2020-2021 TRIAL RESULTS

vkb
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PREFACE

Welcome to VKB Agricultural Management Services' trial report for the period 2020-2021. I would like to use this opportunity to voice my sincere gratitude towards our Creator, VKB's board of directors, management and colleagues for their support of this very important initiative to supply VKB members with appropriate scientific practice information.

The purpose of VKB's trials is to supply independent statistically accountable management information to VKB's members. During the past planting season 12 trials were planted in the VKB area at six different locations, varying from Heidelberg to Kestell. The trial in Heidelberg was done on a controlled spoorverkeerstelsel while all the other trials were done on the conventional tilling system. The information and results of each of these trials are contained in this report.

The biggest value of these trial lies in the independence of the trials, economic analysis of each trial, the applicability in practice and the methods that we use, i.e. strip trials which are randomized and replicated at least three times to minimise probable soil and climate differences.

The applicability of these trials also aim to simulate farming practices as best as possible under different climate conditions, like the last season we had, which was characterised by higher than average rainfall, waterlogged conditions, less heat units and less sunlight energy. The results of the current season's trials provide VKB's producers with valuable information to make the right management decisions in future should a season similar to the past season is predicted.

Economical and sustainable crop production must always form an integral part of VKB's research projects and must aim to empower farmers to understand the principles around these aspects as circumstances change.

Our Farmer Collaborators are the most important links in our trials. Without their willingness and co-operation it would not have been possible for us to plant these trials. Our sincere gratitude is voiced towards each and every one who is mentioned in the complete collaborators' list.

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ACKNOWLEDGEMENTS

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Sonop Farmers' Association:	Appropriation of a trial plot for the nitrogen trial. Evaluation of the effects of various N application practices with various sources of nitrogen on the yield of maize.
Various day labourers:	Digging of profile holes

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Louw vd Merwe (Louw's Chem) (Reitz):	Tillage trial Soya bean plant population trial and soya bean cultivar trial Maize plant population trial on a control traffic system
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Mr Lukie du Plessis:	Technical assistance with maize trials at Reitz
Mr J.T. Prinsloo Junior:	Evaluating the effect of different fungicide products applied during the V5 growth stage on the yield of maize

CALCULATIONS AND STATISTICS

All statistical calculations are calculated with the Mullen ANOVA generator program, which uses Fisher's least significant difference (LSD, alpha 0.05) method to establish whether treatments vary statistically from one another. Below is a more extensive description and example of LSD, etc.

STUDY THE EXAMPLE OF A TRIAL BELOW

LSD: Least significant difference (kleinste betekenisvolle verskil) word gebruik om die gemiddelde waardes van verskillende behandelings met dieselfde getal herhalings te vergelyk. Vir hierdie verslag is 'n betekenisvolheidvlak van 0,05 (of 5%) gebruik, wat beteken wanneer behandelings statisties betekenisvol verskil, daar met 95% vertroue gesê kan word dat behandelings waarlik verskil.

Treatment	Yield (t/ha^{-1})	Significance*
1	7.8	a
2	7.2	b
3	6.7	c
4	6.3	cd
Average	7.0	**LSD $_{(0.05)}$ = 0.45** **CV (%) = 6.8**

CV: The CV is defined as the coefficient of variation, which is a calculation of the variation between treatments and each replication of a treatment. In agriculture, and specifically in strip trials, a coefficient of variation less than 25% is acceptable.

REPLICATION: Each treatment is planted with at least three replications. The reason for this being:
– To be able to do the statistical analysis and
– To get more results from treatments in order to get a more credible average of one treatment to be able to come to a conclusion.

RANDOMIZATION: In other words, it is the random planting of a trial. The reason for this being:
– To eliminate variation in a field, e.g. pH, soil type, soil depth, rainfall distribution, etc., because each treatment replication has the same chance to be planted in any area of the field;
– Randomization prevents data from being biased based on the location of a treatment in a field.

EXPLANATION: For treatment 1 to statistically vary significantly from treatment 2, the difference must be more than 450 kg/ha (LSD (0.05) = 0.45). They do indeed vary and therefore the letters of treatment 1 -a- and treatment 2 -b- differ. Treatment 3 also differs with more than 450 kg/ha from treatment 2 and treatment 1. Therefore the letter -c- stands next to treatment 3. Thus, if the letters are not the same, the treatments statistically differ significantly from each other. Treatment 4 has the letters -cd- next to it. This means that treatment 4 does not differ significantly from treatment 3, because the difference between the two treatments is less than 450 kg/ha. Treatments which do not differ significantly from each other will have the same letter or one of the letters will be the same, like in this case where treatments 3 and 4 both have the letter -c- next to it.

PARAMETERS MEASURED

In all trials, where possible, various parameters were measured in order to determine why certain treatments lead to higher or lower yields. The parameters which were measured in most of the trials were:

SOYA BEANS

Days to each growth stage – growth stages of each treatment (cultivar) were determined weekly.

Final plant population – plants were counted over 10 m on at least three spots in the field of each replication.

Pods per plant – pods of at least ten plants on at least three spots in the field of each replication.

Moisture percentage – the moisture percentage of each replication was determined with a Dickey John moisture gauge.

Hundred-kernel weight – one hundred seeds of each replication were counted whereafter the moisture percentage was amended to 12.5%.

Yield – yield was determined with VKB's weighing cart whereafter the moisture percentage was amended to 12.5%. The plot/strip surface was determined with a GPS.

MAIZE

Final plant population – plants were counted over 10 m on at least three spots in the field of each replication.

Kernels around an ear – six ears per replication were picked randomly whereafter the number of kernels on the ear were counted.

Kernels in a row of an ear – six ears per replication were picked randomly whereafter the number of kernels in the row of an ear were counted.

Ears per plant – ears per plant were counted over 10 m on at least three spots in the field of each replication.

Ears per 10 m – the total number of ears were counted over 10 m on at least three spots in the field of each replication.

Moisture percentage – *the moisture percentage of each replication was determined with a Dickey John moisture gauge.*

Hundred-kernel weight – one hundred kernels of each replication were counted and weighed whereafter the moisture percentage was amended to 12.5%.

Ear weight – the weight of an ear was determined by calculating the total kernels per ear by multiplying the number of kernels around an ear by the number of kernels in the row of an ear, which was then multiplied by the hundred-kernel weight.

Yield – yield was determined with VKB's weighing cart whereafter the moisture percentage was amended to 12.5%, and yield per hectare was calculated. The plot/strip surface was determined with a GPS.

Rainfall, temperature and heat units:

In the past season there were weather stations present at each trial plot which measured rainfall and temperature. With the temperature data, heat units were determined from emergence to the physiological maturity growth stage. In all the trials 130 days after planting was used as benchmark for the physiological maturity (R6) growth stage.

ECONOMIC ANALYSIS

MARGIN ABOVE COST OF PARTICULAR TREATMENTS

The margin above cost of a particular treatment enables the farmer to not only take into consideration yield increase/decrease, but also the economic benefit/loss of a particular treatment, which is the most important evaluation for the sustainable profitability for each farmer. The following were considered in the economic analysis of each trial:

Commodity price – an average farmer price for the year was used (Soya beans: R6 500 and maize: R2 750).

Mechanization/input costs – to determine these costs, figures obtained from VKB Agriculture's agricultural economy department were used.

Treatment costs – the cost of each treatment, e.g. seed costs, fungicide and cultivar, were obtained from each input supplier.

