

DROËBOONKULTIVARAANBEVELINGS DRY BEAN CULTIVAR RECOMMENDATIONS 2022 / 2023



Excellence in Research and Development

N. Shargie

LNR-Graangewasse/ARC-Grain Crops

Privaatsak/Private Bag X1251, Potchefstroom, 2520, Tel. 018 299 6312/6284, Faks/Fax. 018 294 7146

Inleiding

Die doel van hierdie pamflet is om produsente te help om die beste bonekultivars vir hulle omstandighede te kies. Dit is opgestel na aanleiding van die resultate van die Nasionale Droëboonkultivar-proewe. Drie seisoene se data is gebruik (2019/20 tot 2021/22). Die proewe is moontlik gemaak deur die finansiële ondersteuning van die Landbounavorsingsraad (LNR), die Droëbone Produsente-Organisasie (DPO) en saadmaatskappye. 'n Groot aantal medewerkers het proewe uitgevoer soos die KZN Departement van Landbou, landbou koöperasies en landbou maatskappye. Die DPO het 'n groot bydrae gelewer.

Hoe om die inligting te gebruik

- Besluit eers op 'n saadtype byvoorbeeld Rooi Gespikkelde bone of Kleinwit Inmaakbone. Doen dit aan die hand van die aanvraag, ondervinding en moontlike pryse. Kontak die DPO by 012 819 8100 of 082 388 0510 vir meer inligting.
- Kies tussen beskikbare kultivars dié met die hoogste gemiddelde opbrengs en oessekerheid. Tabel 1 toon 28 kultivars vir die 2021/2022 seisoen en Tabel 2 toon die inligting van hierdie kultivars oor drie seisoene (2019/20-2021/22).
- Sommige kultivars is beter aangepas in sekere produksiegebiede en dit word nie weerspieël in die oessekerheid nie. Kyk dus hoe die kultivars met mekaar vergelyk in u produksiegebied (Tabel 3).
- Vergelyk kultivars in Tabelle 1 en 2 met mekaar by realistiese opbrengsmikpunte vir u plaas. Hoe nader die kultivar se

Introduction

This pamphlet is aimed at helping producers decide on the best bean cultivars for their specific conditions. Recommendations are based on the results of the National Dry Bean Cultivar Trials. Three seasons' data were used for this purpose (2019/20 - 2021/22). The trials were made possible by the financial support of the Agricultural Research Council (ARC), the Dry Bean Producers' Organization (DPO) and the seed companies. A large number of co-operators conducted the trials i.e. the Department of Agriculture of KZN, agricultural co-ops and agricultural companies. The DPO made a large contribution in this regard.

How to use this information

- First decide on a seed type, for instance Red Speckled beans or Small White Canning beans. It is important to keep the demand and possible prices in mind. Contact the DPO at 012 819 8100 or 082 388 0510 for more information.
- From the available cultivars choose those with the highest mean yield and yield reliability. Table 1 shows the data of 28 cultivars for the 2021/22 season and Table 2 shows data of cultivars for three seasons (2019/20 - 2021/22).
- Some cultivars are better adapted in certain production areas, but this is not shown in the yield reliability table. Use Table 3 to compare the mean yield of the cultivars for your production area.
- Compare cultivars in Tables 1 and 2 at a realistic yield target for your specific farm. The nearer the calculated yield of a cultivar

berekende opbrengs aan 'n bepaalde mikpunt is, hoe hoër is die opbrengspotensiaal by die betrokke mikpunt. Dit dui op hoër opbrengstabiliteit.

- Kyk nou na die eienskappe van die kultivar (Tabel 4) om seker te maak dat dit nie ongewenste eienskappe het ten opsigte van, byvoorbeeld: oopspring, siektevatbaarheid, groeiseisoenlengte en saadgrootte.
- Kultivars verskil min van mekaar in hulle vatbaarheid vir bakteriese siektes, wortelsiektes en Ascochyta. Almal is vatbaar behalwe Kranskop-HR 1 met vetvleksierte weerstand en Werna en RS 7 met gewone skroei weerstand.
- Stel vas wat die bemarkingsmoontlikhede van die bepaalde kultivar is, byvoorbeeld of die inmaakwaliteit, saadgrootte en kleur vir die inmakers of bonehandelaars aanvaarbaar is. Dit bepaal die prys en dus die winsgewendheid.
- Bestel saad deur u koöperasie, landboumaatskappy, saadhandelaar of direk van die betrokke saadfirma. Doen dit een seisoen vooruit om te verseker dat u saad kry. Waar aangedui word dat dit 'n nuwe kultivar is, moet in gedagte gehou word dat twee tot drie jaar nodig is om voldoende gesertifiseerde saad daarvan te produseer.
- Dring aan op Siektevry Gesertifiseerde saad om die gevaar van saadgedraagde siektes te beperk (bakteriese siektes en antraknoses). As dit nie beskikbaar is nie, gebruik minstens Gesertifiseerde saad.

Faktore wat kultivaraanpassing beïnvloed

- **Roes** kom meer in KwaZulu-Natal en Mpumalanga voor, veral by laat aanplantings. Roesvatbare kultivars moet dus in dié gebiede vermy word. Die risiko kan verminder word deur so vroeg moontlik te plant en/of goeie chemiese beheer toe te pas.
- In Tabel 4 word die invloed van **swamdoders** op die gemiddelde opbrengs, oor drie seisoene, van verskillende kultivars op bespuitte en onbespuitte proewe op Cedara en Greytown, gegee. Die persentasie dui die grootste moontlike opbrengsverhoging aan wat 'n produsent kan verwag as gevolg van die beheer van swamsiektes. In die geval van kultivars met roesweerstand, was die opbrengsverhogings die gevolg van die beheer van ander swamsiektes byvoorbeeld Ascochyta en Hoekige Blaavlek (HBV). Let asseblief daarop dat die resultate van sommige kultivars baie tussen seisoene gewissel het en groot afwykings, van die gemiddeldes wat hier gegee word, kom dus voor. Hierdie syfers moet slegs beskou word as aanduidings van wat kan gebeur as toestande gunstig is vir die ontwikkeling van swamsiektes. Hoe verder wes die kultivars geplant word hoe kleiner sal die effek van swambeheer wees.
- Alle kleinsadige kultivars het weerstand teen **HBV**. Die meeste grootsadige kultivars is vatbaar. Kultivars wat goeie weerstand gebied het die afgelope seisoen was PAN 9292, Kamiesberg en Tygerberg.
- Besmetting met **bakteriese siektes**, veral vetvlek en bakteriese bruinvlek, is meer algemeen wes van die Drakensberge as in KwaZulu-Natal.
- Kultivars met 'n **kort groeiseisoen** en 'n **bepaalde groei-**

comes to the yield target, the higher its yield potential at that particular target. This indicates higher yield stability.

