## BELANGRIK

Resultate van 'n kultivarproef by 'n enkele lokaliteit in enige jaar, of selfs 'n beperkte aantal lokaliteite in 'n enkele jaar, kan as gevolg van die kenmerkende seisoenale variasie in die RSA hoogs misleidend wees en kan sodoende onregverdiglik teen die beste genotypes vir daardie omgewing diskrimineer. **'N ERNSTIGE BEROEP WORD OP ALLE BETROKKENES GEDOEN OM NIE HUL GENOTIPEADVIES OP SO 'N HOOGS ONBETROUBARE METODE TE BASEER NIE.** Produsente word veral versoek om nougeset daarteen te waak dat hulle nie ook foutiewe genotipe uitsprake op dieselfde wyse doen nie, of op hierdie wyse mislei word nie.

Resultate van hierdie nasionale kultivarproewe, wat deur die LNR- Instituut vir Graangewasse uitgevoer is en gepubliseer word, geskied in belang van produsente, adviesdienste en die teeltbedryf. Die resultate mag derhalwe vryelik gebruik word, mits dit wetenskaplik korrek gedoen word deur die totale spektrum van lokaliteite en waarnemings in berekening te bring. Vrye gebruik van die resultate word ook met 'n verdere voorwaarde toegelaat, naamlik dat die nodige erkenning aan die bron van die inligting verleen word.

LNR-Instituut vir Graangewasse

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POTCHEFSTROOM

2520

## DANKBETUIGINGS

Die sukses van hierdie navorsingsprojek is toe te skryf aan die goeie samewerking en medewerking tussen die private en openbare sektore asook boere by wie genotipeproewe geplant is. Die verantwoordelike navorsers betuig hiermee hul grootste waardering vir die besondere samewerking en ondersteuning wat hulle van al die betrokkenes ontvang het.

**<u>Medewerkende Instansies</u>**

Medewerkers vir die 2011/2012 proefreeks word in Tabel 2 aangedui. **Hul getroue ondersteuning en uitstekende samewerking verdien vermelding en word erken.**

**<u>Saadfirmas</u>**

Agricol Saad (Edms) Bpk

Capstone Seeds South Africa (Pty) Ltd

Link Saad (Edms) Bpk

K2

Monsanto SA (Edms) Bpk

Pannar Saad (Edms) Bpk

Pioneer Hi-Bred RSA (Edms) Bpk

**<u>LNR - Navorsingsinstituut vir Graangewasse</u>**

Hierdie verslag se samestelling, voorbereiding en vermeerdering het bydraes deur verskeie kollegas en beamptes geverg. Spesiale vermelding moet egter gemaak word aan Mnr. D De V Bruwer vir sy beplanning en bestuur van die proewe. Me T. Mathobisa-Manyokole vir data voorbereiding.

**Die LNR-IGG wil hiermee ook sy dank uitspreek teenoor die Mielietrust vir hul finansiële ondersteuning wat die uitvoering van die proewe moontlik gemaak het.**

## IMPORTANT

Due to typical seasonal variations in the RSA, results of a Cultivar trial at a single locality in any year, or even at a limited amount of localities in a single year can be highly misleading and can discriminate unfairly against genotypes which may in reality be the best for certain areas. **ALL THOSE INVOLVED, ARE STRONGLY URGED NOT TO BASE THEIR GENOTYPE RECOMMENDATIONS ON A HIGHLY UNRELIABLE METHOD SUCH AS THIS.** Producers, especially, are requested to guard against letting themselves be misled in this way and against making incorrect genotype judgements.

The Institute in the interest of producers, advisory services and the breeding industry publishes results of these national Cultivar trials, carried out by the ARC - Grain Crops Institute. These results may thus be freely used, as long as they are used in a scientifically correct manner, incorporating the whole spectrum of localities and observations. The source of the information should also be awarded the necessary recognition when using these results.


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## ACKNOWLEDGEMENTS

The success of this research project is a result of the good co-operation between the private, co-operative, and public sectors as well as farmers on whose farms cultivar trials were planted.  The researchers wish to express their utmost appreciation for the exceptional co-operation and support received from all those involved.

### Co-workers

The 2011/2012 trial series co-workers are listed in Table 2. **Their loyal support and excellent co-operation deserves mentioning and is acknowledged.**

### Seed Companies

Agricol Seed (Pty) Ltd

Capstone Seeds South Africa (Pty) Ltd

Link Seed (Pty) Ltd

K2

Monsanto SA (Pty) Ltd

National Seeds (Pty) Ltd

Pannar Seed (Pty) Ltd

Pioneer Hi-Bred RSA (Pty) Ltd

### ARC - Grain Crops Institute

The compilation of this report was made possible by the efforts of many colleagues and officials. A special thanks goes to Mr D De V Bruwer for his planning and management of the trials. Ms. T. Mathobisa-Manyokole for data preparation

**The ARC-GCI would like to thank the Maize Trust for their financial support that made these trials possible.**

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# INLEIDING

Eenjarige resultate van 2011/2012 seisoen en meerjarige resultate vir, 2009/2010, 2010/2011en 2011/2012 van die Nasionale Kultivarproewe met kommersieel beskikbare mieliegenotipes is in hierdie verslag saamgevat. Kommersiële kultivars word jaarliks vir hul aanpassingsvermoë in 'n wye reeks potensiaaltoestande in hierdie proewe geëvalueer. Inskrywings vir hierdie proefreeks bestaan uit gewilde genotipes sowel as ander nuwer kommersiële genotipes wat volgens verwagting ook gewild by produsente sal word.

Hierdie resultate is `n aanduidend van genotipeprestasie onder spesifieke omgewingstoestande wat gedurende die groeiseisoen voorgekom het. Meerjarige resultate wat vanuit hierdie proewe saamgevat word, is meer betroubaar as eenjarige resultate en is by uitstek vir die doel van genotipe aanbevelings geskik.

# NAVORSINGSPROSEDURE

Standaard en wetenskaplik aanvaarde prosedures is vir die uitvoering van die navorsingsprogram voorgeskryf. Medewerkers is 'n vrye keuse gelaat om die beste verbouingspraktyke in hul omgewing vir die proewe te gebruik ten einde graanopbrengs sover moontlik te kan optimaliseer en om verskillende potensiaaltoestande te skep.

## Proefontwerp

‘n Gerandomiseerde blokontwerp met drie herhalings is deurgaans gebruik om die 50 genotipeinskrywing te akkommodeer. Elke proeflokaliteit is 'n eie proefrandomisasie toegeken wat ook van jaar tot jaar verskil.

## Genotipe inskrywings

Dieselfde 50 genotipes het in elkeen van die proewe voorgekom en het bestaan uit inskrywings deur die betrokke saadfirmas gedoen. Inskrywings deur firmas geskied in orde van prioriteit en indien te veel inskrywings ontvang is, is die inskrywingslys deur onderhandeling met elkeen van die saadfirmas gefinaliseer.

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**Perseelgrootte en spasiëring**

'n Standaard van 40 plante per netto perseel is deurgaans voorgeskryf terwyl 'n vrye keuse ten opsigte van plantpopulasies (plante/ha), rywydtes en spasiëring binne die plantry toegelaat is. 'n Plantestand van 22 plante in elk van twee plantrye per bruto perseel is vir rywydtes minder as 1.5 m en 'n plantestand van 42 plante in 'n enkele plantry per bruto perseel vir rywydtes van 1.5 m en wyer aanbeveel. Geen kantrye is tussen persele benodig nie en slegs kantrye rondom die proef is voorgeskryf. Een grensplant op elke punt van elke plantry moes verwyder word voor oestyd.

**Grond en bemesting**

Grondsoorte wat algemeen vir mielieproduksie in die betrokke omgewings geskik is, is waar moontlik uitgesoek. Verskille in produksiepotensiaal is ook benut deur spesifieke grondtoestande vir spesifieke proefdoeleindes uit te kies. Bemesting geskied hoofsaaklik volgens grondvrugbaarheid asook die potensiaal vir mielies in die betrokke omgewings en is derhalwe nie voorgeskryf nie.

**Planttyd**

Die aangewese planttyd vir suksesvolle mielieproduksie in die betrokke omgewings is as planttyd aanbeveel.

**Plant- en oesmetodes**

Proewe is meganies of met die hand geplant (twee of meer pitte per plantgat) en uitgedun sodra die saailinge sterk genoeg was. Proewe is met die hand of meganies geoes. Al drie herhalings van die proewe moes deurgaans geoes word en die totale.

**Plaagbeheer**

Doeltreffende plaagbeheer (onkruide en insekte) is noodsaaklik en die gebruik van onkruiddoders en insekmiddels is vryelik toegelaat. Die gebruik van grondsistemiese-insekdoders is ook toegelaat. Die gebruik van plaagmiddels moet gerapporteer word.

**Siektes**

Medewerkers word elke jaar versoek om die voorkoms van enige siektes onmiddellik te rapporteer sodat die nodige opvolging en data-insameling kon geskied. Natuurlike

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besmetting moes egter straf genoeg wees om genotipereaksie te kon rapporteer. ‘n Besmetting van meer as 10.0% word as riglyn gebruik.

**Waarnemings**

Die volgende inligting en waarnemings word jaarliks aangevra:

1. Hoeveelheid bemesting, tyd en metode van toediening.
2. Hoeveelheid plaagdoder, tyd en metode van toediening.
3. Plant-, opkoms- en oesdatum.
4. Spasiëring, bruto en netto perseeloppervlaktes.
5. Maandelikse reënval (en besproeiing waar van toepassing).
6. Aantal dae vanaf plantdatum tot 50 % stuifmeelstorting (slegs navorsingstasies en proefplase).
7. Aantal dae vanaf plantdatum tot 50 % baardverskyning (slegs navorsingstasies en proefplase).
8. Aantal plante wat teen oestyd omgeval het (meer as 45 grade omlê).
9. Aantal plante per netto perseel.
10. Aantal spruite per netto perseel.
11. Aantal koppe per netto perseel.
12. Ongedorste kopmassa of graanmassa van alle persele oor al drie herhalings.
13. Gedorste graanmassa van Herhaling 1, indien kopmassa bepaal is.
14. Graanvogpersentasie.
17. Addisionele waarnemings oor opmerklike en sinvolle genotipeverskille waar en wanneer dit voorkom.

**Statistiese verwerking**

Graanopbrengs was die enigste parameter wat statisties ontleed is. In die algemeen is ‘n AMMI analise gebruik om die aanpasbaarheid en stabiliteit van genotipes aan te dui vir verskillende omgewings. Die gekombineerde variansieanalise volgens die “Additive Mean Effective And Multiplicative Interaction (AMMI)” model is uitgevoer met die GENSTAT program (Tabel 1). Die “Principle Component Interaction Analysis (IPCA)” van genotipes in

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die AMMI analise gee ‘n aanduiding van die genotipe se stabiliteit oor verskillende omgewings. Hoe groter die IPCA-waarde, beide negatief of positief, hoe meer is ‘n genotipe aangepas vir ‘n spesifieke omgewing. Hoe nader die IPCA-waardes aan nul kom hoe meer stabiel is die genotipes vir al die omgewings waarin dit getoets is. AMMI Stabiliteits-Waardes (ASW) is die afstand vanaf nul in ‘n tweedimensionele verspreidingsgrafiek van IPCA 1-waardes teenoor IPCA 2-waardes. Soos die ASW-waarde nader kom aan nul kan ‘n spesifieke genotipe as meer stabiel geklassifiseer word vir omgewings. Addisionele beskrywings en informasie oor AMMI is beskikbaar in Aanhangsel A.

Statistiese prosedures wat normaalweg gebruik word om uitskieterproewe te identifiseer, is vir doeleindes van hierdie verslag wel toegepas. Sekere statistiese parameters is egter ook vir diagnostiese doeleindes gebruik aan die hand waarvan besluit is watter proewe liefs weggelaat moes word.

**Diagnostiese parameters:**

KV- Die Koëffisient van Variasie verwys na die fout van enkel persele en gee 'n aanduiding van die grootte van die variasie tussen perseelwaardes wat vanaf verskeie bronne afkomstig is. Die KV gee dus 'n aanduiding van die akkuraatheid van die perseelwaardes (grootte van die waarde). Bronne van variasie is byvoorbeeld grondvariasie (vrugbaarheid, diepte, grondvog, kleipersentasie, ongelykheid, ens) en plantvariasie (bevolkingsgrootte, oneweredige groei ens). Stremmingstoestande (vog, temperatuur, siektes, ens) het so dikwels tot gevolg dat normaalweg aanvaarbare grond- en plantvariasie baie sterker in die proefdata tot uiting kan kom en die KV vergroot. 'n Relatief hoë KV, wat aan hand van bekende bronne van variasie verklaar kan word, kan nie as die enigste parameter gebruik word om onbetroubare proefdata te identifiseer nie.

GKV- Die Genetiese Koëffisient van Variasie verwys na die verskille in genotype-opbrengs. Die GKV is dus 'n aanduiding van die variasiegrootte wat aan verskille in genetiese samestelling tussen genotypeinskrywings toegeskryf kan word. Hoë waardes kan die gevolg wees van siektevatbaarheid, groot verskille in rypwordingstadium, temperatuurgevoeligheid en soortgelyke afwykings. Dit word ook gebruik om uitskieterproewe te identifiseer.

tn- Genotipeherhaalbaarheid verwys na die herhaalbaarheid van genotypegemiddeldes en kan gedefinieer word as die verwantskap tussen die genotipe variansie en die totale variansie.

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Hierdie parameter is eintlik van waarde vir proewe waarvan die aantal herhalings nie dieselfde is nie.

t- Die Intraklas Korrelasie verwys na die herhaalbaarheid van perseelwaardes oor herhalings. Hoe groter die ooreenstemming tussen perseelwaardes oor herhalings vir elke genotipeinskrywing is, hoe nader sal "t" na 1.0 neig.

SF(t)- Die Standaard Fout van die Intraklas Korrelasie (t) gee 'n aanduiding van hoe akkuraat die skatting van "t" is.

t/SF(t)- Hierdie verhouding word as 'n belangrike parameter beskou daar die Intraklas Korrelasie (t) moet verkieslik minstens drie keer groter as sy foutterm moet wees. 'n Verhouding van kleiner as 3.0 dui aan dat die betrokke stel proefdata as minder betroubaar beskou kan word.

H of R- Is 'n belangrike maatstaf van die presisie (betroubaarheid) van 'n eksperiment. Dit is 'n bepaling van die verwagte korrelasie tussen verskillende herhalings of repetisie van dieselfde eksperiment, of andersins die verwagte korrelasie tussen gemiddeldes van dieselfde stel kultivars. Waardes van H is tussen 0 en 1.

## EENJARIGE RESULTATE

### Proeflokaliteite

Lokaliteite, proefplasings en die besonderhede van medewerkers vir die 2011/2012 proefreeks verskyn in Tabel 2.

### Lokaliteitsbeskrywing

Beskikbare inligting aangaande die grondbeskrywing met bemesting en ander relevante inligting oor verbouing verskyn in Tabel 3, reënval en besproeiing in Tabel 4.

### Groeitoestande

Groei kondisies verskil tussen lokaliteite en moet dus in ag geneem word wanneer resultate geïnterpreteer word. In die algemeen het die land 'n stadige begin tot die 2011/2012 seisoen ervaar maar bo-gemiddelde reënval het oor die hele produksie area van die land voorgekom

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en het in sommige gevalle vloede veroorsaak wat stroop van gewasse benadeel het. In die algemeen was dit 'n goeie groeiseisoen in meeste van die mielies produserende gebiede.

Groeitoestande verskil tussen lokaliteite en dit moet in ag geneem word wanneer die genotiperesultate vertolk word.

**Standaard van proefuitvoering**

Tydens proefbesoeke is vasgestel dat voorskriftelike prosedures oor die algemeen nagekom is en dat proefversorging aan die verwagtings voldoen het. Dataverwerking is vertraag deurdat proefdata in sommige gevalle nie in die voorgeskrewe vorm voorsien is nie. Resultate is dikwels ook onvolledig verskaf, wat die inligting onaanvaarbaar of onbetroubaar gemaak het.

**Proefmislukkings**

The trials at Bultfontein (Link Seed), Hartbeesfontein (GCI), Ottosdal, Viljoenskroon

(K2) en Wesselsbron (Poineer) is nie aangeplant nie of het misluk.

**Statistiese diagnostiek**

Volgens die statistiese parameters in Tabel 5 van diegraanopbrengs van die verhoor Bothaville en Viljoenskroon (LinkSeed), Coligny (Pannar), Rietgat (Monsanto), Rietgat (North west Co-op), Ventersdorp (GCI) en Wesselsbron (Agricol) nie vir statistiese verwerking en vir verdere opbrengsanalises aanvaarbaar nie. till here

**Staanvermoë**

Die gemiddelde totale persentasie omgevalde plante, dit sluit beide stambreek en wortelvrot in, word in Tabel 6 aangegee. Die groeiseisoenlengte (groeidae tot blom plus groeidae tot fisiologiese volwassenheid) en die afdrogingstempo van genotipes dra ook verder by tot omval. Genotipeverskille is vanselfsprekend in al die proewe waarneembaar en hierdie feite moet noodwendig aan omval gekoppel word.

Omval is nie statisties verwerk nie, maar die gemiddeldes in Tabel 6 kan 'n aanduiding gee van die staanvermoë van genotipes. Omdat die genotipes egter tot verskillende vogpersentasies uitgedroog het, is dit moeilik om gevolgtrekkings te maak. ‘n Lae graad van omval is vanjaar in die proewe waargeneem.

**Spruitvorming**

Die invloed van omgewingsfaktore soos onder andere grondvrugbaarheid, bemesting, vog,

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temperatuurtoestande, plantbevolking en plantspasiëring is sodanig dat die bydrae van elkeen by spruitvorming nie altyd duidelik is nie. Die gemiddelde persentasie spruitvorming van die genotipes word in Tabel 7 aangegee. Die gemiddelde persentasie spruitvorming wissel tussen 7.69 % by Ottosdal tot 52.35 % by Coligny. Die wit genotipe IMP 52-11 (63.02%) en geel genotipe LS 8218 (44.52 %) het die hoogste persentasie spruitvorming getoon.

**Meerkoppigheid**

Enkelkoppigheid of meerkoppigheid by genotipes is 'n eienskap wat ook deur 'n hele aantal omgewingsfaktore beïnvloed word en die 2009/2010

seisoen dui aan dat groeikondisies geskik was vir kopvorming (Table 8). Die hoogste gemiddeld vir koppe plant was gemeet by by Coligny (2.17), terwyl die laagsre gemiddeld vir antal koppe gemeet is by Ottosdal (1.12) . Genotipes PAN 6Q-445B (2.10) en PAN 6Q-745BR (2.08) her die hoogste meerkoppige voorkoms.

**Graanvog**

Die persentasie vog van die graan tydens oestyd word in Tabel 9 weergegee. Die graanvog saam met die groeiseisoenlengte van 'n genotipe kan 'n aanduiding gee van die afdrogingstempo van die spesifieke genotipe. Oor die algemeen was die graanvog redelik laag gewees. Die gemiddelde persentasie graanvog het gewissel van 12.12 % by Kepsteel (6) tot 14.50 % by Bothaville. Van die geel genotypes het CAP 444NG(13.08 en SC608 (18.07%) onderskeidelik die laagste en hoogste persentasie graanvog getoon terwyl CRN 3505 (13.22%) en SC 637 (18.34%) die ooreenstemmende wit genotipes was.

Die vogpersentasie van elke genotipe was geplot teenoor die opbrengs van elke genotipe en word aangedui in Figuur (1a & b). Vanuit die figuur kan produseerders aflei dat op grond van graanvogpersentasie, die genotipes geklassifiseer kan word as vroeë of laat groeiseisoen genotipes.

**Graanopbrengs**

Die opbrengspotensiaal en aanpassingsvermoë van genotipes in spesifieke omgewings bly die belangrikste maatstaf om genotipeprestasie te vergelyk. Omgewingstoestande verskil van jaar tot jaar en afleidings van genotipeprestasie vanaf een jaar se data is nie so betroubaar soos vanaf meerjarige data nie. Die gekombineerde variansieanalise (ANOVA) van die 50 genotipes oor 20 lokaliteite wat ontleed is volgens die AMMI 2 model word weergegee in Tabel 1. Die ANOVA dui op hoogs betekenisvolle verskille vir omgewings, genotipes en

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belangrik, genotipe x omgewingsinteraksies. Die IPCA 1 en IPCA 2 – waardes was ook hoogs betekenisvol. Tabel 10 toon die gemiddelde graanopbrengs aan van 50 mielie genotipes wat getoets is by 21 omgewings.

Die hoogste gemiddelde opbrengs van 7.25 t $ha^{-1}$ is by Hoogekraal (8) aangeteken en die laagste by Nampo(3) (2.54 t $ha^{-1}$). Die geel genotipe wat die beste gevaar het was PAN 6Q-708BR met 'n gemiddeld van 5.43 t $ha^{-1}$ en die beste wit genotipe was PAN 6Q-223 met 'n gemiddeld van 5.67 t $ha^{-1}$ behaal het. Tabel 11 verteenwoordig data van die AMMI analise met die IPCA 1 en IPCA 2 – waardes vir die omgewings.

Tabel 12 toon die AMMI stabiliteitswaardes aan vir elke genotipe. Die mees stabiele geel genotipe was KKS 4522B wat gevolg is deur DKC 80-12BGEN. Die mees stabiele wit genotipes was PAN 5Q-433B wat gevolg is deur LS 8535B. Tabel 13 dui die beste AMMI seleksies aan van genotipes in omgewings.

**<u>Gemiddelde waardes van eienskappe</u>**

'n Samevatting van die gemiddelde waardes van alle eienskappe word in Tabel 14 weergegee.

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## INTRODUCTION

The annual results of 2011/2012 and the multi-seasonal results of 2009/2010, 2010/2011 and 2011/2012 series of National Cultivar Trials with commercially available maize genotypes are summarised in this report. The adaptability of commercial genotypes to a wide range of yield potentials is evaluated in these trials. Genotype entries consist of popular as well as newer commercial genotypes with the potential to become popular.

These results are indicative of genotype performance under specific environmental conditions occurring during a season. Results of more than one year, compiled from these trials, are more reliable and are more suitable for genotype recommendations than annual results.

## RESEARCH PROCEDURE

Standard and scientifically acceptable procedures were prescribed for the execution of this research programme. Co-workers were given a free hand to implement the most suitable cultivation practices in their areas in order to optimise yield and to create conditions of varying yield potential.

### Trial design

A randomized Complete Block Design with three replicates to accommodate the 50 entries was used throughout. Each locality was allocated its own trial randomisation which differs annually.

### Genotype entries

The same 50 genotypes were used in all the trials and consisted of genotypes entered by the seed companies involved. Seed company entries are in order of priority. Where too many entries were received the final genotype choice was made through negotiations with each seed company.

### Plot size and spacing

A standard of 40 plants per net plot was prescribed throughout whereas the choice of plant population (plants $ha^{-1}$), row widths and spacing was left to the discretion of the co-workers. A number of 22 plants in each of two plant rows per gross plot was recommended for row widths less than 1.5 m, while a number of 42 plants in a single plant row per gross plot was recommended for row widths of 1.5 m and greater.

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Border rows were only prescribed for the perimeter of the trial and no border rows were required between plots. One boundary plant had to be removed from each end of the plant row at harvest.

**Soil and fertilization**

Soil types normally used for maize production were used where possible. Choosing specific soil conditions for specific trial purposes also incorporated differences in production potentials. Fertilizer applications were not prescribed but applied according to soil fertility and maize yield potential of that area.

**Planting date**

Accepted planting dates for successful maize production in the area involved were recommended.

**Planting and harvesting methods**

Trials were mechanically or manually planted (two or more seeds per hill) and thinned out as soon as the seedlings were strong enough. Trials were mechanically or hand harvested.

**Pest control**

The use of suitable herbicides and insecticides were freely allowed as effective pest control, weed and insects, was required. Use of suitable systemic soil insecticides were also allowed. The use of pesticides was required to be reported.

**Disease**

Co-workers were requested to report the incidence of any diseases immediately to ensure that the necessary follow-up and data collecting could be done. Natural infection of any disease should be severe enough to give genotype reaction and differences. A disease infestation of more than 10.0 % is used as a guideline.