EXAMPLE OF AN ECONOMIC ANALYSIS ON A MAIZE PLANT POPULATION TRIAL

Plant population (plants/ha)	25 000	35 000	45 000 (Control)	55 000
Grain yield (t/ha)	3.41	3.88	3.67	3.59
Grain price	R2 350.00	R2 350.00	R2 350.00	R2 350.00
Gross income	**R8 013.50**	**R9 118.00**	**R8 624.50**	**R8 436.50**
Seed cost per bag (80 000 seeds)	R4 450.00	R4 450.00	R4 450.00	R4 450.00
Price (R/ha)	R1 390.63	R1 946.88	R2 503.13	R3 059.38
Total seed cost/ha	**R1 390.63**	**R1 946.88**	**R2 503.13**	**R3 059.38**
Margin above seed cost/ha	R6 622.88	R7 171.13	R6 121.38	R5 377.13
Difference in margin of control	R501.50	R1 049.75	-	-R744.25

In each trial report only the margin above seed cost, fertiliser cost, etc. is indicated and not the full economic analysis. For the full economic analysis, the complete report of each trial can be requested or it can be viewed on VKB Agriculture's website: www.vkb.co.za.

CONCLUSION

A conclusion, followed by an appropriate recommendation, can only be made after at least three years' trial results. Therefore no conclusion or recommendation can be made from any of these trials yet since only one or two years' results are available. It is therefore important to keep this in mind when these trials are studied.

2020-'21 TRIALS

SOYA BEANS

- Don Mario soya bean cultivar trial
- Soya bean fungicide trial
- Soya bean plant population trial

MAIZE

- Sonop Farmers' Association nitrogen source and application practice trial
- Maize fungicide trial 1
- Maize fungicide trial 2
- Maize plant population trial 1
- Maize plant population trial 2
- Maize plant population trial 3
- Tillage practice trial
- Maize cultivar and plant population trial

DON MARIO SOYA BEAN CULTIVAR TRIAL

OBJECTIVE OF TRIAL

To compare the yield of different Don Mario soya bean cultivars to each other in a controlled traffic system.

Trial information

Production year	2020/21
Year of trial	Year 1
Locality	Grootvlei
Previous crop	Maize
Tillage	Controlled traffic system
Cultivar	N.A.
Fertiliser	6N, 6P, 13K
Plant population	250 000 plants/ha
Planting date	4 December 2020
Weed control	Arysta program
Harvesting date	12 April 2021

Rainfall and temperature summary

	4 Dec	Jan	Feb	31 March	Tot
Rainfall (mm)	67.8	160.4	57.6	37.2	323.0
Avg. max. temp. (°C)	30.2	29.1	27.8	28.9	
Avg. min. temp. (°C)	16.0	15.8	14.0	10.5	
Heat units	347	373	300	296	
Cum. heat units	347	719	1 019	1 315	

Rainfall data: From planting to physiological maturity (118 days)

TRIAL DESIGN

The trial consists of three cultivars of which each cultivar was replicated three times. The trial was planted in pre-measured strips in a completely randomized block design. Each plot was 7.28 m wide and on average 247 m long.

TRIAL PLAN

Plot	1	2	3	4	5	6	7	8	9
Treatments	B1 H1	B3 H1	B2 H1	B1 H2	B2 H2	B3 H2	B2 H3	B1 H3	B3 H3

TREATMENTS

Treatments	Cultivar	Growth period
B1	DM 5351 RSF	5.3
B2	DM 5953 RSF (Control)	5.3
B3	DM 5302 RSF	5.7

RESULTS

Treatment (Cultivar)	Yield (t/ha)	Significance*	Initial plant population (plants/ha)	Final plant population (plants/ha)	Pods per plant	Hundred-seed weight (g)	Margin above seed cost (difference from control)	
DM 5351 RSF	2.37	a	217 582	206 777	39	14.79	R14 610.00	R585.00
DM 5953 RSF (Control)	2.28	a	217 216	206 593	47	14.71	R14 025.00	-
DM 5302 RSF	2.26	a	230 403	228 205	35	14.41	R13 895.00	- R130.00
Average	**2.19**	**$LSD_{(0.05)}$ = ns (0.12) CV = 2.23**	**221 734**	**213 858**	**40**	**14.64**		

* Statistically treatments with the same letter do not vary significantly from each other according to Fisher's least significant difference (LSD, alpha 0.05) method at alpha = 0.05

Planting date 4 December 2020 Cultivar	Days to: Flower (R1)	Pod formation (R3)	Pod filling (5)	Start of physiological maturity (R7)	Physiological maturity (R8)	Harvest (date)	Total period of: (days) Flower (R1-R2)	Pod formation (R3-R4)	Pod filling (R5-R6)	Physiological ripening (R8)	Drying down
DM 5351 RSF	49	62	75	105	112	129 (12-04)	13	13	30	7	17
DM 5953 RSF	45	62	75	105	112	129 (12-04)	17	13	30	7	17
DM 5302 RSF	52	68	91	112	119	129 (12-04)	16	23	21	7	10
Average	**49**	**64**	**80**	**107**	**114**	**129**	**15**	**16**	**27**	**7**	**15**

DISCUSSION

- DM 5351 RSF delivered the highest yield. Even though statistically there weren't significant differences amongst the various cultivars, there still was an economical advantage.
- This was only the first year of the trial, therefore no recommendations or conclusion could be made.

SOYA BEAN FUNGICIDE TRIAL

OBJECTIVE OF TRIAL

To evaluate the effect of different fungicide products applied at different growth stages on the yield of soya bean in a controlled traffic system.

Trial information	
Production year	2020/21
Year of trial	Year 1
Locality	Heidelberg
Previous crop	Maize
Tillage	Controlled traffic system
Cultivar	DM 5953 RSF
Fertiliser	6N, 6P, 13K
Plant population	280 000 plants/ha
Planting date	2 December 2020
Weed control	Arysta program
Harvesting date	9 April 2021

TRIAL DESIGN

The trial consists of seven fungicide treatments of which each treatment was replicated three times. The trial was planted in pre-measured strips in a completely randomized block design. Each plot was 7.28 m wide and on average 750 m long. Each fungicide product was separately mixed according to the label and was applied to each strip according to the trial plan.

TRIAL PLAN

Plot	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Treatments	B1 H1	B2 H1	B3 H1	B4 H1	B5 H1	B6 H1	B7 H1	B2 H2	B4 H2	B6 H2	B1 H2	B3 H2	B5 H2	B7 H2	B5 H3	B3 H3	B1 H3	B7 H3	B6 H3	B4 H3	B2 H3

TREATMENTS

Treatments	Product	Growth stage of application
B1	Control	
B2	Mycoblock 250 SC	R2 (Full flowering)
B3	Evito T	R2 + R4 (Full flowering and pod)
B4	Mycoblock 250 SC	R5 (Start of pod filling)
B5	Evito T	R5 (Start of pod filling)
B6	Mycoblock 250 SC	R2 + R4 (Full flowering and pod)
B7	Evito T	R2 (Full flowering)

Product	Level of application per hectare	Active ingredient
Mycoblock 250 SC	400 mℓ	(Azoxystrobin *(strobilurin)* 250 g/ℓ)
Evito T	500 mℓ	(Fluoxastrobin *(Dihydrodioxazine)* 200 g/ℓ) (Tebuconazole *(Triazole)* 277 g/ℓ)

RESULTS

Treatment (Fungicide product)	Yield (t/ha)	Significance*	Margin above fungicide cost (difference from control)	
B1 (Control)	1.55	a	R9 286.59	-
B2 (Mycoblock R2)	1.48	a	R8 603.44	-R683.15
B3 (Evito T R2+R4)	1.56	a	R8 538.68	-R747.91
B4 (Mycoblock R5)	1.63	a	R9 523.31	R236.72
B5 (Evito T R5)	1.72	a	R9 831.15	R544.56
B6 (Mycoblock R2+R4)	1.52	a	R8 671.12	-R615.47
B7 (Evito T R2)	1.58	a	R9 034.48	-R252.11
Average	1.58	$LSD_{(0.05)}$ = ns (0.30) CV = 10.59		

*Statistically treatments with the same letter do not vary significantly from each other according to Fisher's least significant difference (LSD, alpha 0.05) method at alpha = 0.05

DISCUSSION

- Both products applied at R5 growth stage delivered the highest yield as well as an economical advantage.
- This is only one year's data.