- Thereafter study the characteristics of the cultivar of your choice (Table 4) to ensure that it has no undesired characteristics with respect to: shattering, seed size, disease susceptibility or growing season requirements.
- Cultivars do not differ much with respect to their susceptibility to bacterial diseases, root diseases and Ascochyta (they are all susceptible except Kranskop-HR 1 with halo blight resistance and Werna and RS 7 with common blight resistance).
- Determine the possible market for a specific cultivar, for instance whether the canning quality, seed size and colour are acceptable to bean dealers. This determines the price and therefore the profitability.
- Order seed from your local cooperative, agricultural company, seed dealer or directly from the seed company. Do this one season in advance to prevent disappointment. In the case of a new cultivar, it must be borne in mind that at least two years (probably three years) are needed to produce sufficient certified seed.
- Insist on Disease Free Certified seed to limit the detrimental effect of seed borne diseases. If this is not available, you should ensure that it is at least certified.

Factors that determine adaptation

- **Rust** is more common in KwaZulu-Natal and Mpumalanga especially on late planted cultivars. Avoid rust susceptible cultivars in these areas. The risk can be reduced by planting as early as possible and/or by the application of effective chemical control.
- In Table 4 the effect of **fungicides** on the yield of different cultivars on sprayed and unsprayed trials is compared for three seasons at Cedara and Greytown. The percentages indicate the largest yield increase that a producer can expect as a result of the control of fungal diseases. In the case of rust resistant cultivars, the control of other fungal diseases e.g. Ascochyta and Angular Leaf Spot (ALS) contributes to a yield increase. Please note that for some cultivars the results varied greatly between seasons. These figures must therefore only be taken as indicators of what could happen if conditions are favourable for the development of fungal diseases. The effect of fungicide application will be less striking in productions further west.
- All small-seeded cultivars are resistant to **ALS**. Most large-seeded cultivars are susceptible. Cultivars with resistance to ALS are PAN 9292, Kamiesberg and Tygerberg.
- **Bacterial diseases**, especially halo blight and bacterial brown spot, are more common west of the Drakensberg than in KwaZulu-Natal.
- Cultivars with a **short growing season** as well as a **determinate growth habit** generally have a lower yield potential (especially in areas with cool nights), than those with a long growing season but are better adapted to higher night temperatures.
- Decide on a cultivar that fits into the **available growing**

wyse het oor die algemeen 'n laer opbrengspotensiaal (veral in gebiede met koue nagte) as die met 'n lang groeiseisoen, maar is beter aangepas by hoër nagtemperatuur.

- Kies 'n kultivar wat inpas in die beskikbare **groeiseisoen**. Oor die algemeen kan 7 dae afgetrek word van die groeiseisoen-lengte wat in Tabel 4 aangegee word, omdat die bone dan reeds fisiologies volwasse is en nie meer deur ryp benadeel sal word nie. Hoë of lae temperatuur sal die groeiseisoen verkort of verleng en die syfers in Tabel 4 moet dus nie as absoluut beskou word nie. Kultivars kan gemiddeld 10 dae vroeër as normaal ryp word weens warm droë toestande voor oestyd. As gevolg van koel nat toestande kan hulle 10 tot 20 dae later as normaal ryp word.
- Vermoed groot aanplantings van kultivars wat geneig is tot **oorsprong**. Oes sulke kultivars so gou moontlik nadat hulle oesryp is. Al die kultivars wat hier bespreek word het goeie oorsprongweerstand.

Kleinwit Inmaakbone

Daar is 'n goeie mark vir inmaakbone. Slegs kultivars wat deur die inmakers aanvaar word, behoort aangeplant te word aangesien die mark vir klein wit verpakkingsbone beperk is.

- **SW 1 (2.92 t/ha)** het die hoogste gemiddelde opbrengs getoon tydens 'n drie jaar tydperk wat die 2021/22 seisoen insluit. SW 1 het 'n hoë opbrengs standvastigheid. Opbrengsteikens van 1.0 en hoër kan verwag word. SW 1 is goed aangepas in al die provinsies en het klein sade (490 sade/100g) in vergelyking met ander wit inmaak kultivars.
- **PAN 123 (2.69 t/ha)** het die tweede hoogste gemiddelde opbrengs onder die Kleinwit inmaakbone getoon tydens 'n drie jaar tydperk wat die 2021/22 seisoen insluit. PAN 123 het 'n hoë opbrengs standvastigheid. Opbrengsteikens van 2.0 en hoër kan verwag word. Bevat goeie weerstand teen siektes, veral roes en Boontjiemosaiekvirus. Dit het 'n bepaalde groeiwyse en goeie weerstand teen omval en oorsprong. Die inmaak kwaliteit kan vergelyk word met Teebus.
- **PAN 9141 (2.43 t/ha)** het 'n hoë gemiddelde opbrengs getoon. Dit het 'n bepaalde groeiwyse en goeie weerstand teen omval. PAN 9141 se saadgrootte is die grootste in vergelyking met die ander inmaakbone (391 sade/100g).
- **Teebus-RR 1 (2.36 t/ha)** is 'n terug-kruising met die doel om roesweerstand in te sluit. Dit het 'n bepaalde groeiwyse en goeie weerstand teen omval. Dit is weerstandbiedend teen roes en Boontjiemosaiekvirus (ressessiewe weerstand). Die inmaak kwaliteit is goed en is aanvaarbaar vir die inmakers. Teebus-RR 1 het 'n hoë gemiddelde opbrengs en is goed aangepas in Mpumalanga en KwaZulu-Natal.
- **Dongara (1.99 t/ha)** het 'n hoë gemiddelde opbrengs getoon tydens die 2021/22 seisoen. Dit het 'n bepaalde groeiwyse met goeie weerstand teen omval en het 'n saadgrootte van 433 sade/100 g.

Rooi Gespikkelde bone

Daar is 'n groot aanvraag vir Rooi Gespikkelde bone en goeie pryse

season. Seven days can generally be deducted from the length of the growing season indicated in Table 4 as the beans are already physiologically mature at this stage and will not be harmed by frost. High or low temperatures will shorten or lengthen the growing season and the figures in Table 4 must therefore not be regarded as absolute. Under hot dry conditions before harvest time, beans will ripen on average 10 days earlier than normal. Under cool wet conditions, beans ripen 10 to 20 days later than normal.

- Avoid planting large areas with cultivars that are inclined to **shatter**. Harvest such cultivars as soon as possible after ripening. All the cultivars discussed here have good resistance to shattering.

Small White Canning beans

There is a good market for canning beans. Only cultivars that are acceptable to the canners should be planted as the market for pre-packed small white beans is limited.

