Landbounavorsingsraad

Graangewasse

Potchefstroom

Agricultural Research Council

Grain Crops

Potchefstroom

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VERSLAG VAN DIE NASIONALE SOJABOON KULTIVARPROEWE 2022/23

REPORT OF THE NATIONAL SOYBEAN CULTIVAR TRIALS

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1 INTRODUCTION

The National Soybean Cultivar Trials (project M101/62 (P05000002) were planted for the 45th successive year this past growing season. A total of 33 trials (of the planned 34 trials) were planted at 29 localities, illustrated in the locality list.

1.1 AIM

The aim of the project was primarily the following:

(I) To compare cultivars for agronomic and economic performance.

(ii) To test the adaptability of cultivars and new releases for specific areas and cultivation practices.

2 MATERIALS AND METHODS

2.1 GENERAL

The trials were planted as randomized block designs as well as a Latinized row-column design using three replications and 32 cultivars. Cultivar characteristics are shown in Table 1.

Each trial plot consisted of four, 5 m rows. Four metres were harvested from each of the middle two rows, to avoid border effects. Soil form, fertilization and weed control are indicated together with row spacing in Table 2. All seeds were inoculated with Bradyrhizobium japonicum bacteria (UPL inoculant) at planting.

The localities where trials were planted represent a wide range of climatic conditions. Trials were carried out on the ARC and Departmental Research Stations as well as on privately owned farms. Observations were recorded by responsible officers and collaborators as indicated in the list of collaborators. Planting time and cultivation practice were executed to correspond with that of commercial plantings in the specific areas. Rainfall and irrigation are indicated in Table 3. Note that rainfall is only recorded from October to April and not for the specific growing season of a trial.

2.2 OBSERVATIONS

A brief definition of some of the observations in the trials is as follow:

2.2.1 Date of flowering: The time at which one fully open flower per plant was observed across 50% of the plot.

2.2.2 Physiological maturity: The number of days when 50% of the pods appear yellow or brown.

2.2.3 Date of harvest maturity: When 95% of the pods for a given plot had turned brown. This is an indication of length of growing season, (number of days from date of planting to date of maturity).

2.2.4 Plant height: The average height in centimetre (cm) of plants from the soil surface to the growth point at maturity.

2.2.5 Pod height: The average height in centimetre (cm) of the lowest pods on the plant from soil surface at maturity.

2.2.6 Lodging: Lodging at time of harvest was rated on the following scale:

1 = No lodging
2 = Few lodgings, will not hamper mechanical harvesting
3 = Few lodgings, lodging less than what will hamper mechanical harvesting
4 = Few lodgings, will hamper mechanical harvesting, with yield loss
5 = Fair number of plants lodged, will hamper mechanical harvesting, with yield loss
6 = Many plants lodged, will hamper mechanical harvesting, with yield loss
7 = Many plants lodged, will hamper mechanical harvesting, with yield loss
8 = Nearly all plants lodged, will hamper mechanical harvesting, yield loss

9 = All plants lodged, will hamper mechanical harvesting, yield loss

2.2.7 Green stem: The percentage green stems at harvest rated on a 1 (normally mature) to 5 (more than 80% green stems) scale.

2.2.8 Shattering: Measured at time of harvest. Shattering is reported on a scale of 1 (no shattering) to 5 (more than 91-100% pods shattered).

2.2.9 Plant count three (3) weeks after emergence: The number of plants counted on 5 m of the two inner rows. This data will be used to calculate the germination percentage and will be compared with the germination percentage of different soil types.

2.2.10 100 seeds mass: Determined on an air-dry basis from a randomly selected sample retained on a 4,75 mm standard grading screen.

2.2.11 Undesirable seed: The mass of undesirable seed was determined in a random 100 g sample with seed size greater than 4,75 mm (excluding mechanical damaged seeds).

2.2.12 Protein and oil percentage: The analysis was done by the SAGL (Southern African Grain Laboratory NPC) by using the “Soxhlet” apparatus (oil percentage) and the “Dumas” method (protein percentage).

2.2.13 Grain yield: Four metres of the two centre rows were harvested by hand at soil level and threshed. The grain moisture was determined, and yield calculated on a basis of 12,5% moisture content.