KEY FINDING

- To ensure optimal photosynthesis during grain filling, leaves must be kept free of diseases and fungus for as long as possible to ensure withdrawal of nutrients from the soil.
- The spray program must be managed in such a way that fungicide application starts during R4 and all attempts should be made to spray the biggest share of the cultivation during the R5 growth stage in order to get the same advantage of the fungicide spray gotten in this trial.

SOYA BEAN PLANT POPULATION TRIAL

OBJECTIVE OF TRIAL

To evaluate the effect of different plant populations on the yield of soya beans.

Trial information

Production year	2020/21
Year of trial	Year 1
Locality	Reitz
Previous crop	Maize
Tillage	Rip and seedbed
Cultivar	DM 5953 RSF
Fertiliser	6N, 12P, 24K
Plant population	NVT
Planting date	26 November 2020
Weed control	Nulandis program
Harvesting date	1 April 2021

Rainfall and temperature summary

	26 Nov	Dec	Jan	Feb	25 March	Tot
Rainfall (mm)	7.8	135.2	190.4	106.8	62.0	502.2
Avg. max. temp. (°C)	27.6	30.0	27.8	29.8	30.6	
Avg. min. temp. (°C)	13.3	14.3	14.9	13.8	11.1	
Heat units	51	358	338	305	251	
Cum. heat units	51	410	748	1053	1304	

Rainfall data: From planting to physiological maturity (120 days)

TRIAL DESIGN

The trial consists of six plant population treatments of which each treatment was replicated three times. The trial was planted in a completely randomised block design with a 12-row 0.76 m planter. Each plot was 9.12 wide and on average 100 m long.

TRIAL PLAN

Plot	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Treatments	B1	B3	B5	B2	B4	B6	B4	B6	B1	B2	B3	B5	B4	B2	B3	B6	B5	B1
	150 000	250 000	350 000	200 000	300 000	400 000	300 000	400 000	150 000	200 000	250 000	350 000	300 000	200 000	250 000	400 000	350 000	150 000
	H1	H1	H1	H1	H1	H1	H2	H2	H2	H2	H2	H2	H3	H3	H3	H3	H3	H3

TREATMENTS

Treatments	Plant population (plants/ha)
B1	**150 000**
B2	**200 000**
B3	**250 000**
B4 (Control)	**300 000**
B5	**350 000**
B6	**400 000**

RESULTS

Treatment (plants/ha)	Yield (t/ha)	Significance*	Initial plant population (plants/ha)	Final plant population (plants/ha)	Pods per plant	Hundred-seed weight (g)	Margin above seed cost (difference from control)	
150 000	1.23	cd	137 281	139 035	44	13.90	R7 998.79	- R3 607.60
200 000	1.13	d	187 865	183 991	30	14.06	R7	-
							328.01	R4 278.38
250 000	1.59	bc	239 620	233 114	29	14.18	R10 328.30	-R1 278.09
300 000 (Control)	1.79	ab	284 503	268 421	28	13.75	R11 606.39	-
350 000	1.97	a	329 240	307 895	27	13.71	R12 803.88	R1 197.49
400 000	1.94	ab	423 246	365 789	20	13.80	R12 590.91	R984.52
Average	**1.61**	**LSD $_{(0.05)}$ = 0.37 CV = 12.52**	266 959	249 707	30	**13.90**		

*Statistically treatments with the same letter do not vary significantly from each other according to Fisher's least significant difference (LSD, alpha 0.05) method at alpha = 0.05.

DISCUSSION

- 350 000 plants/ha delivered the highest yield. Although there were statistically significant differences between the treatments, it was not possible to make recommendations or to come to conclusions since this was the first year of the trial.
- The higher yield produced by the higher plant population can be contributed to the above normal rainfall as well as the later planting date.

SONOP FARMERS' ASSOCIATION NITROGEN SOURCE AND APPLICATION PRACTICE TRIAL

OBJECTIVE OF TRIAL

To determine the effect of different nitrogen application practices with different sources of nitrogen on maize yield.

Trial information

Production year	2020/21
Year of trial	Year 3
Locality	Sonop Farmers' Association
Previous crop	Maize
Tillage	Rip and seedbed
Cultivar	PHB 33H56
Fertiliser	NVT
Plant population	31 500
Planting date	9 November 2020
Weed control	Syngenta program
Harvesting date	9 June 2021

Rainfall and temperature summary

	9 Nov	Dec	Jan	Feb	18 March	Tot
Rainfall (mm)	51.4	163.2	125.0	89.0	17.4	446
Avg. max. temp. (°C)	27.3	28.1	27.0	28.5	31.1	
Avg. min. temp. (°C)	13.1	14.4	14.9	13.6	10.4	
Heat units	221	345	332	295	181	
Cum. heat units	221	566	898	1192	1374	

Rainfall data: From planting to physiological maturity (130 days)

TRIAL DESIGN

The trial consists of four treatments of which each treatment was replicated three times. The trial was planted in pre-measured plots in a completely randomised design with a 4-row 0.91 m planter. Each plot was on average 0.4 hectares in size, but it did indeed vary because of the layout of the land. Buffer strips of an average of 5 m were left open between the different plots.

TRIAL PLAN

Plot	1	2	3	4	5	6	7	8	9	10	11	12
Treatments	NH3 Pre-plant H1	NH3 Pre-plant H2	KAN Top dressing H1	Urea Top dressing H1	Urea Pre-plant H1	KAN Top dressing H2	Urea Pre-plant H2	Urea Top dressing H2	KAN Top dressing H3	Urea Pre-plant H3	Urea Top dressing H3	NH3 Pre-plant H3

TREATMENTS

Fertiliser	Pre/topdressing	With planting	Total fertiliser
NH_3 (82) pre-planting	65 kg NH_3 (53N)	200 kg 3:2:1 (30)	83N, 20P, 10K (0.5% Zn)
KAN (28) topdressing	190 kg KAN (53N)		
Urea (46) topdressing	115 kg urea (53N)		
Urea (46) pre-planting	115 kg urea (53N)		

RESULTATE

Treatment	Yield (t/ha)	Significance*	Final plant population	Ears per plant	Hundred-seed weight (g)	Margin above fertiliser cost (difference from control)	
NH_3 Pre-plant	5.30	a	31 319	1.25	29.57	R12 397.64	-R226.06
Urea topdressing	4.73	a	31 044	1.09	27.87	R10 766.54	-R1 857.16
KAN topdressing	5.47	a	31 777	1.28	29.63	R12 623.70	-
Urea Pre-plant	5.92	a	31 685	1.38	29.94	R13 970.01	R1 346.31
Average	**5.36**	**$LSD_{0.05}$ = 1.20 CV = 11.94**	**31 456**	**1.25**	**29.25**		

* Statistically treatments with the same letter do not vary significantly from each other according to Fisher's least significant difference (LSD, alpha 0.05) method at alpha = 0.05.