- **SW 1 (2.92 t/ha)** had the highest mean yield during the 2021/22 season as well over a three-year period with high yield reliability at yield targets of 1.0 and above. It was well adapted in all the provinces. It has small seeds (490 seeds/100 g) compared to the other white canning bean cultivars.
- **PAN 123 (2.69 t/ha)** had the second highest mean yield of the small white canning beans during the 2021/22 season as well as over a three-year period with high yield reliability at targets of 2.0 and higher. It has good resistance to diseases especially rust and BCMV. It has a determinate growth habit and good resistance to lodging and shattering. Its canning quality is similar to that of Teebus.
- **PAN 9141 (2.43 t/ha)** had a high mean yield. It has a determinate growth habit and good resistance to lodging with the largest seeds (391 seeds/100 g) of all the canning beans.
- **Teebus-RR 1 (2.36 t/ha)** is a backcross aimed at incorporating rust resistance into Teebus. It has a determinate growth habit and good resistance to lodging. It is resistant to rust and BCMV (recessive resistance) and acceptable for canning. It had a high mean yield and was well adapted in Mpumalanga and KwaZulu-Natal.
- **Dongara (1.99 t/ha)** had a high mean yield during the 2021/22 season. It has a determinate growth habit with good resistance to lodging and a seed size of 433 seeds/100 g.

Red Speckled Beans

There is a good market for Red Speckled beans and high prices can be obtained, but the market can discriminate against cultivars with small seeds or a dark background colour.

- **Cultivars of which seed is available:** Long season cultivars with high mean yield, and yield reliability as well as good seed quality and disease resistance are: **Tygerberg, Kamiesberg, PAN 9292, RS 5, RS 6, RS 7, PAN 9216, OPS-RS 4, KRANSKOP-HR 1, PAN 148, PAN 9261, Mbomvu, Bwindi, Oribi, Ruby, Kranskop, LAKE 101, LAKE 102 and DBS 310.**

word behaal, maar die mark kan diskrimineer teen kultivars met klein sade of 'n donker agtergrondkleur.

- **Kultivars waarvan daar saad beskikbaar is: Tygerberg, Kamiesberg, PAN 9292, RS 5, RS 6, RS 7, PAN 9216, OPS-RS 4, KRANSKOP-HR 1, PAN 148, PAN 9261, Mbomvu, Bwindi, Oribi, Ruby, Kranskop, LAKE 101, LAKE 102 en DBS 310.**
- **Kultivars waarvan daar nie saad hierdie seisoen beskikbaar is nie: Werna, PAN 9213 en PAN 9265.**

Kranskop het 'n laer opbrengspotensiaal as meeste van die lang-seisoenkultivars. Dit was ook as kontrole gebruik.

Lappiesbone

Daar was geen lappiesbone tydens die 2021/22 seisoen geëvalueer nie. Lappiesbone word hoofsaaklik in die Wes-Kaap onder besproeiing verbou vanweë sy siektevatbaarheid en kwaliteitsvereistes. Die mark daarvoor is baie beperk.

Ander saadtipes

Carioca bone

Die mark vir Carioca bone is baie beperk en produsente moet seker maak van 'n afset alvorens hulle dit plant. Geen Carioca kultivars is die afgelope seisoen in die kultivar proewe ingesluit nie. **Mkuzi** en **CAR 2008** (nie in proewe) is wyd aangepas en het goeie siekte weerstand. Saad is egter nie beskikbaar nie.

Groot Wit Nierbone

Daar is 'n beperkte plaaslike mark vir Groot Wit Nierbone. Dit behaal hoë pryse in seisoene wanneer oorproduksie nie voorkom nie.

SSN 1 (nie in proewe) is die enigste kultivar in hierdie saadtipe. By is nodig vir bestuiwing. Nierbone is baie gevoelig vir hoë temperatuur gedurende die blomperiode en dit word daarom slegs aanbeveel vir koel hoë reënvalgebiede waar dit hoë opbrengste gee. Weens sy hoë siekteweerstand is nierbone in hierdie gebiede beter aangepas as byvoorbeeld Rooi Gespikkelde bone. Geen gesertifiseerde saad is beskikbaar nie.

Verdere inligting

'n Nuttige bron van verdere inligting is die **Droëbone Produksie-handleiding** wat op bestelling verkrygbaar is vanaf die DPO of LNR-GG.

Saad kan by saadhandelaars of direk by die leweransiers bestel word. Indien u probleme ondervind met u bestelling kontak die volgende:

Dry Bean Seed (Pty) Ltd., Posbus 15587, Lynn East, 0039. Tel. 082 388 0510

PANNAR, Posbus 19, Greytown, 3250. Tel. (033) 413 9500, Faks. (033) 413 2618.

McDonald Seeds, Posbus 40, Mkondeni, 3212. Tel/Fax. 033 346 0121

- **Cultivars of which no seed is available: Werna, PAN 9213, PAN 9265 and PAN 9244.**
- **Kranskop** has a lower yield potential than most of the long season cultivars and was used as the standard.

Painted Lady

No cultivar of this seed type was evaluated during the 2021/22 season. Painted Lady cultivars are mainly produced in the Western Cape under irrigation because of its disease susceptibility and quality requirements. The market is very limited.

Other seed types

Carioca beans

The market for Carioca beans is limited and producers must assure themselves of a market before planting these cultivars. Mkuzi and CAR 2008 (not included in trials) are widely adapted and have high levels of resistance to nearly all diseases. However, no seed are available.

Large White Kidney beans

There is a limited local market for Large White Kidney beans. They fetch high prices in seasons when over-production does not occur.

- **SSN 1** (not included in the trials) is the only cultivar in this seed type. Kidney beans are sensitive to high temperatures during the flowering period. Bees are necessary for pollination. They are only recommended for the cool high rainfall areas where high yields can be obtained. Because of their disease resistance, kidney beans are better adapted in these areas than, for instance, Red Speckled beans. No certified seed is available.

Further information

A handy source of information is the **Dry Bean Production Manual** that can be ordered from the DPO or ARC-GC.

Seed can be ordered from seed dealers or directly from the suppliers. If you encounter problems with your order, please contact the following:

Dry Bean Seed (Pty) Ltd, P.O. Box 15587, Lynn East, 0039. Tel. 082 388 0510

PANNAR, P.O. Box 19, Greytown, 3250. Tel. (033) 413 9500, Fax. (033) 413 2618.

McDonald Seeds, P.O. Box 40, Mkondeni, 3212. Tel/Fax 033 346 0121

Tabel 1 Oessekerheid by die verskillende opbrengsmikpunte, 2021/22**Table 1** Yield reliability at different yield targets, 2021/22