**Observations**

The following information and observations are requested each year:

1. Fertilizer quantity, time and method of application.
2. Pesticide quantity, time and method of application.

`

3. Planting, plant emergence and harvesting dates.
4. Spacing, gross and net plot size.
5. Monthly rainfall (and irrigation where applicable).
6. Number of days from planting date to 50 % pollen shed (where possible).
7. Number of days from planting date to 50 % silking (where possible).
8. Number of plants lodged (leaning more than 45 degrees) at harvest.
9. Number of plants per net plot.
10. Number of tillers per net plot.
11. Number of ears per net plot.
12. Ear mass or grain mass of all plots of all three replications.
13. Grain mass of Replication 1, if ear mass was measured.
14. Grain moisture percentage.
15. Additional observations, for example the amount of rotted ears or other noticeable and meaningful genotype differences.

**Statistical analysis**

Grain yield was the only parameter statistically analyzed. In general, an AMMI analysis was used to indicate the adaptability and stability of genotypes for different environments. The combined analysis of variance according to the Additive Mean Effects And Multiplicative Interaction (AMMI) model was performed using the GENSTAT Package (Table1).

AMMI Stability Value (ASV) is the distance from zero in a two dimensional scatter-gram of IPCA 1 scores against IPCA 2 scores.

As the ASV nearing zero the genotype can be considered more stable for the environments. Additional explanations and information about AMMI are available in Appendix A

Statistical procedures normally used to identify and exclude outlier trials from the AMMI model were used for the purposes of this report. Certain statistical parameters (diagnostic parameters) were also used to help in the selection of trials for presentation.

**The diagnostic parameters were as follows:**

CV- The coefficient of variation - this parameter relates to the error of a single plot, and as such relates to the variability as induced by soil variation or plant population i.e. the larger

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the variation the larger the CV. Stress conditions (moisture, temperature, diseases, etc.) result in acceptable soil variation to be more pronounced in trials and a higher CV is recorded. The CV on its own cannot be used as a parameter to discard trials.

GCV- The genetic coefficient of variation - this parameter relates to the yield differential between the highest and lowest entry yield, relative to the trial mean i.e. the greater the difference between the extreme values, the larger the GCV. High values are indicative of disease sensitivity, differences in maturity stage, temperature sensitivity and like problems.

tn - Repeatability of genotype mean yield - relates to the repeatability of entry means, and can be defined as the relationship of genetic variance of observed means. In genotype trials this parameter is useful only when the number of replications between trials varies, otherwise the t-value is sufficient.

t - The repeatability of plot yield or intra class correlation coefficient - relates to the repeatability of plot means over replications, and is interpreted as is the normal correlation coefficient, i.e. the greater the concurrence of plot values per entry over replications the closer “t” will strive towards unity. The standard error calculated for a particular t-value indicates the accuracy of the estimate of "t"

SE (t) - Standard Error of the Intraclass Correlation (t) denotes how accurate the estimation of "t" is.

t/ SE (t) - This relationship is considered an important parameter as the Inter Class Correlation

(t) should be at least three times greater than it's error term. A relationship of less than 3.0 denotes low reliability.

H or R- Is an important measure of the precision (reliability) of an experiment, It is an estimate of the correlation expected between different repetitions or runs of exactly the same experiment, or the correlation you would expect between means estimated for the same set of cultivars. Values of H are between 0 and 1.

## SINGEL SEASONAL RESULTS

### <u>Trial localities</u>

Localities, trial placements and co-worker particulars for the 2011/2012 trial series appear in Table 2

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**Locality descriptions**

Available information about fertilization and other relevant cultivation information appear in Table 3, rainfall and irrigation in Table 4.

**Growing conditions**

Growing conditions differed between localities and this must be taken into consideration when interpreting results. In general, the summer production area experienced another slow start to the 2011/2012 summer season due to late rainfall. Far below normal rainfall occurred over the entire summer production area of the country with bad rain distributions.

Growing conditions differed between localities and this must be taken into account when interpreting results.

**Standard of trial execution**

Visits to trials confirmed that prescribed procedures were followed and that trials were satisfactorily carried out. Data processing was delayed as some of the trial data was not in the prescribed format or incomplete, which made it unacceptable or unreliable.

**Trial failures**

The trials at Bultfontein (Link Seed), Hartbeesfontein (GCI), Ottosdal, Viljoenskroon (K2) and Wesselsbron (Poineer) was not planted or failed during the season.

**Statistical diagnostics**

According to the statistical parameters in Table 5 the grain yield of the trial at Bothaville and Viljoenskroon (Linkseed), Coligny (Pannar), Rietgat (Monsanto), Rietgat (North West Co-Op), Ventersdorp (GCI) and Wesselsbron (Agricol) were unacceptable for statistical and yield analysis.

**Stand ability**

The mean total percentages of lodged plants, which include both stalk and root lodging, appear in Table 6. The length of the growing season (days to flowering plus days to physiological maturity) and the rate of drying of the genotypes also have an effect on lodging and must be borne in mind. Genotype differences were noted and must be kept in mind.

Lodging was not statistically analysed, but the means in Table 6 give an indication of the

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stand ability of the genotypes. It is, however, difficult to make any conclusions as the genotypes dried out to different moisture percentages. Lodging was observed to be low in all the trials.

**Tillering**

The influence of environmental factors like soil fertility, fertilization, moisture, temperature conditions, plant population and plant spacing is such that their contribution to the occurrence of tillering is not clear. The mean percentage tillering is presented in Table 7. The mean percentage of tillering ranged from 7.69 % at Ottosdal to 52.35 % at Coligny. The white genotype IMP 52-11 (63.02%) and the yellow genotype LS 8218 (44.52 %) had the highest percentage tillering.

**Prolificacy**

A number of environmental conditions affect prolificacy in maize. Results for the 2011/2012 season indicate that growing conditions were favourable for ear development (Table 8)**.** The highest mean for ears per plant was recorded at Coligny (2.17), while the lowest mean number of ears was recorded at Ottosdal (1.12). Genotypes PAN 6Q-445B (2.10) and PAN 6Q-745BR (2.08) had the highest prolificacy incidence.

**Grain moisture**

The percentage moisture of the grain at harvest is presented in Table 9**.** The grain moisture together with the growing season length of a genotype can give an indication of the genotype's drying rate. The recorded grain moisture tended to be low. The mean percentage grain moisture recorded varied between 12.12 % for Kepsteel (6) and 14.50 % at Bothaville The yellow genotypes CAP 444NG (13.08) and SC 608 (18.07%) had the lowest and highest grain moisture percentages respectively, while CRN 3505 (13.22%) and SC 637 (18.34%) were the white counterparts. The moisture percentage of each hybrid was plotted with the yield of each hybrid were shown in figure number 2a&b, from these figures the producers will be able to classified the hybrids according to the moisture percentage if it is late or early growing season hybrids.

**Yield**

The yield potential and adaptability of genotypes in specific environments are the most important criteria for measuring genotype performance. Environmental conditions differ

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from year to year, thus more reliable conclusions can be drawn from multi-seasonal data than from just one year's data. The combined analysis of variance (ANOVA) of the 50 genotypes over 20 environments, according to the AMMI 2 model are presented in Table 1. The ANOVA indicated highly significant differences for environments, genotypes and importantly, genotype X environment interaction. The IPCA 1 and IPCA 2 scores were also highly significant. Table 10 shows the mean grain yield of 50 maize genotypes tested at 20 environments.

The highest mean yield recorded was at Hoogekraal (8) (7.25 t $ha^{-1}$) and the lowest at Nampo(3) (2.54 t $ha^{-1}$). The yellow genotype that produced the highest mean yield was PAN 6Q-708BR with 5.43 t $ha^{-1}$ and the highest yielding white genotypes was PAN 6Q-223 with a mean yield of 5.67 t $ha^{-1}$. Table 11 presents data of the AMMI analysis with the IPCA1 and IPCA2 scores for the environments.

Table 12 represents the AMMI stability values for each genotype. The most stable yellow genotype was KKS 4522B followed by DKC 80-12BGEN and the most stable white genotypes were PAN 5Q-433B followed by LS 8535B. Table (13) indicates the best AMMI selections of genotype per environment.

**Mean values for all characteristics.**

The mean values for all characteristics for which data were collected are presented in Table 14.

## MEERJARIG PROEWE

## INLEIDING

Resultate van, 2009/2010, 2010/2011en 2011/2012 Nasionale Kultivar Proefreekse met mielies, is in hierdie verslag saamgevat. Hierdie meerjarige genotiperesultate is aanduidend van genotipeprestasie onder die spesifieke omgewingstoestande wat in die betrokke drie jaar ondervind is. Genotipe aanbevelings sal vir soortgelyke groeitoestande geldig wees.

## NAVORSINGSPROSEDURE

Standaard en wetenskaplik erkende prosedures en waarnemings wat vir die

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navorsingsprogram voorgeskryf is, word in die jaarverslae beskryf en word dus nie herhaal nie. Slegs daardie prosedures wat gewysig is of spesifiek op hierdie meerjarige verslag van toepassing is, word aangehaal.

**Genotipevergelyking**

'n Regverdigbare genotipe vergelykingsnorm het tot gevolg dat slegs daardie genotipes wat elke jaar sedert 2009/2010 in die Nasionale Genotipeproewe met mielie genotipe ingeskryf is, in die verslag opgeneem kon word. Nuwe belowende genotipes of ander genotipes wat slegs vir een of twee van die drie jare in die proewe voorgekom het, is nie in hierdie verslag opgeneem nie. Meerjarige resultate van 15 genotipes word aangebied.

Die gemiddeld van al die genotipes oor al die lokaliteite word as 'n standaard genotipe vergelykingsnorm gebruik in die AMMI-analises.

**Statistiese verwerking en diagnostiek**

Graanopbrengs was die enigste parameter wat statisties ontleed is. In die algemeen is ‘n AMMI analise gebruik om die aanpasbaarheid en stabiliteit van genotipes aan te dui vir verskillende omgewings. Die gekombineerde variansieanalise volgens die “Additive Mean Effective And Multiplicative Interaction (AMMI)” model is uitgevoer met die GENSTAT program (Tabel 1).

Die “Principle Component Interaction Analysis (IPCA)” van genotipes in die AMMI analise gee ‘n aanduiding van die genotipe se stabiliteit oor verskillende omgewings. Hoe groter die IPCA-waarde, beide negatief of positief, hoe meer is ‘n genotipe aangepas vir ‘n spesifieke omgewing. Hoe nader die IPCA-waardes aan nul kom hoe meer stabiel is die genotipes vir al die omgewings waarin dit getoets is. AMMI Stabiliteits-Waardes (ASW) is die afstand vanaf nul in ‘n tweedimensionele verspreidingsgrafiek van IPCA 1-waardes teenoor IPCA 2-waardes. Soos die ASW-waarde nader kom aan nul kan ‘n spesifieke genotipe as meer stabiel geklassifiseer word vir omgewings. Addisionele beskrywings en informasie oor AMMI is beskikbaar in Aanhangsel A.

Die proewe wat gebruik is vir die multi-seisoenale vergelyking is daardie wat voldoen aan die voorvereistes van diagnostiese parameters en die toets vir uitskieters gedurende elk van die drie jaar.

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# RESULTATE

## Groeitoestande

Dit is belangrik dat die groeitoestande wat gedurende die 2009/2010, 2010/2011en 2011/2012 seisoene geheers het, deeglik in ag geneem word by die interpretasie van die resultate. Dit sal verhoed dat onregverdige genotipe uitsprake gemaak word.

## Staanvermoë

Omval is as gevolg van die teenwoordigheid van stam- en wortelvrotsiektes sowel as oorsake wat nie met 'n swak stam verband hou nie, 'n gekompliseerde aspek. Die groeiseisoenlengte (groeidae tot blom plus groeidae tot fisiologiese volwassenheid) en die afdrogingstempo van genotipe dra ook by tot omval. Die genotipe droog egter tot verskillende vogpersentasies af, en duidelike gevolgtrekkings is moeilik om te maak. Min seisoensverskille het voorgekom volgens die omvalpersentasies van die 15 genotipes in Tabel 16**.** Meer omval het in die 2008/2009 seisoen voorgekom as in sie ander twee seisoen en verskille tussen gentopies is waarneem baar.

## Spruitvorming

‘n Hoë mate van spruitvorming het by van die 15 genotipes oor die drie seisoene voorgekom (Tabel 17). Dit kan die gevolg wees van die vele faktore soos grondvrugbaarheid, bemesting, vog, temperatuurtoestande, plantbevolking en plantspasiëring wat spruitvorming kan beïnvloed. Genotipeverskille kan tog tot 'n mate waargeneem word.

## Kopvermoë

Enkelkoppigheid of meerkoppigheid by genotipe is eienskappe wat ook deur 'n hele aantal omgewingsfaktore beïnvloed word. Die aantal koppe per plant in Tabel 18 toon geringe variasie tussen genotipes en seisoene aan.

## Graanvogpersentasie

Die gemiddelde persentasie vog van die graan tydens oestyd, word in Tabel 19 weergegee. Die graanvog saam met die groeiseisoenlengte van 'n genotipe kan 'n aanduiding gee van die pitvullings- en afdrogingstempo van 'n spesifieke genotipe. Figuur 2 dui die verhouding aan tussen vogpersentasie en graanopbrengs vir die 15 genotipes wat getoets is, oor ‘n periode van drie jaar. Produsente kan van die figuur aflei watter genotipes is vroeë of laat fisiologiese

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ryp genotipes.

**Graanopbrengs**

Die opbrengspotensiaal en aanpassingsvermoë van genotipe in spesifieke omgewings bly die belangrikste maatstaf om genotipeprestasie te vergelyk. Omgewingstoestande verskil van jaar tot jaar asook van lokaliteit tot lokaliteit, en afleidings van genotipeprestasie vanaf een jaar se data is nie so betroubaar soos vanaf meerjarige data nie. Die gekombineerde variansieanalise (ANOVA) van die 15 genotipes oor 70 lokaliteite wat ontleed is volgens die AMMI 2 model word weergegee in Tabel 15. Die ANOVA dui op hoogs betekenisvolle verskille vir omgewings, genotipes en belangrik, genotipe x omgewingsinteraksies. Die IPCA 1 en IPCA 2 – waardes was ook hoogs betekenisvol. Tabel 20 toon die gemiddelde graanopbrengs aan van 15 mielie genotipes wat getoets is by 70

omgewings.

Die hoogste gemiddelde opbrengs van 11.674 t $ha^{-1}$ is by Leeudoringstad11 aangeteken en die laagste by Tweebuffels-11 (2.39 t $ha^{-1}$). Die geel genotipe wat die beste gevaar het was PAN 6Q-708BR met ‘n gemiddeld van 6.10 t $ha^{-1}$ en die beste wit genotipe was PAN 6Q-445B wat ‘n gemiddeld van 6.75 t $ha^{-1}$ behaal het. Tabel 21 verteenwoordig data van die AMMI met die IPCA 1 en IPCA 2 – waardes vir die omgewings. Tabel 22 verteenwoordig die AMMI stabiliteitswaardes vir elke genotipe. Die mees stabiele geel genotipe was PAN6Q-508R en die mees stabiele wit genotipe PAN 5Q-649R. Tabel 23 dui die beste AMMI genotipe seleksies aan per omgewing.

**Gemiddelde waardes**

Die samevatting van die gemiddelde waardes verskyn in Tabel 24 vir gerieflike gebruik.

**Vrywaring**

Die opsteller van die dokument en enige ander bron/instansie/persoon verantwoordelik vir enige inligting genoem in hierdie dokument is na die beste wete van die opstellers korrek met druktyd. Die inligting is ontwikkel deur wetenskaplike prosesse en word in goeder trou aangebied. Enige persoon/instansie wat hierdie inligting gebruik doen dit op eie risiko en die opstellers of enige ander party sal onder geen omstandighede verantwoordelik gehou kan word vir enige verliese gelei deur enige persoon/instansie wat die inligting in hierdie dokument gebruik nie.

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## MULTI-SEASONAL TRIALS

## INTRODUCTION

Results of 2009/2010, 2011/2012 and 2011/2012National Cultivar Trial series with maize are summarised in this report. These multi-seasonal results are indicative of genotype performance under specific environmental conditions experienced during the relevant three years. Genotype recommendations will be valid for similar growing conditions.

## RESEARCH PROCEDURE

Standard and scientifically acceptable procedures were prescribed for this research programme and are described in the annual reports and are therefore not repeated. Only those procedures that were adapted or are specifically applicable to this multi-seasonal report are mentioned.

### Genotype comparison

To obtain fair genotype comparison only genotypes that were entered in the National Cultivar Trials with maize since 2009/2010 were included in this report. Promising new genotypes and other genotypes that were included in one or two of the three years were not included in this report. Multi-seasonal results of 15 genotypes are presented.

The mean of all genotypes over all localities is used as standard genotype comparison in the AMMI model analysis.

### Statistical analysis and diagnostics

The grain yield data were statistically analysed and is presented in the form of AMMI model analysis which was used to indicate the adaptability and stability of genotypes for different environments. The combined analysis of variance according to the Additive Mean Effects and Multiplicative Interaction (AMMI) model was performed using the GENSTAT Package (Table 15).

The Principle Component Interaction Analysis (IPCA) of genotypes in the AMMI analysis is an indication of the stability of a genotype over environments. The greater the IPCA scores, either negative or positive, the more specifically adapted a genotype is to a certain environment. The closer IPCA scores approach zero the more stable the genotype is over all

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environments sampled.

AMMI Stability Value (ASV) is the distance from zero in a two dimensional scatter-gram of IPCA 1 scores against IPCA 2 scores. As the ASV nearing zero the genotype can be considered more stable for the environments. Additional explanations and information about AMMI were available in Appendix A

The trials that are used for this multi-seasonal comparison are those that fulfilled the requirements of the diagnostic parameters and the test for outliers during each of the three years.

## RESULTS

### Growing conditions

It is most important that the growing conditions that prevailed during the 2009/2010, 2011/2012 and 2011/2012seasons, are taken into account thoroughly in the interpretation of the results. This will prevent incorrect genotype comparisons.

### Stand ability

The stand ability of genotypes is an important characteristic, but is often caused by moisture stress and the incidence of stalk and root rot and stalk borer damage, that genotype differences can very often not be directly linked to the genotype itself. The length of growing season (growing days to flowering, plus growing days to physiological maturity) and the rate of drying of genotypes, can contribute to lodging. Genotypes dried out to various moisture percentages and clear conclusions are difficult to draw. Significant lodging can also occur during times of drought. Relatively high seasonal differences did occur according to the results on mean percentage lodging of the 15 genotypes over three years as given in Table 16.

More lodging occurred during 2010/2011 than in the other season and differences between genotypes were noticeable.

### Tillering

A high degree of tillering occurred amongst the 15 genotypes. Factors such as soil fertility, fertilization, moisture, temperature during the season, plant population, plant spacing and the genotype, determine the amount of tillers produced.

The mean percentage tillering of the genotypes over three years is given in Table 17 where genotype differences can be noted.

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**Prolificacy**

The number of ears produced per plant can be determined by a number of environmental conditions, but is also a characteristic of the genotype. The mean number of ears per plant of the genotypes over 3 years is given in Table 18.

**Grain moisture percentage**

The percentage grain moisture at harvest is presented in Table 19. The grain moisture percentage and length of growing season of a genotype can give an indication of the rate of drying. Figure 2 shows the relationship between moisture percentage and grain yield for the 15 genotypes have been tested for three seasons. From this figure the producers might conclude which genotypes are early maturing or late.

**Grain Yield**

The yield potential and adaptability of genotypes in specific situations are the most important criteria for measuring genotype performance. Environmental conditions differ between years and localities, thus more reliable conclusions can be drawn from multi- seasonal data than from that of one single year. The combined analysis of variance (ANOVA) of the 15 genotypes over 70 environments and three years, according to the AMMI 2 model, are presented in Table 15. The ANOVA indicated highly significant differences for environments, genotypes and importantly genotype x environment interaction. The IPCA 1 and IPCA 2 scores were also highly significant. Table 20 shows the mean grain yield of 15 maize genotypes tested at 70 environments. The highest mean yield recorded was at Leeudoringstad 11 (11.674t $ha^{-1}$) and the lowest at Tweebuffels 11 (2.39 t $ha^{-1}$). The yellow genotype that produced the highest mean yield was PAN 6Q-708BR with 6.10 t $ha^{-1}$ and the highest yielding white genotype was PAN 6Q-445B with a mean yield of (6.75) t $ha^{-1}$. Table 21 presents data of the AMMI analysis with the IPCA1 and IPCA2 scores for the environments. Table 22 represents the AMMI stability values for each genotype. The most stable yellow genotype was PAN 6Q-508R and the most stable white genotype was PAN 5Q-649R. Table 23 indicates the best AMMI selections of genotypes per environment.

**Mean values**

The mean values of all characteristics are summarised in Table 24 for easy use.