2.3 THE EVALUATION OF TRIALS

The yield data of the individual trials were subjected to analysis of variance (ANOVA) with a randomized complete block design (RCBD) as well as a Latinized row-column design.

The localities with coefficient of variance higher than 25% were rejected from the analysis. The trial means (x-axis) versus the cultivar means (y-axis) is plotted. A regression line is then fitted with the trial means as x variable and cultivar mean as predictor variable. Out of the regression estimates, the yield probability percentage above the mean for each cultivar at different yield potentials is then calculated and presented in a table as a guideline for the use of different cultivars under different circumstances.

A yield probability of more than 50% indicated above average yield and a yield probability of less than 50% indicated a below average yield.

3 DISCUSSIONS OF RESULTS

3.1 GENERAL

The rainfall and irrigation data are shown in Table 3.

Six (6) of the 33 trials planted could not be included (18.2%) in the report compared to the six (6) out of 27 trials (22.2%) in the 2021/22 season.

The following trial could not be included in the report for the following reasons:

1. Cedara- flooding and hail damage
2. Chrissiesmeer – flooding
3. Cornelia – hail damage
4. Derby – high CV%
5. Frankfort - flooding
6. Lichtenburg – flooding followed by extreme drought

As in the previous seasons the evaluation of the trials was based on several parameters. No conclusion can be made on a single parameter.

3.2 DISCUSSION OF TABLES

3.2.1 Days to flowering (Table 4), physiologically mature (Table 5) and length of the growing season (Table 6)

The number of days from planting to flowering (Table 4) is an effective measure for the grouping of cultivars because the relative order of rank for this characteristic is repeated to a great extent over localities and years. As expected, the average days to flowering was the shortest in the warm areas (48 days Groblersdal ARC) and the longest in the cooler areas (88 days at Kokstad).

The number of days to physiological maturity is shown in Table 5. The longest average days to maturity was experienced at Bethlehem PD1 (156 days).

The number of days to harvest maturity (Table 6) was used to determine the length of the growing season of a cultivar. The number of days to harvest maturity is however, more dependent on climatic changes and planting date for soybeans and, the number of days to flowering is therefore a more reliable maturity grouping criterion.

3.2.2 Plant height (Table 7)

The indeterminate cultivar P71T74 R (MG 7.1) had a mean plant height of 133 cm (highest) in the warm area compared to 68 cm (lowest) of the indeterminate cultivar RA5022BR (MG 5.0) in the cool region.

The average plant height between localities varied from a mean of 63 cm at Umtata to 122 cm at Hoopstad.

3.2.3 Pod height (Table 8)

The variation in pod and plant height between cultivars is linked with the length of the growing season of a cultivar. The cultivar Y651 RR PRO (MG 6.5; indeterminate), had a mean pod height of 26 cm in the warm area, but also had an above average pod height in the cool and moderate areas.

Other cultivars with above average pod heights for all the climate areas are NS 5909 R (MG 5.9; indeterminate), LS 6860 R (MG 6.2; indeterminate), P57T19 R MG 5.7; indeterminate), DM59R03 (MG 6.0; indeterminate, PAN 1555 R (MG 5.7, indeterminate), LGG60260IPR (MG 6.0; indeterminate), DM 59I60RSF IPRO (MG 6.0; indeterminate), LG60261 IPR (MG 6.0; indeterminate), Y651 RR PRO (MG 6.5; indeterminate), Y657 (VG 6.5; indeterminate), DM 61I63RSF IPRO (MG 6.6; indeterminate). DM 6.8i RR (MG 6.8; indeterminate) and P71T74 R (MG 7.1; indeterminate).

NS 5258 R (MG 4.9) (indeterminate) had the lowest reading of 8 cm in the cool area. Considerable harvest losses can occur due to low pod height; thus, pod height is an important factor influencing cultivar choice. Differences in pod height between localities can mainly be attributed to differences in row width and climate. A pod height of at least 7.5 cm (combine harvesting height) is preferable.

3.2.4 Lodging (Table 9)

The highest overall lodging occurred in the trial at Groblersdal (Agri-Seeds). The highest lodging figures was reported for Y651 RR PRO, P71T74 R and DM 6.8 i RR at Groblersdal (Agri-Seeds) in the warm area.