KULTIVAR CULTIVAR	OPBRENGSMIKPUNTE (t/ha) YIELD TARGETS (t/ha)								GEM MEAN	B-KOEFF B-COEFF	D-PARAM
	0,5	1	1,5	2	2,5	3	3,5	4			
KLEINWIT INMAAK / SMALL WHITE CANNING											
TEEBUS-RR 1	0,12	0,47	0,83	1,18	1,54	1,89	2,25	2,60	2,36	0,7104	0,2450
SW 1	0,00	0,38	0,84	1,30	1,76	2,22	2,68	3,14	2,92	0,9186	0,4890
PAN 123	0,00	0,43	0,91	1,39	1,87	2,35	2,83	3,31	2,69	0,9602	0,2339
PAN 9141	0,00	0,36	0,83	1,29	1,75	2,21	2,67	3,13	2,43	0,9219	0,1590
DONGARA	0,00	0,00	0,27	0,82	1,36	1,91	2,45	3,00	1,99	1,0907	0,1280
ROOI GESPIKKELD / RED SPECKLED											
KRANSKOP	0,00	0,21	0,67	1,13	1,59	2,05	2,51	2,97	2,42	0,9180	0,2422
KRANSKOP-HR 1	0,46*	0,79*	1,13*	1,46*	1,80	2,13	2,47	2,80	2,65	0,6699	0,2694
OPS-RS 4	0,53*	0,96*	1,39*	1,82*	2,25*	2,68*	3,11*	3,54*	2,95	0,8596	0,1666
RS 5	0,00	0,31	0,91	1,51*	2,11*	2,71*	3,31*	3,91*	3,14	1,1994	0,3702
RS 6	0,86*	1,16*	1,47*	1,78*	2,09*	2,40	2,71	3,02	2,74	0,6181	0,1499
PAN 148	0,00	0,00	0,38	0,91	1,43	1,96	2,48	3,01	2,34	1,0501	0,2892
PAN 9292	0,00	0,22	0,79	1,36	1,93	2,50*	3,07*	3,64*	2,93	1,1397	0,3456
WERNA	0,54*	0,97*	1,41*	1,85*	2,28*	2,72*	3,16*	3,59*	2,97	0,8740	0,1608
TYGERBERG	0,00	0,21	0,61	1,01	1,42	1,82	2,22	2,63	2,61	0,8063	0,5271
KAMIESBERG	0,00	0,28	0,86	1,44	2,02*	2,60*	3,18*	3,76*	2,76	1,1593	0,1799
DBS 310	0,00	0,00	0,41	0,91	1,40	1,89	2,38	2,87	2,34	0,9840	0,3150
PAN 9216	0,00	0,48	1,10*	1,72*	2,34*	2,96*	3,58*	4,20*	2,96	1,2411	0,1190
RS 7	0,33*	0,69*	1,06*	1,42	1,78	2,15	2,51	2,88	2,79	0,7281	0,3755
ORIBI	0,00	0,00	0,24	0,77	1,30	1,84	2,37	2,90	1,92	1,0653	0,1223
PAN 9213	0,00	0,28	0,80	1,32	1,84	2,37	2,89	3,41	2,75	1,0435	0,2857
PAN 9244	0,00	0,00	0,50	1,14	1,78	2,42	3,06*	3,70*	2,63	1,2787	0,2426
BWINDI	0,00	0,00	0,00	0,54	1,18	1,81	2,45	3,09	2,00	1,2739	0,2237
MBOMVU	0,00	0,17	0,85	1,52*	2,20*	2,88*	3,56*	4,23*	3,04	1,3540	0,2301
PAN 9261	0,00	0,46	1,01*	1,55*	2,09*	2,64*	3,18*	3,72*	2,71	1,0860	0,1197
PAN 9265	0,00	0,24	0,71	1,19	1,66	2,14	2,61	3,09	2,37	0,9495	0,1706
RUBY	0,00	0,44	0,97*	1,50*	2,04*	2,57*	3,10*	3,63*	2,66	1,0651	0,1255
LAKE 101	0,00	0,00	0,00	0,00	0,40	0,98	1,57	2,16	1,81	1,1763	0,7305
LAKE 102	0,00	0,00	0,01	0,44	0,87	1,30	1,73	2,16	1,95	0,8584	0,4277

Waardes met (*) sterretjies aangedui binne dieselfde kolom is betekenisvol hoër as die gemiddeld

(*) Star printed values in the same column are significantly higher than the mean

Tabel 2 Oessekerheid by verskillende opbrengsmikpunte, 2019/20 - 2021/22
Table 2 Yield reliability at different targets, 2019/20 - 2021/22

KULTIVAR CULTIVAR	OPBRENGSMIKPUNTE (t/ha) YIELD TARGETS (t/ha)							GEM MEAN	B-KOEFF B-COEFF	D-PARAM. D-PARAM.	
	0,5	1.0	1,5	2.0	2,5	3.0	3,5				4.0
	KLEINWIT INMAAK / SMALL WHITE CANNING										
TEEBUS-RR 1	0,03	0,44	0,85	1,26	1,67	2,08	2,49	2,90	0,8202	0,2808	
SW 1	0,14*	0,64*	1,14*	1,65*	2,15*	2,65*	3,15*	3,65*	1,0032	0,2543	
PAN 123	0,07	0,56*	1,05	1,53	2,02	2,51	2,99	3,48	0,9731	0,2025	
PAN 9141	0,15*	0,56*	0,97	1,38	1,79	2,20	2,61	3,02	0,8197	0,1426	
DONGARA	0,00	0,16	0,63	1,11	1,58	2,06	2,53	3,01	0,9490	0,1781	
ROOI GESPIKKELD / RED SPECKLED											
KRANSKOP	0,00	0,33	0,79	1,25	1,71	2,17	2,63	3,09	0,9215	0,1749	
KRANSKOP-HR 1	0,15*	0,56*	0,97	1,38	1,79	2,20	2,61	3,02	0,8196	0,1588	
OPS-RS 4	0,31*	0,78*	1,25*	1,73*	2,20*	2,67*	3,15*	3,62*	0,9478	0,1100	
RS 5	0,00	0,23	0,82	1,42	2,01	2,61*	3,21*	3,80*	1,1919	0,2416	
RS 6	0,02	0,49	0,97	1,45	1,93	2,41	2,88	3,36	0,9561	0,1710	
PAN 148	0,00	0,18	0,64	1,11	1,58	2,05	2,51	2,98	0,9354	0,1930	
PAN 9292	0,00	0,25	0,86	1,46	2,07*	2,67*	3,28*	3,88*	1,2084	0,1462	
WERNA	0,33*	0,82*	1,31*	1,80*	2,30*	2,79*	3,28*	3,77*	0,9827	0,1200	
TYGERBERG	0,00	0,36	0,89	1,42	1,95	2,48	3,01	3,54	1,0624	0,2723	
KAMIESBERG	0,14*	0,65*	1,17*	1,68*	2,19*	2,71*	3,22*	3,74*	1,0283	0,1150	
PAN 9216	0,00	0,43	1,00	1,57*	2,15*	2,72*	3,29*	3,87*	1,1467	0,1300	
RS 7	0,31*	0,77*	1,22*	1,68*	2,13*	2,59*	3,04	3,50	0,9097	0,1552	
ORIBI	0,00	0,00	0,48	0,990	1,49	1,99	2,49	3,00	1,0060	0,1875	
PAN 9213	0,10*	0,62*	1,14*	1,66*	2,18*	2,70*	3,22*	3,74*	1,0409	0,1046	
BWINDI	0,00	0,00	0,41	0,97	1,52	2,07	2,62	3,17	1,1006	0,3022	
MBOMVU	0,00	0,25	0,85	1,44	2,04	2,63*	3,23*	3,82*	1,1906	0,2306	
PAN 9261	0,11*	0,64*	1,17*	1,70*	2,23*	2,76*	3,29*	3,82*	1,0597	0,0667	
PAN 9265	0,02	0,49	0,95	1,41	1,88	2,34	2,80	3,27	0,9264	0,1643	

