Sojaboon Kultivaraanbevelings
Soybean Cultivar Recommendations

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Hoewel sojabone 'n gewas is wat bykans wêreldwyd verbou word, het individuele kultivars 'n beperkte gebiedsaanpassing. Gevolglik sal die kultivar wat die beste aangepas is vir 'n gegewe lokaliteit, dié een wees wat oor 'n aantal jare die hoogste opbrengs en saadkwaliteit lewer. Onder vergelykbare omgewingstoestande en produksiepraktyke kan 'n seleksie uit kultivars gemaak word wat 'n hoë opbrengs en 'n meer akkurate oessekerheidswaarde het. Die Nasionale Sojaboonkultivarproewe van die LNR-Instituut vir Graangewasse en verskeie medewerkers lewer in die opsig waardevolle inligting ten opsigte van verskillende produksie areas in Suid-Afrika.

BELANGRIKE INLIGTING VIR KULTIVARKEUSE

Die belangrikste inligting wat in ag geneem moet word ten opsigte van kultivarkeuse by sojabone, is lengte van groeiseisoen. Anders as by die meeste algemeen verboude gewasse, is sojabone gevoelig vir daglengte 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 van die groeiseisoen beïnvloed en sal 'n gegewe kultivar heelwat gouer blom by 'n later plantdatum.

Although soybeans as a crop is grown worldwide, individual cultivars or genotypes demonstrate a limited adaptation to specific geographical areas. The best adapted cultivar is therefore the one that will, in the long term, give the best yield and quality for a specific locality within a specific geographical area. A selection can be made of cultivars with high yield and optimal yield reliability under comparable environmental conditions as well as production practises. The National Soybean Cultivar Trials conducted by the ARC-Grain Crops Institute and several collaborators render a valuable service in identifying such cultivars for different production areas in South Africa.

IMPORTANT INFORMATION FOR CULTIVAR CHOICE

The length of the growing season is the most important characteristic to take into consideration in terms of cultivar choice for soybean. Unlike the other most commonly cultivated crops, soybean are sensitive to day length and a given cultivar will ripen later and result in a longer growing season the further south it is planted in Southern Africa. Planting dates will therefore also influence the length of the growing season and a given cultivar will flower much earlier should it be planted at a later planting date.

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Tabel 1. Gemiddelde aantal dae tot 50% blom en oesrypheid van kultivars gedurende die 2010/11 groeiseisoen vir warm, matig en koue produksiegebiede.
Table 1. Average number of days to 50 % flowering and harvesting of cultivars during the 2010/11 growing season for warm, moderate and cool production areas.

Kultivar/ Cultivar	Dae tot 50% blom/Days to 50% flower			Dae tot oesryp/Days to harvest		
	Warm/ Warm[1]	Matig/ Moderate[2]	Koud/ Cool[3]	Warm/ Warm[4]	Matig/ Moderate[5]	Koel/ Cool[6]
LS 6162 R	38	44	61	130	123	-
PAN 1454 R	40	46	57	145	125	-
PAN 1583 R	51	62	77	148	135	-
PHB 95 B 53	55	69	80	147	135	-
PHB 95 Y 20	55	68	73	149	135	-
PHB 95 Y 40	54	59	80	151	139	-
A 5409 RG	54	69	77	141	134	-
PAN 1666 R	54	66	73	146	132	-
PAN 1664 R	48	64	76	146	135	-
LS 6164 R	53	66	79	144	135	-
PHB 96 B 01	54	71	83	160	140	-
LS 6161 R	54	68	80	146	136	-
LS 6050 R	53	66	79	148	135	-
LS 6150 R	55	66	79	149	136	-
PAN 737 R	54	72	82	151	143	-
Dundee	55	68	79	146	136	-
Egret	59	75	87	166	143	-
Heron	53	71	84	149	139	-
Ibis 2000	60	74	81	161	141	-

[1] - Gemiddeld van 4 lokaliteite / average of 4 localities
[2] - Gemiddeld van 5 lokaliteite / average of 5 localities
[3] - Gemiddeld van 3 lokaliteite / average of 3 localities
[4] - Gemiddeld van 1 lokaliteit / average of 1 locality
[5] - Gemiddeld van 3 lokaliteite / average of 3 localities
[6] - Geen inligting beskikbaar / No information available

Dae tot blom – Gemiddeld 50% van die plante het een blom / Days to flowering – Average of 50% of plants with one flower.
Dae tot oesryp – Gemiddeld van alle peule is volwasse, bros en droog / Days to harvest – Average of pods is mature, brittle and dry.

Tabel 2. Groepering van lokaliteite volgens warm, matige en koue produksiegebiede gedurende die 2010/11 groeiseisoen.
Table 2. Grouping of localities according to warm, moderate and cool production areas during the 2010/11 growing season.