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**Indemnity**

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# EEN JARIGE TABELLE / ONE YEAR TABLES

**Tabel 1** ANOVA analise van mielie genotipes geëvalueer met die gebruik van die AMMI 2 model vir die westelike gebiede gedurende die 2011/2012seisoen
**Table 1** Combined analysis of variance (ANOVA) according to the AMMI 2 model of maize genotypes evaluated in the western areas during 2011/2012season

| Bron<br>Source | df | SS | MS | F | F_ prob |
|---|---|---|---|---|---|
| Totaal/Total | 3149 | 16003 | 5.08 | * | * |
| Behandeling/Treatment | 1049 | 14416 | 13.74 | 20.85 | 0 |
| Genotipe/Genotype | 49 | 1071 | 21.87 | 33.17 | 0 |
| Omgewing/Environment | 20 | 11528 | 576.39 | 105.25 | 0 |
| Block | 42 | 230 | 5.48 | 8.31 | 0 |
| Interaksie/Interaction | 980 | 1817 | 1.85 | 2.81 | 0 |
| IPCA 1 | 68 | 334 | 4.91 | 7.45 | 0 |
| IPCA 2 | 66 | 276 | 4.18 | 6.35 | 0 |
| Res/Residual | 846 | 1207 | 1.43 | 2.16 | 0 |
| Fout/Error | 2058 | 1357 | 0.66 | * | * |

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**Tabel 2** Proeflokalitiete en medewerkers 2011/2012
**Table 2** Trial Localities and Co-Workers 2011/2012

| Localiteit<br>Locality | Adres / Adress | Medewerker<br>Co-Worker |
|---|---|---|
| Bothaville D | Monsanto | Philip Vosloo |
| Bothaville D | Pannar | Chris van Zyl |
| Bothaville D | Link Seed | Pieter Herbst |
| Bultfontein D | Pannar | Pieter Herbst |
| Coligny D | Pannar | Chris van Zyl |
| Coligny D | LNR / ARC - GCI | Dirk Bruwer |
| Delareyville D | NW Koöp / NW Co-op | Willem Otto |
| Glaudina D | Monsanto | Philip Vosloo |
| Hartebeesfontein D | LNR / ARC - GCI | Dirk Bruwer |
| Hoogekraal D | Pannar | Chris van Zyl |
| Kapsteel D | Monsanto | Philip Vosloo |
| Kapsteel D | Pioneer Hi-Bred | Gawie van Staden |
| Koster D | NW Koöp / NW Co-op | Willem Otto |
| Leeudoringstad D | LNR / ARC - GCI | Dirk Bruwer |
| Lichtenburg D | Monsanto | Philip Vosloo |
| Lichtenburg D | NW Koöp / NW Co-op | Willem Otto |
| Lichtenburg D | Pioneer Hi-Bred | Gawie van Staden |
| Nampo D | LNR / ARC - GCI | Dirk Bruwer |
| Ottosdal D | LNR / ARC - GCI | Danie Muller |
| Potchefstroom D | Capstone | Michelle Lloyd |
| Potchefstroom D | Agricol | Andries Wessels |
| Potchefstroom D | LNR / ARC - GCI | Dirk Bruwer |
| Rushof D | LNR / ARC - GCI | Dirk Bruwer |
| Tweebuffels D | LNR / ARC - GCI | Dirk Bruwer |
| Ventersdorp D | LNR / ARC - GCI | Dirk Bruwer |
| Viljoenskroon D | Agricol | Andries Wessels |
| Viljoenskroon D | Link Seed | Pieter Herbst |
| Viljoenskroon D | Monsanto | Philip Vosloo |
| Wesselsbron D | LNR / ARC - GCI | Dirk Bruwer |
| Wesselsbron D | Pioneer Hi-Bred | Gawie van Staden |
| Wesselsbron D | Klein Karoo | Anita Janeke |
| Wolmaranstad D | Link Seed | Pieter Herbst |

D = Droeland / Dryland

**Tabel 3** Grondbeskrywing, bemesting, plantdatum, spasiëring en plantbevolking vir elke proeflokaliteit 2011/12

**Table 3** Soil description, fertilization, planting date, row width and plant population for localities 2011/12

| Lokaliteit | | | | Grondvorm & serie | Bemesting voor/ met planttyd | Bemesting na planttyd | | Plant-datum | Oes-datum | Rywydte | Plantbe-volking |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Proef / Trial** | **Lokaliteit / Locality** | **Medewerker / Co-operator** | Previous crop crop | Soil form & series | Fertilization before/at planting kg/ha | Fertilization after planting kg/ha | herbicide application | Planting date | Harvest date | Row width cm | Plant population x1000 |
| 1 | Bothaville D | Monsanto | | | | | | 08/12/2011 | 03/07/2012 | 150 | |
| 2 | Bothaville D | Pannar | Mielies | Hutton 15- 20% clay | 150kg/ha Urea,<br>200kg 3.1.0(30)Zn | None | Guardian EC 1L/ha<br>Atrazine super 600 2L/ha | 22/12/2011 | 10/06/2012 | 90 | 24.0 |
| 3 | Bothaville D | Link Seed | Maize | Avalon | 200KG 3:2:0(30) | 100KG UREA | ATARAZINE | 16/12/2011 | 14/06/2012 | 91 | 28.0 |
| 4 | Bultfontein D | Link Seed | - | - | - | - | - | - | - | - | - |
| 5 | Coligny D<br>( Vierfontein geplant ) | Pannar | Mielies | Clovelley 5% Clay | 80kgNh3 220kg 15.8.4(27) | 220kg 3.0.1(31) | Guardian 750ml/ha<br>Lamdex 100ml<br>Harness 0.8L/ha<br>Tylanex 1L/ha | 15/12/2011 | 25/05/2012 | 150 | 28.0 |
| 6 | Coligny D | LNR / ARC - GCI | -- | -- | -- | - | - | 11/12/2011 | 21/06/2012 | 230 | 16.0 |
| 7 | Delareyville D | NW Koöp / NW Co-op | Maize | Clovelly Mooilaagte | 39 N/ha, 11 P/ha, 5 K/ha | 39 N/ha | Gardomil Gold, Dual S Gold | 08/12/2011 | 01/06/2012 | 152 | 21.8 |
| 8 | Glaudina D | Monsanto | | | | | | 09/01/2012 | 18/07/2012 | 230 | |
| 10 | Hoogekraal D | Pannar | Mielies | Hutton 20-25% clay | 250kg4.3.4(33)Zn | Topbemes 330kg Greensulf | Gardomil 2l/ha , Gesaprim 3l/ha<br>Orivital 500ml | 08/11/2011 | 18/05/2011 | 150 | 21.0 |
| 11 | Kapsteel D | Monsanto | | | | | | 16/12/2011 | 03/07/2012 | 230 | |
| 12 | Kapsteel D | Pioneer Hi-Bred | | | | | | | | | |
| 14 | Kroonstad D | Capstone | Mielies | Avalon | 200kg/ha 3:1:0 (33) | 180kg/ha Urea | Supragine/Harness | 08/12/2011 | 12/06/2012 | 180 | 14.0 |
| 15 | Leeudoringstad D | LNR / ARC - GCI | - | - | - | - | - | 15/12/2011 | - | 165 | 20.0 |
| 16 | Lichtenburg D | Monsanto | | | | | | 25/11/2011 | 25/05/2012 | 230 | |
| 17 | Lichtenburg D | NW Koöp / NW Co-op | Maize | Hutton Stella | 39 N/ha, 11 P/ha, 5 K/ha | 39 N/ha | Gardomil Gold, Dual S Gold | 15/12/2011 | 01/07/2012 | 152 | 19.2 |
| 18 | Lichtenburg D | Pioneer Hi-Bred | | | | | | | | | |
| 19 | Nampo D | LNR / ARC - GCI | - | - | - | - | - | 06/12/2011 | 08/06/2012 | 150 | 20.0 |
| 20 | Ottosdal D | LNR / ARC - GCI | Maize | Clovelly | 11.3N: 24.8P: 14.8K<br>Ca 8.2 Mg 5.1 Sw 28.8 | | Supramax 900W6 @800g/ha<br>Guardian 1L/ha | 13/12/2011 | 18/06/2012 | 76 | 30.2 |
| 23 | Potchefstroom D | LNR / ARC - GCI | - | - | - | - | - | 21/12/2011 | 10/07/2012 | 150 | 16.5 |
| 24 | Rushof D | LNR / ARC - GCI | - | - | - | - | - | 30/11/2011 | - | 150 | 22.0 |
| 25 | Tweebuffels D | LNR / ARC - GCI | - | - | - | - | - | 02/12/2011 | - | 150 | 16.5 |
| 26 | Ventersdorp D | LNR / ARC - GCI | - | - | - | - | - | 30/11/2011 | 23/05/2012 | 135 | 16.0 |
| 27 | Viljoenskroon D | Agricol | | | | | | | | | |
| 28 | Viljoenskroon D | Link Seed | Maize | Avalon | 240KG 3:2:0(30) | 100KG UREA | ATARAZINE | 16/12/2011 | 15/06/2012 | 90 | 28.0 |
| 29 | Viljoenskroon D | Monsanto | | | | | | 15/12/2011 | 18/06/2012 | 150 | |
| 31 | Wesselsbron D | LNR / ARC - GCI | - | - | 125kg (57.7N) 75kg Super P (<br>170kg 20.7.3 (30) 34N 11.9P 5.1K | 85lt UAN (32) 34N | Scat 360, Sorgomil Gold, Velocit<br>Primaram Gold, Karate Zeon, Aqua Right 5<br>Lexar pak, Gardomil Gold | 08/12/2011 | - | 150 | 22.0 |
| 34 | Wolmaranstad D | Link Seed | GRONDBONE | Avalon | 220KG 3:2:0(30) | 100KG UREA | ATARAZINE | 16/12/2011 | 28/06/2012 | 152 | 21.0 |

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**Tabel 4** Reënval en Besproeiing by proeflokaliteite 2011/12
**Table 4** Rainfall and Irrigation at trial localities 2011/12

| | | | Reënval vir 2011 Rainfall for 2011 (mm) | | | | | | Reënval vir 2012 Rainfall for 2012 (mm) | | | | | | Totaal Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Proef / Trial** | **Lokaliteit / Locality** | **Medewerker / Co-operator** | Jul | Aug | Sept | Okt/Oct | Nov | Des/Dec | Jan | Feb | Mrt/March | Apr | Mei/May | Jun | |
| 1 | Bothaville D | Monsanto | 13.72 | 0 | 3.3 | 13.21 | 44.45 | 119.13 | 30.99 | 59.69 | 17.02 | 3.81 | 0 | 26.67 | 331.99 |
| 2 | Bothaville D | Pannar | | | | | | | | | | | | | |
| 3 | Bothaville D | Link Seed | 0 | 0 | 2 | 5 | 44 | 97 | 19 | 48 | 26 | 0 | 2 | 2 | 245 |
| 4 | Bultfontein D | Link Seed | 21 | 0 | 0 | 1 | 20 | 145 | 24 | 49 | 45 | 18 | 2 | 28 | 353 |
| 5 | Coligny D | Pannar | | | | | | | | | | | | | |
| 6 | Coligny D | LNR / ARC - GCI | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 7 | Delareyville D | NW Koöp / NW Co-op | 1.78 | 0 | 0 | 4.32 | 40.13 | 84.84 | 13.21 | 73.4 | 47.24 | 1.02 | 0 | 26.16 | 292.1 |
| 8 | Glaudina D | Monsanto | | | | | | | | | | | | | |
| 9 | Hartbeesfontein D | LNR / ARC - GCI | | | | | | | | | | | | | |
| 10 | Hoogekraal D | Pannar | | | | | | | | | | | | | |
| 11 | Kapsteel D | Monsanto | | | | | | | | | | | | | |
| 12 | Kapsteel D | Pioneer Hi-Bred | | | | | | | | | | | | | |
| 13 | Koster D | NW Koöp / NW Co-op | | | | | | | | | | | | | |
| 14 | Kroonstad D | Capstone | - | - | 30 | 32 | 65 | 60 | 22 | 6 | - | - | - | - | 215 |
| 15 | Leeudoringstad D | LNR / ARC - GCI | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 16 | Lichtenburg D | Monsanto | 0.25 | 0 | 0 | 41 | 19 | 24 | 5 | - | - | - | - | 9 | 98 |
| 17 | Lichtenburg D | NW Koöp / NW Co-op | 0.25 | 0 | 0 | 41 | 19 | 24 | 5 | - | - | - | - | 9 | 98 |
| 18 | Lichtenburg D | Pioneer Hi-Bred | 0.25 | 0 | 0 | 41 | 19 | 24 | 5 | - | - | - | - | 9 | 98 |
| 19 | Nampo D | LNR / ARC - GCI | 11 | 0 | 4 | 9 | 47 | 100 | 49 | 76 | 61 | 11 | 0.25 | 24 | 392 |
| 20 | Ottosdal D | LNR / ARC - GCI | - | - | - | 11 | 40 | 114 | - | 53 | 48 | - | - | 12 | 278 |
| 21 | Ottosdal D | Klein Karoo | | | | | | | | | | | | | |
| 22 | Potchefstroom D | Agricol | | | | | | | | | | | | | |
| 23 | Potchefstroom D | LNR / ARC - GCI | 6 | 0 | 0 | 58 | 107 | 161 | 95 | 100 | 88 | 15 | 0 | 18 | 648 |
| 24 | Rushof D | LNR / ARC - GCI | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 25 | Tweebuffels D | LNR / ARC - GCI | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 26 | Ventersdorp D | LNR / ARC - GCI | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 27 | Viljoenskroon D | Agricol | | | | | | | | | | | | | |
| 28 | Viljoenskroon D | Link Seed | 0 | 0 | 0 | 4 | 45 | 94 | 22 | 42 | 25 | 0 | 0 | 5 | 232 |
| 29 | Viljoenskroon D | Monsanto | | | | | | | | | | | | | |
| 30 | Viljoenskroon D | Klein Karoo | | | | | | | | | | | | | |
| 31 | Wesselsbron D | LNR / ARC - GCI | - | - | 14 | 14 | 20 | 179 | 23 | 65 | 15 | - | - | 20 | 350 |
| 32 | Wesselsbron D | Pioneer Hi-Bred | | | | | | | | | | | | | |
| 33 | Wesselsbron D | Klein Karoo | | | | | | | | | | | | | |
| 34 | Wolmaranstad D | Link Seed | 12 | 15 | 14 | 20 | 58 | 112 | 34 | 56 | 36 | 11 | 5 | 20 | 393 |

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**Tabel 5** Diagnostiese parameters vir die statistiese aanvaarbaarheid van proewe vir betroubare opbrengsanalises

**Table 5** Diagnostic parameters for the statistical acceptabilitiy of trials for reliable yield analysis

| Omgewing<br>Environment | Proefgemiddeld<br>Trial mean | KV<br>CV % | GKV<br>GCV % | tn<br>% | t | SF(t)<br>SE(t) | t/Sf(t)<br>t/Se(t) | H |
|---|---|---|---|---|---|---|---|---|
| **Bothaville (5)** | **3.55** | **25.10** | **11.14** | **20.87** | **0.08** | **0.03** | **3.08** | **0.22** |
| Bothaville (8) | 6.91 | 10.70 | 11.47 | 77.37 | 0.53 | 0.09 | 6.05 | 0.76 |
| Bothaville (6) | 5.64 | 19.40 | 13.02 | 57.48 | 0.31 | 0.08 | 4.10 | 0.56 |
| Coligny(3) | 5.92 | 11.40 | 7.38 | 55.79 | 0.30 | 0.07 | 4.02 | 0.55 |
| **Coligny(8)** | **3.25** | **26.50** | **11.45** | **54.44** | **0.28** | **0.07** | **3.94** | **0.53** |
| Glaudin(6) | 3.53 | 12.70 | 8.00 | 54.33 | 0.28 | 0.07 | 3.95 | 0.53 |
| Delareyville(7) | 4.94 | 9.20 | 16.50 | 90.56 | 0.76 | 0.06 | 11.88 | 0.88 |
| Hoogekraal(8) | 7.25 | 10.60 | 7.70 | 63.65 | 0.40 | 0.08 | 4.48 | 0.55 |
| Kapsteel(6) | 5.36 | 17.60 | 9.16 | 44.71 | 0.21 | 0.06 | 3.59 | 0.44 |
| Kapsteel(9) | 4.88 | 16.70 | 12.29 | 63.41 | 0.37 | 0.08 | 4.46 | 0.62 |
| Leeudoringstad(3) | 6.52 | 16.60 | 10.47 | 54.42 | 0.28 | 0.07 | 3.95 | 0.83 |
| Kroonstad(12) | 4.35 | 17.30 | 7.11 | 33.53 | 0.14 | 0.04 | 3.30 | 0.33 |
| **Rietgat(6)** | **4.33** | **26.10** | **11.27** | **35.73** | **0.16** | **0.05** | **3.35** | **0.35** |
| **Rietgat(7)** | **1.07** | **12.60** | **14.41** | **79.73** | **0.57** | **0.09** | **6.54** | **0.79** |
| Lichtenburg(9) | 3.36 | 19.80 | 15.95 | 83.63 | 0.63 | 0.08 | 7.65 | 0.58 |
| Nampo(3) | 2.53 | 17.60 | 13.74 | 64.60 | 0.38 | 0.08 | 4.55 | 0.63 |
| Ottosdal(3) | 3.83 | 15.00 | 16.46 | 78.40 | 0.55 | 0.09 | 6.22 | 0.77 |
| Potchefstroom(3) | 6.28 | 10.60 | 11.22 | 73.66 | 0.48 | 0.09 | 5.47 | 0.65 |
| Rushof(3) | 4.05 | 9.70 | 7.65 | 64.87 | 0.38 | 0.08 | 4.57 | 0.64 |
| Tweebuffels(3) | 5.48 | 13.20 | 11.67 | 60.91 | 0.44 | 0.06 | 7.55 | 0.61 |
| **Ventersdorp(3)** | **1.38** | **25.10** | **21.93** | **69.49** | **0.43** | **0.09** | **4.98** | **0.68** |
| Viljoenskroon(6) | 4.50 | 18.50 | 13.52 | 45.10 | 0.22 | 0.06 | 3.60 | 0.45 |
| Viljoenskroon(1) | 4.90 | 11.00 | 11.90 | 77.26 | 0.53 | 0.09 | 6.03 | 0.76 |
| **Viljoenskroon(5)** | **3.22** | **29.60** | **13.54** | **38.59** | **0.17** | **0.05** | **3.42** | **0.38** |
| **Wesselsbron(1)** | **5.03** | **14.60** | **3.55** | **9.62** | **0.05** | **0.01** | **4.47** | **0.09** |
| Wesselsbron(3) | 6.39 | 11.70 | 8.18 | 59.06 | 0.33 | 0.08 | 4.19 | 0.58 |
| Wolmaranstad(5) | 4.68 | 12.20 | 9.29 | 63.73 | 0.37 | 0.08 | 4.48 | 0.61 |

1=Agricol, 3=GCI, 4=K2, 5=Link seeds, 6=Monsanto, 7=North West, 8=Pannar, 9=Pioneer,12=Capstone

Bold =Trials have been rjected

Vetgedruk=Proewe is verwerp

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Tabel 6 Gemiddelde persentasie plante omval vir die 2011/2012 seisoen
Table 6 Mean percentage lodged plants 2011/2012 season

| Genotipes<br>Genotypes | Potchef-<br>stroom(3) | Delarey<br>ville(7) | Hooge-<br>kraal(8) | Ottosdal (3) | Gem<br>Mean |
|---|---|---|---|---|---|
| CAP444NG | 1.71 | 0.00 | 7.62 | 3.33 | 3.16 |
| CRN3505 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| DKC66-60BR | 0.83 | 0.00 | 1.04 | 0.00 | 0.47 |
| DKC 73 - 72 | 0.83 | 0.00 | 0.98 | 1.69 | 0.88 |
| DKC73-74BRGEN | 0.00 | 0.00 | 4.04 | 1.67 | 1.43 |
| DKC73-76R | 0.83 | 0.00 | 2.22 | 0.85 | 0.98 |
| DKC77-85BGEN | 0.83 | 0.00 | 9.39 | 0.00 | 2.56 |
| DKC78-15B | 0.83 | 0.00 | 6.45 | 0.00 | 1.82 |
| DKC78-35R | 1.67 | 1.08 | 0.00 | 0.00 | 0.69 |
| DKC78-45BRGEN | 1.71 | 0.51 | 8.07 | 0.00 | 2.57 |
| DKC80-12BGEN | 0.00 | 0.00 | 0.00 | 1.71 | 0.43 |
| DKC80-40BRGEN | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| IMP51-22B | 0.00 | 0.00 | 0.00 | 1.67 | 0.42 |
| IMP52-11 | 1.67 | 0.00 | 2.15 | 1.67 | 1.37 |
| IMP52-11B | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| IMP53-03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| IMP53-13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| KKS4412B | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| KKS4522B | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| KKS4577B | 0.00 | 0.00 | 0.00 | 1.67 | 0.42 |
| KKS8301 | 0.00 | 0.00 | 0.00 | 1.71 | 0.43 |
| KKS8406B | 0.00 | 0.00 | 1.91 | 0.83 | 0.68 |
| KKS8424B | 0.00 | 0.00 | 0.00 | 0.85 | 0.21 |
| LS8518 | 0.83 | 0.00 | 3.27 | 0.00 | 1.03 |
| LS8524R | 0.83 | 0.00 | 0.00 | 0.00 | 0.21 |
| LS8526 | 0.00 | 0.00 | 11.89 | 0.00 | 2.97 |
| LS8529 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| LS8533R | 0.83 | 0.00 | 8.73 | 0.83 | 2.60 |
| LS8535B | 0.83 | 0.00 | 0.00 | 0.00 | 0.21 |
| P2653WB | 2.56 | 0.00 | 3.23 | 0.00 | 1.45 |
| P2823WB | 1.67 | 0.00 | 0.00 | 0.83 | 0.63 |
| PAN5Q-251 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PAN5Q-433B | 1.71 | 1.89 | 8.60 | 0.00 | 3.05 |
| PAN5Q-649R | 0.83 | 0.00 | 0.00 | 0.00 | 0.21 |
| PAN5Q-653R | 0.00 | 0.00 | 2.08 | 0.83 | 0.73 |
| PAN5Q-751BR | 0.00 | 0.00 | 0.00 | 0.83 | 0.21 |
| PAN6P-110 | 1.67 | 0.00 | 1.11 | 0.00 | 0.69 |
| PAN6Q-223 | 0.00 | 0.00 | 5.56 | 0.00 | 1.39 |
| PAN6Q-245 | 0.00 | 0.00 | 9.11 | 0.00 | 2.28 |
| PAN6Q-308B | 0.00 | 0.00 | 3.57 | 0.00 | 0.89 |
| PAN6Q-445B | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PAN6Q-508R | 0.00 | 0.00 | 5.16 | 0.00 | 1.29 |
| PAN6Q-708BR | 0.83 | 0.00 | 1.01 | 0.00 | 0.46 |
| PAN6Q-745BR | 1.67 | 0.00 | 6.19 | 2.54 | 2.60 |
| Phb30Y79B | 5.00 | 0.00 | 5.21 | 0.00 | 2.55 |
| Phb31D48BR | 0.83 | 0.00 | 0.00 | 0.83 | 0.42 |
| Phb32W72B | 0.83 | 0.00 | 3.23 | 0.00 | 1.01 |
| Phb33H52B | 0.00 | 0.00 | 0.00 | 0.83 | 0.21 |
| SC608 | 0.85 | 0.00 | 13.72 | 6.67 | 5.31 |
| SC637 | 0.00 | 0.00 | 7.31 | 0.85 | 2.04 |
| Gem/Mean | 0.65 | 0.07 | 2.86 | 0.65 | 1.06 |

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**Tabel 7** Gemiddelde persentasie spruitvorming vir die 2011/2012 seisoen
**Table 7** Mean percentage tillering 2011/2012 season

| Genotipes Genotypes | Both-ville(8) | Nampo(3) | Coligny(3) | Delarey ville(7) | Leeudoring-stad(3) | Ottosdal (3) | Rushof (3) |
|---|---|---|---|---|---|---|---|
| CAP444NG | 51.27 | 55.36 | 43.48 | 1.78 | 70.49 | 9.17 | 51.71 |
| CRN3505 | 31.82 | 41.33 | 58.00 | 28.38 | 55.07 | 8.33 | 54.36 |
| DKC66-60BR | 31.18 | 29.22 | 33.22 | 0.00 | 26.55 | 3.33 | 48.56 |
| DKC 73 - 72 | 47.73 | 25.65 | 31.67 | 0.00 | 39.37 | 3.38 | 42.33 |
| DKC73-74BRGEN | 27.80 | 23.77 | 22.71 | 0.00 | 33.12 | 3.33 | 41.49 |
| DKC73-76R | 29.75 | 28.11 | 46.40 | 2.65 | 29.76 | 5.06 | 32.85 |
| DKC77-85BGEN | 33.80 | 34.71 | 75.29 | 6.68 | 48.20 | 10.83 | 67.33 |
| DKC78-15B | 32.09 | 51.16 | 47.56 | 5.56 | 50.63 | 15.83 | 58.13 |
| DKC78-35R | 31.31 | 36.82 | 66.82 | 18.16 | 54.04 | 5.00 | 50.90 |
| DKC78-45BRGEN | 10.22 | 36.66 | 62.20 | 5.11 | 45.22 | 5.83 | 49.05 |
| DKC80-12BGEN | 51.08 | 38.47 | 28.61 | 0.00 | 44.44 | 8.38 | 36.57 |
| DKC80-40BRGEN | 10.65 | 30.78 | 48.93 | 0.00 | 40.93 | 6.69 | 43.07 |
| IMP51-22B | 54.89 | 53.96 | 55.00 | 0.98 | 38.33 | 9.17 | 71.28 |
| IMP52-11 | 58.19 | 59.52 | 85.55 | 36.31 | 69.58 | 16.80 | 69.68 |
| IMP52-11B | 71.20 | 65.76 | 75.49 | 20.75 | 81.53 | 11.67 | 81.03 |
| IMP53-03 | 52.10 | 60.21 | 78.61 | 18.35 | 57.50 | 10.00 | 62.95 |
| IMP53-13 | 30.05 | 58.32 | 72.50 | 15.88 | 49.35 | 4.17 | 58.06 |
| KKS4412B | 49.60 | 33.87 | 49.25 | 0.00 | 42.32 | 5.02 | 50.45 |
| KKS4522B | 9.84 | 25.15 | 32.81 | 0.00 | 33.86 | 4.17 | 25.76 |
| KKS4577B | 11.72 | 30.43 | 53.15 | 12.12 | 27.19 | 7.50 | 42.14 |
| KKS8301 | 29.27 | 53.01 | 11.67 | 2.05 | 26.27 | 7.59 | 49.35 |
| KKS8406B | 28.51 | 25.69 | 23.94 | 0.00 | 19.76 | 3.33 | 45.28 |
| KKS8424B | 9.92 | 23.26 | 37.03 | 0.00 | 27.18 | 3.38 | 33.41 |
| LS8518 | 73.94 | 39.32 | 65.02 | 0.67 | 62.42 | 8.46 | 53.82 |
| LS8524R | 10.28 | 33.79 | 58.96 | 0.00 | 47.77 | 7.50 | 61.62 |
| LS8526 | 8.88 | 35.38 | 74.30 | 3.61 | 23.90 | 3.33 | 31.68 |
| LS8529 | 10.09 | 55.68 | 46.33 | 19.65 | 49.57 | 2.50 | 53.46 |
| LS8533R | 52.83 | 43.85 | 45.00 | 11.48 | 52.19 | 8.40 | 65.50 |
| LS8535B | 28.95 | 39.55 | 34.17 | 0.56 | 26.71 | 6.67 | 25.20 |
| P2653WB | 50.93 | 62.45 | 80.61 | 32.73 | 47.37 | 12.50 | 79.06 |
| P2823WB | 45.36 | 66.07 | 58.51 | 51.90 | 79.44 | 7.50 | 69.81 |
| PAN5Q-251 | 9.55 | 27.75 | 43.38 | 0.49 | 31.47 | 2.50 | 33.30 |
| PAN5Q-433B | 29.46 | 46.35 | 78.80 | 20.57 | 44.69 | 5.83 | 40.51 |
| PAN5Q-649R | 10.77 | 22.48 | 41.65 | 0.00 | 40.83 | 0.83 | 40.17 |
| PAN5Q-653R | 28.57 | 27.78 | 31.92 | 0.00 | 40.60 | 10.00 | 39.64 |
| PAN5Q-751BR | 27.85 | 32.55 | 36.45 | 1.45 | 26.50 | 6.67 | 49.60 |
| PAN6P-110 | 30.92 | 32.89 | 49.77 | 0.00 | 55.93 | 5.02 | 61.83 |
| PAN6Q-223 | 50.85 | 61.19 | 84.15 | 15.57 | 75.51 | 12.50 | 69.48 |
| PAN6Q-245 | 53.53 | 44.55 | 52.52 | 22.36 | 62.69 | 7.50 | 59.70 |
| PAN6Q-308B | 51.27 | 38.29 | 28.77 | 0.48 | 38.10 | 11.67 | 33.61 |
| PAN6Q-445B | 55.92 | 44.63 | 86.82 | 37.77 | 78.41 | 25.00 | 69.61 |
| PAN6Q-508R | 29.55 | 46.77 | 66.37 | 0.00 | 47.37 | 5.83 | 55.13 |
| PAN6Q-708BR | 104.81 | 46.79 | 44.11 | 0.00 | 60.69 | 6.67 | 62.21 |
| PAN6Q-745BR | 30.33 | 54.04 | 65.44 | 7.29 | 71.74 | 9.21 | 70.95 |
| Phb30Y79B | 72.75 | 49.53 | 67.50 | 9.99 | 69.12 | 14.17 | 56.41 |
| Phb31D48BR | 37.52 | 21.05 | 49.69 | 0.00 | 30.07 | 6.67 | 50.54 |
| Phb32W72B | 11.20 | 46.03 | 68.07 | 0.00 | 51.88 | 15.39 | 29.49 |
| Phb33H52B | 35.00 | 31.69 | 30.06 | 0.00 | 47.51 | 5.00 | 50.28 |
| SC608 | 31.47 | 26.46 | 30.47 | 0.00 | 38.08 | 3.33 | 34.65 |
| SC637 | 28.60 | 43.92 | 58.54 | 12.01 | 51.45 | 5.98 | 63.93 |
| Gem/Mean | 36.10 | 40.84 | 52.35 | 8.47 | 47.25 | 7.69 | 51.54 |