3.2.5 Green stem (Table 10)

A high percentage of green stem was recorded at Barberspan while the cultivars P62T16R, DM 6.8i RR, RA5722BR, LG60261 IPR and RA6422 R showed an above average tendency for green stem for all the climatic regions. Plants also retained their leaves that could hamper the harvesting process.

3.2.6 Shattering with harvesting (Table 11)

No shattering occurred at any of the localities.

3.2.7 Number of plants three (3) weeks after emergence (Table 12)

Enough certified seed was provided to establish 400 000 plants ha^{-1} for the irrigation and high rainfall areas and 350 000 for dryland. The lowest plants ha^{-1} count were recorded at Groblersdal (ARC) due to bird damage.

3.2.8 Percentage undesirable seed (Table 13)

The lowest mean of 0.57% undesirable seeds was recorded for the moderate region. The range varied from 2.34% at Kinross to 0.19% at Potchefstroom (Limagrain) and Rietvlei.

3.2.9 Mass (g) 100^{-1} seeds (Table 14)

The variation in seed mass among localities ranged between 10.61 g 100^{-1} seeds at Schweizer-Reneke PD2 to 18.78 g 100^{-1} seeds at Thabazimbi. The highest average seed mass was recorded for DM 53154RSF IPRO in the warm region, while LS 6851 R, had the smallest average seed in the cool area.

1.2.10 Oil percentage (Table 15)

RA4918R and NS 5258 R had an above average (>23%) for the moderate and warm areas as well as (>22%) for the cool area. The average oil percentages are 20.96% for the cool-, 22.00% moderate- and 22.48% for the warm areas.

1.2.11 Crude Protein percentage (Table 16)

PAN 1507 R had an above average percentage of 41.04% in the cool-, 39.84% in the moderate- and 40.84% in the warm area. The overall averages are 39.09% for the cool-, 37.97% for the moderate- and 39.42% in the warm areas.

3.2.12 Profat (Table 17)

The inclusion of this table in the report was requested by Dr Erhard Bredenham as the total value of oil and protein is a much better indicator for the selection of a cultivar

than the single oil or protein factor. The cultivars PAN 1507 R and P57T19 R had the highest average profat value (>61%) for all the regions.

3.2.10 Yield (Table 18)

Due to the sensitivity of soybean cultivars to environmental conditions, it is preferable to divide the soybean production areas into cool, moderate and warm regions. A better yield can be established by choosing a cultivar suitably adapted for a specific region. It is also necessary to use data from more than one year to select between cultivars. Due to the significant cultivar and locality interaction, conclusions on cultivar performance should not be made from average yield data alone. The mean yield over localities has therefore been omitted.

4 INTERPRETATION OF YIELD RESULTS

4.1 INTRODUCTION

A stated aim of the national soybean cultivar trials is the evaluation of cultivars for their adaptability to a potential production area, and for their yield performance. Adaptability is especially important because soybean cultivars are known to be restricted in terms of recommended production area. This fact is also demonstrated by the results discussed in this report.

Because of genotypic restriction in adaptability the statistical analysis of data over all trial entries and localities tend to demonstrate strong interaction components which confound interpretation. Interaction makes genotype rankings at one site inapplicable to another site. The larger the interaction the more information is lost if interaction is not analysed effectively. This will be a lesser problem for homogeneous areas than for non-homogeneous areas. However, a purpose of the national trials is to identify homogeneous areas or homogeneous growing conditions based on cultivar performance. Localities were therefore grouped together based on past research experience and with the assistance of photo thermal charts provided by the Institute for Soil, Climate and Water. Localities were grouped in cool, moderate and warm production areas.

4.2 YIELD PROBABILITY AND YIELD (Tables 19, 20, 21, 22, 23 & 24)

A minimum number of successful trials per climatic area are needed to calculate saved yield probability values. Yield probability tables are set up for cool-, moderate and warm regions, if enough data is available.