Warm/Warm	Matig/Moderate	Koud/Cool
Atlanta (B/I)	Cedara (D)	Bethlehem (D)
Brits (D)	Dundee (D)	Clocolan (D)
Groblersdal (B/I)	Glen (B/I)	Delmas (D)
Koedoeskop (B/I)	Greytown (D)	Kinross (D)
Rustenburg (D)	Greytown Kranskop (D)	Kokstad (D)
Vaalharts (B/I)	Lichtenburg (D)	Villiers (D)
	Potchefstroom PD1 (B/I)	
	Potchefstroom PD2 (B/I)	
	Potchefstroom Drg PD1(D)	
	Potchefstroom Drg PD2(D)	

B – Besproeing / I - Irrigation D – Droëland / Dry land

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Tabel 3. Algemene inligting ten opsigte van geregistreerde sojaboonkultivars wat tydens die 2010/11 groeiseisoen geëvalueer is.
Table 3. General information on registered soybean cultivars that were evaluated during the 2010/11 growing season.

Kultivar/ Cultivar	Volwassenheidsgroepering/ Maturity Group	Groeiwyse/ Growth habit[1]	Hilum kleur/ Hilum Colour[2]	Oliepersentasie/ Oil percentage (%)			Proteïenpersentasie Protein Percentage (%)			Peulhoogte/ Pod height[3]			Oopspring/ Shattering[4]			Verskaffer/ Supplier
				Koel	Matig	Warm	Koel	Matig	Warm	Koel	Matig	Warm	Koel	Matig	Warm	
LS 6162 R	4.0	D	BL	20.00	18.93	19.08	37.33	42.63	42.75	6	7	5	1.00	1.00	2.33	LINK SEED
PAN 1454 R	4.5	I	BL	19.17	18.83	19.73	39.80	43.64	44.48	8	9	10	1.00	1.06	1.55	PANNAR
PAN 1583 R	5.0	D	LB	17.50	18.17	19.38	39.20	42.43	41.05	11	12	10	1.00	1.06	1.33	PANNAR
PHB 95 B 53	5.5	D	BL	16.83	17.50	19.20	41.43	45.46	44.53	15	12	11	1.00	1.00	1.11	PIONEER
PHB 95 Y 20	5.2	D	BL	16.70	17.50	19.28	40.87	45.06	43.95	13	13	13	1.00	1.00	1.33	PIONEER
PHB 95 Y 40	5.4	D	BL	16.23	17.24	18.45	42.60	45.73	43.83	9	10	7	1.00	1.06	1.33	PIONEER
A 5409 RG	5.5	I	G	17.67	17.44	18.78	39.57	43.50	41.95	10	12	10	1.00	1.00	1.11	PANNAR
PAN 1666 R	5.8	I	BL	17.57	18.23	19.43	40.27	43.60	44.03	19	14	12	1.00	1.00	1.22	PANNAR
PAN 1664 R	5.9	D	LB	17.83	17.79	18.93	38.90	42.64	42.63	13	12	11	1.00	1.00	1.00	PANNAR
LS 6164 R	6.0	D	LB	18.30	17.96	19.43	38.57	43.30	41.80	14	13	10	1.00	1.06	1.67	LINK SEED
PHB 96 B 01	6	D	LB	17.10	17.87	18.98	39.97	43.86	43.00	11	13	11	1.00	1.00	1.00	PIONEER
LS 6161 R	6.3	D	IB	17.57	18.29	19.10	41.03	44.14	42.95	16	15	13	1.00	1.06	1.44	LINK SEED
LS 6050 R	6.4	D	LB	18.10	17.86	19.85	40.07	43.87	41.78	14	14	10	1.00	1.06	2.00	LINK SEED
LS 6150 R	6.5	I	LB	17.33	17.79	20.80	39.10	43.91	38.53	15	14	13	1.00	1.00	2.00	LINK SEED
PAN 737 R	7.0	D	IB	17.40	18.04	19.10	41.00	44.46	42.50	16	14	10	1.00	1.00	1.22	PANNAR
DUNDEE	6.0	I	B	16.93	17.89	19.38	39.47	43.26	40.95	19	18	15	1.00	1.00	1.22	ALLGRO
EGRET	7.0	D	KL	15.07	15.51	15.95	42.07	45.99	45.50	16	13	12	1.00	1.00	1.44	ALLGRO
HERON	7.0	D	LB	15.80	17.00	18.10	39.40	43.69	43.18	11	14	11	1.00	1.00	1.44	ALLGRO
IBIS 2000	7.0	D	IB	16.17	17.81	18.20	40.93	44.50	44.70	10	14	10	1.00	1.00	1.44	ALLGRO

[1] D - Bepaald/determinate
I - Onbepaald/Indeterminate
[2] BL - Swart/Black
IB - Onvolledig swart/Imperfect black
B - Bruin/Brown
LB - Ligbruin/Buff
G - Grys/Grey
KL - Kleurloos/Buff
[3] Peulhoogte in cm/Pod height in cm
[4] Geneigdheid tot oopspring geëvalueer op 'n skaal van 1-9, waar 1 = goed en 9 = swak
Tendency to shatter evaluated on a scale from 1-9, where 1 = good and 9 = poor