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**Tabel 7** Vervolg
**Table 7** Continued

| Genotipes Genotypes | Potchef-stroom(3) | Viljoens-kroon(1) | Twee buffels(3) | Gem Mean |
|---|---|---|---|---|
| CAP444NG | 47.66 | 17.50 | 38.89 | 38.73 |
| CRN3505 | 54.16 | 22.00 | 56.21 | 40.97 |
| DKC66-60BR | 40.28 | 10.09 | 27.92 | 25.04 |
| DKC 73 - 72 | 25.00 | 6.26 | 29.93 | 25.13 |
| DKC73-74BRGEN | 17.83 | 14.98 | 23.24 | 20.83 |
| DKC73-76R | 21.25 | 19.80 | 31.42 | 24.71 |
| DKC77-85BGEN | 65.60 | 12.81 | 71.43 | 42.67 |
| DKC78-15B | 66.91 | 15.00 | 26.52 | 36.94 |
| DKC78-35R | 55.48 | 19.16 | 38.60 | 37.63 |
| DKC78-45BRGEN | 47.30 | 17.20 | 48.03 | 32.68 |
| DKC80-12BGEN | 30.99 | 10.26 | 30.83 | 27.96 |
| DKC80-40BRGEN | 17.89 | 9.64 | 17.57 | 22.61 |
| IMP51-22B | 65.80 | 25.91 | 59.58 | 43.49 |
| IMP52-11 | 103.57 | 44.54 | 86.43 | 63.02 |
| IMP52-11B | 88.16 | 42.46 | 85.99 | 62.40 |
| IMP53-03 | 69.58 | 20.52 | 100.73 | 53.06 |
| IMP53-13 | 31.64 | 23.28 | 85.21 | 42.85 |
| KKS4412B | 20.00 | 16.77 | 17.48 | 28.48 |
| KKS4522B | 27.92 | 17.85 | 24.60 | 20.20 |
| KKS4577B | 42.11 | 15.42 | 52.16 | 29.39 |
| KKS8301 | 16.54 | 6.35 | 28.12 | 23.02 |
| KKS8406B | 25.07 | 14.83 | 13.75 | 20.02 |
| KKS8424B | 11.25 | 9.24 | 13.16 | 16.78 |
| LS8518 | 50.80 | 15.62 | 75.09 | 44.52 |
| LS8524R | 50.45 | 20.32 | 70.45 | 36.11 |
| LS8526 | 27.63 | 20.84 | 40.33 | 26.99 |
| LS8529 | 35.00 | 12.97 | 52.42 | 33.77 |
| LS8533R | 75.25 | 22.61 | 81.94 | 45.90 |
| LS8535B | 33.57 | 14.74 | 21.49 | 23.16 |
| P2653WB | 72.79 | 22.50 | 82.80 | 54.37 |
| P2823WB | 62.30 | 33.17 | 81.94 | 55.60 |
| PAN5Q-251 | 32.87 | 12.55 | 10.62 | 20.45 |
| PAN5Q-433B | 44.97 | 15.48 | 36.22 | 36.29 |
| PAN5Q-649R | 22.47 | 10.69 | 12.75 | 20.26 |
| PAN5Q-653R | 31.53 | 15.81 | 9.18 | 23.50 |
| PAN5Q-751BR | 25.00 | 5.02 | 18.50 | 22.96 |
| PAN6P-110 | 49.17 | 17.12 | 33.06 | 33.57 |
| PAN6Q-223 | 64.68 | 50.52 | 80.01 | 56.45 |
| PAN6Q-245 | 57.02 | 11.53 | 48.04 | 41.94 |
| PAN6Q-308B | 42.50 | 17.56 | 50.87 | 31.31 |
| PAN6Q-445B | 64.21 | 24.36 | 90.72 | 57.75 |
| PAN6Q-508R | 30.72 | 12.83 | 74.24 | 36.88 |
| PAN6Q-708BR | 34.80 | 11.31 | 29.28 | 40.07 |
| PAN6Q-745BR | 66.40 | 10.83 | 87.21 | 47.34 |
| Phb30Y79B | 60.00 | 26.50 | 74.62 | 50.06 |
| Phb31D48BR | 28.90 | 15.11 | 48.47 | 28.80 |
| Phb32W72B | 47.30 | 16.88 | 33.47 | 31.97 |
| Phb33H52B | 35.54 | 15.10 | 49.06 | 29.92 |
| SC608 | 38.04 | 13.55 | 26.07 | 24.21 |
| SC637 | 29.03 | 13.32 | 49.24 | 35.60 |
| Gem/Mean | 44.10 | 17.81 | 47.52 | 35.37 |

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**Tabel 8** Gemiddelde aantal koppe per plant 2011/2012seisoen
**Table 8** Mean number of cobs per plant 2011/2012season

| Genotipes Genotypes | Coligny(3) | Delarey ville(7) | Nampo (3) | Leeudoring-stad(3) | Potchef-stroom(3) | Rushof(3) | Twee-buffels(3) |
|---|---|---|---|---|---|---|---|
| CAP444NG | 2.35 | 1.61 | 1.40 | 2.25 | 2.58 | 1.43 | 2.13 |
| CRN3505 | 2.33 | 2.12 | 1.19 | 2.32 | 2.14 | 1.63 | 2.20 |
| DKC66-60BR | 1.92 | 1.05 | 1.33 | 1.59 | 2.01 | 1.30 | 1.62 |
| DKC 73 - 72 | 1.59 | 1.14 | 1.18 | 1.42 | 1.39 | 1.17 | 1.40 |
| DKC73-74BRGEN | 1.49 | 1.07 | 1.22 | 1.37 | 1.23 | 1.18 | 1.29 |
| DKC73-76R | 1.50 | 1.09 | 1.07 | 1.33 | 1.26 | 1.25 | 1.30 |
| DKC77-85BGEN | 2.42 | 1.92 | 1.45 | 1.93 | 2.52 | 1.72 | 2.32 |
| DKC78-15B | 2.16 | 1.76 | 1.38 | 2.23 | 2.22 | 1.50 | 2.04 |
| DKC78-35R | 2.57 | 1.83 | 1.40 | 2.17 | 2.15 | 1.49 | 1.83 |
| DKC78-45BRGEN | 2.19 | 1.76 | 1.43 | 2.02 | 2.30 | 1.49 | 2.22 |
| DKC80-12BGEN | 2.19 | 1.61 | 1.22 | 2.08 | 2.27 | 1.36 | 2.02 |
| DKC80-40BRGEN | 2.40 | 1.63 | 1.36 | 2.10 | 2.28 | 1.52 | 2.04 |
| IMP51-22B | 1.94 | 1.35 | 1.42 | 1.81 | 2.62 | 1.57 | 1.78 |
| IMP52-11 | 2.13 | 1.12 | 1.35 | 1.78 | 1.79 | 1.22 | 1.89 |
| IMP52-11B | 2.21 | 1.15 | 1.38 | 2.03 | 2.44 | 1.42 | 2.11 |
| IMP53-03 | 2.26 | 1.12 | 1.26 | 1.95 | 1.82 | 1.36 | 2.11 |
| IMP53-13 | 2.63 | 1.91 | 1.35 | 2.14 | 2.32 | 1.65 | 2.22 |
| KKS4412B | 2.04 | 1.27 | 1.35 | 1.87 | 1.71 | 1.44 | 1.80 |
| KKS4522B | 1.44 | 1.11 | 1.12 | 1.42 | 1.44 | 1.22 | 1.39 |
| KKS4577B | 1.95 | 1.59 | 1.39 | 1.70 | 1.65 | 1.31 | 1.97 |
| KKS8301 | 1.63 | 1.06 | 1.27 | 1.38 | 1.61 | 1.36 | 1.18 |
| KKS8406B | 2.04 | 1.19 | 1.34 | 1.55 | 1.99 | 1.40 | 1.48 |
| KKS8424B | 1.60 | 1.20 | 1.30 | 1.32 | 1.45 | 1.19 | 1.62 |
| LS8518 | 2.07 | 1.54 | 1.32 | 1.82 | 1.82 | 1.24 | 1.79 |
| LS8524R | 2.08 | 1.11 | 1.26 | 1.73 | 1.89 | 1.32 | 1.82 |
| LS8526 | 2.20 | 1.10 | 1.52 | 1.83 | 2.30 | 1.45 | 2.16 |
| LS8529 | 2.15 | 1.97 | 1.24 | 1.95 | 2.10 | 1.52 | 2.35 |
| LS8533R | 2.31 | 1.58 | 1.46 | 1.91 | 2.51 | 1.39 | 2.22 |
| LS8535B | 2.23 | 1.64 | 1.34 | 2.04 | 2.01 | 1.50 | 2.05 |
| P2653WB | 1.92 | 1.16 | 1.35 | 1.60 | 1.75 | 1.47 | 1.74 |
| P2823WB | 1.99 | 1.72 | 1.54 | 2.19 | 2.15 | 1.38 | 2.04 |
| PAN5Q-251 | 2.24 | 1.55 | 1.43 | 1.65 | 2.19 | 1.35 | 1.77 |
| PAN5Q-433B | 2.67 | 1.84 | 1.59 | 1.78 | 2.39 | 1.41 | 2.01 |
| PAN5Q-649R | 2.31 | 1.67 | 1.56 | 2.22 | 2.18 | 1.45 | 1.97 |
| PAN5Q-653R | 2.17 | 1.32 | 1.43 | 1.75 | 2.16 | 1.36 | 1.92 |
| PAN5Q-751BR | 2.27 | 1.43 | 1.26 | 1.58 | 1.88 | 1.36 | 2.01 |
| PAN6P-110 | 2.29 | 1.46 | 1.25 | 1.99 | 2.48 | 1.63 | 2.27 |
| PAN6Q-223 | 2.70 | 1.73 | 1.41 | 2.43 | 2.61 | 1.62 | 2.56 |
| PAN6Q-245 | 2.71 | 1.84 | 1.48 | 2.40 | 2.31 | 1.69 | 2.19 |
| PAN6Q-308B | 2.29 | 1.77 | 1.42 | 2.17 | 2.40 | 1.47 | 2.09 |
| PAN6Q-445B | 2.92 | 1.85 | 1.64 | 2.29 | 2.67 | 1.61 | 2.35 |
| PAN6Q-508R | 2.54 | 1.62 | 1.49 | 2.33 | 2.45 | 1.63 | 2.38 |
| PAN6Q-708BR | 2.35 | 1.66 | 1.58 | 2.30 | 2.68 | 1.63 | 2.09 |
| PAN6Q-745BR | 2.53 | 1.72 | 1.61 | 2.32 | 2.71 | 1.79 | 2.71 |
| Phb30Y79B | 2.08 | 1.29 | 1.30 | 1.99 | 1.70 | 1.32 | 1.72 |
| Phb31D48BR | 2.10 | 1.03 | 1.27 | 1.55 | 2.19 | 1.50 | 1.69 |
| Phb32W72B | 2.60 | 1.44 | 1.35 | 2.04 | 2.10 | 1.03 | 2.00 |
| Phb33H52B | 2.08 | 1.19 | 1.22 | 1.78 | 2.23 | 1.47 | 1.71 |
| SC608 | 2.03 | 1.18 | 1.41 | 1.57 | 1.94 | 1.20 | 1.55 |
| SC637 | 1.51 | 1.08 | 1.22 | 1.39 | 1.29 | 1.08 | 1.21 |
| Mean/Gem | 2.17 | 1.46 | 1.36 | 1.89 | 2.08 | 1.42 | 1.93 |

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**Tabel 8** Vervolg
**Table 8** Continued

| Genotipes Genotypes | Wessels bron(3) | Ottosdal (3) | Botha-ville(8) | Gem Mean |
|---|---|---|---|---|
| CAP444NG | 1.73 | 1.30 | 1.49 | 1.83 |
| CRN3505 | 2.03 | 1.46 | 2.35 | 1.98 |
| DKC66-60BR | 1.52 | 0.89 | 1.77 | 1.50 |
| DKC 73 - 72 | 1.46 | 0.95 | 1.59 | 1.33 |
| DKC73-74BRGEN | 1.23 | 0.97 | 1.65 | 1.27 |
| DKC73-76R | 1.27 | 0.93 | 1.10 | 1.21 |
| DKC77-85BGEN | 1.95 | 1.45 | 2.02 | 1.97 |
| DKC78-15B | 2.14 | 1.50 | 2.11 | 1.90 |
| DKC78-35R | 1.71 | 1.30 | 1.98 | 1.84 |
| DKC78-45BRGEN | 1.92 | 1.38 | 1.97 | 1.87 |
| DKC80-12BGEN | 1.59 | 1.02 | 1.86 | 1.72 |
| DKC80-40BRGEN | 2.34 | 1.00 | 2.22 | 1.89 |
| IMP51-22B | 1.80 | 1.11 | 2.21 | 1.76 |
| IMP52-11 | 1.90 | 0.96 | 2.21 | 1.63 |
| IMP52-11B | 1.84 | 1.02 | 2.00 | 1.76 |
| IMP53-03 | 1.70 | 0.94 | 2.02 | 1.65 |
| IMP53-13 | 1.71 | 1.38 | 1.88 | 1.92 |
| KKS4412B | 1.48 | 1.09 | 1.92 | 1.60 |
| KKS4522B | 1.40 | 1.01 | 1.28 | 1.28 |
| KKS4577B | 1.59 | 1.00 | 1.55 | 1.57 |
| KKS8301 | 1.32 | 1.03 | 1.22 | 1.30 |
| KKS8406B | 1.41 | 1.07 | 2.07 | 1.55 |
| KKS8424B | 1.34 | 1.06 | 1.27 | 1.33 |
| LS8518 | 1.53 | 0.87 | 1.59 | 1.56 |
| LS8524R | 1.62 | 0.97 | 1.60 | 1.54 |
| LS8526 | 2.08 | 0.96 | 2.10 | 1.77 |
| LS8529 | 1.99 | 1.00 | 1.98 | 1.82 |
| LS8533R | 2.04 | 1.36 | 1.75 | 1.85 |
| LS8535B | 2.04 | 1.31 | 2.51 | 1.86 |
| P2653WB | 1.61 | 1.04 | 1.56 | 1.52 |
| P2823WB | 1.85 | 1.00 | 2.32 | 1.82 |
| PAN5Q-251 | 1.43 | 1.05 | 1.85 | 1.65 |
| PAN5Q-433B | 1.96 | 1.38 | 2.22 | 1.93 |
| PAN5Q-649R | 1.82 | 1.13 | 1.93 | 1.82 |
| PAN5Q-653R | 1.56 | 1.09 | 1.37 | 1.61 |
| PAN5Q-751BR | 1.69 | 1.06 | 1.92 | 1.65 |
| PAN6P-110 | 1.85 | 1.14 | 1.91 | 1.83 |
| PAN6Q-223 | 2.00 | 1.27 | 2.32 | 2.06 |
| PAN6Q-245 | 2.07 | 1.30 | 2.28 | 2.03 |
| PAN6Q-308B | 1.87 | 1.24 | 2.01 | 1.87 |
| PAN6Q-445B | 1.98 | 1.28 | 2.37 | 2.10 |
| PAN6Q-508R | 2.00 | 1.18 | 2.44 | 2.00 |
| PAN6Q-708BR | 2.05 | 1.20 | **2.65** | 2.02 |
| PAN6Q-745BR | 2.17 | 1.26 | 2.03 | 2.08 |
| Phb30Y79B | 1.46 | 1.10 | 1.67 | 1.56 |
| Phb31D48BR | 1.55 | 1.11 | 1.95 | 1.59 |
| Phb32W72B | 1.54 | 1.18 | 1.92 | 1.72 |
| Phb33H52B | 1.53 | 1.06 | 2.16 | 1.64 |
| SC608 | 1.44 | 0.98 | 1.90 | 1.52 |
| SC637 | 1.15 | 0.89 | 1.08 | 1.19 |
| Mean/Gem | 1.73 | 1.12 | 1.90 | 1.71 |

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**Tabel 9** Gemiddelde graanvogpersentasie met oestyd 2011/2012 seisoen
**Table 9** Mean percentage grain moisture at harvest 2011/2012 season

| Genotipes Genotypes | Botha-ville(8) | Botha-ville(6) | Lichten-burg(9) | Leeudoring-stad (3) | Coligny(3) | Delarey-ville(7) | Glaudina(6) |
|---|---|---|---|---|---|---|---|
| CAP444NG | 14.80 | 13.53 | 13.03 | 13.10 | 17.00 | 12.17 | 16.47 |
| CRN3505 | 18.20 | 12.87 | 13.33 | 11.20 | 15.00 | 14.37 | 15.93 |
| DKC66-60BR | 13.00 | 12.20 | 12.83 | 10.40 | 11.80 | 9.43 | 12.23 |
| DKC 73 - 72 | 14.80 | 12.67 | 13.00 | 10.80 | 14.50 | 10.77 | 13.40 |
| DKC73-74BRGEN | 14.90 | 12.93 | 13.20 | 16.30 | 15.20 | 11.10 | 13.07 |
| DKC73-76R | 12.90 | 12.53 | 13.50 | 13.20 | 12.20 | 10.23 | 11.53 |
| DKC77-85BGEN | 12.10 | 12.53 | 13.00 | 12.10 | 13.70 | 12.63 | 14.70 |
| DKC78-15B | 13.10 | 12.70 | 13.37 | 11.00 | 13.80 | 13.40 | 15.57 |
| DKC78-35R | 13.10 | 12.90 | 13.47 | 14.50 | 14.30 | 15.03 | 15.67 |
| DKC78-45BRGEN | 12.80 | 13.33 | 13.03 | 12.20 | 16.20 | 13.37 | 15.17 |
| DKC80-12BGEN | 13.50 | 12.40 | 13.07 | 10.90 | 12.60 | 10.67 | 12.07 |
| DKC80-40BRGEN | 12.30 | 12.17 | 13.13 | 10.60 | 14.80 | 10.30 | 11.87 |
| IMP51-22B | 11.10 | 10.90 | 13.47 | 10.60 | 12.40 | 9.63 | 10.50 |
| IMP52-11 | 13.80 | 12.70 | 13.50 | 11.30 | 13.20 | 10.80 | 11.43 |
| IMP52-11B | 14.60 | 13.07 | 13.47 | 11.50 | 12.90 | 11.13 | 13.63 |
| IMP53-03 | 14.40 | 13.07 | 13.10 | 12.30 | 13.30 | 11.47 | 12.33 |
| IMP53-13 | 13.80 | 12.63 | 13.47 | 13.40 | 16.50 | 14.67 | 17.83 |
| KKS4412B | 12.20 | 12.43 | 12.77 | 11.60 | 12.40 | 9.87 | 11.77 |
| KKS4522B | 16.50 | 13.30 | 13.27 | 13.80 | 14.10 | 13.03 | 16.90 |
| KKS4577B | 14.90 | 12.77 | 13.20 | 11.10 | 15.80 | 13.80 | 15.40 |
| KKS8301 | 12.50 | 12.47 | 12.83 | 11.30 | 10.50 | 10.50 | 11.10 |
| KKS8406B | 14.60 | 12.33 | 12.93 | 10.90 | 13.00 | 10.23 | 10.97 |
| KKS8424B | 18.50 | 12.60 | 12.87 | 14.10 | 14.00 | 12.50 | 13.90 |
| LS8518 | 18.10 | 13.17 | 14.00 | 12.30 | 14.10 | 9.83 | 15.37 |
| LS8524R | 13.70 | 12.10 | 13.00 | 11.90 | 12.10 | 12.17 | 11.40 |
| LS8526 | 11.30 | 12.17 | 12.93 | 10.80 | 11.80 | 10.23 | 12.43 |
| LS8529 | 13.90 | 13.13 | 13.83 | 11.80 | 14.20 | 12.70 | 15.57 |
| LS8533R | 12.60 | 12.30 | 13.13 | 10.20 | 12.70 | 12.50 | 13.67 |
| LS8535B | 15.90 | 13.40 | 13.60 | 14.20 | 15.10 | 13.70 | 16.77 |
| P2653WB | 14.80 | 13.60 | 13.73 | 11.30 | 16.90 | 15.13 | 14.03 |
| P2823WB | 17.70 | 12.97 | 13.63 | 14.10 | 16.40 | 15.47 | 14.63 |
| PAN5Q-251 | 14.50 | 12.60 | 13.13 | 12.50 | 14.10 | 14.23 | 15.33 |
| PAN5Q-433B | 12.60 | 12.50 | 13.57 | 13.60 | 12.80 | 12.27 | 13.70 |
| PAN5Q-649R | 14.10 | 12.47 | 13.43 | 11.50 | 12.30 | 11.50 | 11.67 |
| PAN5Q-653R | 12.90 | 12.33 | 13.13 | 11.30 | 12.80 | 12.60 | 13.67 |
| PAN5Q-751BR | 11.70 | 12.30 | 13.07 | 10.40 | 12.40 | 11.20 | 11.53 |
| PAN6P-110 | 13.80 | 11.57 | 13.03 | 11.20 | 15.20 | 11.43 | 14.43 |
| PAN6Q-223 | 18.40 | 13.57 | 14.37 | 15.10 | 15.50 | 15.93 | 17.33 |
| PAN6Q-245 | 13.20 | 12.73 | 13.63 | 12.30 | 12.40 | 12.93 | 16.80 |
| PAN6Q-308B | 16.40 | 13.03 | 13.20 | 13.80 | 14.20 | 12.47 | 15.80 |
| PAN6Q-445B | 14.50 | 12.33 | 13.77 | 11.90 | 13.30 | 12.40 | 11.47 |
| PAN6Q-508R | 14.70 | 12.33 | 13.30 | 12.30 | 13.00 | 10.97 | 15.07 |
| PAN6Q-708BR | 14.60 | 12.97 | 13.23 | 14.00 | 13.50 | 10.97 | 15.80 |
| PAN6Q-745BR | 13.30 | 12.43 | 13.47 | 10.50 | 14.70 | 11.23 | 11.80 |
| Phb30Y79B | 20.90 | 12.73 | 13.47 | 11.40 | 13.20 | 12.33 | 14.40 |
| Phb31D48BR | 17.20 | 12.27 | 13.07 | 11.90 | 11.40 | 9.70 | 12.13 |
| Phb32W72B | 11.10 | 12.67 | 13.00 | 10.60 | 11.90 | 9.40 | 11.33 |
| Phb33H52B | 11.00 | 12.20 | 13.17 | 10.00 | 11.50 | 9.73 | 12.17 |
| SC608 | 19.10 | 16.47 | 14.93 | 23.30 | 25.10 | 14.83 | 20.67 |
| SC637 | 20.80 | 17.27 | 16.37 | 18.30 | 23.30 | 18.80 | 18.97 |
| Gem/ Mean | 14.50 | 12.81 | 13.38 | 12.41 | 14.10 | 12.16 | 14.03 |