Waardes met (*) sterretjies aangedui binne dieselfde kolom is betekenisvol hoër as die gemiddeld

(*) Star printed values in the same column are significantly higher than the mean

Tabel 3: Gemiddelde saadopbrengs (kg/ha) van verskillende produksiegebiede, 2019-22 en 2021/22.**Table 3:** Mean seed yield (kg/ha) of different production regions, 2019-22 and 2021/22

Kultivars / Cultivars	Westelike gebied Western region		Mpumalanga		Oos-Vrystaat Eastern Free State		KwaZulu-Natal		Gemiddeld Mean		Rangorde Rank		Saadfirma Seed Firm
	2019-22	2021/22	2019-22	2021/22	2019-22	2021/22	2019-22	2021/22	2019-22	2021/22	2019-22	2021/22	
Kleinwit Inmaak / Small White Canning													
TEEBUS-RR 1	2099	3364	1570	1376	1738	1968	2736	2630	2036	2335	18	18	DBS
SW 1	2922	4566	1849	2192	2251	2148	3068	2909	2523	2954	1	2	IGG/GCI
PAN 123	2331	3683	2021	1893	1903	1962	2891	2750	2287	2572	10	14	PANNAR
PAN 9141	2170	3527	1571	1081	1825	1981	2454	2697	2005	2322	19	19	PANNAR
DONGARA	1835	2375	1323	1007	1407	978	2515	2417	1770	1694	22	26	PRO-SEED
Rooi Gespikkeld / Red Speckled													
KRANSKOP	1936	2938	1580	1340	1856	1914	2428	2640	1950	2208	20	21	DBS
KRANSKOP-HR 1	2253	3542	1727	2004	1910	2235	2364	2534	2063	2579	16	13	DBS
OPS-RS 4	2937	4359	1960	2157	1915	1889	2743	2970	2389	2844	3	3	DBS
RS 5	2374	3771	1881	1955	1716	2210	3064	3426	2259	2841	11	4	DBS
RS 6	2038	3586	1987	2106	2019	2641	2625	2683	2167	2754	15	9	DBS
PAN 148	1484	2476	1277	1268	1771	1765	2387	2659	1730	2042	23	23	PANNAR
PAN 9292	2835	4923	1435	1477	1892	2526	2795	3121	2239	3012	12	1	PANNAR
WERNA	2562	3927	2241	2298	2125	2062	2832	3010	2440	2824	2	7	IGG/GCI
TYGERBERG	2707	4192	2063	2235	2087	2022	2564	2450	2355	2725	6	10	DBS
KAMIESBERG	2543	4641	1937	1788	2139	2219	2738	2711	2339	2840	9	5	DBS
PAN 9216	2408	3978	1673	1860	1802	2383	2934	3124	2204	2836	13	6	PANNAR
RS 7	2579	3438	2082	2105	2106	2640	2740	2877	2377	2765	5	8	DBS
ORIBI	1717	2403	1097	733	1050	1226	2438	2437	1576	1700	24	25	PRO-SEED
PAN 9213	2445	4099	1608	1556	1902	2064	2808	2767	2191	2622	14	12	PANNAR
BWINDI	2255**	2654	837**	510	1521**	1217	2534**	2453	1787**	1709	21	24	PRO-SEED
MBOMVU	2822**	3599	1555**	1585	2170**	2258	2989**	3357	2384**	2700	4	11	PRO-SEED
PAN 9261	2608**	3189	1691**	1388	2214**	2300	2850**	3051	2341**	2482	8	17	PANNAR
PAN 9265	2339**	3189	1587**	1626	1681**	1440	2624**	2579	2058**	2209	17	20	PANNAR
RUBY	2759**	3678	1791**	1657	2090**	1811	2780**	2858	2355**	2501	6	16	DPO
LAKE 101	1260**	1284	777**	421	1113**	1007	2310**	2542	1365**	1314	26	28	LAKE AGRICULTURE
LAKE 102	1412**	1527	1047**	1085	1151**	980	2171**	2449	1445**	1510	25	27	LAKE AGRICULTURE
DBS 310	2513*	2513	1629*	1629	2044*	2044	2612*	2612	2200*	2200		22	DBS
PAN 9244	4159*	4159	1585*	1585	1606*	1606	2875*	2875	2556*	2556		15	PANNAR

* One year data ** Two year data

Tabel 4 Algemene inligting oor droëboonkultivars 2019-2022 en 2021/22

Table 4: General information on dry bean cultivars 2019-2022 and 2021/22

Kultivars / Cultivars	Saad beskikbaar Seed available	Groeiiwyse Growth habit	Groei seisoen (dae) Growing season (days) (2019-22)	Sade per 100g Seeds per 100g (2019-22)	Omval Lodging	Opsprong Shattering	Siektes Diseases			Opbrengsverhoging (%) agv swamdoder	
							HBV ALS	Roes Rust	BCMV	2019-22	2021/22
Kleinwit / Small White											
Teebus- RR 1	Ja/Yes	I	99	387	B	B	B	B	B	-8	0
SW 1	Ja/Yes	I	104	490	B	B	B	B	B	0	-16
PAN 123	Ja/Yes	I	102	464	B	B	B	B	B	11	10
PAN 9141	Ja/Yes	I	108	391	B	B	B	B	B	11	17
Dongara	Nee/No	I	104	433	B	B	B	B	B	16	25
Rooi Gespikkeld / Red Speckled											
Kranskop	Ja/Yes	II	104	226	MV	B	V	MB	B	24	43
Kranskop-HR 1	Ja/Yes	II	106	220	MV	B	MB	MB	B	35	51
OPS-RS 4	Ja/Yes	II	108	239	MV	B	MB	MB	B	11	11
RS 5	Ja/Yes	I	101	217	B	B	V	MB	V	19	21
RS 6	Ja/Yes	II	103	229	MV	B	V	MB	B	8	21
PAN 148	Ja/Yes	II	108	253	MV	B	V	MB	B	31	39
PAN 9292	Ja/Yes	II	111	257	MB	B	B	MB	B	17	21
Werna	Nee/No	II	107	252	MV	B	V	MV	B	21	32
Tygerberg	Ja/Yes	II	107	209	MV	B	B	B	B	21	26
Kamiesberg	Ja/Yes	II	110	228	MV	B	B	B	B	15	23
PAN 9216	Ja/Yes	II	102	198	MV	B	B	B	B	5	1
RS 7	Ja/Yes	II	107	248	MV	B	MB	MB	B	18	39
Oribi	Ja/Yes	I	101	217	B	B	MB	MB	-	20	27
PAN 9213	Nee/No	II	107	224	MV	B	B	MB	B	7	13
Bwindi	Ja/Yes	I	99	231	B	B	MV	B	-	16	12
Mbomvu	Ja/Yes	I	104	200	B	B	MB	B	-	5	-2
PAN 9261	Ja/Yes	II	108	241	MV	B	-	-	-	4	9
PAN 9265	Nee/No	II	103	239	MV	B	-	-	-	23	30
Ruby	Ja/Yes	II	110	218**	-	B	-	-	-	26	27
Lake 101	Ja/Yes	I	103	191**	-	B	-	-	-	10	15
Lake 102	Ja/Yes	I	103	183**	-	B	-	-	-	1	-6
DBS 310	Ja/Yes	I		226*	-	-	-	-	-	-	-
PAN 9244	Nee/No	I		196*	-	-	-	-	-	-	-