Treatment	Ears on 10 m				Number of kernels					
					Main ear		Second ear		Tassel ear	
	Main ear	Second ear	Tassel ear	Total	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear
NH_3 pre-plant	28.42	2.75	4.33	35.50	38.22	15.22	25.67	14.98	25.53	14.47
Urea topdressing	27.75	0.42	2.50	30.67	38.17	14.89	22.25	15.40	21.13	15.50
KAN topdressing	28.92	1.42	6.58	36.92	38.89	14.89	27.83	13.33	23.93	14.27
Urea pre-plant	28.75	3.58	7.42	39.75	40.11	15.00	26.17	15.50	26.92	14.06
Average	28.50	2.00	5.20	35.70	38.85	15.00	25.48	14.80	24.38	14.57

END OF TRIAL 3 YEAR RESULTS

Treatment	Yield (t/ha)					Kg N/ton grain	Average margin above fertiliser cost Difference from control	
	2018-19	2019-20	2020-21	Average	Significance *			
NH_3 pre-plant	7.03	5.78	5.30	6.04	a	13.74	R13 037.38	R831.64
Urea topdressing	6.85	4.55	5.47	5.62	a	14.77	R11 810.94	-R394.80
KAN topdressing	6.65	4.52	5.92	5.70	a	14.56	R12 205.74	-
Urea pre-plant	6.94	5.28	4.73	5.65	a	14.69	R11 994.54	-R211.20
Average	$LSD_{0.05}$ = ns CV = 3.53	$LSD_{0.05}$ = 0.88 CV = 9.27	$LSD_{0.05}$ = 1.20 CV = 11.94	$LSD_{0.05}$ = 0.56 CV = 10.03				

DISCUSSION

- Out of the three years' results, the NH3 gas treatment delivered the highest yield as well as the highest economical advantage of all the sources of nitrogen in the trial.
- From the results above it seems that the NH3 gas treatment was the most effective source of nitrogen over the three year trial period. The yield, economy and kg N per ton grain produced confirms this statement.
- KAN top fertiliser seems to be the second best source of nitrogen followed by urea pre-plant and urea top fertiliser.

MAIZE FUNGICIDE TRIAL 1

OBJECTIVE OF TRIAL

To evaluate the effect of different fungicide products applied on the V5 growth stage on the yield of maize.

Trial information

Production year	2020/21
Year of trial	Year 2
Locality	Kransfontein
Previous crop	Maize
Tillage	CLC and seedbed
Cultivar	PHB 1513
Fertiliser	116N, 25P, 15K
Plant population	34 782
Planting date	13 November 2020
Weed control	Nulandis program
Harvesting date	9 April 2021

Rainfall and temperature summary

	13 Nov	Dec	Jan	Feb	22 March	Tot
Rainfall (mm)	36.0	166.4	103.4	73.4	28.8	408
Avg. max. temp. (°C)	28.30	28.65	27.22	28.88	30.69	
Avg. min. temp. (°C)	12.62	14.06	14.61	13.33	9.4	
Heat units	184	345	329	293	217	
Cum. heat units	184	529	858	1151	1368	

TRIAL DESIGN

The trial consists of six fungicide treatments of which each treatment was replicated four times. The trial was planted in strips in a completely randomised block design with a 6-row 0.91 m planter. Each plot was 5.46 m wide and on average 510 m long. Each fungicide treatment was mixed separately in one tank and applied according to the trial plan on the plants five weeks after planting.

TRIAL PLAN

Plot	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Treatments	B1	B2	B3	B4	B5	B6	B5	B1	B6	B3	B4	B2	B6	B2	B3	B4	B5	B1	B2	B4	B6	B1	B3	B5
	H1	H1	H1	H1	H1	H1	H2	H2	H2	H2	H2	H2	H3	H3	H3	H3	H3	H3	H4	H4	H4	H4	H4	H4

TREATMENTS

Treatments	Product	Level of application per hectare	Active ingredient
B1	**Mycoblock 250 SC**	400 mℓ	Azoxystrobin *(strobilurin)* 250 g/ℓ
B2	**Inhibit 480 SC**	500 mℓ	Azoxystrobin *(strobilurin)* 240 g/ℓ Tebuconazole (*Triazole*)240 g/ℓ
B3	**Evito T**	500 mℓ	Fluoxastrobin *(Dihydrodioxazine)* 200 g/ℓ Tebuconazole (*Triazole*)277 g/ℓ
B4	**Amistar Top**	500 mℓ	Azoxystrobin *(strobilurin)* 200 g/ℓ Difenoconazole *(Triazole)* 125 g/ℓ
B5	**Custodia 320 SC**	1000 mℓ	Azoxystrobin (*strobilurin)* 120 g/ℓ Tebuconazole (*Triazole*) 200 g/ℓ
B6	**Control**		

Treatment	Yield (t/ha)	Significance*	Final plant population	Ears per plant	Hundred-seed weight (g)	Margin above fungicide cost (difference from control)	
Mycoblock 250 SC	6.56	a	34 341	1.34	34.00	R17 906.99	R36.53
Inhibit 480 SC	6.83	a	33 791	1.38	34.35	R18 410.59	R540.13
Evito T	6.68	a	33 516	1.30	33.93	R18 003.07	R132.61
Amistar Top	7.07	a	34 341	1.32	35.30	R19 011.48	R1 141.02
Custodia 320 SC	6.93	a	34 066	1.22	34.88	R18 655.76	R785.30
Control	6.50	a	33 791	1.11	33.33	R17 870.46	-
Average	**6.76**	**$LSD_{(0.05)}$ = 0.50 CV = 4.90**	**33 974**	**1.28**	**34.30**		

* Statistically treatments with the same letter do not vary significantly from each other according to Fisher's least significant difference (LSD, alpha 0.05) method at alpha = 0.05.

RESULTS

Treatment	Ears on 10 m				Kernel counts					
					Main ear		Second ear		Tassel ear	
	Main ear	Second ear	Tassel ear	Total	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear
Mycoblock 250 SC	30.50	30.50	0.25	42.00	32.83	18.40	31.50	20.00	28.00	17.00
Inhibit 480 SC	31.25	30.75	3.50	42.50	33.00	19.00	26.67	18.00	28.33	17.00
Evito T	26.00	25.50	1.75	39.75	33.00	19.50	25.33	20.00	29.33	18.00
Amistar Top	26.75	26.50	4.25	41.25	33.75	16.67	27.50	19.00	30.00	18.00
Custodia 320 SC	28.25	27.50	1.75	37.75	33.33	19.60	30.33	20.00	32.67	17.00
Control	28.00	26.50	1.25	34.00	35.00	17.60	25.75	18.00	29.00	16.00
Average	**28.46**	**27.88**	**2.13**	**39.54**	**33.49**	**18.46**	**27.85**	**19.17**	**29.56**	**17.17**

DISCUSSION

- All the fungicide treatments delivered a higher yield as well as economical advantage for the second year.
- Due to the high rainfall and fungal infections the fungicide products with both the strobilurin as well as the triazole combinations delivered the highest yield as well as the highest economic advantage.