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**Tabel 9** Vervolg
**Table 9** Continued

| Genotipes Genotypes | Kroon stad(12) | Hooge-kraal(8) | Kep steel(6) | Kep steel(9) | Rushof(3) | Otto-sdal(3) | Potchef-stroom(3) |
|---|---|---|---|---|---|---|---|
| CAP444NG | 10.10 | 14.37 | 11.23 | 14.90 | 11.40 | 15.21 | 12.90 |
| CRN3505 | 11.30 | 14.46 | 9.50 | 15.20 | 10.70 | 20.28 | 13.70 |
| DKC66-60BR | 10.60 | 13.81 | 9.07 | 13.23 | 9.80 | 10.08 | 11.10 |
| DKC 73 - 72 | 11.60 | 14.39 | 9.03 | 14.70 | 10.30 | 12.96 | 11.60 |
| DKC73-74BRGEN | 11.30 | 14.14 | 10.37 | 15.27 | 10.40 | 14.45 | 11.50 |
| DKC73-76R | 10.80 | 14.14 | 9.27 | 14.07 | 9.80 | 12.44 | 10.60 |
| DKC77-85BGEN | 11.00 | 14.10 | 9.30 | 13.93 | 10.20 | 17.00 | 13.20 |
| DKC78-15B | 11.40 | 14.44 | 11.03 | 14.87 | 10.70 | 15.81 | 12.30 |
| DKC78-35R | 10.40 | 14.26 | 10.87 | 15.33 | 10.40 | 17.11 | 13.80 |
| DKC78-45BRGEN | 10.70 | 14.22 | 11.67 | 14.67 | 10.60 | 15.81 | 12.90 |
| DKC80-12BGEN | 10.60 | 14.26 | 9.13 | 13.40 | 9.60 | 13.47 | 11.80 |
| DKC80-40BRGEN | 9.80 | 13.77 | 8.90 | 13.37 | 10.20 | 12.96 | 11.20 |
| IMP51-22B | 9.90 | 13.75 | 8.43 | 13.67 | 10.00 | 11.53 | 10.80 |
| IMP52-11 | 9.90 | 14.12 | 10.07 | 14.23 | 10.40 | 11.53 | 10.40 |
| IMP52-11B | 11.10 | 14.72 | 9.97 | 13.87 | 10.50 | 13.13 | 11.40 |
| IMP53-03 | 9.80 | 14.20 | 9.80 | 14.33 | 10.70 | 11.90 | 11.60 |
| IMP53-13 | 12.80 | 14.27 | 10.70 | 13.93 | 11.40 | 17.41 | 11.60 |
| KKS4412B | 11.70 | 13.94 | 9.40 | 14.03 | 10.50 | 13.30 | 11.40 |
| KKS4522B | 15.60 | 13.90 | 10.57 | 15.47 | 10.40 | 15.69 | 14.40 |
| KKS4577B | 11.70 | 13.91 | 10.23 | 14.70 | 9.60 | 14.45 | 11.60 |
| KKS8301 | 10.10 | 13.80 | 9.00 | 13.57 | 9.60 | 10.08 | 10.80 |
| KKS8406B | 11.10 | 13.69 | 8.43 | 13.07 | 10.20 | 10.94 | 12.30 |
| KKS8424B | 12.10 | 14.03 | 11.40 | 14.33 | 10.50 | 14.59 | 13.60 |
| LS8518 | 13.80 | 14.51 | 11.53 | 14.77 | 12.50 | 14.85 | 13.30 |
| LS8524R | 10.80 | 14.72 | 9.73 | 13.77 | 10.10 | 12.08 | 11.40 |
| LS8526 | 10.70 | 14.18 | 9.30 | 13.97 | 9.60 | 10.94 | 11.10 |
| LS8529 | 11.80 | 14.60 | 11.10 | 14.37 | 10.50 | 14.59 | 11.40 |
| LS8533R | 10.50 | 13.91 | 9.43 | 14.20 | 10.70 | 12.62 | 10.80 |
| LS8535B | 11.90 | 14.09 | 11.73 | 14.77 | 11.50 | 16.56 | 11.90 |
| P2653WB | 10.40 | 14.30 | 11.03 | 15.20 | 10.40 | 15.33 | 11.60 |
| P2823WB | 12.90 | 14.12 | 10.77 | 14.47 | 12.10 | 17.41 | 12.80 |
| PAN5Q-251 | 11.00 | 13.85 | 10.13 | 14.93 | 9.90 | 16.53 | 11.90 |
| PAN5Q-433B | 10.30 | 14.08 | 12.57 | 13.90 | 10.10 | 13.81 | 11.60 |
| PAN5Q-649R | 10.20 | 13.94 | 9.77 | 14.07 | 9.80 | 13.47 | 11.90 |
| PAN5Q-653R | 11.00 | 13.71 | 9.77 | 14.13 | 10.30 | 15.45 | 11.80 |
| PAN5Q-751BR | 10.60 | 13.95 | 9.17 | 14.07 | 9.80 | 12.44 | 10.90 |
| PAN6P-110 | 11.20 | 14.02 | 9.80 | 15.63 | 11.40 | 14.45 | 12.40 |
| PAN6Q-223 | 16.30 | 14.19 | 17.57 | 16.30 | 10.90 | 19.20 | 13.20 |
| PAN6Q-245 | 11.50 | 14.02 | 10.83 | 14.67 | 10.10 | 16.17 | 12.10 |
| PAN6Q-308B | 12.50 | 14.20 | 11.70 | 14.70 | 10.40 | 16.41 | 12.10 |
| PAN6Q-445B | 11.80 | 13.96 | 10.13 | 14.20 | 11.00 | 16.17 | 11.00 |
| PAN6Q-508R | 12.10 | 13.81 | 10.37 | 14.97 | 10.90 | 14.15 | 11.30 |
| PAN6Q-708BR | 13.40 | 14.56 | 10.33 | 14.73 | 10.80 | 15.21 | 12.50 |
| PAN6Q-745BR | 10.50 | 13.91 | 9.60 | 13.77 | 11.00 | 11.72 | 11.60 |
| Phb30Y79B | 10.00 | 14.60 | 10.43 | 14.60 | 11.70 | 16.53 | 11.30 |
| Phb31D48BR | 10.60 | 14.14 | 9.17 | 13.87 | 10.30 | 11.72 | 11.60 |
| Phb32W72B | 10.40 | 13.79 | 9.10 | 13.27 | 9.30 | 9.86 | 11.20 |
| Phb33H52B | 9.70 | 13.83 | 10.23 | 12.83 | 10.80 | 9.41 | 11.20 |
| SC608 | 17.10 | 15.27 | 17.23 | 17.60 | 17.30 | 21.58 | 18.70 |
| SC637 | 17.90 | 16.58 | 17.73 | 18.53 | 18.90 | 19.74 | 17.80 |
| Gem/ Mean | 11.53 | 14.19 | 10.55 | 14.49 | 10.80 | 14.41 | 12.14 |

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**Tabel 9** Vervolg
**Table 9** Continued

| Genotipes Genotypes | Viljoens-kroon(1) | Viljoens-kroon(6) | Wessels bron(3) | Twee buffles(3) | Nampo(3) | Wolmaran stad (5) | Gem Mean |
|---|---|---|---|---|---|---|---|
| CAP444NG | 12.05 | 14.47 | 10.90 | 11.50 | 11.20 | 11.20 | 13.08 |
| CRN3505 | 11.02 | 12.60 | 11.20 | 11.50 | 10.50 | 11.50 | 13.22 |
| DKC66-60BR | 10.17 | 11.77 | 9.80 | 10.60 | 9.00 | 10.30 | 11.06 |
| DKC 73 - 72 | 10.64 | 14.47 | 11.30 | 12.40 | 9.80 | 11.00 | 12.21 |
| DKC73-74BRGEN | 11.55 | 13.67 | 11.20 | 11.10 | 10.60 | 11.00 | 12.66 |
| DKC73-76R | 10.81 | 12.30 | 10.30 | 11.90 | 9.80 | 10.70 | 11.65 |
| DKC77-85BGEN | 10.73 | 12.25 | 11.30 | 10.60 | 11.10 | 10.80 | 12.31 |
| DKC78-15B | 11.44 | 12.17 | 11.50 | 11.90 | 11.10 | 10.90 | 12.63 |
| DKC78-35R | 11.31 | 13.40 | 10.90 | 10.90 | 10.70 | 11.20 | 12.98 |
| DKC78-45BRGEN | 12.04 | 12.33 | 10.80 | 11.30 | 10.00 | 11.10 | 12.71 |
| DKC80-12BGEN | 10.42 | 11.27 | 10.80 | 10.30 | 9.20 | 10.60 | 11.50 |
| DKC80-40BRGEN | 10.36 | 11.57 | 10.30 | 10.90 | 10.20 | 10.60 | 11.47 |
| IMP51-22B | 10.65 | 11.50 | 10.80 | 11.40 | 9.90 | 10.30 | 11.06 |
| IMP52-11 | 11.27 | 12.60 | 10.90 | 10.40 | 10.80 | 11.30 | 11.73 |
| IMP52-11B | 12.5 | 12.33 | 11.20 | 11.90 | 9.60 | 12.30 | 12.24 |
| IMP53-03 | 11.72 | 13.20 | 10.20 | 11.60 | 10.20 | 10.90 | 12.01 |
| IMP53-13 | 12.14 | 16.33 | 11.20 | 11.50 | 12.80 | 11.70 | 13.50 |
| KKS4412B | 10.55 | 11.93 | 10.50 | 10.30 | 9.20 | 11.00 | 11.54 |
| KKS4522B | 12.27 | 14.60 | 12.00 | 11.70 | 11.60 | 12.80 | 13.60 |
| KKS4577B | 11.28 | 12.50 | 11.40 | 10.90 | 10.00 | 11.60 | 12.54 |
| KKS8301 | 10.55 | 11.53 | 10.30 | 10.10 | 9.40 | 10.40 | 11.02 |
| KKS8406B | 10.18 | 11.87 | 11.70 | 11.10 | 10.10 | 10.00 | 11.48 |
| KKS8424B | 11.62 | 13.93 | 11.80 | 12.30 | 11.10 | 11.40 | 13.06 |
| LS8518 | 12.52 | 16.97 | 11.30 | 12.80 | 11.40 | 12.00 | 13.46 |
| LS8524R | 10.53 | 12.10 | 11.40 | 10.40 | 10.60 | 10.40 | 11.72 |
| LS8526 | 10 | 11.77 | 10.20 | 12.60 | 9.20 | 10.30 | 11.28 |
| LS8529 | 11.54 | 14.33 | 12.10 | 12.30 | 10.30 | 11.60 | 12.78 |
| LS8533R | 10.37 | 11.77 | 10.60 | 10.40 | 10.60 | 10.60 | 11.68 |
| LS8535B | 12.01 | 15.40 | 12.30 | 12.50 | 12.20 | 11.50 | 13.55 |
| P2653WB | 13.36 | 16.73 | 11.10 | 13.40 | 10.00 | 11.80 | 13.21 |
| P2823WB | 11.77 | 15.13 | 11.10 | 11.30 | 12.10 | 11.70 | 13.63 |
| PAN5Q-251 | 10.8 | 12.87 | 11.40 | 10.50 | 10.80 | 11.50 | 12.63 |
| PAN5Q-433B | 11.01 | 12.30 | 10.20 | 10.40 | 10.00 | 10.80 | 12.11 |
| PAN5Q-649R | 10.37 | 11.80 | 10.60 | 10.80 | 9.00 | 10.80 | 11.67 |
| PAN5Q-653R | 10.55 | 12.67 | 10.50 | 10.90 | 10.40 | 10.80 | 12.04 |
| PAN5Q-751BR | 10.49 | 11.90 | 11.30 | 10.40 | 10.00 | 10.00 | 11.38 |
| PAN6P-110 | 12.43 | 12.73 | 11.30 | 11.90 | 10.10 | 11.60 | 12.48 |
| PAN6Q-223 | 12.58 | 17.17 | 12.20 | 13.50 | 12.30 | 15.70 | 15.07 |
| PAN6Q-245 | 11.1 | 13.03 | 11.50 | 11.80 | 11.00 | 11.60 | 12.67 |
| PAN6Q-308B | 11.67 | 14.00 | 11.10 | 11.70 | 10.70 | 11.60 | 13.08 |
| PAN6Q-445B | 11.18 | 12.53 | 10.70 | 10.80 | 11.10 | 11.70 | 12.30 |
| PAN6Q-508R | 11.36 | 13.50 | 11.20 | 11.50 | 11.40 | 11.20 | 12.47 |
| PAN6Q-708BR | 11.44 | 14.27 | 11.20 | 12.50 | 10.50 | 11.70 | 12.91 |
| PAN6Q-745BR | 10.82 | 12.03 | 11.30 | 10.50 | 10.20 | 10.70 | 11.75 |
| Phb30Y79B | 12.09 | 12.85 | 11.27 | 11.30 | 11.40 | 11.30 | 12.89 |
| Phb31D48BR | 10.76 | 12.37 | 10.73 | 11.10 | 9.80 | 10.20 | 11.70 |
| Phb32W72B | 10.73 | 11.60 | 10.10 | 10.40 | 9.00 | 10.70 | 10.97 |
| Phb33H52B | 10.69 | 11.63 | 10.90 | 10.60 | 9.50 | 10.40 | 11.07 |
| SC608 | 15.92 | 20.77 | 16.30 | 16.40 | 16.30 | 16.50 | 18.07 |
| SC637 | 16.03 | 21.70 | 17.60 | 16.70 | 16.20 | 17.50 | 18.34 |
| Gem/ Mean | 11.43 | 13.41 | 11.28 | 11.55 | 10.68 | 11.42 | 12.56 |

`

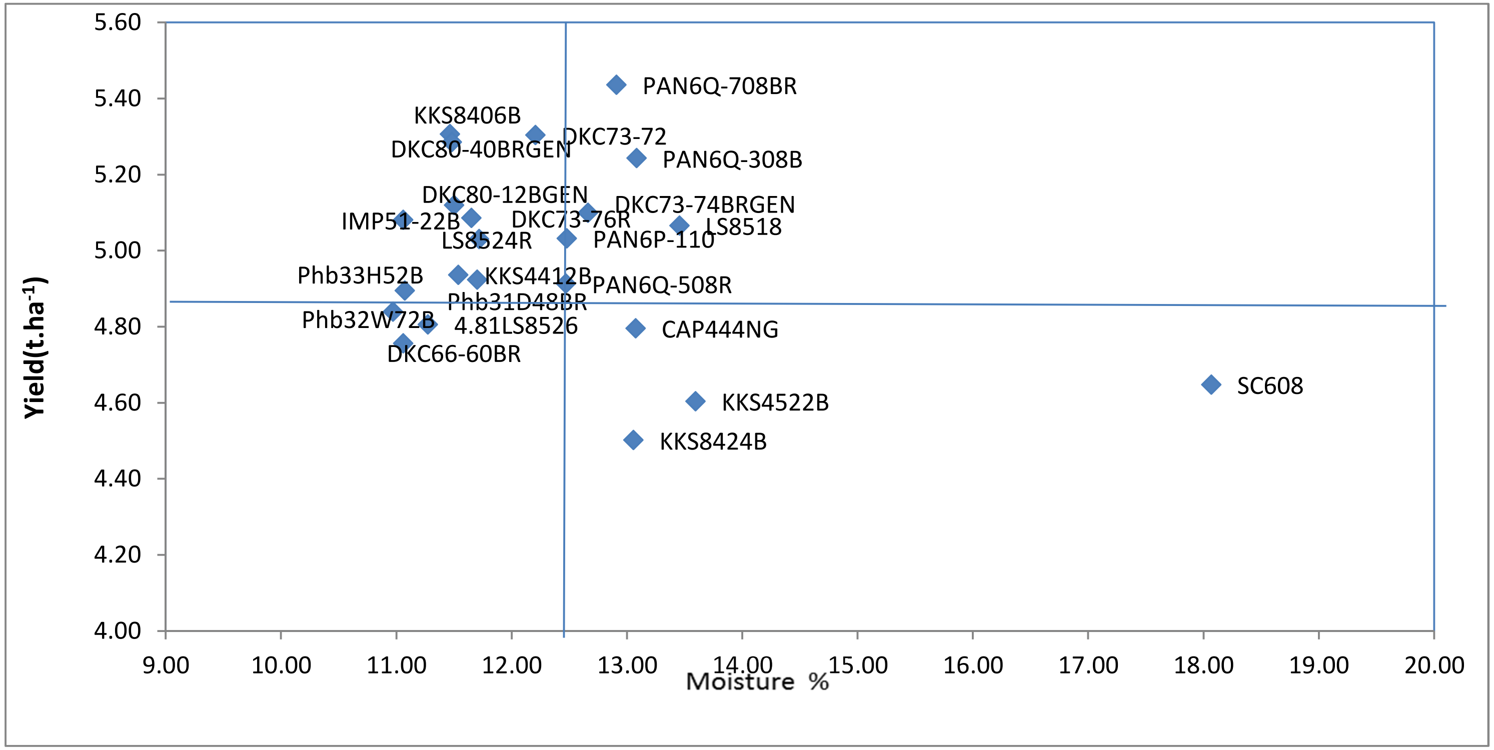


**Figure 2a** Moisture % and yield for differente yellow maize hybrids in the western region during the 2011/2012 season
**Figuur 2a** Vog % en opbrengs van verskillende geel mielie basters in die westelike gebied gedurend die 2011/2012 seisoen

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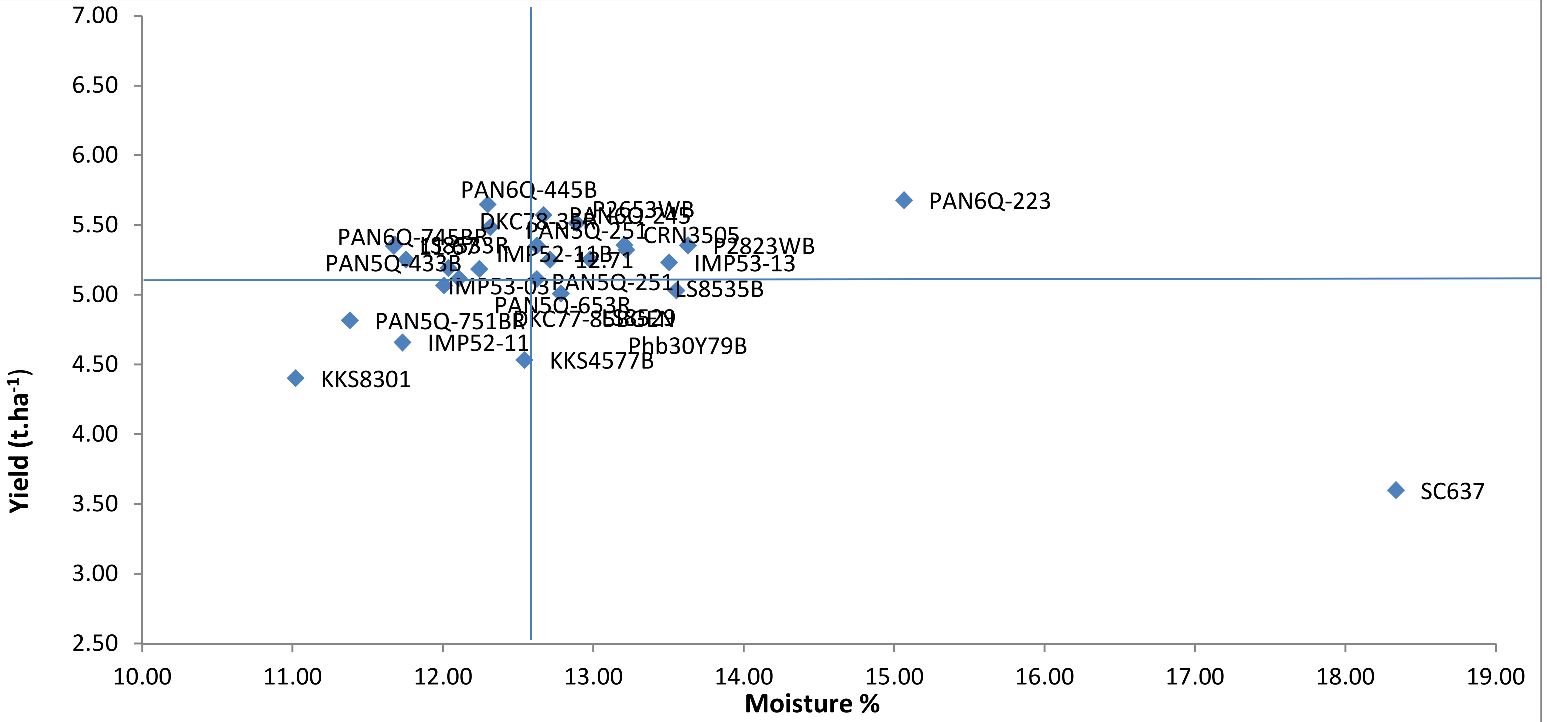


**Figure 2b** Moisture % and yield for differente white maize hybrids in the western region during the 2011/2012 season

**Figuur 2b** Vog % en opbrengs van verskillende wit mielie basters in die westelike gebied gedurend die 2011/2012 seisoen

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**Tabel 10** Gemiddelde graanopbrengs (t.ha$^{-1}$) vir mielie genotipes by verskillende westelike omgewings gedurende 2011/2012seisoen