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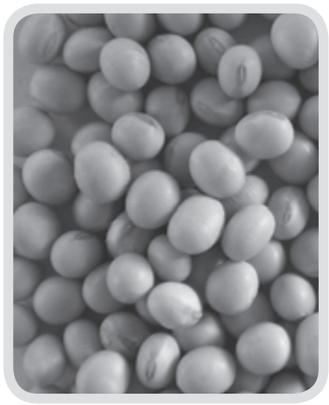
Heersende temperatuur (veral nagtemperatuur) het ook 'n invloed en sojabone groei heelwat stadiger op die hoëveld, vergeleke met die warmer laeveld. Tabel 1 illustreer die invloed wat die lengte van groeiseisoene het ten opsigte van die verskillende kultivars asook vir 'n spesifieke kultivar in verskillende produksiegebiede. Dit is belangrik om te onthou dat vroeë en later plantdatums binne dieselfde gebied ook die groeiseisoenlengte van 'n kultivar beïnvloed.



Vir produsente met ondervinding van sojaboonproduksie kan die gevoeligheid vir daglengte en die genetiese variasie vir relatiewe groeiseisoenlengte, 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

Prevailing temperature also has an affect, with soybean growing much slower on the Highveld compared to the warmer Lowveld. Table 1 illustrates the substantial variation for length of growing season among cultivars as well as for the different production areas.

Producers well experienced in soybean cultivation can utilize the photoperiod sensitivity of soybean, along with the genetic variation for relative length of the growing season with great success, for example, for hay production (a long growing season cultivar can be used), for scheduling of harvesting (plant cultivars with different ripening dates) and for drought avoidance or emergency planting (use relatively short growing season cultivars). 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 optimal yield is not realised because a) the cultivar does not ripen where a too long grower has been planted for the area, b) is ready for harvesting

Tabel 4. Oessekerheid by die verskillende opbrengsmikpunte vir die koeler produksiegebiede, 2008/09, 2009/10, 2010/11.
Table 4. Yield reliability at different yield targets for the cooler production areas, 2008/09, 2009/10, 2010/11.

Kultivar/ Cultivar	Opbrengsmikpunte/Yield targets (ton ha^{-1})							Gem/ Mean	D^2
	1	1.5	2	2.5	3	3.5	4		
LS 6162 R	0.12	0.58	1.05	1.51	1.97	2.44	2.90	2.50	0.416
PAN 1454 R	0.00	0.58	1.18	1.78	2.38	2.98	3.58	2.57	0.247
PHB 95 B 53	0.23	0.87	1.51	2.15*	2.79*	3.44*	4.08*	2.59	0.061
A 5409 RG	0.54	1.11*	1.67*	2.24*	2.81*	3.37*	3.94*	2.76	0.099
PAN 1666 R	0.80*	1.25*	1.71*	2.16*	2.62	3.07	3.53	2.71	0.116
PAN 1664 R	0.98*	1.45*	1.93*	2.41*	2.89*	3.36*	3.84*	2.88	0.083
LS 6164 R	0.37	0.92	1.47	2.01	2.56	3.11	3.65	2.69	0.181
PHB 96 B 01	1.01*	1.27*	1.53	1.79	2.05	2.31	2.57	2.30	0.107
LS 6161 R	0.65*	1.12*	1.60*	2.07	2.55	3.02	3.49	2.62	0.114
LS 6050 R	0.47	1.03	1.59*	2.15*	2.71*	3.28*	3.84*	2.71	0.114
LS 6150 R	0.20	0.70	1.21	1.71	2.22	2.72	3.23	2.31	0.136
PAN 737 R	0.48	1.06*	1.65*	2.23*	2.81*	3.40*	3.98*	2.60	0.044
Dundee	0.00	0.54	1.16	1.77	2.39	3.00	3.62	2.49	0.198
Egret	0.00	0.12	0.51	0.90	1.30	1.69	2.08	2.19	0.730
Heron	0.00	0.44	1.13	1.81	2.50	3.19*	3.88*	2.59	0.231
Ibis 2000	0.38	0.80	1.23	1.66	2.09	2.52	2.94	2.13	0.083

* Betekenisvol beter as kolomgemiddelde / Significantly higher than column mean

D^2 waarde dui stabiliteit van 'n kultivar aan. Hoe kleiner die D^2 waarde, hoe meer stabiel is die kultivar

D^2 value indicates the stability of a cultivar. A smaller D^2 value indicates a more stable cultivar

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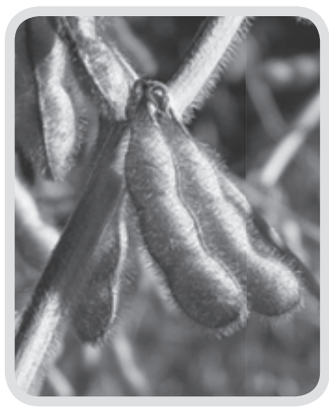
word nie in die geval van waar 'n kultivar met 'n te lang groeiseisoen in die gebied aangeplant is, b) reeds oesgereed is terwyl reën en hoë temperature stroop bemoeilik en kwaliteit benadeel waar 'n kultivar met 'n te kort groeiseisoen vir 'n gebied gekies is en c) onstroopbaar is as gevolg van 'n te lae peulhoogte.