MAIZE FUNGICIDE TRIAL 2

OBJECTIVE OF TRIAL

To evaluate the effect of fungicide application on R2 growth stage of the yield of maize in a controlled traffic system.

Trial information	
Production year	2020/21
Year of trial	Year 1
Locality	Heidelberg
Previous crop	Soya beans
Tillage	Controlled traffic system
Cultivar	PAN 6R-710 BR
Fertiliser	105N, 22P, 13K
Plant population	32 000
Planting date	6 November 2020
Weed control	Arysta
Harvesting date	27 May 2021

TRIAL DESIGN

The trial consists of four plant population treatments of which each treatment was replicated four times. The trial was planted in pre-measured strips in a completely randomised block design. Each plot was 7.28 m wide and on average 1 080 m long. The fungicide products were mixed separately according to the label and were applied according to the trial plan to each strip by aeroplane. Buffer strips of two planter widths were left open to prevent spreading of fungicide between the treatment and the control strips.

TRIAL PLAN

Plot	1	2	3	4	5	6
Treatments	B1 H1	B2 H1	B1 H2	B2 H2	B1 H3	B2 H3

TREATMENTS

Treatments	Product	Level of application per hectare	Active ingredient
B1	**Tenazole 250 EW**	800 mℓ	Tebuconazole (*Triazole*)250 g/ℓ
B2	**Control**		

RESULTS

Treatment (fungicide product)	Yield (t/ha)	Significance*	Final plant population (plants/ha)	Ears per plant	Hundred-seed weight (g)	Margin above fungicide cost (difference from control)	
B1 (Tenazole 250 EW)	8.45	a	33 059	1.92	27.78	R22 860.31	-R751.30
B2 (Control)	8.56	a	31 868	1.83	28.69	R23 529.11	-
Average	**8.50**	**LSD $_{(0.05)}$ = 0.72 CV = 2.42**	**32 463**	**1.88**	**28.24**		

Treatment (fungicide product)	Ears on 10 m				Number of kernels					
					Main ear		Second ear		Tassel ear	
	Main ear	Second ear	Tassel ear	Total	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear
B1 (Tenazole 250 EW)	**30.0**	**24.9**	**2.9**	**57.8**	**38.0**	**16.0**	**33.2**	**14.4**	**-**	**-**
B2 (Control)	**28.6**	**22.5**	**1.9**	**53.0**	**40.4**	**14.4**	**33.6**	**14.4**	**-**	**-**
Average	**29.3**	**23.7**	**2.4**	**55.4**	**39.2**	**15.2**	**33.4**	**14.4**	**-**	**-**

*Statistically treatments with the same letter do not vary significantly from each other according to Fisher's least significant difference (LSD, alpha 0.05) method at alpha = 0.05.

DISCUSSION

- Due to the specific cultivar's tolerance for disease, together with the less than average rainfall, the spraying of the fungicide had a negative effect on economy.

MAIZE PLANT POPULATION TRIAL 1

OBJECTIVE OF TRIAL

To evaluate the effect of different plant populations on the yield of maize.

Trial information

Production year	2020/21
Year of trial	Year 2
Locality	Villiers
Previous crop	Maize
Tillage	Rip and seedbed
Cultivar	PAN 4R-728 BR
Fertiliser	Green Liquid MAP Technical 68N, 23P, 0K
Plant population	N.A.
Planting date	23 November 2020
Weed control	Wilgechem program
Harvesting date	24 May 2021

Rainfall and temperature summary

	23 Nov	Dec	Jan	Feb	March	1 Apr	Tot
Rainfall (mm)	8.4	88.2	75.8	82.4	61.6	0.8	317.2
Avg. max. temp. (°C)	31.0	30.2	30.0	30.4	31.6	31.52	
Avg. min. temp. (°C)	13.3	14.4	15.5	13.6	10.5	7.93	
Heat units	90	359	366	315	315	10	
Cum. heat units	90	450	815	1130	1445	1455	

Rainfall data: From planting to physiological maturity (130 days)

TRIAL DESIGN

The trial consists of four plant population treatments of which each treatment was replicated three times. The trial was planted in a completely randomized block design with a 12-row 0.76 m planter. Each plot was 9.12 m wide and on average 380 m long.

TRIAL PLAN

Plot	1	2	3	4	5	6	7	8	9	10	11	12
Treatments	B1 25 000 H1	B3 45 000 H1	B2 35 000 H1	B4 55 000 H1	B2 35 000 H2	B1 25 000 H2	B4 55 000 H2	B3 45 000 H2	B4 55 000 H3	B1 25 000 H3	B2 35 000 H3	B3 45 000 H3

TREATMENTS

Treatments	Plant population (plants/ha)
B1	25 000
B2 (Control)	35 000
B3	45 000
B4	55 000

RESULTS

Treatment (plants/ha)	Yield (t/ha)	Significance*	Final plant population (plants/ha)	Ears per plant	Hundred-seed weight (g)	Margin above seed cost (difference from control)	
25 000	5.77	c	25 000	1.39	33.88	R14 443.63	-R1 723.13
35 000 (Control)	6.61	b	33 004	1.07	34.58	R16 166.76	-
45 000	7.22	a	37 006	1.04	32.53	R17 255.48	R1 088.72
55 000	7.71	a	48 355	1.00	31.28	R18 051.68	R1 884.92
Average	**6.83**	**LSD $_{(0.05)}$ = 0.70 CV = 12.19**	**35 841**	**1.12**	**33.07**		

Treatment (plants/ha)	Ears on 10 m				Number of kernels					
					Main ear		Second ear		Tassel ear	
	Main ear	Second ear	Tassel ear	Total	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear
25 000	19.00	7.33	-	26.33	35.72	17.22	29.17	17.11	-	-
35 000 (Control)	25.00	1.75	-	26.75	35.96	17.73	29.76	17.56	-	-
45 000	28.13	1.13	-	29.25	37.08	17.67	28.00	15.00	-	-
55 000	36.17	0.50	-	36.67	35.00	17.33	-	-	-	-
Average	27.07	2.68	-	29.75	35.94	17.49	28.97	16.56	-	-

*Statistically treatments with the same letter do not vary significantly from each other according to Fisher's least significant difference (LSD, alpha 0.05) method at alpha = 0.05.

DISCUSSION

- 55 000 plants/ha delivered the highest yield as well as the highest economical advantage. Both the high plant populations had a statistically significant higher yield than both the low plant populations.

MAIZE PLANT POPULATION TRIAL 2

OBJECTIVE OF TRIAL

To evaluate the effect of different plant populations on the yield of maize.

Trial information	
Production year	2020/21
Year of trial	Year 1
Locality	Kestell
Previous crop	Dry beans
Tillage	Rip and seedbed
Cultivar	DKC 68-56 R
Fertiliser	80N, 25P, 25K
Plant population	NVT
Planting date	20 November 2020
Weed control	Nulandis program
Harvesting date	8 June 2021

TRIAL DESIGN

The trial consists of two plant population treatments of which each treatment was replicated three times. The trial was planted in a completely randomised block design. Each plot was 5.46 m wide and on average 400 m long.

