	1.85	Pannar
PAN 564	I	IB	P	G	11.30	-	11	1.38	Link Seed
LS 555	D	LB	P	G	12.3	-	5	1.77	Pannar
PAN 626	I	KL	P	G	6.20	6.32	11	1.38	GW Bührmann
Marula	I	BL	P	B	0.20	2.10	10	1.62	Pannar
PAN 660	D	BL	W	B	5.20	1.70	9	1.54	Link Seed
LS 677	I	LB	P	G	27.60	12.10	10	1.69	GW Bührmann
Knap	I	B	P	B	5.50	1.80	10	1.92	Monsanto
A 5409 RG	I	LB	P	G	2.50	0.20	9	1.46	Sensako
SNK 500	D	LB	P	G	5.10	9.30	8	1.38	Monsanto
AG 5601	I	LB	W	G	1.7	-	9	1.46	Link Seed
LS 580	D	KL	P	G	2.8	-	7	1.46	Link Seed
LS 678	D	LB	P	G	2.40	2.30	9	1.46	Link Seed
LS 666	I	IB	P	G	13.8	-	9	1.77	Monsanto
AG 5603	D	LB	P	G	1.80	11.90	7	1.62	Monsanto
AG 6101	I	LB	P	G	27.70	12.20	9	1.46	H Vreken
Dumela	I	B	P	B	0.082	0.62	9	1.85	
Egret	D	KL	P	G	2.80	3.20	10	1.69	OPS
PAN 809	D	LB	P	G	1.60	-	10	1.46	Pannar
Stork	D	KL	P	G	0.08	1.30	10	1.62	OPS
LS 599	D	LB	P	G	9.9	-	8	1.69	Link Seed
PAN 522 RR	D	BL	W	B	6.60	0.60	11	1.77	Pannar
SCS 1	I	KL	P	G			14	1.38	Syngenta

<sup>1</sup> D - Bepaald/determinate

I - Onbepaald/Indeterminate

<sup>2</sup> BL - Swart/Black

IB - Onvolledig swart/Imperfect black

B - Bruin/Brown

LB - Ligbruin/buff

G - Grys/Grey

KL - Kleurloos/buff

<sup>3</sup> P - Pers/Purple

W - Wit/White

<sup>4</sup> B - Bruin/Brown

G - Grys/Grey

<sup>5</sup> Rf < 1 dui aan dat die kultivar 'n swak gasheer is vir die bepaalde spesie/

Indicate a poor host to the particular species

<sup>6</sup> Peulhoogte in cm/Pod height in cm

<sup>7</sup> Geneidheid tot oopspring evalueer op 'n skaal van 1-5 waar 1 = goed en 5 = swak  
Tendency to shatter evaluated on a scale from 1-5 where 1 = good and 5 = poor

Tabel 4 Oessekerheid by die verskillende opbrengsmikpunte vir koeler produksiegebiede, 2001/02, 2002/03, 2003/04

Table 4 Yield reliability at different yield targets for cooler production areas, 2001/02, 2002/03, 2003/04

Kultivar/ Cultivar	Opbrengsmikpunte/Yield targets ton/ha <sup>-1</sup>							Gem/ Mean	B_koeff/ B-coeff	D <sup>2</sup>
	1.0	1.5	2.0	2.5	3.0	3.5	4.0			
Prima 2000**	0.00	0.29	0.77	1.25	1.73	2.22	2.70	2.21	0.9653	0.7203
Wenner**	0.64*	1.06*	1.49*	1.92*	2.35	2.78	3.20	2.32	0.8561	0.1888
Sonop	0.00	0.63	1.28	1.93*	2.59*	3.24*	3.89*	2.32	1.3056	0.2578
Highveld Top	0.98*	1.35*	1.72*	2.09*	2.46*	2.84	3.21	2.47	0.7424	0.1584
CRN 5550	0.33	0.90	1.48*	2.06*	2.64*	3.22*	3.80*	2.31	1.1588	0.1466
PAN 564	0.21	0.77	1.33	1.89	2.45	3.00*	3.56*	2.36	1.1168	0.2835
LS 555	0.49	1.02*	1.55*	2.09*	2.62*	3.15*	3.68*	2.30	1.0654	0.1174
Marula	0.43	0.91	1.39	1.87	2.35	2.83	3.31	2.21	0.9602	0.1658
PAN 660	0.46	0.96*	1.46*	1.96*	2.46*	2.96	3.46	2.28	0.9992	0.1631
LS 677***	0.20	0.81	1.41	2.01*	2.61*	3.21*	3.82*	2.15	1.2040	0.0985
Knap	0.00	0.62	1.29	1.96*	2.63*	3.30*	3.97*	2.26	1.3403	0.2018
SNK 500	0.00	0.06	0.74	1.43	2.12	2.81	3.49	1.96	1.3740	0.3762
LS 666	0.76*	1.13*	1.50*	1.88	2.25	2.62	2.99	2.39	0.7434	0.2473
Dumela	0.15	0.63	1.11	1.59	2.07	2.55	3.03	2.17	0.9618	0.3385
Egret	0.87*	1.05*	1.23	1.41	1.59	1.78	1.96	2.13	0.3614	0.3226
LS 599	0.03	0.51	0.99	1.48	1.96	2.44	2.93	2.16	0.9669	0.4229
SCS 1****	0.08	0.52	0.96	1.39	1.83	2.27	2.71	2.15	0.8786	0.4759