Yield probability of a cultivar is the chance to get an above average yield at a particular yield potential. For instance, if the yield probability of a cultivar, at a particular yield potential equals 60%, the chance to get a yield above the mean of all cultivars is 60% with a 40% chance of obtaining a yield below the mean. Thus a 60% probability indicated a 10% change of an above average yield, while a 40% probability indicated a 10% change of getting a below average yield.

P64T39 R showed an above average yield probability for all the yield potentials in the cool, moderate as well as the warm areas (Tables 19, 21 & 23). PAN 1521 R, RA660R and P71T74 R performed above average for both the moderate and warm areas (Tables 21 & 23). DM 5351 RSF and PAN 1644 R only performed above average for the cool area (Table 19), while RA565 R and DM 6.8i RR showed an above average yield probability in moderate area (Table 23).

Lokaliteite, medewerkers en proeflokaliteit van kultivarproewe soos beplan vir, 2022/23
Localities, co-operators and trial locality of the cultivar trials for 2022/23

Nr No	Lokaliteit Locality	Proeflokaliteit Trial locality	Verantwoordelike beampte Responsible officer
1	Barberspan	J Basson	G de Beer & L Bronkhorst
2-3	Bapsfontein	Corteva Agriscience Research Centre	J Serfontein
4	Belfast	G Roos	L Bronkhorst
5-6	Bethlehem	Kleingraan Instituut ARC	L Bronkhorst
7	Cedara	Departmaent of Agriculture	J Arathoon
8	Chrissiesmeer	-	D van Staden
9	Clarens	D Terblanche	L Bronkhorst
10	Cornelia	-	G van Rensburg
11-12	Delmas (Agri Seed)	-	D van Staden
13	Derby	C Coetzer	G van Rensburg
14	Frankfort	-	D van Staden
15	Greytown	Pannar Proefplaas	A Jarvie
16	Groblersdal (Agri Seed)	-	D van Staden
17	Groblersdal (ARC)	-	L Bronkhorst
18	Hoopstad	R Taljaard	G de Beer & L Bronkhorst
19	Kinross	Vosstoffel Boerdery	L Bronkhorst
20	Kokstad	Research Stadion	MP Skhakhane
21	Kroonstad	Hoërskool Kroonstad	L Bronkhorst
22	Kroonstad (Agricol)	Blouskool	G van Rensburg
23	Leeudoringstad	D Bergh	G de Beer & L Bronkhorst
24	Lichtenburg	F du Plessis	G van Rensburg
25	Potchefstroom	Limagrain Research Station	F Middleton
26	Potchefstroom	Pannar Research station	A Jarvie
27	Rietvlei	-	A Venter
28-29	Schweizer Reneke	J du Plessis	G de Beer & L Bronkhorst
30	Standerton	E Buurman	G van Rensburg
31	Thabazimbi	-	F Middleton
32	Umtata	Dimanda High School	M Mtyobile
33	Winterton	Terry Muirhead	F Middleton

Tabel 1 Sojaboonsaad eienskappe en inligting oor verskaffers, 2022/23
Table 1 Soybean seed characteristics and information about agents, 2022/23