TRIAL PLAN

Plot	1	2	3	4	5	6
Treatments	B1 30 000 H1	B2 34 000 H1	B1 30 000 H2	B2 34 000 H2	B1 30 000 H3	B2 34 000 H3

TREATMENTS

Treatments	Plant population (plants/ha)
B1	**30 000**
B2 (Control)	**34 000**

RESULTS

Treatment (Plants/ha)	Yield (t/ha)	Significance*	Final plant population	Ears per plant	Hundred-seed weight (g)	Margin above seed cost (difference from control)	
30 000	7.21	a	30 128	1.78	32.51	R19 581.55	R735.28
34 000 (Control)	6.85	a	34 249	1.75	30.40	R18 846.27	-
Average	**6.99**	**$LSD_{(0.05)}$ = 0.44 CV = 1.80**	**32 188**	**1.76**	**31.46**		

*Statistically treatments with the same letter do not vary significantly from each other according to Fisher's least significant difference (LSD, alpha 0.05) method at alpha = 0.05.

Treatment	Ears on 10 m				Number of kernels					
					Main ear		Second ear		Tassel ear	
	Main ear	Second ear	Tassel ear	Total	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear
30 000	27.58	21.25	-	48.83	37.8	14.8	30.1	15.7	-	-
34 000 (Control)	31.25	23.25	-	54.50	37.7	15.2	33.2	15.5	-	-
Average	29.42	22.25	-	51.67	37.75	15.0	31.7	15.7	-	-

DISCUSSION

- 30 000 plants/ha delivered the highest yield. Although there was no statistically significant difference between the two plant populations, there still was an economical advantage.

MAIZE PLANT POPULATION TRIAL 3

OBJECTIVE OF TRIAL

To evaluate the effect of different plant populations on the yield of maize in a controlled traffic system.

Trial information

Production year	2020/21
Year of trial	Year 1
Locality	Heidelberg
Previous crop	Maize
Tillage	Controlled traffic system
Cultivar	DKC 72-76 R
Fertiliser	105N, 22P, 13K
Plant population	NVT
Planting date	20 November 2020
Weed control	Arysta program
Harvesting date	27 May 2021

Rainfall and temperature summary

	20 Nov	Des	Jan	Feb	29 March	Tot
Rainfall (mm)	20.8	75.2	129.2	34.2	41.0	300.4
Avg. max. temp. (°C)	30.1	31.2	31.7	31.4	32.4	
Avg. min. temp. (°C)	14.7	15.4	16.2	14.4	10.6	
Heat units	127	381	391	326	291	
Cum. heat units	127	508	898	1225	1516	

Rainfall data: From planting to physiological maturity (130 days)

TRIAL DESIGN

Die proef bestaan uit vier plantpopulasiebehandelings waarvan elke behandeling vier maal herhaal is. Die proef is geplant in voorafgemete stroke in 'n volledige ewekansige blokontwerp. Elke perseel was 7,28 m breed en gemiddeld 1 080 m lank.

TRIAL PLAN

Plot	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Treatments	B1 31 000	B2 32 500	B3 34 000	B4 36 500	B1 31 000	B4 36 500	B3 34 000	B2 32 500	B4 36 500	B3 34 000	B1 31 000	B2 32 500	B4 36 500	B3 34 000	B1 31 000	B2 32 500
	H1	H1	H1	H1	H2	H2	H2	H2	H3	H3	H3	H3	H4	H4	H4	H4

TREATMENTS

Treatments	Plant population (plants/ha)
B1	31 000
B2	32 500
B3 (Control)	34 000
B4	36 500

RESULTS

Treatment (plants/ha)	Yield (t/ha)	Significance*	Final plant population (plants/ha)	Ears per plant	Hundred-seed weight (g)	Margin above seed cost (difference from control)	
31 000	6.98	b	31 112	1.60	31.08	R17 386.33	-R425.54
32 500	7.25	ab	32 738	1.60	30.48	R18 021.26	R209.39
34 000 (Control)	7.20	ab	34 100	1.56	30.93	R17 811.87	-
36 500	7.34	a	36 607	1.50	30.90	R18 047.05	R235.18
Average	**7.19**	**$LSD_{(0.05)}$ = 0.289 CV = 2.51**	**33 639**	**1.57**	**30.84**		

Treatment (plants/ha)	Ears on 10 m				Number of kernels					
					Main ear		Second ear		Tassel ear	
	Main ear	Second ear	Tassel ear	Total	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear
31 000	28.71	15.31	1.32	45.34	40.31	13.78	33.79	14.58	-	-
32 500	30.00	16.72	0.83	47.56	39.58	13.81	33.23	14.63	-	-
34 000 (Control)	31.38	16.92	0.17	48.46	40.29	13.88	32.06	14.48	-	-
36 500	33.88	15.58	0.58	50.04	39.73	13.85	32.84	14.28	-	-
Average	30.99	16.13	0.73	47.85	39.98	13.83	32.98	14.49	-	-

*Statistically treatments with the same letter do not vary significantly from each other according to Fisher's least significant difference (LSD, alpha 0.05) method at alpha = 0.05.

DISCUSSION

- The specific cultivar kept its multi-headedness at all the relevant plant populations.
- The 36 500 plant population delivered the highest yield as well as the best economical advantage.

TILLAGE PRACTICE TRIAL

OBJECTIVE OF TRIAL

To evaluate the effect of different ripper tillage together with two vibroflex tillage on the yield of maize.

Trial information

Production year	2020/21
Year of trial	Year 1
Locality	Reitz
Previous crop	Soya beans
Tillage	Rip (12-05-2020) and seedbed
Cultivar	PHB 2137
Fertiliser	118N, 29P, 17K
Plant population	32 000
Planting date	27 October 2020
Weed control	Nulandis program
Harvesting date	22 April 2021

Rainfall and temperature summary

	27 Oct	Nov	Dec	Jan	Feb	5 March	Tot
Rainfall (mm)	6.2	133.2	135.2	190.4	106.8	0.0	571.8
Avg. max. temp. (°C)	13.3	27.2	30.0	27.8	29.8	30.43	
Avg. min. temp. (°C)	30.32	12.7	14.3	14.9	13.8	13.26	
Heat units	55	297	358	338	305	51	
Cum. heat units	55	353	711	1049	1355	1406	

Rainfall data: From planting to physiological maturity (130 days)

TRIAL DESIGN

The trial consists of eight ripper treatments of which each treatment was replicated four times. Each strip was tilled with each implement (ripper) on a depth of 350 mm. The tillage depth was previously determined by a penetrometer reading as well as a profile hole. The trial was tillaged in strips in a completely randomised block design. Maize was planted thereafter with an 8-row 0.76 m planter. Each plot was an average of 7 to 9 m wide, depending on the work width of each ripper implement. The planted plots were on average 240 m long. Each plot was pre-tillaged according to the trial plan, followed by near-surfaced seedbed tillage just before planting.