\* Waardes in dieselfde kolom is betekenisvol beter/Values in the same column are significantly higher

Verwysingscultivars/Reference cultivars

\*\* Kort groeiseisoen/Short growing season      \*\*\* Medium groeiseisoen/Medium growing season

\*\*\*\* Lang groeiseisoen/Long growing season

Tabel 5 Oessekerheid by die verskillende opbrengsmikpunte vir koeler produksiegebiede, 2002/03, 2003/04

Table 5 Yield reliability at different yield targets for cooler production areas, 2002/03, 2003/04

Kultivar/ Cultivar	Opbrengsmikpunte/Yield targets ton ha <sup>-1</sup>							Gem/ Mean	B_koeff/ B-coeff	D <sup>2</sup>
	1.0	1.5	2.0	2.5	3.0	3.5	4.0			
Prima 2000**	0.05	0.52	1.00	1.47	1.95	2.42	2.90	2.20	0.9501	0.3267
Wenner**	0.12	0.55	0.97	1.39	1.82	2.24	2.67	2.36	0.8482	0.5281
LS 677***	0.13	0.51	0.89	1.27	1.66	2.04	2.42	2.28	0.7654	0.5669
A 5409 RG	0.22	0.78	1.35*	1.92*	2.48*	3.05*	3.62*	2.50	1.1329	0.2387
AG 5601	0.34	0.75	1.17	1.58	2.00	2.41	2.83	2.32	0.8296	0.3269
AG 6101	0.68*	1.24*	1.79*	2.34*	2.90*	3.45*	4.00*	2.63	1.1066	0.0795
PAN 809	0.31	0.76	1.21	1.66	2.11	2.56	3.01	2.32	0.8987	0.2714
Stork	0.04	0.63	1.21	1.79	2.38*	2.96*	3.54*	2.35	1.1665	0.2233
SCS 1****	0.00	0.10	0.62	1.13	1.65	2.17	2.69	2.16	1.0357	0.6203

\* Waardes in dieselfde kolom is betekenisvol beter/Values in the same column are significantly higher

Verwysingscultivars/Reference cultivars

\*\* Kort groeiseisoen/Short growing season      \*\*\* Medium groeiseisoen/Medium growing season

\*\*\*\* Lang groeiseisoen/Long growing season

Tabel 6 Oessekerheid by die verskillende opbrengsmikpunte vir koeler produksiegebiede, 2003/04  
Table 6 Yield reliability at different yield targets for cooler production areas, 2003/04