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



while rain and high temperatures hamper harvesting and adversely affect quality where a too short grower has been planted for the area, and c) the cultivar is unable to be harvested because of a too low pod height.

Procedure for 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).

Tabel 5. Saadopbrengs (kg ha^{-1}) van kultivars gedurende die 2009/10 en 2010/11 groeiseisoene ten opsigte van die verskillende lokaliteite wat in die koeler produksiegebiede geleë is.
Table 5. Seed yield (kg ha^{-1}) of cultivars during the 2009/10 and 2010/11 growing seasons for the various localities situated in the cooler production areas.

Kultivar/Cultivar	2009/10					2010/2011			
	Bethlhem	Delmas	Kinross	Villiers	Gem/Mean	Bethlehem	Delmas	Kokstad	Gem/Mean
LS 6162 R	2931	3562	2094	3139	2873	3672	2121	1969	2587
PAN 1454 R	2622	3979	1869	2787	2655	3589	3166	1756	2837
PAN 1583 R	2890	2910	2242	2476	2589	3383	3774	2583	3247
PHB 96 B 01	2285	2863	1778	2556	2269	2692	2524	1780	2332
A 5409 RG	2806	2835	2368	2752	2523	3666	3653	2567	3295
PAN 535 R	2547	2609	2238	1946	2311				
PAN 1666 R	2502	3100	2203	2525	2488	2746	4246	2129	3040
PAN 1664 R	2900	2844	2138	2993	2634	3676	4264	2356	3432
LS 6164 R	3015	2323	1864	2572	2458	3478	4276	2362	3372
PHB 95 B 53	2209	3383	1920	2491	2434	3311	3565	2269	3048
LS 6161 R	2798	2911	2256	1873	2491	3137	3865	2488	3163
LS 6050 R	2947	2280	1883	2868	2454	3444	4234	2181	3286
LS 6150 R	2680	1951	1956	2113	2101	2731	3463	2436	2877
PAN 538 R	2122	2442	2050	2018	2142				
PAN 737 R	2366	2836	1868	2359	2362	3387	4117	2180	3228
PAN 1652	2488	3140	2025	3086	2685				
PAN 660	2901	2654	2195	2351	2525				
DUNDEE	2263	2624	1904	2395	2297	2751	3196	2140	2696
EGRET	1969		1635	1936	1847	2665	3256	2314	2745
HERON	1724	2450	1631	2233	2010	4079	3606	2275	3320
IBIS 2000	1776	2400	1797	2159	2033	1945	3368	1727	2347
PHB 95 Y 20						2735	3567	2603	2968
PHB 95 Y 40						2305	3076	1545	2309
GEM/MEAN	2511	2805	1996	2458	2390	3126	3544	2193	2954

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Wanneer daar 'n kultivar keuse gemaak word is dit belangrik om die gebied te identifiseer wat dieselfde klimaatstoestande het en dan die Tabelle te gebruik wat dieselfde klimaatstreek verteenwoordig. Risiko kan geminimaliseer word wanneer Tabel 1 en 3 gebruik word. As algemene reël word aanvaar dat kultivars met 'n langer groeiseisoen die beste sal doen in gebiede met 'n warmer klimaat, medium groeiseisoen kultivars in gebiede met 'n gematigde klimaat en korter groeiseisoen kultivars 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 sowel opbrengs en aanpassingsvermoë van kultivars soos aangedui in Tabelle 4, 5, 6, 7, 8, 9 en 10 saam met groeiseisoenlengte gebruik sal word om 'n meer akkurate kultivarkeuse vir 'n spesifieke gebied te maak.

Plantdatum beïnvloed sojabone se aanpassing en gevolglik kultivarkeuse. Die optimale plantdatum is normaalweg tydens November. In warmer gebiede kan produsente egter tot die eerste week in Januarie nog plant, maar dan word nouer rywydte, hoër plantpopulasie en 'n vinniger-groeiende kultivar aanbeveel. Waar grond- en

When cultivar selections is been done it is important to establish which localities has the same climate conditions and to use these Tables representing the same region. Risk can be minimised if Tables 1 and 3 are utilised. It is generally accepted that cultivars with a longer growing season will perform better in the warmer growing areas, cultivars with a medium growing season in the moderate growing areas and cultivars with a shorter growing season in the cooler production areas. There are however exceptions to the rule and it is therefore recommended to also use yield performance and cultivar adaptation presented in Tables 4, 5, 6, 7, 8, 9 and 10 in combination with length of growing season during cultivar selection for a specific area.

Planting date influences the adaptation of soybean cultivars and therefore also cultivar choice. The optimum planting date is usually during November. In warmer areas though, soybean can be planted until the first week of January. With later planting dates narrow rows, higher plant populations and shorter growing season cultivars are recommended. A planting date during October, especially in areas with a

Tabel 6. Oessekerheid by die verskillende opbrengsmikpunte vir die matige produksiegebiede, 2008/09, 2009/10 en 2010/11.
Table 6. Yield reliability at different yield targets for the moderate production areas, 2008/09, 2009/10 and 2010/11.