*One year data ** Two year data

Type/Type I Bepaalde groeiiwyse: Blomme aan punt van takke beëindig stamverlenging / Determinate growth habit: Flowers at end of branches top stem growth

Type/Type II Onbepaalde groeiiwyse: Min kort en regopgroeiende sytakke, groei nog na blom / Indeterminate growth habit: Few short and upright branches, grow after flowering

Type/Type III Onbepaalde groeiiwyse: Baie lang en plat (rankende sytakke) / Indeterminate growth habit: Very long and low trailing branches

V Vatbaar / Susceptible: Chemiese beheer noodsaaklik / Chemical control necessary, MV Matig vatbaar / Moderately susceptible: Chemiese beheer gewoonlik nodig / Chemical control normally needed

MB Matige weerstand / Moderately resistant: Chemiese beheer nie nodig nie / No chemical control needed B Goeie weerstand / Good resistance: Geen chemiese beheer nodig / No chemical control needed

BCMV Boontjiemosaiëkvirus / Bean Common Mosaic Virus

HBV / ALS Hoekige blaarvlek / Angular leaf spot

Verslag oor die droëbone strookproewe: 2021/22

Report on the dry bean strip trials: 2021/22

September 2022

LNR-Graangewasse / ARC-Grain Crops

INLEIDING/INTRODUCTION

Sedert die 2006/07 seisoen word droëboonstrookproewe beplan en uitgevoer as 'n gesamentlike projek tussen die Droëbone Produsente-Organisasie (DPO), die saadmaatskappy Corteva (PANNAR) en die LNR-Graangewasse (LNR-GG) met die volgende doelwitte: Evaluering van die verskillende kommersieel beskikbare droëboonkultivars op 'n skaal wat produsente in staat sal stel om dit te vergelyk met hulle eie toestande

- Vergelyking van die aanpassing en opbrengspotensiaal van kultivars op 'n groter skaal as in die nasionale droëbone kultivarproewe.
- Evaluering van akkerboukundige eienskappe soos weerstand teen omval, oopspring en geskiktheid vir meganiese oes.
- Gebruik deur saadmaatskappye vir bemarkingsdoeleindes tydens inligtingsdae en besoeke deur produsente en verteenwoordigers.

METODES / METHODS

One 25 kg bag of certified seed per cultivar was supplied for each trial and planted under the production practices of the producer in strips of three, four or eight rows. Each trial consisted of 12 Red Speckled cultivars, with a control strip at the start and finish, as well as after every four cultivars. Only one cultivar was used as control within each trial, but different controls were used in the different production regions (see Tables 1 - 4). The trials were planted and harvested at the same time as the commercial beans and a representative of a seed company supervised both activities. During the growing season producers and representatives visited the trials. Information days were held at some of the trials.

Die proefresultate is statisties ontleed en die opbrengs is bereken. Die opbrengs (t/ha) en die opbrengs as persentasie van die kontrole asook hulle rangordes is bereken vir elke proef en produksiegebied. Die variasie tussen die kontrolestroke is gebruik om die uniformiteit (koëffisiënt van variasie (CV)) van 'n proef te bereken. Wanneer die CV te hoog was (groter as 15%), is die resultate as onbetroubaar beskou en is nie gebruik in die berekening van die gemiddeldes van 'n produksiegebied nie. Vir elke gebied is die gemiddelde opbrengs van die kultivars ook vergelyk met dié in die kultivarproewe. Wanneer die rangordes van 'n kultivar in die twee stelde proewe met drie of minder verskil het, is dit beskou as 'n goeie ooreenkoms.

RESULTATE / RESULTS

Twelve (12) Red Speckled Sugar (RSS) bean trials were planted in four provinces: Free State (2), Mpumalanga (2), North West (2) and Limpopo (5) during the 2021/22 season. The data of five trials was reliable (CV<15%) to use in the report. Kranskop and RS 5 that were included in the 2019/20 trials were replaced by PAN 9265 and RS 7 during the 2021/22 season. Yields of the different sites varied mainly because of the difference in rainfall/irrigation and soil type. The yields are expressed in t/ha and as a percentage of the control. The ranks of

the yield in t ha⁻¹ and percentage of the control differed slightly in a few instances.

Wanneer die gemiddelde opbrengs van die strook- en kultivarproewe van die gespikkelde suikerbone vergelyk word, sien ons die volgende verskille en ooreenkomste:

Comparing the means of the strip and cultivar trials of the red speckled sugar beans we observed the following:

Oos Vrystaat / Eastern Free State (Tabelle 1, 5 en 6)

Die resultate van albei (2) proewe was nie betroubaar om te gebruik.

Mpumalanga (Tabelle 2, 5 en 6)

- Two trials were planted in Mpumalanga Province but only one was reliable to use in the Report / Twee proewe is geplant en slegs een was betroubaar om te gebruik in die berekeninge.
- The mean yield of the strip trial was less than the cultivar trials by 0.51 t/ha / Die gemiddelde opbrengs van die strookproewe was 0.51 t ha⁻¹ minder as dié van die kultivarproef.
- Tygerberg en OPS-RS 4 het die hoogste opbrengs in die strookproewe (2021/22) gelewer, gevolg deur RS 7, PAN 9261 en PAN 148. Rangordes van Tygerberg, OPS-RS 4 en RS 7, het goed gekorreleer met dié verkry in die kultivarproewe.
- Die opbrengste van Tygerberg, OPS-RS 4 en PAN 148 in die 2021/22 strookproewe het baie goed gekorreleer met opbrengste oor die drie jaar tydperk (2019-2022). Die rangordes van al die kultivars, behalwe PAN 148 het goeie ooreenkomste met die kultivarproewe oor dieselfde tydperk getoon.

Noordwes / North West (Tables 3, 5 and 6)

- Two trials were planted in North West Province but only one was reliable (CV<15%) to use in the report.
- The mean yield of the strip trial was 2.28 t/ha lower than that of the cultivar trials.
- Tygerberg had the highest mean yield in the strip trial followed by PAN 9292, RS 6, OPS-RS 4 and PAN 9244. The yield of all cultivars doesn't correlate well with yields obtained in the cultivar trials except Kamiesberg, Tygerberg and PAN 9216.
- Tygerberg was the highest yielding cultivar in the strip trials over a three-year period (2019-2022) followed by OPS-RS 4, Kamiesberg and PAN 9292. The ranking of Tygerberg and Kamiesberg cultivars correlated well with the ranking in the cultivar trials over the same period.