Kultivar/ Cultivar	Opbrengsmikpunte/Yield targets ton ha <sup>-1</sup>							Gem/ Mean	B_koeff/ B_coeff	D <sup>2</sup>
	1.0	1.5	2.0	2.5	3.0	3.5	4.0			
PAN 421 RR	0.46	0.89	1.32	1.75	2.18	2.62	3.05	2.56	0.8642	0.2749
LS 444	0.55*	1.06*	1.58*	2.09*	2.61	3.12	3.64	2.76	1.0283	0.1938
PAN 520 RR	0.01	0.67	1.33	1.99	2.65*	3.31*	3.97*	2.62	1.3204	0.1815
Prima 2000**	0.17	0.78	1.39	2.01	2.62	3.23*	3.84*	2.72	1.2238	0.2258
Wenner**	0.59*	1.23*	1.88*	2.53*	3.18*	3.83*	4.47*	2.89	1.2962	0.0640
PAN 626	0.41	1.09*	1.77*	2.46*	3.14*	3.82*	4.51*	3.02	1.3662	0.1465
LS 677***	0.00	0.47	1.02	1.58	2.13	2.68	3.24	2.43	1.1070	0.3074
A 5409 RG	0.18	0.75	1.33	1.90	2.48	3.05	3.63	2.44	1.1496	0.1326
AG 5601	0.35	0.86	1.36	1.86	2.36	2.86	3.36	2.29	1.0020	0.0854
LS 580	0.23	0.73	1.22	1.72	2.22	2.72	3.22	2.37	0.9954	0.1837
LS 678	0.00	0.48	1.18	1.89	2.59	3.30*	4.00*	2.58	1.4087	0.2174
AG 5603	0.97*	1.35*	1.73*	2.11*	2.49	2.87	3.24	2.46	0.7564	0.0561
AG 6101	0.59*	0.84	1.10	1.35	1.60	1.86	2.11	1.79	0.5084	0.0813
PAN 809	0.58*	0.92	1.25	1.58	1.91	2.24	2.58	2.22	0.6640	0.1731
Stork	0.34	0.55	0.75	0.96	1.16	1.37	1.58	1.90	0.4128	0.3580
PAN 522 RR	0.00	0.00	0.01	0.41	0.81	1.22	1.62	1.63	0.8077	0.6044
SCS 1****	0.00	0.00	0.00	0.19	0.43	0.67	0.91	1.49	0.4801	0.6810

\* Waardes in dieselfde kolom is betekenisvol beter/Values in the same column are significantly higher

Verwysingscultivars/Reference cultivars

\*\* Kort groeiseisoen/Short growing season \*\*\* Medium groeiseisoen/Medium growing season

\*\*\*\* Lang groeiseisoen/Long growing season

Tabel 7 Oessekerheid by die verskillende opbrengsmikpunte vir matige produksiegebiede, 2001/02, 2002/03, 2003/04

Table 7 Yield reliability at different yield targets, 2001/02, 2002/03, 2003/04

Kultivar/ Cultivar	Opbrengsmikpunte/Yield targets ton ha <sup>-1</sup>							Gem/ Mean	B_koeff/ B_coeff	D <sup>2</sup>
	1.0	1.5	2.0	2.5	3.0	3.5	4.0			
Prima 2000**	0.13	0.60	1.07	1.54	2.01	2.48	2.95	2.54	0.9390	0.5657
Wenner**	0.28*	0.70	1.12	1.53	1.95	2.37	2.78	2.62	0.8340	0.6707
Sonop	0.39*	0.83*	1.27	1.71	2.15	2.58	3.02	2.58	0.8766	0.4294
Highveld Top	0.39*	0.92*	1.44*	1.97*	2.50*	3.03*	3.56*	2.71	1.0586	0.3114
CRN 5550	0.21	0.77*	1.32*	1.88*	2.43*	2.99*	3.55*	2.67	1.1113	0.3543
PAN 564	0.18	0.78*	1.38*	1.98*	2.59*	3.19*	3.79*	2.64	1.2044	0.2507
LS 555	0.20	0.69	1.18	1.67	2.15	2.64	3.13	2.47	0.9762	0.3718
Marula	0.40*	0.92*	1.44*	1.97*	2.49*	3.01*	3.53*	2.60	1.0449	0.2303
PAN 660	0.18	0.77*	1.36*	1.95*	2.54*	3.13*	3.73*	2.53	1.1814	0.1936
LS 677***	0.08	0.62	1.15	1.68	2.22	2.75	3.29	2.36	1.0683	0.2645
Knap	0.05	0.61	1.17	1.73	2.30	2.86	3.42	2.43	1.1224	0.2772
SNK 500	0.11	0.66	1.21	1.75	2.30	2.85	3.40	2.48	1.0991	0.3056
LS 666	0.12	0.64	1.16	1.67	2.19	2.71	3.23	2.43	1.0379	0.3293
Dumela	0.00	0.56	1.11	1.67	2.22	2.77	3.33	2.42	1.1073	0.3239
Egret	0.06	0.52	0.98	1.44	1.91	2.37	2.83	2.28	0.9254	0.3985
LS 599	0.23	0.66	1.10	1.53	1.97	2.40	2.83	2.44	0.8683	0.4646
SCS 1****	0.13	0.40	0.68	0.95	1.22	1.49	1.77	2.11	0.5449	0.7555