**Table10** Mean yield(t ha$^{-1}$) for maize genotypes under different western environments during 2011/2012 season

| Genotipes Genotypes | Botha-ville(8) | Botha-ville(6) | Coligny(3) | Delarey ville(7) | Glaudina(6) | Hooge-kraal(8) | Kap steel(6) | Kap steel(9) |
|---|---|---|---|---|---|---|---|---|
| CAP444NG | 5.23 | 4.31 | 6.23 | 4.98 | 3.00 | 7.41 | 4.00 | 5.27 |
| CRN3505 | 7.26 | 7.19 | 5.75 | 5.87 | 3.80 | 7.18 | 6.22 | 6.01 |
| DKC66-60BR | 7.96 | 4.24 | 5.50 | 3.49 | 4.00 | 6.49 | 6.45 | 5.04 |
| DKC 73 - 72 | 8.01 | 6.38 | 6.02 | 4.54 | 3.93 | 9.30 | 5.53 | 3.71 |
| DKC73-74BRGEN | 7.87 | 6.35 | 5.90 | 4.39 | 3.64 | 7.30 | 5.73 | 5.23 |
| DKC73-76R | 6.02 | 5.88 | 5.68 | 3.99 | 3.74 | 6.14 | 5.96 | 5.93 |
| DKC77-85BGEN | 7.96 | 5.64 | 5.90 | 6.58 | 3.86 | 7.65 | 5.46 | 5.20 |
| DKC78-15B | 7.27 | 6.22 | 6.07 | 5.71 | 3.80 | 7.96 | 5.95 | 6.07 |
| DKC78-35R | 6.56 | 6.65 | 6.17 | 5.79 | 4.04 | 8.34 | 6.43 | 5.52 |
| DKC78-45BRGEN | 7.43 | 6.71 | 5.24 | 5.65 | 3.75 | 6.93 | 4.83 | 5.24 |
| DKC80-12BGEN | 6.10 | 6.12 | 6.32 | 4.30 | 3.31 | 8.08 | 5.45 | 5.28 |
| DKC80-40BRGEN | 7.52 | 7.47 | 5.44 | 4.75 | 3.71 | 7.71 | 5.84 | 5.87 |
| IMP51-22B | 7.38 | 5.99 | 5.43 | 4.10 | 3.57 | 6.99 | 4.01 | 5.18 |
| IMP52-11 | 5.72 | 5.00 | 5.86 | 4.83 | 2.88 | 6.93 | 4.50 | 4.43 |
| IMP52-11B | 7.55 | 6.08 | 7.18 | 5.30 | 3.62 | 7.13 | 4.97 | 5.94 |
| IMP53-03 | 7.79 | 7.14 | 6.30 | 4.80 | 3.63 | 7.27 | 5.09 | 4.24 |
| IMP53-13 | 6.43 | 5.56 | 6.22 | 7.22 | 3.18 | 7.32 | 4.12 | 3.96 |
| KKS4412B | 7.04 | 5.48 | 6.38 | 3.79 | 3.49 | 7.49 | 5.68 | 3.95 |
| KKS4522B | 6.16 | 4.79 | 4.29 | 4.10 | 3.38 | 5.90 | 5.46 | 4.82 |
| KKS4577B | 5.04 | 5.32 | 6.06 | 5.46 | 3.20 | 6.74 | 5.35 | 3.85 |
| KKS8301 | 6.21 | 5.66 | 4.90 | 4.90 | 2.83 | 6.07 | 4.77 | 4.61 |
| KKS8406B | 8.00 | 6.10 | 6.03 | 4.53 | 4.20 | 7.00 | 5.26 | 4.65 |
| KKS8424B | 5.56 | 4.43 | 5.09 | 4.63 | 3.29 | 6.53 | 4.27 | 3.75 |
| LS8518 | 7.96 | 5.25 | 6.07 | 4.44 | 3.40 | 6.57 | 5.58 | 4.56 |
| LS8524R | 6.57 | 4.59 | 6.44 | 4.03 | 3.36 | 8.07 | 5.64 | 4.26 |
| LS8526 | 7.08 | 4.49 | 5.80 | 3.67 | 3.23 | 7.27 | 5.12 | 4.35 |
| LS8529 | 6.54 | 6.24 | 5.23 | 5.77 | 2.98 | 6.53 | 4.47 | 4.67 |
| LS8533R | 7.17 | 6.51 | 6.34 | 5.43 | 4.12 | 8.18 | 4.92 | 5.74 |
| LS8535B | 7.72 | 5.36 | 5.42 | 4.88 | 3.24 | 6.95 | 4.84 | 4.33 |
| P2653WB | 7.06 | 7.05 | 5.60 | 5.45 | 3.59 | 7.24 | 5.58 | 5.90 |
| P2823WB | 7.49 | 5.83 | 5.86 | 5.49 | 4.20 | 7.58 | 6.29 | 5.22 |
| PAN5Q-251 | 6.73 | 6.05 | 6.08 | 5.75 | 3.86 | 6.29 | 5.32 | 4.62 |
| PAN5Q-433B | 7.05 | 4.56 | 6.43 | 5.30 | 3.77 | 7.42 | 6.30 | 4.86 |
| PAN5Q-649R | 7.46 | 6.09 | 6.11 | 5.58 | 4.18 | 7.29 | 6.25 | 5.03 |
| PAN5Q-653R | 7.12 | 6.75 | 6.42 | 5.04 | 3.60 | 7.28 | 6.31 | 4.31 |
| PAN5Q-751BR | 7.03 | 5.12 | 5.86 | 4.98 | 2.89 | 6.68 | 5.38 | 4.11 |
| PAN6P-110 | 6.89 | 4.98 | 5.87 | 4.13 | 3.59 | 6.84 | 5.05 | 5.30 |
| PAN6Q-223 | 7.93 | 7.19 | 6.36 | 5.94 | 3.38 | 7.16 | 5.82 | 4.81 |
| PAN6Q-245 | 8.58 | 4.23 | 6.91 | 6.46 | 3.20 | 7.11 | 5.53 | 6.05 |
| PAN6Q-308B | 7.09 | 5.59 | 6.02 | 5.76 | 3.47 | 8.22 | 5.63 | 3.89 |
| PAN6Q-445B | 6.95 | 5.30 | 6.45 | 5.69 | 3.38 | 8.04 | 5.64 | 4.43 |
| PAN6Q-508R | 6.41 | 3.46 | 5.96 | 4.20 | 3.43 | 7.30 | 6.24 | 4.98 |
| PAN6Q-708BR | 7.55 | 7.16 | 5.72 | 4.58 | 3.89 | 7.63 | 5.69 | 5.90 |
| PAN6Q-745BR | 7.03 | 5.37 | 6.87 | 5.02 | 3.75 | 7.17 | 3.82 | 5.48 |
| Phb30Y79B | 5.77 | 5.43 | 7.04 | 6.05 | 3.02 | 8.11 | 5.59 | 4.39 |
| Phb31D48BR | 6.90 | 5.45 | 5.40 | 3.44 | 3.55 | 7.61 | 6.23 | 5.02 |
| Phb32W72B | 6.59 | 6.19 | 6.29 | 4.34 | 3.43 | 7.81 | 4.10 | 5.33 |
| Phb33H52B | 6.89 | 5.01 | 5.30 | 4.48 | 3.04 | 6.66 | 4.42 | 4.25 |
| SC608 | 6.34 | 3.77 | 5.59 | 3.66 | 4.19 | 7.97 | 6.37 | 3.30 |
| SC637 | 3.69 | 4.24 | 4.41 | 3.92 | 2.81 | 5.57 | 4.33 | 2.76 |
| Gem/ Mean | 6.91 | 5.64 | 5.92 | 4.94 | 3.53 | 7.25 | 5.36 | 4.83 |
| Cv% | 10.70 | 19.40 | 11.40 | 9.30 | 12.70 | 10.60 | 17.60 | 16.70 |
| $LSD_{(0.05)}$ | 1.203 | 1.773 | 1.090 | 0.739 | 0.727 | 1.2482 | 1.531 | 1.310 |

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**Tabel 10** Vervolg
**Table 10** Continued

| Genotipes Genotypes | Kroon stad(12) | Leeudoring-stad(3) | Nampo(3) | Lichten burg(9) | Ottosdal(3) | Potchef-stroom(3) | Rushof(3) |
|---|---|---|---|---|---|---|---|
| CAP444NG | 4.42 | 6.90 | 2.90 | 2.65 | 4.26 | 6.29 | 4.18 |
| CRN3505 | 4.42 | 7.35 | 2.37 | 3.18 | 4.78 | 5.63 | 3.81 |
| DKC66-60BR | 5.47 | 4.55 | 2.23 | 3.27 | 2.51 | 5.33 | 3.95 |
| DKC 73 - 72 | 5.57 | 6.22 | 1.94 | 3.98 | 3.52 | 5.66 | 3.91 |
| DKC73-74BRGEN | 4.09 | 6.27 | 2.56 | 3.48 | 3.92 | 5.74 | 3.90 |
| DKC73-76R | 5.14 | 5.76 | 2.43 | 4.64 | 2.77 | 5.80 | 4.71 |
| DKC77-85BGEN | 4.51 | 7.25 | 2.60 | 3.24 | 4.95 | 7.22 | 4.36 |
| DKC78-15B | 4.13 | 7.57 | 2.23 | 2.96 | 5.50 | 6.53 | 4.05 |
| DKC78-35R | 3.32 | 7.92 | 2.33 | 3.03 | 4.00 | 6.31 | 3.77 |
| DKC78-45BRGEN | 4.53 | 6.80 | 2.19 | 2.72 | 4.99 | 6.01 | 3.70 |
| DKC80-12BGEN | 5.03 | 6.45 | 2.69 | 3.61 | 3.43 | 6.41 | 3.88 |
| DKC80-40BRGEN | 3.70 | 5.74 | 2.62 | 3.97 | 3.04 | 6.49 | 4.11 |
| IMP51-22B | 4.35 | 5.63 | 2.94 | 4.42 | 3.30 | 6.92 | 4.58 |
| IMP52-11 | 3.60 | 5.29 | 2.01 | 3.08 | 3.61 | 6.09 | 3.57 |
| IMP52-11B | 3.98 | 6.94 | 1.94 | 3.39 | 3.64 | 6.27 | 3.72 |
| IMP53-03 | 4.53 | 6.60 | 2.11 | 3.21 | 3.34 | 6.06 | 3.97 |
| IMP53-13 | 4.23 | 7.04 | 3.16 | 3.22 | 4.59 | 6.28 | 4.63 |
| KKS4412B | 4.36 | 7.52 | 3.13 | 2.93 | 3.31 | 5.79 | 4.24 |
| KKS4522B | 4.29 | 7.17 | 1.90 | 2.57 | 4.05 | 5.38 | 3.55 |
| KKS4577B | 3.92 | 4.51 | 2.58 | 2.99 | 3.34 | 5.22 | 3.67 |
| KKS8301 | 3.57 | 5.91 | 2.56 | 2.88 | 3.28 | 5.53 | 4.16 |
| KKS8406B | 5.08 | 6.92 | 2.90 | 3.79 | 4.28 | 5.90 | 4.35 |
| KKS8424B | 4.78 | 5.59 | 2.60 | 3.07 | 3.98 | 5.35 | 3.76 |
| LS8518 | 3.98 | 6.96 | 2.71 | 3.74 | 2.45 | 5.93 | 3.63 |
| LS8524R | 4.40 | 5.70 | 2.74 | 2.73 | 3.87 | 5.91 | 4.10 |
| LS8526 | 4.42 | 5.96 | 2.39 | 3.88 | 2.88 | 5.68 | 4.02 |
| LS8529 | 4.93 | 6.13 | 2.53 | 3.30 | 3.56 | 6.14 | 4.04 |
| LS8533R | 3.91 | 6.30 | 2.98 | 3.82 | 4.82 | 6.85 | 4.24 |
| LS8535B | 4.07 | 7.03 | 2.63 | 3.21 | 4.66 | 5.84 | 4.46 |
| P2653WB | 4.22 | 6.93 | 2.02 | 3.99 | 4.38 | 6.22 | 4.23 |
| P2823WB | 3.79 | 7.05 | 2.62 | 3.36 | 3.08 | 5.97 | 4.28 |
| PAN5Q-251 | 4.14 | 5.72 | 2.91 | 2.97 | 4.04 | 6.63 | 4.40 |
| PAN5Q-433B | 3.76 | 5.78 | 3.11 | 3.20 | 4.29 | 6.84 | 4.14 |
| PAN5Q-649R | 4.07 | 7.63 | 3.47 | 3.54 | 3.78 | 6.36 | 4.10 |
| PAN5Q-653R | 4.16 | 6.09 | 2.81 | 3.78 | 4.17 | 7.07 | 4.10 |
| PAN5Q-751BR | 4.30 | 6.02 | 2.91 | 2.90 | 4.20 | 6.16 | 4.23 |
| PAN6P-110 | 4.53 | 6.36 | 2.42 | 2.67 | 3.91 | 7.14 | 4.23 |
| PAN6Q-223 | 4.23 | 7.11 | 1.89 | 4.54 | 4.42 | 8.00 | 4.39 |
| PAN6Q-245 | 4.64 | 8.02 | 2.11 | 3.65 | 4.91 | 7.72 | 4.34 |
| PAN6Q-308B | 4.03 | 6.53 | 3.03 | 2.72 | 4.45 | 7.68 | 3.80 |
| PAN6Q-445B | 5.45 | 7.82 | 2.78 | 5.16 | 3.96 | 8.14 | 4.39 |
| PAN6Q-508R | 4.04 | 6.35 | 2.69 | 3.11 | 3.44 | 7.22 | 4.13 |
| PAN6Q-708BR | 4.76 | 7.21 | 2.63 | 3.13 | 3.83 | 7.45 | 4.23 |
| PAN6Q-745BR | 4.74 | 7.80 | 2.88 | 3.98 | 3.51 | 7.00 | 4.45 |
| Phb30Y79B | 4.92 | 9.00 | 3.46 | 3.39 | 4.92 | 6.54 | 4.09 |
| Phb31D48BR | 3.91 | 5.33 | 2.61 | 3.97 | 3.26 | 5.49 | 4.36 |
| Phb32W72B | 4.55 | 6.41 | 2.24 | 3.63 | 2.93 | 6.11 | 2.59 |
| Phb33H52B | 5.24 | 6.35 | 2.26 | 2.99 | 3.07 | 6.51 | 4.37 |
| SC608 | 4.06 | 5.85 | 1.41 | 1.82 | 3.88 | 6.09 | 3.90 |
| SC637 | 3.19 | 4.76 | 1.79 | 2.71 | 2.67 | 3.38 | 2.96 |
| Gem/ Mean | 4.35 | 6.52 | 2.54 | 3.36 | 3.83 | 6.28 | 4.05 |
| Cv% | 17.30 | 16.60 | 17.60 | 19.80 | 15.00 | 10.60 | 9.70 |
| $LSD_{(0.05)}$ | 1.222 | 1.753 | 0.725 | 1.080 | 0.933 | 1.083 | 0.640 |

1=Agricol, 3=GCI, 4=K2, 5=Link seeds, 6=Monsanto, 7=North West, 8=Pannar, 9=Pioneer,12=Capstone

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**Tabel 10** Vervolg

**Table 10** Continued

| Genotipes Genotypes | Viljoen-skroon(1) | Viljoen-skroon(6) | Twee buffels(3) | Wessels bron(3) | Wolmaran-stad(5) | Gem Mean |
|---|---|---|---|---|---|---|
| CAP444NG | 4.75 | 4.24 | 4.87 | 6.25 | 3.76 | 4.80 |
| CRN3505 | 4.22 | 4.59 | 5.21 | 6.87 | 4.73 | 5.32 |
| DKC66-60BR | 5.79 | 5.28 | 4.61 | 5.35 | 3.62 | 4.76 |
| DKC 73 - 72 | 5.45 | 4.90 | 5.73 | 7.50 | 4.29 | 5.30 |
| DKC73-74BRGEN | 5.05 | 4.61 | 5.50 | 5.61 | 4.85 | 5.10 |
| DKC73-76R | 5.12 | 5.19 | 5.64 | 6.31 | 4.85 | 5.09 |
| DKC77-85BGEN | 5.99 | 4.89 | 4.86 | 7.15 | 4.43 | 5.48 |
| DKC78-15B | 4.31 | 4.30 | 5.22 | 6.76 | 4.46 | 5.35 |
| DKC78-35R | 4.37 | 5.66 | 4.20 | 5.99 | 4.70 | 5.25 |
| DKC78-45BRGEN | 5.88 | 5.65 | 5.21 | 6.21 | 5.42 | 5.25 |
| DKC80-12BGEN | 4.72 | 4.47 | 5.99 | 5.68 | 5.07 | 5.12 |
| DKC80-40BRGEN | 4.62 | 5.04 | 6.62 | 7.71 | 4.17 | 5.31 |
| IMP51-22B | 6.34 | 4.81 | 4.39 | 6.91 | 4.38 | 5.08 |
| IMP52-11 | 5.00 | 4.11 | 5.68 | 6.13 | 4.87 | 4.66 |
| IMP52-11B | 4.33 | 4.15 | 6.16 | 6.48 | 4.94 | 5.19 |
| IMP53-03 | 4.12 | 3.95 | 5.34 | 7.32 | 4.51 | 5.07 |
| IMP53-13 | 5.67 | 5.09 | 6.40 | 5.85 | 4.46 | 5.23 |
| KKS4412B | 5.03 | 3.77 | 4.34 | 6.19 | 4.84 | 4.94 |
| KKS4522B | 4.92 | 4.82 | 4.93 | 5.52 | 4.07 | 4.60 |
| KKS4577B | 4.41 | 4.34 | 5.29 | 5.24 | 4.16 | 4.53 |
| KKS8301 | 4.58 | 3.34 | 2.79 | 5.75 | 3.74 | 4.40 |
| KKS8406B | 5.66 | 4.64 | 5.93 | 5.99 | 4.49 | 5.29 |
| KKS8424B | 5.09 | 3.42 | 5.26 | 5.79 | 3.81 | 4.50 |
| LS8518 | 5.39 | 4.96 | 5.87 | 6.95 | 4.96 | 5.07 |
| LS8524R | 5.82 | 4.91 | 5.85 | 6.45 | 5.20 | 5.03 |
| LS8526 | 5.03 | 3.40 | 4.61 | 8.03 | 4.81 | 4.81 |
| LS8529 | 5.11 | 4.28 | 6.00 | 6.57 | 5.15 | 5.01 |
| LS8533R | 5.34 | 4.01 | 4.85 | 6.52 | 5.11 | 5.36 |
| LS8535B | 4.89 | 4.72 | 5.84 | 6.26 | 4.25 | 5.03 |
| P2653WB | 5.60 | 4.57 | 5.54 | 6.37 | 5.61 | 5.36 |
| P2823WB | 5.12 | 5.37 | 6.36 | 6.97 | 5.17 | 5.35 |
| PAN5Q-251 | 4.86 | 5.79 | 5.28 | 5.98 | 4.86 | 5.11 |
| PAN5Q-433B | 4.58 | 3.87 | 5.98 | 6.83 | 4.32 | 5.12 |
| PAN5Q-649R | 4.30 | 4.59 | 5.33 | 6.60 | 5.24 | 5.35 |
| PAN5Q-653R | 4.51 | 4.33 | 5.17 | 5.82 | 4.99 | 5.19 |
| PAN5Q-751BR | 4.24 | 3.70 | 5.32 | 6.02 | 4.27 | 4.82 |
| PAN6P-110 | 3.91 | 4.34 | 6.36 | 6.50 | 5.62 | 5.03 |
| PAN6Q-223 | 6.11 | 4.25 | 7.52 | 6.95 | 5.56 | 5.68 |
| PAN6Q-245 | 5.70 | 4.11 | 6.10 | 6.97 | 5.09 | 5.57 |
| PAN6Q-308B | 4.78 | 5.11 | 6.06 | 5.87 | 5.15 | 5.24 |
| PAN6Q-445B | 5.80 | 4.68 | 7.20 | 6.73 | 5.00 | 5.65 |
| PAN6Q-508R | 4.26 | 4.06 | 5.56 | 6.65 | 4.77 | 4.91 |
| PAN6Q-708BR | 4.88 | 4.84 | 6.05 | 6.79 | 4.80 | 5.44 |
| PAN6Q-745BR | 4.20 | 4.32 | 6.20 | 7.32 | 4.14 | 5.25 |
| Phb30Y79B | 6.08 | 3.64 | 6.42 | 6.44 | 5.96 | 5.51 |
| Phb31D48BR | 4.84 | 5.72 | 5.26 | 6.08 | 4.04 | 4.92 |
| Phb32W72B | 5.38 | 3.38 | 5.06 | 6.35 | 4.09 | 4.84 |
| Phb33H52B | 5.84 | 5.35 | 4.89 | 6.75 | 4.25 | 4.89 |
| SC608 | 4.15 | 4.30 | 5.09 | 6.26 | 4.95 | 4.65 |
| SC637 | 3.46 | 3.37 | 4.02 | 4.14 | 3.79 | 3.60 |
| Gem/ Mean | 4.99 | 4.50 | 5.48 | 6.39 | 4.68 | 5.07 |
| Cv% | 11.00 | 18.50 | 13.20 | 11.70 | 12.20 | 15.10 |
| $LSD_{(0.05)}$ | 0.888 | 1.348 | 1.456 | 1.218 | 0.921 | 1.225 |

1=Agricol, 3=GCI, 4=K2, 5=Link seeds, 6=Monsanto, 7=North West, 8=Pannar, 9=Pioneer,12=Capstone

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**Table 11** Die IPCA 1 en IPCA 2- waardes vir 20 omgewings
**Table11** The IPCA 1 and IPCA 2 scores for 20 enviroments

| Omgewing Environment | Omg /Env. .No | Gem Mean | IPCA1 Waarde Score | IPCA2 Waarde Score |
|---|---|---|---|---|
| Bothaville(6) | 1 | 5.64 | 0.2723 | -1.9595 |
| Bothaville(8) | 2 | 6.91 | 0.6257 | -0.5316 |
| Coligny(3) | 3 | 5.92 | -0.3381 | 0.4553 |
| Delareyville(7) | 4 | 4.94 | -1.3725 | -0.4314 |
| Glaudina(6) | 5 | 3.53 | 0.5409 | -0.0330 |
| Hoogekraal(8) | 6 | 7.25 | -0.0215 | 0.2886 |
| Kapsteel(6) | 7 | 5.36 | 0.7256 | 0.1724 |
| Kapsteel(9) | 8 | 4.83 | 0.2287 | -0.8085 |
| Kroonstad(12) | 9 | 4.35 | 0.4583 | 0.6704 |
| Leeudoringstad(3) | 10 | 6.52 | -1.2272 | -0.2106 |
| Lichtenburg(9) | 11 | 3.36 | 0.5762 | 0.0734 |
| Nampo(3) | 12 | 2.54 | 0.0049 | 0.4759 |
| Ottosdal(3) | 13 | 3.83 | -1.0158 | -0.0675 |
| Potchefstroom(3) | 14 | 6.29 | -0.5696 | 0.3467 |
| Rushof(3) | 15 | 4.05 | 0.2389 | 0.3757 |
| Tweebuffels(3) | 16 | 5.23 | -0.2932 | 0.4804 |
| Viljoenskroon(1) | 17 | 4.99 | 0.3202 | 0.5171 |
| Viljoenskroon(6) | 18 | 4.50 | 0.7776 | -0.0786 |
| Wesselsbron(3) | 19 | 6.39 | 0.2541 | 0.0598 |
| Wolmaranstad(5) | 20 | 4.68 | -0.1857 | 0.2050 |