TRIAL PLAN

Plot	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Treatments	B1 Agrico 350 H1	B5 Super 19 H1	B2 Agrico 400 H1	B8 Boki Inline Ripper H1	B6 Kverneland CLG H1	B3 Tatu AST Matic H1	B4 Kverneland CLC H1	B7 Strip till H1	B2 Agrico 400 H2	B4 Kverneland CLC H1	B1 Agrico 350 H2	B7 Strip till H2	B6 Kverneland CLG H2	B8 Boki Inline Ripper H2	B3 Tatu AST Matic H2	B5 Super 19 H2	B1 Agrico 350 H3	B3 Tatu AST Matic H3	B5 Super 19 H3	B8 Boki Inline Ripper H3	B7 Strip till H3	B6 Kverneland CLG H3	B2 Agrico 400 H3	B4 Kverneland CLC H3

TREATMENTS

Treatments	Implement	Work width (mm)
B1	Agrico 350	350
B2	Agrico 400	400
B3	Tatu AST Matic	400
B4	Kverneland CLC	280
B5 (Control)	Super 19	400
B6	Kverneland CLG	400
B7	Strip till	760
B8	Boki Inline ripper	750

RESULTS

Treatment (Implement)	Yield (t/ha)	Significance*	Final plant population	Ears per plant	Hundred-seed weight (g)
B1 Agrico 350	2.82	bc	32 346	1.00	24.35
B2 Agrico 400	3.48	ab	32 237	1.21	26.15
B3 Tatu AST Matic	3.65	a	32 346	1.33	25.60
B4 Kverneland CLC	3.66	a	32 273	1.09	25.76
B5 Super 19 (Control)	3.47	ab	32 675	1.04	25.75
B6 Kverneland CLG	3.72	a	32 566	1.01	25.67
B7 Strip till	2.18	c	30 044	1.15	25.66
B8 Boki Inline ripper	3.09	ab	31 360	1.05	25.74
Average	**3.26**	**$LSD_{(0.05)}$ = 0.70 CV = 12.19**	**31 981**	**1.11**	**25.59**

Treatment (Implement)	Ears on 10 m				Number of kernels					
					Main ear		Second ear		Tassel ear	
	Main ear	Second ear	Tassel ear	Total	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear
B1 Agrico 350	22.00	2.58	-	24.58	35.36	14.20	21.17	15.22	-	-
B2 Agrico 400	24.50	5.08	-	29.58	34.87	14.42	21.11	14.22	-	-
B3 Tatu AST Matic	24.08	8.50	-	32.58	36.67	14.65	27.00	15.00	-	-
B4 Kverneland CLC	22.93	3.69	-	26.63	34.71	14.44	26.00	15.33	-	-
B5 Super 19	24.25	1.50	-	25.75	34.53	14.52	21.40	13.60	-	-
B6 Kverneland CLG	23.33	1.75	-	25.08	36.79	14.14	25.00	16.83	-	-
B7 Strip till	22.42	3.75	-	26.17	36.51	14.58	22.31	14.33	-	-
B8 Boki Inline ripper	22.50	2.50	-	25.00	33.54	14.37	23.00	14.00	-	-
Average	23.25	3.67	-	26.92	35.37	14.42	23.37	14.82	-	-

*Statistically treatments with the same letter do not vary significantly from each other according to Fisher's least significant difference (LSD, alpha 0.05) method at alpha = 0.05.

DISCUSSION

- The Kverneland CLG ripper delivered the highest yield. Statistically there were significant differences between the treatments, but because this is only the first year of the trial, no recommendations or conclusions could be made.

MAIZE CULTIVAR PLANT POPULATION TRIAL

OBJECTIVE OF TRIAL

To evaluate the effect of different single-headed and multi-headed cultivars planted at different populations on the yield of maize.

Trial information

Production year	2020/21
Year of trial	Year 1
Locality	Reitz
Previous crop	Soya beans
Tillage	Rip and seedbed
Cultivar	N.A.
Fertiliser	118N, 29P, 17K
Plant population	NVT
Planting date	26 October 2020
Weed control	Nulandis program
Harvesting date	22-23 April 2021

Rainfall and temperature summary

	26 Oct	Nov	Dec	Jan	Feb	4 March	Tot
Rainfall (mm)	19.2	133.2	135.2	190.4	106.8	0.0	565.6
Avg. max. temp. (°C)	30.4	27.2	30.0	27.8	29.8	32.4	
Avg. min. temp. (°C)	13.3	12.7	14.3	14.9	13.8	9.7	
Heat units	67	297	358	338	305	40	
Cum. heat units	67	364	722	1061	1366	1406	

Rainfall data: From planting to physiological maturity (130 days)

TRIAL DESIGN

The trial consists of ten cultivars planted at three plant populations of which each treatment combination was replicated three times. The trial was planted in a completely randomised block design in a split plot trial design with an 8-row 0.76 m planter. The trial was planted with three planters, each set on the individual plant populations. In each case two cultivars were put into one planter, four-four rows, and were planted simultaneously, which means each cultivar was planted with each of the three previously set planters. Each plot was 3.04 m wide (4 x 0.76 m rows) and on average between 100 and 140 m long.

TRIAL PLAN

Plot	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Planter no.	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15	
Plant population (Plants/ha)	28 500	28 500	32 500	32 500	36 500	36 500	32 500	32 500	36 500	36 500	28 500	28 500	36 500	36 500	28 500	28 500	32 500	32 500	28 500	28 500	32 500	32 500	36 500	36 500	32 500	32 500	28 500	28 500	36 500	36 500
Treatments	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C9	C10	C7	C8	C3	C4	C1	C5	C6	C8	C2	C9	C3	C2	C6	C10	C7	C5	C1	C4
Cultivars	DKC 73-74 BR GEN	DKC 74-74 BR	LG31.648	KKS 8408R	US 9614	US 9610	P1197	P2137	DKC 72-76 BR	P1197	DKC 72-76 BR	P1197	P1197	P2137	LG31.648	KKS 8408R	C 73-74 BR GEN	US 9614	US 9610	P2137	DKC 74-74 BR	DKC 72-76 BR	LG31.648	DKC 74-74 BR	US 9610	P1197	P1197	US 9614	C 73-74 BR GEN	KKS 8408R

TREATMENTS

Treatment (Cultivars)	Single-headed/Multi-headed	Plant populations (Plants/ha)
DKC 73-74 BR GEN	Single-headed	28 500
DKC 74-74 BR	Multi-headed	
LG31.648	Multi-headed	32 500
KKS 8408R	Single-headed	
US 9614	Multi-headed	36 500
US 9610	Multi-headed	
P1197	Single-headed	
P2137 (Control)	Multi-headed	
DKC 72-76 BR	Multi-headed	
P1513	Single-headed	

RESULTS: 28 500 PLANT/HA

Treatment	Yield (t/ha)	Final plant population	Ears per plant	Hundred-seed weight (g)	Margin above seed cost (difference from control)	
DKC 73-74 BR GEN	5.98	27 851	1.04	37.46	R14 613.84	R1 352.54
DKC 74-74 BR	5.94	26 645	1.58	30.44	R14 448.79	R1 187.49
LG31.648	5.50	25 219	1.52	29.57	R13 423.17	R161.88
KKS 8408R	5.26	25 439	1.19	34.49	R13 123.47	-R137.83
US 9614	6.02	25 768	1.61	33.86	R15 848.71	R2 587.41
US 9610	6.04	26 096	1.83	28.38	R15 901.23	R2 639.93
P1197	5.86	24 452	1.69	31.37	R14 671.85	R1 410.55
P2137 (Control)	5.38	25 493	1.58	29.51	R13 261.30	-
DKC 72-76 BR	6.45	27 961	1.68	29.31	R15 840.73	R2 579.43
P1513	5.14	25 329	1.35	34.54	R12 583.26	-R678.04
Average	5.76	26 025	1.51	31.89		