\* Waardes in dieselfde kolom is betekenisvol beter/Values in the same column are significantly higher

Verwysingscultivars/Reference cultivars

\*\* Kort groeiseisoen/Short growing season \*\*\* Medium groeiseisoen/Medium growing season

\*\*\*\* Lang groeiseisoen/Long growing season

Tabel 8 Oessekerheid by die verskillende opbrengsmikpunte vir matige produksiegebiede, 2002/03, 2003/04

Table 8 Yield reliability at different yield targets for moderate production areas, 2002/03, 2003/04

Kultivar/ Cultivar	Opbrengsmikpunte/Yield targets ton ha <sup>-1</sup>							Gem/ MEAN	B_koeff/ B_COEFF	D <sup>2</sup>
	1.0	1.5	2.0	2.5	3.0	3.5	4.0			
Prima 2000**	0.00	0.43	0.93	1.44	1.95	2.46	2.96	2.36	1.0143	0.6413
Wenner**	0.27*	0.61	0.95	1.29	1.63	1.97	2.31	2.24	0.6803	0.6058
LS 677***	0.13	0.74	1.34*	1.94*	2.54*	3.15*	3.75*	2.49	1.2049	0.3119
A 5409 RG	0.14	0.76*	1.39*	2.01*	2.63*	3.26*	3.88*	2.40	1.2484	0.2022
AG 5601	0.00	0.58	1.16	1.74	2.33	2.91	3.49	2.33	1.1664	0.3321
AG 6101	0.05	0.57	1.10	1.62	2.15	2.68	3.20	2.23	1.0521	0.3358
PAN 809	0.21	0.63	1.05	1.48	1.90	2.32	2.74	2.16	0.8446	0.3653
Stork	0.40*	0.74	1.08	1.42	1.76	2.10	2.43	2.05	0.6790	0.3031
SCS 1****	0.00	0.25	0.53	0.82	1.10	1.38	1.66	1.96	0.5657	0.8264

\* Waardes in dieselfde kolom is betekenisvol beter/Values in the same column are significantly higher

Verwysingscultivars/Reference cultivars

\*\* Kort groeiseisoen/Short growing season

\*\*\* Medium groeiseisoen/Medium growing season

\*\*\*\* Lang groeiseisoen/Long growing season

Tabel 9 Oessekerheid by die verskillende opbrengsmikpunte vir matige produksiegebiede, 2003/04  
Table 9 Yield reliability at different yield targets for moderate production areas, 2003/04

Kultivar/ Cultivar	Opbrengsmikpunte/Yield target ton ha <sup>-1</sup>							Gem/ Mean	B_koeff/ B_coeff	D <sup>2</sup>
	1.0	1.5	2.0	2.5	3.0	3.5	4.0			
PAN 421 RR	0.00	0.36	0.82	1.28	1.74	2.21	2.67	2.06	0.9249	0.2573
LS 444	0.12	0.62	1.12	1.63	2.13	2.63	3.13	2.46	1.0064	0.2893
PAN 520 RR	0.39	0.91	1.44	1.96	2.49	3.01	3.54	2.46	1.0495	0.0952
Prima 2000**	0.32	0.89	1.47	2.05*	2.63*	3.21*	3.78*	2.72	1.1559	0.1776
Wenner**	0.00	0.49	1.02	1.54	2.06	2.59	3.11	2.48	1.0459	0.3704
PAN 626	0.70*	1.17*	1.64*	2.11*	2.58*	3.05	3.51	2.67	0.9382	0.1291
LS 677***	0.72*	1.28*	1.83*	2.38*	2.94*	3.49*	4.04*	2.83	1.1075	0.0750
A 5409 RG	0.40	0.95	1.50	2.05	2.60*	3.14*	3.69*	2.61	1.0976	0.1222
AG 5601	0.21	0.64	1.07	1.49	1.92	2.34	2.77	2.42	0.8525	0.3715
LS 580	0.27	0.71	1.16	1.60	2.04	2.48	2.93	2.30	0.8850	0.2051
LS 678	0.55*	1.07*	1.60*	2.12*	2.64*	3.16*	3.69*	2.66	1.0448	0.1143
AG 5603	0.06	0.59	1.11	1.64	2.16	2.69	3.21	2.33	1.0508	0.1931
AG 6101	0.36	0.80	1.25	1.70	2.14	2.59	3.04	2.32	0.8947	0.1578
PAN 809	0.35	0.82	1.29	1.75	2.22	2.69	3.16	2.52	0.9371	0.2463
Stork	0.73*	1.22*	1.70*	2.18*	2.66*	3.14*	3.63*	2.63	0.9635	0.0772
PAN 522 RR	0.29	0.72	1.15	1.58	2.01	2.44	2.87	2.43	0.8612	0.3077
SCS 1****	0.03	0.39	0.75	1.11	1.46	1.82	2.18	2.27	0.7143	0.5989