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**Tabel 12** Gemiddelde opbrengs(t.ha$^{-1}$), orde,IPCA1 en IPCA2- waardes en AMMI stabiliteits-waarde (ASW) vir mielie genotipes geanaliseer volgens die AMMI model oor 20 westelike omgewings vir die 2011/2012 seisoen
**Table12** Mean yield (t.ha$^{-1}$),rank, IPCA1 and IPCA2 scores and AMMI stability value (ASV) of maize genotypes analysed according to the AMMI model over 20 western environments during the 2011/2012 season

| Genotipes Genotypes | Gen.No. Gen.No. | Gem/Mean Opb./yield | Orde Rank | IPCA1 Score | IPCA2 Score | ASW ASV | Orde Rank |
|---|---|---|---|---|---|---|---|
| CAP444NG | 1 | 4.78 | 42 | -0.51465 | 0.38375 | 0.694 | 39 |
| CRN3505 | 2 | 5.31 | 12 | -0.1627 | -0.82488 | 0.845 | 45 |
| DKC66-60BR | 3 | 4.75 | 43 | 1.21115 | 0.41171 | 1.423 | 50 |
| DKC73-72 | 4 | 5.27 | 14 | 0.55248 | 0.02314 | 0.622 | 34 |
| DKC73-74BRGEN | 5 | 5.09 | 26 | 0.2969 | -0.32883 | 0.469 | 27 |
| DKC73-76R | 6 | 5.07 | 27 | 0.74429 | 0.03219 | 0.838 | 44 |
| DKC77-85BGEN | 7 | 5.48 | 5 | -0.35717 | -0.12382 | 0.420 | 23 |
| DKC78-15B | 8 | 5.35 | 8 | -0.4624 | -0.4776 | 0.706 | 40 |
| DKC78-35R | 9 | 5.26 | 16 | -0.22904 | -0.62223 | 0.673 | 37 |
| DKC78-45BRGEN | 10 | 5.24 | 18 | -0.12401 | -0.52486 | 0.543 | 31 |
| DKC80-12BGEN | 11 | 5.12 | 23 | 0.08312 | 0.10054 | 0.137 | 2 |
| DKC80-40BRGEN | 12 | 5.29 | 13 | 0.53331 | -0.64779 | 0.883 | 47 |
| IMP51-22B | 13 | 5.07 | 28 | 0.5228 | -0.05033 | 0.590 | 33 |
| IMP52-11 | 14 | 4.63 | 44 | -0.12689 | 0.19086 | 0.238 | 12 |
| IMP52-11B | 15 | 5.16 | 22 | -0.20567 | -0.37311 | 0.439 | 25 |
| IMP53-03 | 16 | 5.05 | 30 | 0.11365 | -0.4976 | 0.514 | 30 |
| IMP53-13 | 17 | 5.19 | 21 | -0.75169 | 0.11365 | 0.853 | 46 |
| KKS4412B | 18 | 4.92 | 36 | 0.07529 | 0.18957 | 0.208 | 8 |
| KKS4522B | 19 | 4.59 | 46 | 0.02497 | -0.02864 | 0.040 | 1 |
| KKS4577B | 20 | 4.52 | 47 | 0.02781 | 0.17826 | 0.181 | 5 |
| KKS8301 | 21 | 4.39 | 49 | 0.00557 | -0.38065 | 0.381 | 18 |
| KKS8406B | 22 | 5.26 | 15 | 0.2252 | -0.0452 | 0.257 | 15 |
| KKS8424B | 23 | 4.48 | 48 | -0.10516 | 0.45498 | 0.470 | 28 |
| LS8518 | 24 | 5.05 | 29 | 0.35335 | 0.08436 | 0.406 | 21 |
| LS8524R | 25 | 5.02 | 31 | 0.22672 | 0.66347 | 0.711 | 41 |
| LS8526 | 26 | 4.79 | 41 | 0.42391 | 0.41131 | 0.630 | 35 |
| LS8529 | 27 | 4.99 | 34 | -0.1496 | -0.15689 | 0.230 | 10 |
| LS8533R | 28 | 5.36 | 7 | -0.1829 | -0.29794 | 0.362 | 17 |
| LS8535B | 29 | 5.00 | 33 | -0.14285 | -0.04882 | 0.168 | 4 |
| P2653WB | 30 | 5.34 | 10 | -0.0394 | -0.57027 | 0.572 | 32 |
| P2823WB | 31 | 5.34 | 11 | 0.18222 | -0.1332 | 0.244 | 13 |
| PAN5Q-251 | 32 | 5.10 | 25 | 0.02441 | -0.13672 | 0.139 | 3 |
| PAN5Q-433B | 33 | 5.11 | 24 | -0.109 | 0.3737 | 0.393 | 20 |
| PAN5Q-649R | 34 | 5.35 | 9 | -0.13128 | -0.21672 | 0.262 | 16 |
| PAN5Q-653R | 35 | 5.20 | 20 | 0.01522 | -0.18646 | 0.187 | 6 |
| PAN5Q-751BR | 36 | 4.80 | 40 | -0.17418 | 0.15684 | 0.251 | 14 |
| PAN6P-110 | 37 | 5.01 | 32 | -0.08112 | 0.21958 | 0.238 | 11 |
| PAN6Q-223 | 38 | 5.67 | 1 | -0.29795 | -0.24189 | 0.413 | 22 |
| PAN6Q-245 | 39 | 5.54 | 3 | -0.65253 | 0.2318 | 0.769 | 43 |
| PAN6Q-308B | 40 | 5.23 | 19 | -0.40556 | 0.19038 | 0.494 | 29 |
| PAN6Q-445B | 41 | 5.63 | 2 | -0.31674 | 0.56762 | 0.670 | 36 |
| PAN6Q-508R | 42 | 4.92 | 35 | -0.02002 | 0.74921 | 0.750 | 42 |
| PAN6Q-708BR | 43 | 5.43 | 6 | 0.09885 | -0.44578 | 0.459 | 26 |
| PAN6Q-745BR | 44 | 5.24 | 17 | -0.3373 | 0.08696 | 0.389 | 19 |
| Phb30Y79B | 45 | 5.52 | 4 | -1.01485 | 0.51638 | 1.253 | 49 |
| Phb31D48BR | 46 | 4.90 | 37 | 0.86421 | 0.03775 | 0.972 | 48 |
| Phb32W72B | 47 | 4.84 | 39 | 0.02992 | -0.19833 | 0.201 | 7 |
| Phb33H52B | 48 | 4.89 | 38 | 0.24939 | 0.32262 | 0.427 | 24 |
| SC608 | 49 | 4.63 | 45 | 0.15614 | 0.66494 | 0.688 | 38 |
| SC637 | 50 | 3.59 | 50 | 0.05377 | 0.20299 | 0.212 | 9 |

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**Table 13** Die AMMI model sleeks vim die beste vier genotipes se gemiddelde opbrengste in verhouding tot die omgewings geëvalueer gedurende 2011/2012seisoen

**Table 13** The AMMI modal's best four gentotype selection for mean yield in relation to the environments evaluted during the 2011/2012season

| Omgewings Environments | Gem Mean | IPCA 1 waarde Score | AMMI seleksies/selection | | | |
|---|---|---|---|---|---|---|
| Viljoenskroon(6) | 4.50 | 0.7776 | DKC80-40BRGEN | DKC73-72 | DKC66-60BR | DKC73-76R |
| Kapsteel(6) | 5.36 | 0.7256 | DKC66-60BR | DKC73-72 | DKC73-76R | DKC80-40BRGEN |
| Bothaville(8) | 6.91 | 0.6257 | DKC80-40BRGEN | PAN6Q-708BR | CRN3505 | P2653WB |
| Lichtenburg(9) | 3.36 | 0.5762 | DKC73-72 | DKC80-40BRGEN | DKC73-76R | PAN6Q-445B |
| Glaudina(6) | 3.53 | 0.5409 | DKC80-40BRGEN | DKC73-72 | PAN6Q-223 | PAN6Q-708BR |
| Kroonstad(12) | 4.35 | 0.4583 | PAN6Q-445B | DKC66-60BR | LS8524R | DKC73-72 |
| Viljoenskroon(1) | 4.99 | 0.3202 | PAN6Q-445B | Phb30Y79B | PAN6Q-245 | DKC73-72 |
| Bothaville(6) | 5.64 | 0.2723 | CRN3505 | DKC80-40BRGEN | P2653WB | DKC78-35R |
| Wesselsbron(3) | 6.39 | 0.2541 | PAN6Q-223 | PAN6Q-445B | PAN6Q-708BR | DKC73-72 |
| Rushof(3) | 4.05 | 0.2389 | PAN6Q-445B | PAN6Q-223 | PAN6Q-245 | Phb30Y79B |
| Kapsteel(9) | 4.83 | 0.2287 | DKC80-40BRGEN | CRN3505 | PAN6Q-708BR | PAN6Q-223 |
| Nampo(3) | 2.54 | 0.0049 | PAN6Q-445B | Phb30Y79B | PAN6Q-245 | PAN6Q-223 |
| Hoogekraal(8) | 7.25 | -0.0215 | PAN6Q-445B | Phb30Y79B | PAN6Q-245 | PAN6Q-223 |
| Wolmaranstad(5) | 4.68 | -0.1857 | Phb30Y79B | PAN6Q-445B | PAN6Q-245 | PAN6Q-223 |
| Tweebuffels(3) | 5.23 | -0.2932 | Phb30Y79B | PAN6Q-445B | PAN6Q-245 | PAN6Q-223 |
| Coligny(3) | 5.92 | -0.3381 | Phb30Y79B | PAN6Q-445B | PAN6Q-245 | PAN6Q-223 |
| Potchefstroom(3) | 6.29 | -0.5696 | Phb30Y79B | PAN6Q-445B | PAN6Q-245 | PAN6Q-223 |
| Ottosdal(3) | 3.83 | -1.0158 | Phb30Y79B | PAN6Q-245 | PAN6Q-223 | IMP53-13 |
| Leeudoringstad(3) | 6.52 | -1.2272 | Phb30Y79B | PAN6Q-245 | IMP53-13 | PAN6Q-223 |
| Delareyville(7) | 4.94 | -1.3725 | Phb30Y79B | PAN6Q-245 | DKC78-15B | PAN6Q-223 |

1=Agricol, 3=GCI, 4=K2, 5=Link seeds, 6=Monsanto, 7=North West, 8=Pannar, 9=Pioneer,12=Capstone

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**Tabel 14** Opsomming van alle eienskappe vir 2011/2012 seisoen
**Table 14** Summary of mean values for all characteristics for 2011/2012 season

| Genotipes<br>Genotypes | Omval %<br>Logded | Spruite %<br>Tillering | Koppe plant$^{-1}$<br>Ears plant$^{-1}$ | Graan vog%<br>Grain moist.% | Graan opbrengs<br>Grain yield (t.ha$^{-1}$) |
|---|---|---|---|---|---|
| CAP444NG | 3.16 | 38.73 | 1.83 | 13.08 | 4.80 |
| CRN3505 | 0.00 | 40.97 | 1.98 | 13.22 | 5.32 |
| DKC66-60BR | 0.47 | 25.04 | 1.50 | 11.06 | 4.76 |
| DKC 73 - 72 | 0.88 | 25.13 | 1.33 | 12.21 | 5.30 |
| DKC73-74BRGEN | 1.43 | 20.83 | 1.27 | 12.66 | 5.10 |
| DKC73-76R | 0.98 | 24.71 | 1.21 | 11.65 | 5.09 |
| DKC77-85BGEN | 2.56 | 42.67 | 1.97 | 12.31 | 5.48 |
| DKC78-15B | 1.82 | 36.94 | 1.90 | 12.63 | 5.35 |
| DKC78-35R | 0.69 | 37.63 | 1.84 | 12.98 | 5.25 |
| DKC78-45BRGEN | 2.57 | 32.68 | 1.87 | 12.71 | 5.25 |
| DKC80-12BGEN | 0.43 | 27.96 | 1.72 | 11.50 | 5.12 |
| DKC80-40BRGEN | 0.00 | 22.61 | 1.89 | 11.47 | 5.31 |
| IMP51-22B | 0.42 | 43.49 | 1.76 | 11.06 | 5.08 |
| IMP52-11 | 1.37 | 63.02 | 1.63 | 11.73 | 4.66 |
| IMP52-11B | 0.00 | 62.40 | 1.76 | 12.24 | 5.19 |
| IMP53-03 | 0.00 | 53.06 | 1.65 | 12.01 | 5.07 |
| IMP53-13 | 0.00 | 42.85 | 1.92 | 13.50 | 5.23 |
| KKS4412B | 0.00 | 28.48 | 1.60 | 11.54 | 4.94 |
| KKS4522B | 0.00 | 20.20 | 1.28 | 13.60 | 4.60 |
| KKS4577B | 0.42 | 29.39 | 1.57 | 12.54 | 4.53 |
| KKS8301 | 0.43 | 23.02 | 1.30 | 11.02 | 4.40 |
| KKS8406B | 0.68 | 20.02 | 1.55 | 11.48 | 5.29 |
| KKS8424B | 0.21 | 16.78 | 1.33 | 13.06 | 4.50 |
| LS8518 | 1.03 | 44.52 | 1.56 | 13.46 | 5.07 |
| LS8524R | 0.21 | 36.11 | 1.54 | 11.72 | 5.03 |
| LS8526 | 2.97 | 26.99 | 1.77 | 11.28 | 4.81 |
| LS8529 | 0.00 | 33.77 | 1.82 | 12.78 | 5.01 |
| LS8533R | 2.60 | 45.90 | 1.85 | 11.68 | 5.36 |
| LS8535B | 0.21 | 23.16 | 1.86 | 13.55 | 5.03 |
| P2653WB | 1.45 | 54.37 | 1.52 | 13.21 | 5.36 |
| P2823WB | 0.63 | 55.60 | 1.82 | 13.63 | 5.35 |
| PAN5Q-251 | 0.00 | 20.45 | 1.65 | 12.63 | 5.11 |
| PAN5Q-433B | 3.05 | 36.29 | 1.93 | 12.11 | 5.12 |
| PAN5Q-649R | 0.21 | 20.26 | 1.82 | 11.67 | 5.35 |
| PAN5Q-653R | 0.73 | 23.50 | 1.61 | 12.04 | 5.19 |
| PAN5Q-751BR | 0.21 | 22.96 | 1.65 | 11.38 | 4.82 |
| PAN6P-110 | 0.69 | 33.57 | 1.83 | 12.48 | 5.03 |
| PAN6Q-223 | 1.39 | 56.45 | 2.06 | 15.07 | 5.68 |
| PAN6Q-245 | 2.28 | 41.94 | 2.03 | 12.67 | 5.57 |
| PAN6Q-308B | 0.89 | 31.31 | 1.87 | 13.08 | 5.24 |
| PAN6Q-445B | 0.00 | 57.75 | 2.10 | 12.30 | 5.65 |
| PAN6Q-508R | 1.29 | 36.88 | 2.00 | 12.47 | 4.91 |
| PAN6Q-708BR | 0.46 | 40.07 | 2.02 | 12.91 | 5.44 |
| PAN6Q-745BR | 2.60 | 47.34 | 2.08 | 11.75 | 5.25 |
| Phb30Y79B | 2.55 | 50.06 | 1.56 | 12.89 | 5.51 |
| Phb31D48BR | 0.42 | 28.80 | 1.59 | 11.70 | 4.92 |
| Phb32W72B | 1.01 | 31.97 | 1.72 | 10.97 | 4.84 |
| Phb33H52B | 0.21 | 29.92 | 1.64 | 11.07 | 4.89 |
| SC608 | 5.31 | 24.21 | 1.52 | 18.07 | 4.65 |
| SC637 | 2.04 | 35.60 | 1.19 | 18.34 | 3.60 |
| Gem/ Mean | 1.06 | 35.37 | 1.71 | 12.56 | 5.07 |

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## MEER JAARIGE TABELLE / MULTI SEASON TABLES

**Tabel 15** ANOVA analise van die AMMI 2 model vir die westelike gebiede gedurende die 2009/10,2010/11 & 2011/2012 seisoene

**Table 15** ANOVA analysis according to the AMMI 2 model of maize genotypes evaluated in the western areas during the 2009/10,2010/11 & 2011/2012 seasons

| Bron/Source | df | SS | MS | F | F_prob |
|---|---|---|---|---|---|
| Totaal / Total | 3149 | 15318 | 4.86 | * | * |
| Behandeling /Treatment | 1049 | 13856 | 13.21 | 21.09 | 0 |
| Genotipe / Genotype | 14 | 291 | 20.81 | 33.22 | 0 |
| Omgewing /Environment | 69 | 12214 | 177.01 | 105.78 | 0 |
| Blok/ Block | 140 | 234 | 1.67 | 2.67 | 0 |
| Interaksie / Interaction | 966 | 1351 | 1.4 | 2.23 | 0 |
| IPCA 1 | 82 | 260 | 3.17 | 5.06 | 0 |
| IPCA 2 | 80 | 230 | 2.88 | 4.59 | 0 |
| Res / Residual | 804 | 862 | 1.07 | 1.71 | 0 |
| Fout /Error | 1960 | 1228 | 0.63 | * | * |

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**Table16** Meerjarige gemiddeldes ten opsigte van plante omval gedurende 2009/10,2010/11 & 2011/2012 seisoene
**Table 16** Multi-seasonal means in respect of total percentage lodged plants during the 2009/10,2010/11 &2011/2012 seasons

| Genotipe<br>Genotype | 2009/2010 | 2010/011 | 2011/2012 | Gem<br>Mean |
|---|---|---|---|---|
| CRN3505 | 0.28 | 3.00 | 0.00 | 1.09 |
| DKC73-76R | 0.00 | 0.00 | 0.98 | 0.33 |
| DKC78-15B | 0.50 | 0.00 | 1.82 | 0.77 |
| DKC78-35R | 1.02 | 1.36 | 0.69 | 1.02 |
| IMP52-11 | 0.00 | 1.71 | 1.37 | 1.03 |
| LS8518 | 0.29 | 3.86 | 1.03 | 1.73 |
| PAN5Q-433B | 0.47 | 2.83 | 3.05 | 2.12 |
| PAN5Q-649R | 0.18 | 2.83 | 3.05 | 2.02 |
| PAN6P-110 | 1.24 | 1.94 | 0.69 | 1.29 |
| PAN6Q-308B | 1.10 | 0.93 | 0.89 | 0.97 |
| PAN6Q-445B | 0.27 | 1.35 | 0.00 | 0.54 |
| PAN6Q-508R | 0.14 | 1.35 | 1.29 | 0.93 |
| PAN6Q-708BR | 0.35 | 3.38 | 0.46 | 1.40 |
| Phb30Y79B | 1.09 | 2.79 | 2.55 | 2.15 |
| Phb32W72B | 0.49 | 4.27 | 1.01 | 1.92 |
| Gem/Mean | 0.49 | 2.11 | 1.26 | 1.29 |

**Tabel 17** Meerjarige gemiddeldes ten opsigte van persentasie spruitvorming gedurende 2009/10, 2010/2011 & 2011/2012 seisoene
**Table 17** Multi-seasonal means in respect of percentage tillering during the 2009/10,2010/11 & 2011/2012 seasons

| Genotipe<br>Genotype | 2009/2010 | 2010/2011 | 2011/2012 | Gem<br>Mean |
|---|---|---|---|---|
| CRN3505 | 27.28 | 25.67 | 40.97 | 31.31 |
| DKC73-76R | 22.12 | 18.20 | 24.71 | 21.68 |
| DKC78-15B | 28.13 | 25.28 | 36.94 | 30.12 |
| DKC78-35R | 33.44 | 20.69 | 37.63 | 30.59 |
| IMP52-11 | 61.54 | 50.56 | 63.02 | 58.37 |
| LS8518 | 36.49 | 31.89 | 44.52 | 37.63 |
| PAN5Q-433B | 30.77 | 27.38 | 36.29 | 31.48 |
| PAN5Q-649R | 14.30 | 2.83 | 20.26 | 12.46 |
| PAN6P-110 | 25.59 | 19.77 | 33.57 | 26.31 |
| PAN6Q-308B | 32.16 | 21.76 | 31.31 | 28.41 |
| PAN6Q-445B | 59.41 | 51.31 | 57.75 | 56.15 |
| PAN6Q-508R | 31.76 | 1.35 | 36.88 | 23.33 |
| PAN6Q-708BR | 32.11 | 3.38 | 40.07 | 25.19 |
| Phb30Y79B | 40.44 | 43.22 | 50.06 | 44.57 |
| Phb32W72B | 28.52 | 4.27 | 31.97 | 21.59 |
| Gem/Mean | 33.60 | 23.17 | 39.06 | 31.95 |

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**Tabel 18** Meerjarige gemiddeldes ten opsigte van aantal koppe per plant gedurende 2009/10,2010/11 & 2011/2012seisoene
**Table 18** Multi-seasonal means in respect of number of ears per plant during the 2009/10,2010/11 & 2011/2012seasons

| Genotipe<br>Genotype | 2009/2010 | 2010/011 | 2011/2012 | Gem<br>Mean |
|---|---|---|---|---|
| CRN3505 | 2.16 | 2.28 | 1.98 | 2.14 |
| DKC73-76R | 1.39 | 1.46 | 1.21 | 1.35 |
| DKC78-15B | 2.16 | 2.23 | 1.90 | 2.10 |
| DKC78-35R | 2.16 | 2.29 | 1.84 | 2.10 |
| IMP52-11 | 0.00 | 1.80 | 1.63 | 1.15 |
| LS8518 | 0.29 | 2.10 | 1.56 | 1.32 |
| PAN5Q-433B | 0.47 | 2.25 | 1.93 | 1.55 |
| PAN5Q-649R | 2.06 | 2.21 | 1.82 | 2.03 |
| PAN6P-110 | 2.11 | 2.23 | 1.83 | 2.06 |
| PAN6Q-308B | 2.20 | 2.20 | 1.87 | 2.09 |
| PAN6Q-445B | 2.59 | 2.57 | 2.10 | 2.42 |
| PAN6Q-508R | 2.22 | 2.31 | 2.00 | 2.18 |
| PAN6Q-708BR | 2.24 | 2.26 | 2.02 | 2.17 |
| Phb30Y79B | 1.58 | 1.88 | 1.56 | 1.68 |
| Phb32W72B | 1.98 | 2.16 | 1.72 | 1.95 |
| Gem/Mean | 1.71 | 2.15 | 1.80 | 1.88 |

**Tabel 19** Meerjarige gemiddeldes ten opsigte van persentasie graanvog gedurende 2009/10,2010/11 & 2011/2012seisoene
**Table 19** Multi-seasonal means in respect of percentage grain moisture during the 2009/10,2010/11 & 2011/2012seasons

| Genotipe<br>Genotype | 2009/2010 | 2010/2011 | 2011/2012 | Gem<br>Mean |
|---|---|---|---|---|
| CRN3505 | 12.87 | 16.31 | 13.22 | 14.13 |
| DKC73-76R | 11.81 | 14.10 | 11.65 | 12.52 |
| DKC78-15B | 12.91 | 16.07 | 12.63 | 13.87 |
| DKC78-35R | 13.13 | 16.09 | 12.98 | 14.07 |
| IMP52-11 | 11.54 | 13.86 | 11.73 | 12.38 |
| LS8518 | 12.94 | 15.95 | 13.46 | 14.11 |
| PAN5Q-433B | 11.96 | 15.01 | 12.11 | 13.03 |
| PAN5Q-649R | 11.66 | 14.46 | 11.67 | 12.60 |
| PAN6P-110 | 12.57 | 15.15 | 12.48 | 13.40 |
| PAN6Q-308B | 13.27 | 16.22 | 13.08 | 14.19 |
| PAN6Q-445B | 12.05 | 14.79 | 12.30 | 13.05 |
| PAN6Q-508R | 12.25 | 15.69 | 12.47 | 13.47 |
| PAN6Q-708BR | 12.61 | 15.27 | 12.91 | 13.60 |
| Phb30Y79B | 12.55 | 15.10 | 12.89 | 13.52 |
| Phb32W72B | 10.73 | 13.16 | 10.97 | 11.62 |
| Gem/Mean | 12.32 | 15.15 | 12.44 | 13.30 |

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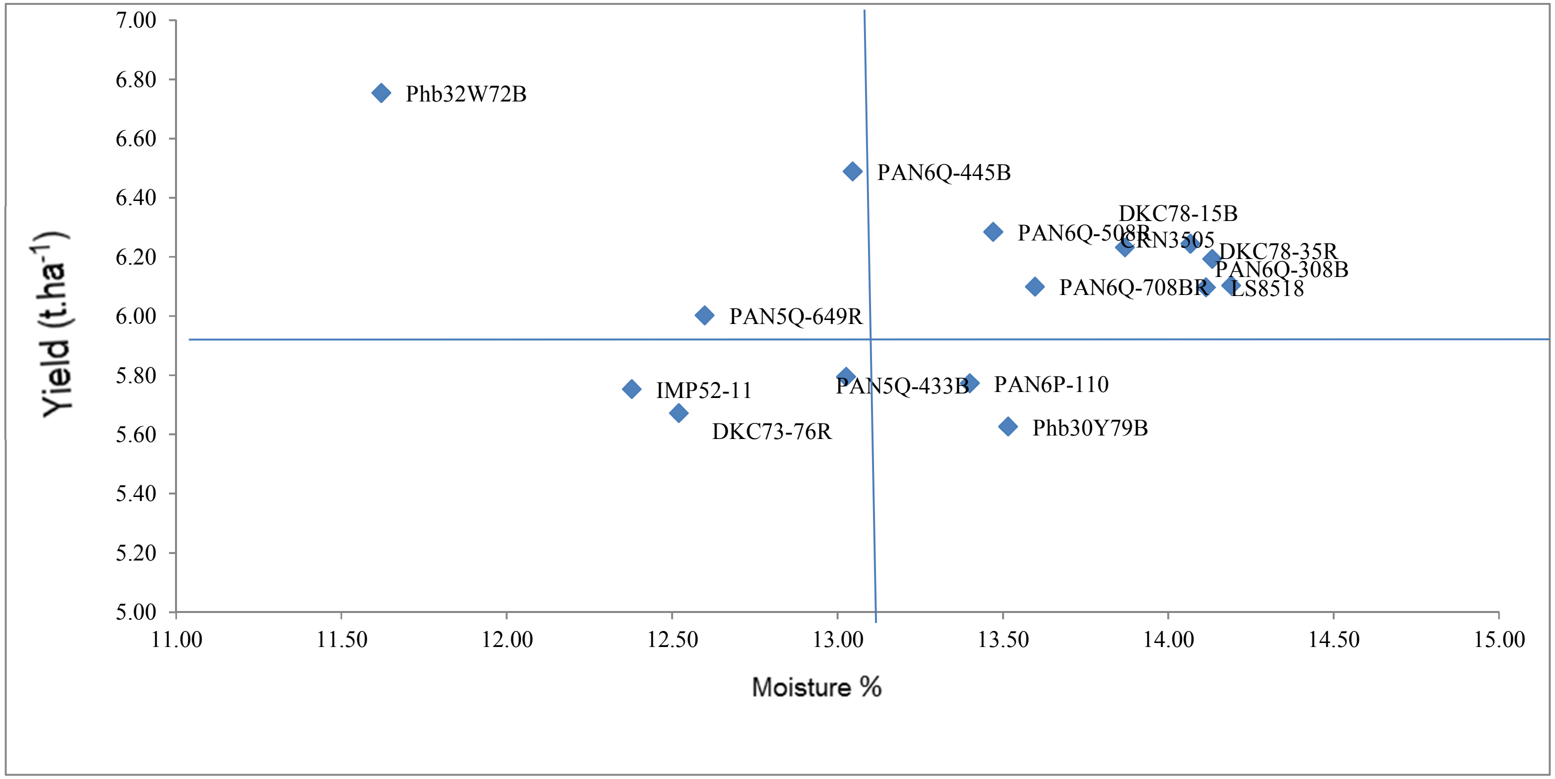