Limpopo (Tables 4 and 5)

- The data of four (4) trials was used for the report.
- No cultivar trials were planted in Limpopo during the 2021/22 season.
- RS 6 had the highest mean yield in the strip trials during 2021/22

- d) RS 6 was the highest yielding cultivar over the past three seasons (2019-2022) followed by OPS-RS 4, PAN 9216, Kamiesberg and PAN 9292.
- e) The ranking of all cultivars except OPS-RS 4 correlated well with the ranking over the same period.

Die waarde van die inligting / The value of the information

Die strookproefdata kan gebruik word as 'n aanduiding van die opbrengspotensiaal van die kultivars. Die groter oppervlakte wat geplant word en die meganisering van die plant, oes en dors prosesse is vergelykbaar met normale boerderypraktyke. Die kultivarproefdata daarteen, behoort gebruik te word om die relatiewe prestasies van al die beskikbare kultivars met mekaar te vergelyk. Dit is meer betroubaar want dit is die resultaat van 'n groter aantal proewe en onbetroubares word makliker geïdentifiseer en uitgeskakel.

Table 1. Yield of dry bean cultivars in the strip trials, Free State with PAN 148 as control

CULTIVAR		STRIP TRIALS 2021/2022										NATIONAL CULTIVAR TRIALS	
		Jan Scheepers Bethlehem			W Badenhorst Harrismith			Mean Yield of Trials					2021/2022
		Mean Yield (t/ha)	% Control		Mean Yield (t/ha)	% Control		Mean Yield (t/ha)	Rank	% Control	Rank	Mean Yield (t/ha)	Rank
1	PAN 148	1,23	113,2		2,01	85,51		1,62	6	99	5	1,77	9
2	PAN 9292	0,83	76,59		2,49	106		1,66	5	91	7	2,53	3
3	OPS-RS 4	1,00	91,88		2,15	91,72		1,58	8	92	6	1,89	8
4	RS 6	1,06	97,91		2,43	103,66		1,75	4	101	4	2,64	1
5	DBS 830	1,02	93,58		2,85	121,23		1,94	1	107	2	NV	NR
6	PAN 9216	0,77	70,86		2,41	102,48		1,59	7	87	8	2,38	4
7	Tygerberg	1,07	98,82		2,66	113,42		1,87	2	106	3	2,02	7
8	Kamiesberg	1,36	124,96		2,38	101,57		1,87	2	113	1	2,22	6
9	PAN 9244	0,79	72,4		1,82	77,57		1,31	11	75	11	1,61	10
10	PAN 9261	0,74	68,14		2,12	90,42		1,43	10	79	9	2,30	5
11	RS 7	0,57	52,77		2,49	105,89		1,53	9	79	9	2,64	1
12	PAN 9265	0,89	81,54		1,33	56,47		1,11	12	69	12	1,44	11
Trial Mean		0,94			2,26			1,60					2,13
Mean of control		1,09			2,35								
CV (%)		19,88			17,94								
Planting date		03/12/2021			18/11/2021								
Harvest date		21/04/2022			01/04/2022								

Table 2. Yield of dry bean cultivars in the strip trials in Mpumalanga with Kranskop as control

CULTIVAR		STRIP TRIALS										NATIONAL CULTIVAR TRIALS	
		2021/2022										2021/2022	
		Gideon Anderson Middelburg		Braam Roos Carolina		Mean Yield of Trials							
No	Name	Mean Yield (t/ha)	% Control	Mean Yield (t/ha)	% Control	Mean Yield (t/ha)	Rank	% Control	Rank	Mean Yield (t/ha)	Rank		
1	PAN 148	2,15	142,32	1,32	113,32	1,74	3	128	3	1,27	11		
2	PAN 9292	1,60	106,03	0,95	81,81	1,28	12	94	12	1,48	9		
3	OPS-RS 4	1,91	126,53	1,61	138,83	1,76	2	133	2	2,16	2		
4	RS 6	2,08	138,13	1,26	108,7	1,67	5	123	5	2,11	3		
5	DBS 830	2,12	140,81	1,16	99,53	1,64	6	120	6	nv	nr		
6	PAN 9216	2,02	133,79	1,09	93,48	1,56	8	114	8	1,86	5		
7	Tygerberg	2,31	153,32	1,61	139,15	1,96	1	146	1	2,24	1		
8	Kamiesberg	1,93	128,19	1,27	109,19	1,60	7	119	7	1,79	6		
9	PAN 9244	1,63	108,15	1,05	90,7	1,34	11	99	11	1,59	8		
10	PAN 9261	1,57	104,08	1,37	117,97	1,47	10	111	9	1,39	10		
11	RS 7	1,88	124,48	1,49	128,37	1,69	4	126	4	2,11	3		
12	PAN 9265	2,01	133,56	0,99	85,02	1,50	9	109	10	1,63	7		
Trial Mean		1,93		1,27		1,60						1,78	
Mean of control		1,51		1,16									
CV (%)		17,41		12,78									
Planting date		16/11/2021		17/11/2021									
Harvest date		30/03/2022		22/04/2022									

Table 3. Yield of dry bean cultivars in the strip trials in North West with Kranskop as control

CULTIVAR		STRIP TRIALS										NATIONAL CULTIVAR TRIALS	
		2021/2022										2021/2022	
		Kobus Du Preez Grootpan		Braam Rabie Ventersdorp		Mean Yield of Trials							
No	Name	Mean Yield (t/ha)	% Control	Mean Yield (t/ha)	% Control	Mean Yield (t/ha)	Rank	% Control	Rank	Mean Yield (t/ha)	Rank	Mean Yield (t/ha)	Rank
1	PAN 148	1,78	106,42	2,01	94,86	1,90	8	101	8	2,48	11		
2	PAN 9292	1,52	91,37	2,50	117,49	2,01	7	104	7	4,92	1		
3	OPS-RS 4	1,91	114,15	2,40	112,86	2,16	5	114	5	4,36	3		
4	RS 6	1,69	101,54	2,42	114,04	2,06	6	108	6	3,59	7		
5	DBS 830	2,72	163,03	2,22	104,35	2,47	2	134	1	nv	nr		
6	PAN 9216	1,15	68,91	2,21	104,01	1,68	10	86	10	3,98	6		
7	Tygerberg	1,81	108,67	2,59	122,07	2,20	4	115	4	4,19	4		
8	Kamiesberg	2,25	134,68	2,25	106,1	2,25	3	120	3	4,64	2		
9	PAN 9244	0,77	45,95	2,36	111,14	1,57	11	79	11	4,16	5		
10	PAN 9261	1,62	96,84	2,07	97,44	1,85	9	97	9	3,19	9		
11	RS 7	2,24	134,29	2,74	129,03	2,49	1	132	2	3,44	8		
12	PAN 9265	0,52	31,34	1,63	76,75	1,08	12	54	12	3,19	9		
Trial Mean		1,67		2,28		1,97						3,83	
Mean of control		1,67		2,12									
CV (%)		16,05		3,34									
Planting date		30/12/2021		05/01/2022									
Harvest date		04/05/2022		12/05/2022									