Kultivar Cultivar	Volwassenheids-groeperings Maturity Group	Groeiwyse Growth habit *1	Hilum kleur Hilum colour *2	Blomkleur Flower colour *3	Hackler Pubescence *4	Op varieteits lys On variety list	Verskaffer Agent	Telersregte Breeding rights
RA4918 R	4.9	I	BL	P	T	JA/YES	Agri Seed & Technology	JA/YES
RA5022 BR	5.0	I	LB	W	G	NEE/NO	Agri Seed & Technology	NEE/NO
DM 5351RSF	5.0	I	BL	W	T	JA/YES	GDM Seeds/Agricol	JA/YES
DM 53I54RSF IPRO	5.1	I	BL	P	T	JA/YES	GDM Seeds/Agricol	JA/YES
NS 5258 R	5.2	I	BL	W	B	JA/YES	Limagrain (K2)	NEE/NO
PAN 1502 R	5.2	I	B	P	T	JA/YES	Pannar	JA/YES
Y540	5.4	I	B	W	-	JA/YES	Southern Hemisphere Seeds	NEE/NO
LS 6851 R	5.5	D	B	P	W	JA/YES	Limagrain	JA/YES
RA565 R	5.5	I	B	P	G	JA/YES	Agri Seed & Technology	JA/YES
PAN 1507 R	5.5	I	IB	P	G	JA/YES	Pannar	JA/YES
RA5722BR	5.7	I	LB	W	G	NEE/NO	Agri Seed & Technology	NEE/NO
PAN 1521 R	5.7	I	IB	P	G	JA/YES	Pannar	JA/YES
PAN 1555 R	5.7	I	B	P	T	JA/YES	Pannar	JA/YES
P57T19 R	5.7	I	DB	P	B	JA/YES	Pioneer	JA/YES
RA5821 R	5.8	I	IB	P	G	JA/YES	Agri Seed & Technology	JA/YES
NS 5909 R	5.9	I	IB	P	G	JA/YES	Limagrain (K2)	NEE/NO
DM59R03	6.0	I	LB	W	G	JA/YES	GDM Seeds/Agricol	JA/YES
LG60260IPR	6.0	I	IB	P	G	JA/YES	Limagrain	-
RA660 R	6.0	I	B	P	G	JA/YES	Agri Seed & Technology	JA/YES
DM 59I60RSF IPRO	6.0	I	IB	P	G	JA/YES	GDM Seeds/Agricol	JA/YES
LG60261IPR	6.1	I	LB	W	G	JA/YES	Limagrain	-
LS 6860 R	6.2	I	B	P	W	JA/YES	Limagrain	JA/YES
P62T16 R	6.2	I	B	W	W	JA/YES	Pioneer	JA/YES
RA6422 R	6.4	I	IB	P	G	NEE/NO	Agri Seed & Technology	NEE/NO
P64T39 R	6.4	I	KL	W	G	JA/YES	Pioneer	JA/YES
Y651 RR PRO	6.5	I	IB	P	G	-	Southern Hemisphere Seeds	NEE/NO
RA6521BR	6.5	I	IB	P	G	NEE/NO	Agri Seed & Technology	NEE/NO
Y 657	6.5	I	B	P	-	JA/YES	Southern Hemisphere Seeds	NEE/NO
DM 61I63RSF IPRO	6.6	I	LB	W	G	JA/YES	GDM Seeds/Agricol	JA/YES
PAN 1644 R	6.7	I	IB	P	G	JA/YES	Pannar	JA/YES
DM 6.8i RR	6.8	I	B	P	G	JA/YES	GDM Seeds/Agricol	JA/YES
P71T74 R	7.1	I	KL	W	G	JA/YES	Pioneer	JA/YES

*1 D - Bepaald/determinate; I - Onbepaald/indeterminate; SD - Semi-Bepaald/semi deteminate

*2 BL - Swart/black; IB - Onvollodig swart/imperfect black; B - Bruin/brown; LB - Ligbruin/buff; G - Grys/grey; KL - Kleurloos/buff

*3 P - Pers/purple; W - Wit/white

*4 B - Bruin/brown; G - Grys/grey; W - Wit/white; T – Taankleurig/Tawn

Tabel 2 Algemene inligting aangaande grond en verbouiingpraktyke by die onderskeie proeflokaliteite van die kultivarproewe, 2022/23
Table 2 General information in connection with soil and cultivation practices at the different trial localities, 2022/23