Treatment	Ears on 10 m				Number of kernels					
					Main ear		Second ear		Tassel ear	
	Main ear	Second ear	Tassel ear	Total	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear
DKC 73-74 BR GEN	21.2	0.8	0.0	21.9	38.8	15.9	29.8	15.0	-	-
DKC 74-74 BR	19.8	11.2	1.0	32.0	33.2	15.2	30.5	14.8	22.4	13.3
LG31.648	18.6	9.0	1.5	29.1	36.7	17.1	30.4	17.4	15.0	16.0
KKS 8408R	19.3	3.5	0.3	23.1	40.7	14.1	33.9	14.1	25.0	12.0
US 9614	19.0	11.0	1.4	31.4	36.7	15.2	29.3	15.5	22.8	14.7
US 9610	19.7	12.8	3.8	36.3	35.2	14.8	30.0	15.3	25.9	14.1
P1197	18.3	10.9	2.1	31.3	32.2	16.2	24.0	18.1	22.5	15.5
P2137 (Control)	19.2	8.7	2.7	30.5	38.8	15.2	33.0	15.3	27.9	15.9
DKC 72-76 BR	20.9	13.3	1.6	35.8	39.0	14.2	33.9	14.4	27.0	13.7
P1513	18.8	5.8	1.5	26.1	34.6	17.9	26.2	18.9	28.9	17.9
Average	19.5	8.7	1.6	29.8	36.6	15.6	30.1	15.9	24.2	14.8

RESULTS: 32 500 PLANT/HA

Treatment	Yield (t/ha)	Final plant population	Ears per plant	Hundred-seed weight (g)	Margin above seed cost (difference from control)	
DKC 73-74 BR GEN	6.38	32 675	0.95	35.76	R15 456.30	R1 748.43
DKC 74-74 BR	6.32	31 579	1.46	34.97	R15 231.71	R1 523.83
LG31.648	4.75	29 605	1.26	26.94	R11 143.65	-R2 564.23
KKS 8408R	5.01	28 289	1.09	34.70	R12 232.46	-R1 475.42
US 9614	6.48	28 289	1.58	32.25	R17 024.94	R3 317.06
US 9610	5.31	31 140	1.42	28.95	R13 798.98	R91.10
P1197	5.40	30 921	1.44	29.26	R13 201.94	-R505.93
P2137 (Control)	5.62	29 825	1.68	27.82	R13 707.88	-
DKC 72-76 BR	5.30	32 566	1.24	28.16	R12 437.48	-R1 270.40
P1513	5.65	29 715	1.17	33.58	R13 749.35	R41.47
Average	5.62	30 460	1.33	31.24		

Treatment	Ears on 10 m				Number of kernels					
					Main ear		Second ear		Tassel ear	
	Main ear	Second ear	Tassel ear	Total	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear
DKC 73-74 BR GEN	23.7	0.0	0.0	23.7	40.3	15.3	-	-	-	-
DKC 74-74 BR	23.7	10.1	1.2	35.0	35.7	14.6	31.0	14.4	30.3	14.3
LG31.648	21.6	5.5	1.3	28.4	37.5	16.7	28.9	17.0	20.0	16.0
KKS 8408R	20.8	2.1	0.5	23.4	39.9	14.0	23.3	9.1	28.0	12.0
US 9614	21.5	11.3	1.2	33.9	36.2	15.4	27.7	15.4	26.7	15.0
US 9610	23.3	9.0	1.3	33.5	33.7	15.0	28.8	15.9	26.0	15.5
P1197	23.2	10.2	0.5	33.8	34.9	16.3	23.9	16.7	27.7	15.3
P2137 (Control)	22.1	12.6	3.3	38.0	39.5	15.0	33.3	14.4	28.3	15.1
DKC 72-76 BR	23.9	5.5	1.3	30.8	36.5	14.8	32.1	14.7	29.5	14.0
P1513	21.4	3.4	1.6	26.4	35.4	17.7	24.8	17.8	30.0	18.0
Average	22.5	7.0	1.2	30.7	37.0	15.5	28.2	15.0	27.4	15.0

RESULTS: 36 500 PLANT/HA

Treatment	Yield (t/ha)	Final plant population	Ears per plant	Hundred-seed weight (g)	Margin above seed cost (difference from control)	
DKC 73-74 BR GEN	6.35	36 184	0.97	31.85	R15 113.95	-R1 340.53
DKC 74-74 BR	7.05	34 868	1.30	32.51	R16 972.98	R518.50
LG31.648	5.86	32 127	1.47	29.01	R13 956.67	-R2 497.82
KKS 8408R	5.93	33 882	1.04	33.09	R14 567.53	-R1 886.95
US 9614	6.13	33 224	1.27	31.59	R15 954.42	-R500.07
US 9610	5.85	33 662	1.41	27.67	R15 190.29	-R1 264.20
P1197	6.54	34 430	1.59	29.53	R 16 131.01	-R 323.48
P2137 (Control)	6.70	32 018	1.61	27.29	R16 454.49	-
DKC 72-76 BR	5.66	36 732	1.20	27.75	R13 147.80	-R3 306.68
P1513	5.99	32 675	1.07	31.57	R14 477.54	-R1 976.94
Average	6.21	33 980	1.29	30.19		

Treatment	Ears on 10 m				Number of kernels					
					Main ear		Second ear		Tassel ear	
	Main ear	Second ear	Tassel ear	Total	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear	Kernels in a row	Kernels around the ear
DKC 73-74 BR GEN	26.6	0.0	0.0	26.6	34.7	16.1	-	-	-	-
DKC 74-74 BR	25.4	8.3	0.7	34.4	34.9	14.0	29.3	14.8	25.0	14.0
LG31.648	24.0	11.3	0.7	35.9	36.4	16.5	29.7	16.9	30.5	18.0
KKS 8408R	25.0	0.8	1.0	26.8	39.9	14.3	28.7	15.5	30.5	14.0
US 9614	24.6	6.6	1.0	32.2	36.5	14.8	28.4	15.2	19.0	16.8
US 9610	25.3	10.3	0.6	36.2	37.1	15.4	28.5	15.6	25.5	14.0
P1197	25.3	13.9	2.3	41.5	34.5	16.5	24.1	16.7	21.5	17.5
P2137 (Control)	24.3	10.6	4.3	39.2	40.6	14.8	30.3	15.2	27.0	14.1
DKC 72-76 BR	27.3	4.9	1.3	33.5	36.4	14.1	32.1	14.6	33.0	13.0
P1513	23.8	1.3	1.5	26.6	35.8	17.9	24.3	17.1	30.5	17.0
Average	25.2	6.8	1.3	33.3	36.7	15.4	28.4	15.7	26.9	15.4

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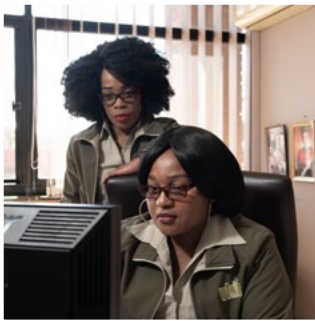


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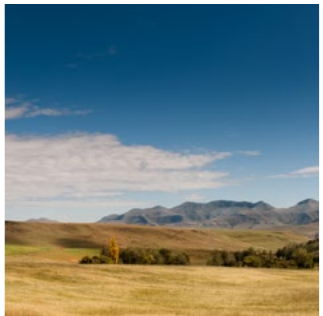


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