Kultivar/ Cultivar	Opbrengsmikpunte/Yield targets (ton ha^{-1})							Gem/ Mean	D^2
	1	1.5	2	2.5	3	3.5	4		
LS 6162 R	0.61	0.99	1.37	1.75	2.13	2.51	2.89	2.66	0.268
PAN 1454 R	0.60	1.04	1.48	1.91	2.35	2.79	3.23	2.73	0.175
PHB 95 B 53	0.30	0.81	1.33	1.85	2.36	2.88	3.40	2.70	0.175
A 5409 RG	0.53	1.05	1.56	2.08	2.59	3.11*	3.62*	2.83	0.115
PAN 1666 R	0.19	0.78	1.36	1.95	2.54	3.13*	3.71*	2.95	0.241
PAN 1664 R	0.66*	1.18*	1.71*	2.23*	2.76*	3.28*	3.80*	3.13	0.197
LS 6164 R	0.76*	1.22*	1.69*	2.16*	2.62*	3.09	3.55	2.98	0.174
PHB 96 B 01	0.29	0.83	1.38	1.92	2.47	3.01	3.56	2.73	0.136
LS 6161 R	0.65*	1.16*	1.67*	2.17*	2.68*	3.18*	3.69*	2.94	0.126
LS 6050 R	0.97*	1.40*	1.84*	2.28*	2.71*	3.15*	3.58*	2.99	0.119
LS 6150 R	0.88*	1.34*	1.81*	2.28*	2.74*	3.21*	3.68*	2.96	0.095
PAN 737 R	0.34	0.84	1.34	1.84	2.34	2.84	3.34	2.88	0.310
Dundee	0.40	0.86	1.31	1.76	2.22	2.67	3.13	2.72	0.268
Egret	0.32	0.79	1.27	1.74	2.22	2.69	3.17	2.46	0.110
Heron	0.55	1.03	1.51	1.99	2.47	2.95	3.44	2.74	0.125
Ibis 2000	0.52	0.95	1.38	1.81	2.24	2.67	3.10	2.48	0.099

* Betekenisvol beter as kolomgemiddelde / Significantly higher than column mean
D^2 waarde dui stabiliteit van 'n kultivar aan. Hoe kleiner die D^2 waarde, hoe meer stabiel is die kultivar
D^2 value indicates the stability of a cultivar. A smaller D^2 value indicates a more stable cultivar

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lugtemperature aanvaarbare vlakke vroeg in die seisoen bereik, word 'n Oktober plantdatum, veral op die hoërliggende gebiede aanbeveel. Dit is belangrik om te onthou dat 'n vroeër of 'n later plantdatum in al die produksiegebiede kultivarkeuse kan beïnvloed.

Peul- en planthoogte beïnvloed die stroopbaarheid en die staanvermoë van sojabone en is faktore wat in ag geneem moet word by kultivarkeuse. Oor die algemeen is daar 'n verband tussen peul- en 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 binnery spasiëring sal peulhoogte betekenisvol verhoog. In die Nasionale Kultivarproewe word by gestandardiseerde toestande vir peulhoogte geëvalueer en kan kultivars met aanvaarbare peulhoogtes gekies word. Peulhoogte word aangedui in Tabel 3.

higher altitude, 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 during deciding on what cultivar to plant. 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 influenced by production practices. More narrow inter- and intra row spacing will increase pod height significantly. Pod clearance for the cultivars evaluated is reported in Table 3.

Standability is influenced by the number of overcast days experienced during the growing season. Plant height tends to increase when overcast weather occurs and could result

Tabel 7. Oessekerheid by die verskillende opbrengsmikpunte vir die matige produksiegebiede, 2009/10, 2010/11
Table 7. Yield reliability at different yield targets for the moderate production areas, 2009/10, 2010/11