\* Waardes in dieselfde kolom is betekenisvol beter/Values in the same column are significantly higher

Verwysingscultivars/Reference cultivars

\*\* Kort groeiseisoen/Short growing season

\*\*\* Medium groeiseisoen/Medium growing season

\*\*\*\* Lang groeiseisoen/Long growing season

Tabel 10 Oessekerheid by die verskillende opbrengsmikpunte vir die warmer produksiegebiede, 2001/02, 2002/03, 2003/04

Table 10 Yield reliability at different yield targets for the warmer production areas, 2001/02, 2002/03, 2003/04

Kultivar/ Cultivar	Opbrengsmikpunte/Yield targets ton ha <sup>-1</sup>							Gem/ Mean	B_koeff/ B_coeff	D <sup>2</sup>
	1.0	1.5	2.0	2.5	3.0	3.5	4.0			
Prima 2000**	0.53*	0.95*	1.38*	1.80	2.23	2.65	3.07	2.73	0.8485	0.2485
Wenner**	0.54*	0.99*	1.44*	1.88*	2.33	2.78	3.22	2.74	0.8924	0.1886
Sonop	0.30	0.85*	1.40*	1.95*	2.50*	3.04*	3.59*	2.84	1.0957	0.1771
Highveld Top	0.17	0.73	1.29	1.85*	2.42*	2.98*	3.54*	2.94	1.1230	0.3078
CRN 5550	0.03	0.58	1.13	1.68	2.23	2.78	3.33	2.73	1.1007	0.2848
PAN 564	0.43*	0.95*	1.47*	1.99*	2.50*	3.02*	3.54*	3.00	1.0366	0.2698
LS 555	0.00	0.44	0.97	1.50	2.03	2.56	3.09	2.76	1.0584	0.4867
Marula	0.31	0.82	1.33*	1.84*	2.34*	2.85	3.36	2.86	1.0166	0.2866
PAN 660	0.36*	0.88*	1.39*	1.91*	2.42*	2.94*	3.45*	2.95	1.0296	0.2888
LS 677***	0.20	0.76	1.32	1.88*	2.44*	2.99*	3.55*	2.87	1.1188	0.2359
Knap	0.30	0.80	1.29	1.79	2.28	2.78	3.27	2.67	0.9897	0.1867
SNK 500	0.24	0.77	1.30	1.83*	2.36*	2.89*	3.42*	2.86	1.0616	0.2734
LS 666	0.00	0.41	0.97	1.52	2.08	2.63	3.19	2.62	1.1113	0.3194
Dumela	0.15	0.66	1.17	1.69	2.20	2.71	3.23	2.81	1.0254	0.3641
Egret	0.27	0.68	1.10	1.52	1.94	2.36	2.78	2.65	0.8364	0.4196
LS 599	0.08	0.54	0.99	1.45	1.91	2.37	2.83	2.71	0.9169	0.5269
SCS 1****	0.20	0.56	0.93	1.30	1.67	2.04	2.41	2.80	0.7382	0.8843

\* Waardes in dieselfde kolom is betekenisvol beter/Values in the same column are significantly higher

Verwysingscultivars/Reference cultivars

\*\* Kort groeiseisoen/Short growing season      \*\*\* Medium groeiseisoen/Medium growing season

\*\*\*\* Lang groeiseisoen/Long growing season

Tabel 11 Oessekerheid by die verskillende opbrengsmikpunte vir warmer produksiegebiede, 2002/03,2003/04

Table 11 Yield reliability at different yield targets for production areas, 2002/03, 2003/04