Lokal Locality	Plantdatum Date of planting	Spasiëring Spacing (cm)	Onkruid beheer Weed control
Bapsfontein PD1/B/I	29/12/2022	90	-
Bapsfontein PD2/B/	29/12/2022	90	-
Barberspan/D	17/11/2022	76	Strongarm, Alahlor
Belfast/D	19/11/2022	76	Strongarm, Alahlor
Bethlehem PD1/D	26/10/2022	76	Strongarm, Alahlor
Bethlehem PD2/D	24/11/2022	76	Strongarm, Alahlor
Cedara/D	22/11/2022	45	-
Chrissiesmeer/D	26/10/2022	76	-
Clarens/D	25/11/2022	76	Strongarm, Alahlor
Cornelia/D	01/11/2022	45	-
Delmas/D	17/11/2022/	76	-
Derby/D	01/12/2022	45	-
Frankfort/D	06/12/2022	76	-
Greytown/D	09/11/2022	75	Glyphosate
Groblersdal Agri Seed/B/I	03/11/2022	90	-
Groblersdal ARC/B/I	30/11/2022	76	Strongarm, Alachlor
Hoopstad/D	29/10/2022/	76	None
Kinross/D	03/11/2022	76	Farmer spray paraquat
Kokstad/D	22/11/2022	45	Metolachlor, Glyphosate powermax
Kroonstad/D	06/12/2022	76	Strongarm, Alahlor
Kroonstad (Agricol)/D	02/12/2022	45	-
Leeudoringstad/D	31/10/2022	76	None
Lichtenburg/D	02/12/2022	45	-
Ngqeleni/D	Nie geplant/Not planted	75	-
Potchefstroom (Limagrain)/D	23/11/2022	76	-
Potchefstroom (Pannar)/B/I	22/12/2022	90	-
Rietvlei/B/I	8/12/2022	45	-
Schweizer Reneke/ PD1/D	28/10/2022	110	Round-up
Schweizer Reneke/ PD2/D	01/12/2022	110	Round-up
Standerton/D	25/10/2022	45	-
Thabazimbi/B/I	24/11/2022	76	-
Umtata/D	24/12/2022	75	Round-up
Winterton/D	30/11/2022	76	Round-up

Tabel 3 Reënval en besproeiing vir die verskillende lokaliteite (mm), 2022/23
Table 3 Rainfall and irrigation at the different localities (mm), 2022/23

Lokaliteit	Maandelikse reënval (mm)/							Totaal	Besproeiing	Totaal
Locality	Monthly rainfall (mm)							Total	Irrigation	Total
	Okt	Nov	Des	Jan	Feb	Mrt	Apr	*		**
Barberspan	-	29	94	35	139	82	55	434	0	434
Belfast	-	98.2	138.6	51.6	138.6	58.6	40	525.6	0	525.6
Bethlehem	12	167.5	160.8	47.3	117.5	9	5	519.1	0	519.1
Clarens	88.9	279.65	116.59	129.79	131.06	39.12	50.8	835.91	0	835.91
Greytown	-	-	171	184	27.3	98.2	114.3	594.8	0	594.8
Groblersdal	-	3.05	111.25	16.76	2.79	3.56	-	137.41	0	137.41
Hoopstad	62	103	157	75	82	31	33	543	0	543
Kinross	27.18	224.54	104.64	61.98	168.4	31.75	32	650.49	0	650.49
Kokstad	0	53.09	196.09	242.82	207.52	62.48	36.07	798.07	0	798.07
Kroonstad	59.6	274.8	96.8	34.4	134.4	70.6	48.2	718.8	0	718.8
Leeudoringstad	52	215	124	67	118	20	40	636	0	636
Rietvlei	-	-	109	48	190	-	-	347	0	347
Schweizer Reneke PD1	65.5	115.6	78	80.3	100.3	45	19.8	504.5	0	504.5
Schweizer Reneke PD2	65.5	115.6	78	80.3	100.3	45	19.8	504.5	0	504.5

* Vir reënval/For rainfall
* Vir reënval en besproeiing/For rainfall and irrigation

Tabel 4 Die aantal dae vanaf plant tot 50% blomstadium van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2022/23
Table 4 The number of days from planting to 50% flowering stage of the different soybean cultivars at the different trial localities, 2021/22