Kultivar/ Cultivar	Opbrengsmikpunte/Yield targets (ton ha^{-1})							Gem/ Mean	D^2
	1	1.5	2	2.5	3	3.5	4		
LS 6162 R	0.85*	1.20*	1.56	1.91	2.27	2.62	2.98	2.78	0.202
PAN 1454 R	0.64	1.14	1.64*	2.13	2.63	3.13	3.63	2.87	0.081
PAN 1583 R	0.39	0.98	1.56	2.15*	2.73*	3.32*	3.90*	3.10	0.162
PHB 95 B 53	0.00	0.57	1.15	1.73	2.31	2.89	3.48	2.74	0.195
A 5409 RG	0.43	1.02	1.61*	2.20*	2.79*	3.38*	3.97*	2.98	0.076
PAN 1666 R	0.00	0.58	1.23	1.87	2.52	3.16*	3.81*	2.96	0.217
PAN 1664 R	0.47	1.05	1.64	2.23*	2.81*	3.40*	3.99*	3.23	0.190
LS 6164 R	0.57	1.05	1.53	2.02	2.50	2.98	3.46	2.94	0.182
PHB 96 B 01	0.42	0.90	1.38	1.85	2.33	2.81	3.29	2.64	0.112
LS 6161 R	0.86*	1.35*	1.84*	2.34*	2.83*	3.32*	3.81*	3.00	0.056
LS 6050 R	0.93*	1.39*	1.84*	2.29*	2.74*	3.20*	3.65*	3.00	0.085
LS 6150 R	0.85*	1.33*	1.80*	2.28*	2.76*	3.23*	3.71*	2.96	0.067
PAN 737 R	0.32	0.84	1.37	1.89	2.41	2.93	3.46	2.79	0.152
Dundee	0.23	0.69	1.14	1.60	2.06	2.52	2.98	2.68	0.300
Egret	0.51	0.92	1.32	1.73	2.14	2.55	2.96	2.48	0.116
Heron	0.51	0.99	1.48	1.96	2.45	2.93	3.42	2.76	0.111
Ibis 2000	0.51	0.92	1.33	1.74	2.15	2.57	2.98	2.42	0.100

* Betekenisvol beter as kolomgemiddelde / Significantly higher than column mean
D^2 waarde dui stabiliteit van 'n kultivar aan. Hoe kleiner die D^2 waarde, hoe meer stabiel is die kultivar
D^2 value indicates the stability of a cultivar. A smaller D^2 value indicates a more stable cultivar

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

Groeiwyse onderskei tussen bepaalde en onbepaalde groeiers. Kultivars met 'n bepaalde groeiwyse word verkieslik onder besproeiing geplant, terwyl kultivars met 'n onbepaalde groeiwyse (wat nie lengtegroei tydens blom staak nie) onder droëlandtoestande verkies word. Die

in a higher lodging percentage of plants.

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

Row width will also influences cultivar selection, since a signifycant relation exists between cultivars and row width. Cultivars with more side

Tabel 8. Saadopbrengs (kg ha^{-1}) van kultivars gedurende die 2010/2011 groeiseisoen ten opsigte van die verskillende lokaliteite wat in die matige produksiegebiede geleë is.
Table 8. Seed yield (kg ha^{-1}) of cultivars during the 2010/2011 growing season for the various localities situated in the moderate production areas.

Kultivar/Cultivar	2010/11								
	Cedara	Glen	Greytown	Greytown Kranskop	Potchefstroom Bespr PD1	Potchefstroom Bespr PD2	Potchefstroom Drg PD1	Potchefstroom Drg PD2	Gem/Mean
LS 6162 R	3073	2930	1202	2442	2873	3483	3008	2939	2744
PAN 1454 R	3088	3093	1314	2225	3666	2524	3574	3386	2859
PAN 1583 R	3091	3600	1301	1854	4841	2493	3647	3491	3040
PHB 95 B 53	2106	4086	1222	1957	3416	2519	4558	3194	2882
PHB 95 Y 20	2675	3401	1269	1571	3513	2462	3445	3230	2696
PHB 95 Y 40	2270	3226	1839	1875	2578	3088	4343	1790	2626
A 5409 RG	2438	3804	1222	1463	4259	2653	4505	3640	2998
PAN 1666 R	2193	3326	1268	1711	4545	2486	4557	4511	3075
PAN 1664 R	2757	3598	1144	2081	4946	3527	4287	4369	3339
LS 6164 R	2226	2554	1775	2063	4523	2363	4192	3464	2895
PHB 96 B 01	1731	3381	1393	1571	3503	2440	3526	3434	2622
LS 6161 R	2776	3759	1542	2207	3673	2883	3776	3236	2982
LS 6050 R	2206	3978	1756	1879	3901	3017	3257	3330	2916
LS 6150 R	2312	3641	1260	2034	3892	2572	4095	3495	2913
PAN 737 R	1880	3926	1604	1506	3511	2366	3106	2629	2566
Dundee	2165	2918	1227	1376	3284	1658	3572	3366	2446
Egret	1590	2901	1712	1801	2899	2713	3406	2134	2394
Heron	2576	3533	1314	1510	3497	2880	3317	2447	2634
Ibis 2000	2201	3051	1243	2013	2797	1864	3366	2801	2417
Gem/Mean	2387	3405	1400	1849	3690	2631	3765	3205	2792

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groeiwyse van die kultivars word in Tabel 3 aangedui.

Rywydte kan ook kultivarkeuse beïnvloed aangesien 'n betekenisvolle interaksie tussen die twee bestaan. Kultivars wat geneig is tot sytakvorming en 'n digte blaredak het, 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 van peule kan 'n belangrike rol speel tydens ongunstige toestande gedurende die oes van sojabone.