Table 4. Yield of dry bean cultivars in the strip trials in the Limpopo with Kranskop/PAN 148 as control

CULTIVAR		STRIP TRIALS											
		2021/2022				2022/2023				2023/2024			
		Oelof De Meyer Roedtan		Louw Schmidt Marble Hall		Fielies du Toit Dendron/Vivo		Louma Boerdery Thabaz/Makopa		Werner Gildenhuys Klaserie		Mean Yield of Trials	
No	Name	Mean Yield (t/ha)	% Control	Mean Yield (t/ha)	% Control	Mean Yield (t/ha)	% Control	Mean Yield (t/ha)	% Control	Mean Yield (t/ha)	% Control	Mean Yield (t/ha)	Rank
1	PAN 148	2,34	99,18	3,24	95,54	2,09	106,23	1,77	105,74	2,56	110,28	2,40	10
2	PAN 9292	2,1	89,27	2,65	78,05	3	152,79	2,25	134,82	2,69	115,96	2,54	6
3	DBS 830	2,71	114,77	2,73	80,59	2,19	111,33	1,87	111,76	2,76	118,98	2,45	9
4	RS 6	2,41	102,3	3,61	106,56	3,06	155,47	2,03	121,39	2,79	120,12	2,78	2
5	PAN 9216	2,23	94,59	3,82	112,74	2,69	136,85	2,62	157,16	2,37	102,28	2,75	3
6	Tygerberg	2,52	107,08	2,71	79,77	2,44	124,3	1,63	97,62	3,05	131,7	2,47	8
7	Kamiesberg	2,41	102,32	3,74	110,41	2,22	113,08	2,28	136,61	2,74	118,07	2,68	4
8	PAN 9244	1,86	78,98	2,7	79,76	3,01	152,83	2,58	154,43	2,64	109,5	2,56	5
9	PAN 9261	2,16	91,53	2,9	85,58	2,92	148,65	1,91	114,21	1,82	78,47	2,34	13
10	RS 7	2,07	87,7	3,07	90,42	2,37	120,6	2,3	137,78	2,81	121,03	2,52	7
11	PAN 9265	2,37	100,43	2,74	80,91	3,17	161,4	2,09	124,84	1,46	63,15	2,37	11
12	RS 5	2,5	106,14	3,48	102,6	3,23	164,39	-	-	-	-	3,07	1
13	KRANSKOP	-	-	-	-	-	-	-	-	1,26	54,5	1,26	14
14	RS 4	-	-	-	-	-	-	2,37	142,04	2,36	101,72	2,37	11
Trial Mean		2,31		3,12		2,7		2,14		2,41		2,47	
Mean of control		2,36		3,39		1,97		1,67		2,32			
CV (%)		17,72		7,53		5,82		9,72		9,09			
Planting date		14/02/2022		17/02/2022		26/01/2022		24/02/2022		18/03/2022			
Harvest date		21/06/2022		13/07/2022		31/05/2022		24/06/2022		12/07/2022			

Table 5. Mean seed yield (t/ha) of strip trials conducted in different production areas during 2019/20 – 2021/22 and 2021/22

Cultivar	Eastern Free State				Mpumalanga				North West				Limpopo				National Mean			
Name	19/20-21/22	Rank	2021/22	Rank	19/20-21/22	Rank	2021/22	Rank	19/20-21/22	Rank	2021/22	Rank	19/20-21/22	Rank	2021/22	Rank	19/20-21/22	Rank	2021/22	Rank
PAN 148	1,80	7	1,62	5	1,74	4	1,74	3	1,84	6	1,90	7	2,49	7	2,40	7	1,97	7	1,91	5
PAN 9292	1,95	5	1,66	4	1,65	6	1,28	10	1,97	4	2,01	6	2,57	5	2,54	4	2,04	5	1,87	6
OPS-RS 4	1,90	6	1,58	8	1,87	3	1,76	2	2,04	2	2,16	4	2,73	2	2,11	10	2,14	2	1,83	7
RS 6	2,16	2	1,75	3	1,66	5	1,67	5	1,76	7	2,06	5	2,76	1	2,78	1	2,08	4	2,06	3
PAN 9216	2,03	3	1,59	6	1,52	7	1,56	7	1,90	5	1,68	9	2,67	3	2,75	2	2,03	6	1,89	8
Tygerberg	2,40	1	1,87	1	2,06	1	1,96	1	2,15	1	2,20	3	2,53	6	2,47	6	2,28	1	2,12	1
Kamiesberg	2,02	4	1,87	1	1,89	2	1,60	6	2,03	3	2,25	2	2,60	4	2,68	3	2,13	3	2,10	2
PAN 9261	1,43*		1,43	8	1,47*		1,47	9	1,85*		1,85	8	2,34*		2,34	9	1,77*		1,77	9
RS 7	1,53*		1,53	7	1,69*		1,69	4	2,49*		2,49	1	2,52*		2,52	5	2,06*		2,06	3
PAN 9265	1,11*		1,11	9	1,50*		1,50	8	1,08*		1,08	10	2,37*		2,37	8	1,51*		1,51	10
Trial Mean	2,04		1,60		1,77		1,62		1,95		1,97		2,62		2,50		2,10		1,91	

Table 6. Mean yields of three seasons' strip trials (2019/20 – 2021/22) compared with that of the cultivar trials over the same period

Cultivar	Eastern Free State				Mpumalanga				North West			
	Strip Trials		Cultivar Trials		Strip Trials		Cultivar Trials		Strip Trials		Cultivar Trials	
	Mean (t/ha)	Rank	Mean (t/ha)	Rank	Mean (t/ha)	Rank	Mean (t/ha)	Rank	Mean (t/ha)	Rank	Mean (t/ha)	Rank
PAN 148	1,80	7	1,77	7	1,74	4	1,27	7	1,84	6	2,48	7
PAN 9292	1,95	5	2,53	2	1,65	6	1,48	6	1,97	4	4,92	1
OPS-RS 4	1,90	6	1,89	6	1,87	3	2,14	2	2,04	2	4,36	3
RS 6	2,16	2	2,64	1	1,66	5	2,11	3	1,76	7	3,59	6
PAN 9216	2,03	3	2,38	3	1,52	7	1,86	4	1,90	5	3,98	5
Tygerberg	2,40	1	2,02	5	2,06	1	2,24	1	2,15	1	4,19	4
Kamiesberg	2,02	4	2,22	4	1,89	2	1,79	5	2,03	3	4,64	2
PAN 9261	1,43*				1,47*				1,85*			
RS 7	1,53*				1,69*				2,49*			
PAN 9265	1,11*				1,50*				1,08*			
Trial Mean	2,04		2,21		1,77		1,84		1,95		4,02	

* One year data