Kultivar Cultivar	Koel/Cool								Matig/Moderate							Warm				
	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Kokstad	Winterton	Gem/Mean	Barberspan	Kroonstad	Leeudoringstad	Potchefstroom (Limagrain)	Rietvlei	Umtata	Gem/Mean	Groblersdal ARC	Hoopstad	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Gem/Mean
RA4918 R	60	65	21	65	50	71	47	54	40	53	48	53	47	62	51	41	51	47	36	44
RA5022 BR	60	65	36	68	61	71	48	58	41	55	49	53	55	62	52	41	51	48	40	45
DM 5351 RSF	52	62	31	69	61	71	47	56	41	53	49	53	45	62	51	36	51	48	39	44
DM 53I54 RSF IPRO	60	60	21	55	50	71	48	52	42	40	49	55	46	62	49	41	53	50	41	46
NS 5258 R	57	60	52	65	68	71	46	60	45	45	49	52	47	69	51	36	55	50	40	45
PAN 1502 R	67	78	71	81	61	87	56	72	57	59	52	59	67	62	59	51	69	61	58	60
Y540	79	76	69	81	66	83	52	72	49	59	60	60	61	62	59	48	59	62	56	56
LS 6851 R	94	67	69	76	90	87	56	77	58	55	63	62	64	69	62	48	69	64	57	60
RA 565 R	94	65	69	81	83	87	57	77	58	57	67	65	65	62	62	48	65	64	58	59
PAN 1507 R	101	67	83	86	78	92	61	81	62	65	62	71	68	62	65	48	70	71	61	63
RA5722BR	79	50	57	81	66	76	49	65	44	40	56	56	56	69	53	41	59	56	43	50
PAN 1521 R	101	65	91	88	90	92	65	85	61	59	65	68	74	62	65	48	70	67	62	62
PAN 1555 R	94	76	83	81	90	93	65	83	63	68	73	69	76	62	68	61	73	70	61	66
P57T19 R	94	65	90	88	88	88	62	82	45	59	64	63	67	62	60	51	68	66	61	62
RA5821R	94	71	52	94	88	88	67	79	60	59	67	67	67	62	64	41	67	67	60	59
NS 5909 R	94	65	83	81	88	94	66	82	62	59	69	67	75	62	66	51	75	72	60	65
DM 59R03 RSF	94	71	71	88	90	87	61	80	60	65	63	64	71	62	64	41	69	67	60	59
LG60260IPR	101	62	83	88	90	98	67	84	65	65	73	72	79	62	69	36	75	73	62	62
RA 660 R	94	65	69	81	90	87	64	79	62	59	66	67	71	62	64	51	70	68	63	63
DM 59I60 RSF IPRO	94	91	83	84	88	84	56	83	62	59	69	72	75	69	68	48	72	73	60	63
LG60261IPR	94	81	80	84	90	91	67	84	67	65	68	71	75	62	68	57	75	74	60	67
LS 6860 R	94	96	83	76	90	95	69	86	64	68	67	70	76	62	68	46	72	70	64	63
P62T16R	94	65	76	81	90	92	62	80	60	55	62	67	76	62	64	57	69	72	61	65
RA6422 R	94	73	83	84	85	92	65	82	67	59	67	71	74	62	67	57	72	74	62	66
P64T39 R	94	67	90	94	78	97	66	84	59	59	68	68	75	62	65	49	72	72	60	63
Y651 RR PRO	94	91	91	88	90	97	70	89	64	67	71	70	76	62	68	48	76	73	63	65
RA6521BR	101	81	91	94	96	98	69	90	64	71	71	72	78	62	70	59	75	76	64	69
Y657	94	67	83	86	90	94	67	83	66	59	67	71	76	62	67	57	72	73	63	66
DM 61I63 RSF IPRO	94	73	83	84	61	92	68	79	64	65	69	71	75	62	68	57	73	74	61	66
PAN 1644 R	94	50	83	81	78	90	65	77	61	65	69	69	72	62	66	57	71	73	63	66
DM 6.8i RR	94	86	83	86	96	95	68	87	65	65	70	69	74	62	67	41	71	76	64	63
P71T74 R	94	81	83	84	96	95	68	86	66	65	68	71	75	62	68	36	75	74	65	63
Gem/Mean	87	71	72	81	81	88	61	77	58	59	63	65	68	63	63	48	68	66	57	60

Tabel 5 Die aantal dae vanaf plant tot fisiologiesrypstadium van die verskillende sojaboonkultivars by die verskillende proef lokaliteite, 2022/23
Table 5 The number of days from planting to physiological maturity of the different soybean cultivars at the different trial localities, 2022/23