Volgens inligting uit die Nasionale Kultivarproewe is dit duidelik dat relatief kort groeiseisoenkultivars die grootste risiko vir oopspring het, terwyl relatief lang groeiseisoenkultivars die minste daardeur geraak word. 'n Aanduiding ten opsigte van genetiese weerstand tussen kultivars van dieselfde groeiseisoenlengte wat oopspring aanbetref, kon egter nie verkry word nie. Kultivars word geëvalueer op 'n skaal van 1 (goed) tot 9 (swak) wat oopspring aanbetref en die resultate word in Tabel 3 aangebied.

branches and leaves are better adapted to wider rows, while cultivars with less side branches and leaves are better adapted to more narrow rows. Resistance against seed shattering can play an important role during unfavourable harvesting conditions.

Information obtained during the National Soybean Cultivar Trials indicates that cultivars with a relative short growing period tend to shatter more than cultivars with a longer growing period. Rating of cultivars in terms of their susceptibility to shattering are done on a scale from 1 (good) to 9 (poor) and are 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 have to be maintained before the planting of soybean can be considered. Ensure, in any case, that the herbicide can be used with the selected cultivar as indicated on the herbicide label.

Tabel 9. Oessekerheid by die verskillende opbrengsmikpunte vir die warmer produksiegebiede, 2008/09, 2009/10, 2010/11.
Table 9. Yield reliability at different yield targets for the warmer production areas, 2008/09, 2009/10, 2010/11.

Kultivar/ Cultivar	Opbrengsmikpunte/Yield targets (ton ha^{-1})							Gem/ Mean	D^2
	1	1.5	2	2.5	3	3.5	4		
LS 6162 R	0.00	0.24	0.85	1.46	2.06	2.67	3.27	3.25	0.549
PAN 1454 R	0.34	0.73	1.12	1.51	1.90	2.29	2.68	2.79	0.316
PHB 95 B 53	0.10	0.62	1.14	1.66	2.18	2.69	3.21	3.16	0.370
A 5409 RG	0.43	0.96	1.49*	2.01*	2.54*	3.07*	3.59*	3.27	0.188
PAN 1666 R	0.11	0.61	1.10	1.59	2.09	2.58	3.08	2.76	0.155
PAN 1664 R	0.60*	1.07*	1.54*	2.01*	2.47	2.94	3.41	3.29	0.253
LS 6164 R	0.00	0.38	1.12	1.86	2.60*	3.34*	4.08*	3.61	0.360
PHB 96 B 01	0.35	0.79	1.23	1.67	2.11	2.55	2.99	2.90	0.234
LS 6161 R	0.59*	1.10*	1.61*	2.12*	2.63*	3.13*	3.64*	3.27	0.139
LS 6050 R	0.26	0.83	1.41	1.98*	2.56*	3.13*	3.70*	3.24	0.152
LS 6150 R	0.24	0.75	1.27	1.78	2.29	2.81	3.32	2.98	0.162
PAN 737 R	1.13*	1.53*	1.93*	2.34*	2.74*	3.15*	3.55*	3.28	0.098
Dundee	0.31	0.81	1.32	1.82	2.32	2.82	3.33	2.94	0.126
Egret	0.69*	1.10*	1.50*	1.90	2.30	2.70	3.10	3.13	0.276
Heron	0.68*	1.16*	1.64*	2.12*	2.59*	3.07*	3.55*	3.15	0.099
Ibis 2000	0.00	0.00	0.34	0.87	1.41	1.95	2.48	2.70	0.678

* Betekenisvol beter as kolomgemiddelde / Significantly higher than column mean
D^2 waarde dui stabiliteit van 'n kultivar aan. Hoe kleiner die D^2 waarde, hoe meer stabiel is die kultivar
D^2 value indicates the stability of a cultivar. A smaller D^2 value indicates a more stable cultivar

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Gevoeligheid vir onkruiddoder kan in sommige gevalle kultivarkeuse beïnvloed. Geen sojaboonkultivar is bestand teen die atrazine-tipe onkruiddoders nie en die volle wagperiode moet nagekom word voordat die plant van sojabone oorweeg word. In alle gevalle moet seker gemaak word dat aanwysings op die onkruiddoder-etiket voorsiening maak vir die kultivar wat aangeplant gaan word.

Saadgrootte, hilumkleur, proteïengehalte en GMO-status is eienskappe wat 'n premieprys moontlik betaal kan word.

Seed size, hilum colour, protein qualities and GMO status are characteristics that can possibly earn a premium price. Seed size is genetically regulated, but is greatly influenced by the environment conditions. Favourable conditions during the seed filling period will positively influence seed size.

The protein content of soybean seed is also genetically regulated and can be adversely affected by environmental conditions (rainfall, temperature, stress) and crops management (poor or no nodulating, acidic soil

Tabel 10. Saadopbrengs (kg ha^{-1}) van kultivars gedurende die 2009/10 en 2010/11 groeiseisoene ten opsigte van die verskillende lokaliteite wat in die warmer produksiegebiede geleë is.
Table 10. Seed yield (kg ha^{-1}) of cultivars during the 2009/10 and 2010/11 growing seasons for the various localities situated in the warmer production areas.