Kultivar/ Cultivar	Opbrengsmikpunte/Yield targets ton ha <sup>-1</sup>							Gem/ Mean	B_koeff / B_coeff	D <sup>2</sup>
	1.0	1.5	2.0	2.5	3.0	3.5	4.0			
Prima 2000**	0.80*	1.05*	1.29	1.54	1.79	2.04	2.28	2.65	0.4942	0.464 3
Wenner**	0.94*	1.24*	1.53*	1.83	2.13	2.42	2.72	2.77	0.5907	0.293 6
LS 677***	0.18	0.80	1.42*	2.05*	2.67*	3.29*	3.91*	2.99	1.2409	0.163 8
A 5409 RG	0.20	0.74	1.28	1.82	2.36	2.90	3.44	2.65	1.0799	0.128 6
AG 5601	0.25	0.80	1.36*	1.91*	2.47*	3.02*	3.57*	2.78	1.1082	0.146 2
AG 6101	0.00	0.42	0.85	1.28	1.71	2.14	2.58	2.57	0.8627	0.537 8
PAN 809	0.00	0.45	1.08	1.71	2.35	2.98*	3.61*	2.91	1.2618	0.337 8
Stork	0.00	0.34	0.88	1.43	1.97	2.52	3.06	2.76	1.0872	0.509 1
SCS 1****	0.00	0.30	0.84	1.38	1.93	2.47	3.02	2.58	1.0895	0.376 5

\* Waardes in dieselfde kolom is betekenisvol beter/Values in the same column are significantly higher

Verwysingscultivars/Reference cultivars

\*\* Kort groeiseisoen/Short growing season      \*\*\* Medium groeiseisoen/Medium growing season

\*\*\*\* Lang groeiseisoen/Long growing season

Tabel 12 Oessekerheid by die verskillende opbrengsmikpunte vir warmer produksiegebiede, 2003/04  
 Table 12 Yield reliability at different yield targets for warmer production areas, 2003/04

Kultivar/ Cultivar	Opbrengsmikpunte/Yield targets ton ha <sup>-1</sup>							Gem/ Mean	B_koeff/ B_coeff	D <sup>2</sup>
	1.0	1.5	2.0	2.5	3.0	3.5	4.0			
PAN 421 RR	0.07	0.44	0.81	1.18	1.55	1.92	2.29	2.17	0.7400	0.2729
LS 444	0.00	0.46	1.07	1.69	2.30	2.92	3.53	2.77	1.2309	0.2363
PAN 520 RR	0.23	0.73	1.22	1.72	2.21	2.70	3.20	2.65	0.9883	0.1864
Prima 2000**	0.55*	1.08*	1.60*	2.12*	2.65*	3.17	3.70	2.81	1.0491	0.0675
Wenner**	0.40	0.49	0.58	0.67	0.76	0.85	0.94	1.90	0.1800	0.6094
PAN 626	0.35	0.92	1.49	2.06	2.62	3.19*	3.76*	2.88	1.1358	0.1103
LS 677***	0.24	0.91	1.57*	2.23*	2.89*	3.56*	4.22*	3.26	1.3254	0.1884
A 5409 RG	0.32	0.88	1.44	2.00	2.57	3.13	3.69	2.78	1.1234	0.0923
AG 5601	0.23	0.62	1.02	1.42	1.81	2.21	2.61	2.49	0.7926	0.3152
LS 580	0.11	0.70	1.29	1.87	2.46	3.05	3.64	2.73	1.1799	0.1205
LS 678	0.49	1.10*	1.70*	2.31*	2.91*	3.51*	4.12*	3.27	1.2092	0.1724
AG 5603	0.52	0.76	1.01	1.26	1.50	1.75	2.00	2.36	0.4929	0.4068
AG 6101	0.23	0.62	1.02	1.42	1.81	2.21	2.61	2.49	0.7926	0.3152
PAN 809	0.77*	1.25*	1.74*	2.22*	2.70*	3.18	3.67	3.09	0.9652	0.1567
Stork	0.21	0.79	1.36	1.94	2.52	3.09	3.67	2.98	1.1546	0.2263
PAN 522 RR	0.56*	1.04*	1.51	1.98	2.46	2.93	3.40	2.94	0.9472	0.2103
SCS 1****	0.66*	1.09*	1.51	1.94	2.37	2.79	3.22	2.86	0.8520	0.2013

\* Waardes in dieselfde kolom is betekenisvol beter/Values in the same column are significantly higher  
 Verwysingscultivars/Reference cultivars  
 \*\* Kort groeiseisoen/Short growing season      \*\*\* Medium groeiseisoen/Medium growing season  
 \*\*\*\* Lang groeiseisoen/Long growing season