Kultivar Cultivar	Koel/Cool								Matig/Moderate						Warm					
	Belfast	Bethlehem PD1	Bethlehem PD2	Clarens	Kinross	Kokstad	Winterton	Gem/Mean	Barberspan	Kroonstad	Leeudoringstad	Potchefstroom (Limagrain)	Umtata	Gem/Mean	Groblersdal ARC	Hoopstad	Schweizer-Reneke PD1	Schweizer-Reneke PD2	Thabazimbi	Gem/Mean
RA4918 R	129	112	131	129	132	134	118	126	125	112	128	121	122	122	105	131	135	108	107	117
RA5022 BR	129	140	124	129	145	136	119	132	121	120	130	120	129	124	115	129	131	109	109	119
DM 5351RSF	129	140	116	140	132	150	121	133	123	112	128	123	122	122	105	134	125	109	109	116
DM 53I54RSF IPRO	109	140	131	129	145	140	124	131	121	120	127	119	129	123	105	135	136	110	110	119
NS 5258 R	136	112	124	129	132	134	123	127	121	112	131	122	122	122	106	131	135	109	106	117
PAN 1502 R	146	153	124	143	145	150	124	141	135	125	127	129	129	129	118	134	140	120	111	125
Y540	146	145	141	143	132	150	123	140	128	120	133	125	122	126	115	137	138	120	109	124
LS 6851 R	152	160	124	140	145	159	129	144	143	130	140	132	122	133	118	148	141	120	117	129
RA565 R	152	160	124	143	145	150	127	143	140	120	135	125	122	128	110	147	145	124	114	128
PAN 1507 R	146	153	137	135	145	153	127	142	140	130	132	127	129	132	126	149	145	126	116	132
RA5722BR	136	153	141	143	145	163	130	144	135	133	144	133	122	133	132	149	143	128	121	135
PAN 1521 R	136	160	116	143	145	150	128	140	136	125	144	124	129	132	110	148	141	128	118	129
PAN 1555 R	146	160	131	143	152	163	129	146	144	133	135	130	122	133	126	149	143	130	121	134
P57T19 R	146	160	145	143	149	152	131	147	144	130	140	129	129	134	110	137	143	128	115	127
RA5821 R	158	145	131	143	145	150	127	143	135	125	141	127	129	132	115	136	140	126	109	125
NS 5909 R	158	153	145	143	152	163	131	149	140	133	141	126	122	132	118	150	151	130	122	134
DM59R03	158	170	145	143	152	159	130	151	138	130	140	132	129	134	110	149	146	130	115	130
LG60260IPR	158	160	145	143	152	163	130	150	139	130	143	134	122	134	110	149	148	130	118	131
RA660 R	146	155	145	143	145	153	125	145	141	125	140	130	122	132	115	151	149	130	114	132
DM 59I60RSF IPRO	158	160	145	143	152	159	112	147	143	130	141	133	122	134	115	149	151	131	116	132
LG60261IPR	158	160	145	143	149	165	130	150	144	133	138	131	129	135	115	151	155	132	114	133
LS 6860 R	158	170	145	143	152	159	132	151	144	133	140	133	122	134	110	172	151	135	120	138
P62T16R	158	170	145	143	149	156	133	151	144	133	148	134	122	136	115	152	153	135	122	135
RA6422 R	158	166	145	143	152	157	136	151	149	137	140	137	122	137	132	158	153	139	125	141
P64T39 R	158	170	145	143	162	165	132	154	144	133	144	136	129	137	118	161	154	131	122	137
Y651 RR PRO	158	166	145	143	162	159	136	153	144	135	146	134	122	136	132	161	155	131	121	140
RA6521BR	158	166	145	143	162	159	133	152	143	137	146	140	122	138	132	158	155	134	125	141
Y657	158	160	145	143	145	150	132	148	143	130	138	132	129	134	118	154	153	132	115	134
DM 61I63RSF IPRO	158	166	145	143	162	163	134	153	140	133	146	137	122	135	110	161	157	131	122	136
PAN 1644 R	128	160	145	143	145	161	131	145	145	133	144	132	122	135	118	161	151	132	122	137
DM 6.8i RR	158	163	145	143	151	162	131	150	145	133	144	134	122	136	124	163	153	133	123	139
P71T74 R	129	170	145	143	162	159	134	149	152	137	150	136	129	141	132	162	158	135	124	142
Gem/Mean	147	156	138	141	148	155	128	145	138	128	139	130	125	132	117	149	146	126	117	131