Kultivar/Cultivar	2009/10				2010/2011					
	Brits	Koedoeskop	Rustenburg	Gem/Mean	Brits	Groblersdal	Koedoeskop	Rustenburg	Vaalharts	Gem/Mean
LS 6162 R	3456	3625	3659	3580	4051	3217	2483	1199	5074	3205
PAN 1454 R	3268	3143	3622	3344	2270	2528	2383	1377	3287	2369
PAN 1583 R	3261	3653	4009	3641	3496	2328	2544	1686	3636	2738
PHB 96 B 01	2911	3038	3504	3151	2983	1735	3111	2170	2605	2521
A 5409 RG	2866	3310	3619	3265	3109	3252	2389	1732	4352	2967
PAN 535 R	3054	3346	2507	2969						
PAN 1666 R	3322	2996	3200	3173	1859	2551	3267	1267	3477	2484
PAN 1664 R	3749	3743	4024	3839	3041	3710	2506	1807	4499	3113
LS 6164 R	4094	3653	3547	3765	3024	2374	3922	1861	5242	3285
PHB 95 B 53	3024	4302	3051	3459	4505	2693	3250	1697	3260	3081
LS 6161 R	2567	3583	3408	3186	3481	2879	3956	2051	4179	3309
LS 6050 R	3984	3680	3401	3688	2528	2639	3733	1622	3340	2772
LS 6150 R	3737	3164	3531	3477	2521	2353	3517	1515	3687	2719
PAN 538 R	2996	3388	4157	3514						
PAN 737 R	3054	3820	3869	3581	3164	2865	3406	2907	3673	3203
PAN 1652	3427	3332	2784	3181						
PAN 660	3562	3213	3734	3503						
DUNDEE	2211	3269	3771	3084	2920	2859	2844	1604	3222	2690
EGRET	2546	3576	2844	2989	2458	2779	3150	3081	3921	3078
HERON	3385	3024	3309	3239	2663	2933	2861	2198	3686	2868
IBIS 2000	3381	3031	3584	3332	4217	2112	2872	1595	3119	2783
PHB 95 Y 20				2898	3061	2120	3728	3335	2854	3028
PHB 95 Y 40				2219	2663	1714	2389	3056	2413	2408
GEM/MEAN	3231	3423	3483	3379	3022	2712	3069	1853	3718	2875

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Saadgrootte is geneties, maar word sterk beïnvloed deur omgewingstoestande. Gunstige toestande tydens die saadvulperiode sal saadgrootte positief beïnvloed.

Proteïeninhoud van die saad is ook geneties maar kan nadelig beïnvloed word deur omgewingstoestande (reënval, temperatuur en stremming) en bestuur (swak of geen nodulering, suur grond en lae grondvrugbaarheid). Proteïeninhoud (vogvrye basis) onder 36% is onbevredigend en bokant 40% is uitstekend wat sojabone aanbetref.

Saadopbrengs gee 'n aanduiding van 'n kultivar se genetiese aanpassing en geskiktheid vir 'n bepaalde gebied. Vir die 2010/ 2011seisoen is 19 kultivars geplant en geëvalueer en was die data van 16 proewe aanvaarbaar vir statistiese analises.

Die oessekerheidswaardes van die 19 kultivars vir die drie verbouingsgebiede (warm, matig en koud) word in Tabelle 4 & 6 en 9 aangebied. Tabelle 4, 6 en 9 asook tabel 7 bevat inligting oor kultivars wat vir onderskeidelik drie en twee jaar in dié proewe ingesluit was. Tabelle 5, 8 en 10 bevat inligting aangaande die opbrengs van die kultivars vir die 2009/2010 en 2010/2011 produksieseisoen op die onderskeie lokaliteite.

Dit is belangrik dat u die verdeling van lokaliteite in Tabel 2 gebruik om te bepaal in watter gebied u plaas geleë is. Vergelyk dan die kultivars in die oessekerheidstabel wat u gekies het met mekaar by die realistiese opbrengsmikpunt vir u plaas.

and low soil fertility). Protein contents of soybean seed below 36 % are unsatisfactory, while that above 40%, on a moisture free basis, is regarded as excellent.

Seed yield indicates the genetic adaptation and suitability of a cultivar to be planted in a specific area. During the 2010/2011 season 19 cultivars were included in the National Soybean Cultivar Trials, while data of 16 localities were acceptable for statistical analyses.

Yield reliability values of the 19 cultivars for the three production areas (warm, moderate and cool) are presented in Tables 4 & 6 and 9. Tables 4, 6 and 9 as well as Table 7 contain information regarding cultivars included in the trials for three and two years respectively. Yield of the cultivars at the different localities for the 2009/2010 and 2010/2011 growing season is presented in Tables 5, 8 and 10.

It is also important to use the information provided in Table 2 to determine whether the area to be planted corresponds with the warm, moderate or cool localities. Use the selected yield reliability table (warm, moderate or cool) to select cultivars for the yield potential of the specific farm.

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* Kultivars wat in die verslag opgeneem is, is die enigste kultivars wat deur die LNR getoets en aanbeveel word.

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* Cultivars that are discussed in this report are the only cultivars evaluated and recommended by the ARC.

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