**Figure 3** Moisture % and yield for different maize hybrids under Western region during 2009/2010 to 2011/2012 seasons
**Figuur 3** Vog % en opbrengs van verskikkende mielie gedurende do 2009/2010 tot 2011/2012 seisoene

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**Tabel 20** Gemiddelde graanopbrengs (t $ha^{-1}$) vir mielie genotipes by 70 westelike omgewings gedurende die 2009/10,2010/11 & 2011/2012seisoene

**Table 20** Mean grain yield (t $ha^{-1}$) for different maize genotypes under 70 western environments during the 2009/10,2010/11 & 2011/2012 seasons

| Omgewing Environment | CRN-3505 | DKC-73-76R | DKC-78-15B | DKC-78-35R | IMP-52-11 | LS-8518 | PAN-5Q-433B | PAN-6Q-445B | PAN-6Q-508R |
|---|---|---|---|---|---|---|---|---|---|
| Bothaville(6)12 | 7.19 | 5.88 | 6.22 | 6.65 | 5.00 | 5.25 | 4.56 | 5.30 | 3.46 |
| Bothaville(8)12 | 7.26 | 6.02 | 7.27 | 6.56 | 5.72 | 7.96 | 7.05 | 6.95 | 6.41 |
| Bothaville(5)10 | 7.23 | 8.08 | 8.94 | 8.11 | 8.24 | 9.37 | 8.03 | 9.16 | 7.24 |
| Bothaville(5)11 | 7.02 | 5.95 | 6.43 | 7.06 | 5.40 | 8.16 | 7.50 | 9.13 | 5.42 |
| Bothaville(6)11 | 6.60 | 6.98 | 6.60 | 8.35 | 5.07 | 6.29 | 5.72 | 5.87 | 4.11 |
| Bothaville(8)10 | 9.66 | 7.45 | 9.34 | 8.93 | 8.59 | 10.04 | 11.15 | 10.83 | 9.61 |
| Bothaville11 | 8.79 | 7.11 | 8.06 | 8.37 | 7.48 | 8.80 | 9.15 | 10.37 | 8.02 |
| Bultfontein11 | 6.09 | 8.17 | 7.47 | 8.81 | 7.08 | 9.10 | 8.64 | 9.95 | 6.40 |
| Coligny(3)11 | 6.13 | 4.94 | 5.08 | 5.69 | 4.35 | 4.24 | 6.07 | 5.29 | 4.72 |
| Coligny(3)12 | 5.75 | 5.68 | 6.07 | 6.17 | 5.86 | 6.07 | 6.43 | 6.45 | 5.96 |
| Coligny(8)11 | 7.29 | 6.67 | 7.60 | 7.42 | 5.81 | 6.58 | 7.71 | 7.17 | 6.14 |
| Coligny(3)10 | 6.70 | 6.33 | 6.76 | 6.92 | 7.26 | 7.53 | 7.37 | 6.98 | 6.21 |
| Coligny(8)10 | 4.83 | 5.74 | 5.27 | 5.21 | 5.13 | 4.47 | 5.73 | 5.43 | 4.31 |
| Delareyville(7)12 | 5.87 | 3.99 | 5.71 | 5.79 | 4.83 | 4.44 | 5.30 | 5.69 | 4.20 |
| Delareyville(7)10 | 3.82 | 2.90 | 4.09 | 3.69 | 3.06 | 3.25 | 3.77 | 3.35 | 2.95 |
| Glaudina(6)12 | 3.80 | 3.74 | 3.80 | 4.04 | 2.88 | 3.40 | 3.77 | 3.38 | 3.43 |
| Glaudina11 | 2.95 | 2.62 | 3.11 | 2.48 | 2.18 | 2.82 | 2.53 | 2.73 | 2.53 |
| Hartbeesfontein(3)10 | 4.38 | 3.77 | 4.12 | 5.05 | 4.25 | 3.99 | 4.15 | 4.59 | 4.07 |
| Hoogekraal(8)12 | 3.59 | 3.07 | 3.98 | 4.17 | 3.47 | 3.29 | 3.71 | 4.02 | 3.65 |
| Hoogekraal8)10 | 9.34 | 8.41 | 11.58 | 9.22 | 9.34 | 8.42 | 10.22 | 10.89 | 9.95 |
| Hoogekraal11 | 8.96 | 7.06 | 10.00 | 8.48 | 8.56 | 10.23 | 8.78 | 10.56 | 8.93 |
| Kapsteel(6)12 | 6.22 | 5.96 | 5.95 | 6.43 | 4.50 | 5.58 | 6.30 | 5.64 | 6.24 |
| Kapsteel(9)12 | 6.01 | 5.93 | 6.07 | 5.52 | 4.43 | 4.56 | 4.86 | 4.43 | 4.98 |
| Kapsteel(6)10 | 4.14 | 4.29 | 3.85 | 4.47 | 2.92 | 4.04 | 3.47 | 3.10 | 3.66 |
| Kapsteel(9)10 | 5.28 | 5.10 | 6.60 | 6.30 | 3.85 | 5.57 | 6.80 | 7.23 | 4.96 |
| Kapsteel(9)11 | 3.63 | 3.30 | 4.10 | 3.72 | 4.22 | 3.85 | 3.38 | 4.27 | 2.69 |
| Kapsteel11 | 4.87 | 3.53 | 3.61 | 4.08 | 3.49 | 4.05 | 4.11 | 3.89 | 3.46 |
| Koster(7)10 | 5.04 | 4.85 | 5.32 | 5.75 | 5.61 | 5.39 | 5.97 | 6.72 | 4.72 |
| Koster(7)11 | 5.02 | 4.04 | 5.78 | 5.03 | 3.74 | 3.71 | 5.76 | 3.36 | 3.31 |
| Kroonstad(12)12 | 4.42 | 5.14 | 4.13 | 3.32 | 3.60 | 3.98 | 3.76 | 5.45 | 4.04 |
| Leeudoringstad(3)12 | 7.35 | 5.76 | 7.57 | 7.92 | 5.29 | 6.96 | 5.78 | 7.82 | 6.35 |
| Leeudoringstad(3)10 | 8.16 | 6.64 | 8.35 | 8.82 | 7.62 | 7.56 | 8.73 | 10.23 | 6.57 |
| Leeudoringstad11 | 11.74 | 8.62 | 10.33 | 11.37 | 11.07 | 11.27 | 12.09 | 14.04 | 13.00 |

10=2010,11=2011 & 12=2012 season

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**Table 20** Continue

| Omgewing Environment | CRN-3505 | DKC-73-76R | DKC-78-15B | DKC-78-35R | IMP-52-11 | LS-8518 | PAN-5Q-433B | PAN-6Q-445B | PAN-6Q-508R |
|---|---|---|---|---|---|---|---|---|---|
| Lichtenburg(9)12 | 3.18 | 4.64 | 2.96 | 3.03 | 3.08 | 3.74 | 3.20 | 5.16 | 3.11 |
| Lichtenburg(6)10 | 5.90 | 6.01 | 5.80 | 5.72 | 6.02 | 5.42 | 6.55 | 6.53 | 6.16 |
| Lichtenburg(611 | 6.84 | 5.32 | 6.81 | 7.21 | 7.20 | 6.74 | 6.59 | 7.05 | 7.73 |
| Lichtenburg(7)10 | 6.25 | 4.89 | 5.81 | 6.17 | 5.22 | 4.89 | 5.90 | 6.74 | 5.17 |
| Lichtenburg(7)11 | 6.07 | 5.78 | 5.46 | 5.17 | 5.74 | 5.57 | 6.47 | 5.01 | 5.81 |
| Lichtenburg(9)10 | 7.18 | 6.67 | 5.90 | 7.70 | 6.71 | 7.00 | 6.47 | 8.24 | 6.42 |
| Lichtenburg(9)11 | 5.26 | 3.80 | 5.26 | 4.48 | 4.28 | 4.56 | 4.45 | 5.09 | 4.27 |
| Nampo(3)12 | 2.37 | 2.43 | 2.23 | 2.33 | 2.01 | 2.71 | 3.11 | 2.78 | 2.69 |
| Nampo(3)10 | 6.80 | 6.16 | 6.48 | 6.87 | 6.17 | 6.47 | 6.96 | 6.70 | 6.20 |
| Nampo11 | 8.04 | 7.44 | 6.52 | 7.34 | 8.13 | 6.70 | 8.32 | 7.72 | 7.11 |
| Ottosdal(3)12 | 4.78 | 2.77 | 5.50 | 4.00 | 3.61 | 2.45 | 4.29 | 3.96 | 3.44 |
| Ottosdal(3)10 | 7.18 | 5.94 | 7.55 | 8.03 | 7.15 | 7.06 | 7.29 | 9.26 | 7.29 |
| Ottosdal11 | 8.69 | 7.64 | 8.61 | 7.81 | 8.50 | 9.29 | 8.91 | 9.59 | 7.03 |
| Potchefstroom(3)12 | 5.63 | 5.80 | 6.53 | 6.31 | 6.09 | 5.93 | 6.84 | 8.14 | 7.22 |
| potchefstroom(1)11 | 8.36 | 7.80 | 9.44 | 10.94 | 9.71 | 8.34 | 9.53 | 8.49 | 7.26 |
| Potchefstroom(3)10 | 7.25 | 5.93 | 7.96 | 7.59 | 6.81 | 7.48 | 7.75 | 9.15 | 6.83 |
| Potchefstroom11 | 8.96 | 6.81 | 9.76 | 8.58 | 7.71 | 9.48 | 9.76 | 11.15 | 9.57 |
| Rushof(3)12 | 3.81 | 4.71 | 4.05 | 3.77 | 3.57 | 3.63 | 4.14 | 4.39 | 4.13 |
| Rushof(3)10 | 7.01 | 6.75 | 6.37 | 7.20 | 5.21 | 7.15 | 7.52 | 8.14 | 7.08 |
| Rushof11 | 8.99 | 7.94 | 9.10 | 9.13 | 9.32 | 8.46 | 9.42 | 9.85 | 7.68 |
| Tweebuffels(3)12 | 4.96 | 5.41 | 5.16 | 4.21 | 5.18 | 5.61 | 5.72 | 6.75 | 5.71 |
| Tweebuffels(3)10 | 4.13 | 4.37 | 3.81 | 4.25 | 3.94 | 3.43 | 3.63 | 4.30 | 3.50 |
| Tweebuffels11 | 3.08 | 2.78 | 2.41 | 2.07 | 2.39 | 2.04 | 1.76 | 2.93 | 2.02 |
| Ventersdorp(3)10 | 4.75 | 4.58 | 5.01 | 4.32 | 5.39 | 4.69 | 5.78 | 5.22 | 4.93 |
| Viljoenskroon(1)12 | 4.22 | 5.12 | 4.31 | 4.37 | 5.00 | 5.39 | 4.58 | 5.80 | 4.26 |
| Viljoenskroon(6)12 | 4.59 | 5.19 | 4.30 | 5.66 | 4.11 | 4.96 | 3.87 | 4.68 | 4.06 |
| Viljoenskroon(3)10 | 9.89 | 8.98 | 9.81 | 9.44 | 11.40 | 10.26 | 10.90 | 12.41 | 9.69 |
| Viljoenskroon(5)10 | 8.17 | 7.18 | 7.59 | 8.21 | 9.04 | 9.26 | 7.33 | 10.20 | 8.07 |
| Viljoenskroon(6)11 | 5.81 | 5.59 | 6.42 | 5.14 | 5.23 | 5.14 | 5.50 | 5.44 | 5.64 |
| Viljoenskroon(6)10 | 3.76 | 3.58 | 4.31 | 3.77 | 3.62 | 4.54 | 4.39 | 3.92 | 4.46 |
| Viljoenskroon11 | 7.21 | 6.69 | 6.63 | 7.03 | 6.21 | 7.75 | 6.94 | 6.03 | 5.62 |
| Wesselsbron(3)12 | 6.87 | 6.31 | 6.76 | 5.99 | 6.12 | 6.95 | 6.83 | 6.73 | 6.65 |
| Wesselsbron(3)10 | 6.61 | 7.06 | 6.92 | 7.01 | 7.11 | 6.09 | 6.63 | 6.74 | 6.77 |
| Wesselsbron(9)10 | 6.86 | 5.03 | 5.71 | 6.55 | 5.16 | 5.70 | 4.72 | 5.13 | 6.02 |
| Wesselsbron11 | 7.83 | 7.77 | 8.38 | 7.36 | 8.38 | 7.25 | 7.74 | 9.29 | 9.66 |
| Wolmaranstad(5)12 | 4.73 | 4.85 | 4.46 | 4.70 | 4.87 | 4.96 | 4.32 | 5.00 | 4.77 |
| Wolmaranstad11 | 6.30 | 7.58 | 6.97 | 7.76 | 7.36 | 9.56 | 7.45 | 8.78 | 8.31 |

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**Tabel 20** Vervolg
**Table 20** Continue

| Omgewing Environment | Phb-30Y79B | Phb-32W72B | Omgewing Environment | Phb-30Y79B | Phb-32W72B |
|---|---|---|---|---|---|
| Bothaville(6)12 | 5.43 | 6.19 | Lichtenburg(611 | 6.65 | 5.94 |
| Bothaville(8)12 | 5.77 | 6.59 | Lichtenburg(7)10 | 5.11 | 4.94 |
| Bothaville(5)10 | 9.47 | 7.78 | Lichtenburg(7)11 | 6.66 | 4.77 |
| Bothaville(5)11 | 6.93 | 6.39 | Lichtenburg(9)10 | 8.09 | 6.83 |
| Bothaville(6)11 | 6.35 | 5.95 | Lichtenburg(9)11 | 4.65 | 4.02 |
| Bothaville(8)10 | 10.18 | 8.99 | Nampo(3)12 | 3.46 | 2.24 |
| Bothaville11 | 8.80 | 7.38 | Nampo(3)10 | 7.02 | 7.13 |
| Bultfontein11 | 9.02 | 7.71 | Nampo11 | 7.96 | 7.61 |
| Coligny(3)11 | 5.46 | 3.88 | Ottosdal(3)12 | 4.92 | 2.93 |
| Coligny(3)12 | 7.04 | 6.29 | Ottosdal(3)10 | 6.86 | 5.52 |
| Coligny(8)11 | 6.31 | 7.11 | Ottosdal11 | 9.01 | 7.92 |
| Coligny(3)10 | 7.87 | 6.60 | Potchefstroom(3)12 | 6.54 | 6.11 |
| Coligny(8)10 | 6.37 | 4.77 | potchefstroom(1)11 | 8.64 | 9.86 |
| Delareyville(7)12 | 6.05 | 4.34 | Potchefstroom(3)10 | 7.43 | 7.22 |
| Delareyville(7)10 | 3.78 | 2.62 | Potchefstroom11 | 8.47 | 9.04 |
| Glaudina(6)12 | 3.02 | 3.43 | Rushof(3)12 | 4.09 | 2.59 |
| Glaudina11 | 2.87 | 2.17 | Rushof(3)10 | 7.27 | 6.31 |
| Hartbeesfontein(3)10 | 4.51 | 3.75 | Rushof11 | 9.65 | 8.08 |
| Hoogekraal(8)12 | 4.06 | 3.90 | Tweebuffels(3)12 | 6.46 | 5.09 |
| Hoogekraal8)10 | 8.16 | 9.12 | Tweebuffels(3)10 | 5.56 | 3.12 |
| Hoogekraal11 | 10.21 | 6.54 | Tweebuffels11 | 2.63 | 2.08 |
| Kapsteel(6)12 | 5.59 | 4.10 | Ventersdorp(3)10 | 4.50 | 4.11 |
| Kapsteel(9)12 | 4.39 | 5.33 | Viljoenskroon(1)12 | 6.08 | 5.38 |
| Kapsteel(6)10 | 3.90 | 3.01 | Viljoenskroon(6)12 | 3.64 | 3.38 |
| Kapsteel(9)10 | 7.03 | 4.87 | Viljoenskroon(3)10 | 11.75 | 8.83 |
| Kapsteel(9)11 | 4.15 | 3.26 | Viljoenskroon(5)10 | 10.09 | 10.14 |
| Kapsteel11 | 3.86 | 3.53 | Viljoenskroon(6)11 | 4.76 | 5.65 |
| Koster(7)10 | 5.66 | 4.44 | Viljoenskroon(6)10 | 4.56 | 3.93 |
| Koster(7)11 | 5.42 | 2.59 | Viljoenskroon11 | 6.67 | 6.52 |
| Kroonstad(12)12 | 4.92 | 4.55 | Wesselsbron(3)12 | 6.44 | 6.35 |
| Leeudoringstad(3)12 | 9.00 | 6.41 | Wesselsbron(3)10 | 6.96 | 7.09 |
| Leeudoringstad(3)10 | 8.64 | 6.48 | Wesselsbron(9)10 | 5.66 | 5.69 |
| Leeudoringstad11 | 11.09 | 11.53 | Wesselsbron11 | 9.95 | 6.46 |
| Lichtenburg(9)12 | 3.39 | 3.63 | Wolmaranstad(5)12 | 5.96 | 4.09 |
| Lichtenburg(6)10 | 6.60 | 4.56 | Wolmaranstad11 | 8.72 | 7.12 |

10=2010,11=2011 & 12=2012 season

1=Agricol, 3=GCI, 4=K2, 5=Link seeds, 6=Monsanto, 7=North West, 8=Pannar, 9=Pioneer,12=Capstone

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**Tabel 21** Die IPCA 1 en IPCA 2- waardes vir 70 omgewings
**Table 21** The IPCA 1 and IPCA2 scores for 70 environments

| Omgewing Environment | Gem/Mean Opb/yield (t ha-1) | IPCA 1waarde score | IPCA 2 waarde score |
|---|---|---|---|
| Bothaville(6)12 | 5.66 | 0.84891 | 0.0601 |
| Bothaville(8)12 | 6.84 | 0.07303 | 0.36888 |
| Bothaville(5)10 | 8.07 | -0.07887 | -0.67201 |
| Bothaville(5)11 | 6.68 | -0.37781 | -0.39419 |
| Bothaville(6)11 | 5.70 | 0.90251 | -0.78703 |
| Bothaville(8)10 | 9.50 | -0.60525 | 0.10917 |
| Bothaville11 | 8.35 | -0.54097 | -0.03399 |
| Bultfontein11 | 8.08 | -0.34041 | -0.46555 |
| Coligny(3)11 | 5.22 | 0.2221 | 0.49832 |
| Coligny(3)12 | 6.10 | 0.00148 | -0.14804 |
| Coligny(8)11 | 6.92 | 0.30009 | 0.2965 |
| Coligny(3)10 | 7.00 | -0.0035 | -0.01668 |
| Coligny(8)10 | 5.07 | 0.23523 | -0.29827 |
| Delareyville(7)12 | 5.08 | 0.01674 | 0.04575 |
| Delareyville(7)10 | 3.28 | 0.20658 | 0.007 |
| Glaudina(6)12 | 3.59 | 0.37388 | 0.23454 |
| Glaudina11 | 2.64 | 0.18693 | 0.11672 |
| Hartbeesfontein(3)10 | 4.20 | 0.12735 | -0.05116 |
| Hoogekraal(8)12 | 3.73 | 0.0896 | 0.09002 |
| Hoogekraal(8)10 | 9.52 | -0.16154 | 0.59272 |
| Hoogekraal11 | 9.01 | -0.68816 | 0.31325 |
| Kapsteel(6)12 | 5.68 | 0.23616 | 0.30958 |
| Kapsteel(9)12 | 5.11 | 0.80112 | 0.22316 |
| Kapsteel(6)10 | 3.64 | 0.54143 | 0.01361 |
| Kapsteel(9)10 | 5.76 | -0.28719 | 0.10193 |
| Kapsteel(9)11 | 3.64 | 0.06598 | -0.25843 |
| Kapsteel11 | 3.89 | 0.23673 | 0.14187 |
| Koster(7)10 | 5.32 | -0.22069 | -0.21571 |
| Koster(7)11 | 4.62 | 0.41205 | 1.01659 |
| Kroonstad(12)12 | 4.31 | 0.07084 | -0.07002 |
| Leeudoringstad(3)12 | 6.93 | -0.05086 | -0.11455 |
| Leeudoringstad(3)10 | 8.03 | -0.41772 | 0.13799 |
| Leeudoringstad11 | 11.67 | -1.00722 | 0.46487 |

10=2010,11=2011 & 12=2012 season

1=Agricol, 3=GCI, 4=K2, 5=Link seeds, 6=Monsanto, 7=North West, 8=Pannar, 9=Pioneer,12=Capstone

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**Tabel 21** Vervolg
**Table 21** Continue

| Omgewing Environment | Gem/Mean Opb/yield (t ha-1) | IPCA 1waarde score | IPCA 2 waarde score |
|---|---|---|---|
| Lichtenburg(9)12 | 3.41 | 0.01249 | -0.48311 |
| Lichtenburg(6)10 | 5.93 | -0.0724 | 0.18196 |
| Lichtenburg(6)11 | 6.66 | -0.10758 | 0.01329 |
| Lichtenburg(7)10 | 5.59 | -0.00129 | 0.27863 |
| Lichtenburg(7)11 | 5.76 | 0.24013 | 0.46081 |
| Lichtenburg(9)10 | 6.92 | -0.10509 | -0.42653 |
| Lichtenburg(9)11 | 4.41 | 0.07573 | -0.09143 |
| Nampo(3)12 | 2.66 | -0.05024 | 0.08195 |
| Nampo(3)10 | 6.63 | 0.13288 | 0.01681 |
| Nampo11 | 7.30 | 0.167 | -0.40692 |
| Ottosdal(3)12 | 3.91 | 0.13023 | 0.47567 |
| Ottosdal(3)10 | 7.14 | -0.44325 | 0.02191 |
| Ottosdal11 | 8.27 | -0.18882 | -0.37929 |
| Potchefstroom(3)12 | 6.65 | -0.4411 | 0.48073 |
| potchefstroom(1)11 | 8.84 | 0.4441 | -0.2954 |
| Potchefstroom(3)10 | 7.52 | -0.39773 | 0.18624 |
| Potchefstroom11 | 9.20 | -0.72935 | 0.54383 |
| Rushof(3)12 | 3.95 | 0.12967 | 0.23288 |
| Rushof(3)10 | 6.81 | -0.1987 | -0.10302 |
| Rushof11 | 8.71 | -0.04629 | -0.26612 |
| Tweebuffels(3)12 | 5.55 | -0.36081 | 0.08876 |
| Tweebuffels(3)10 | 3.91 | 0.18961 | -0.26735 |
| Tweebuffels11 | 2.39 | 0.19911 | 0.02741 |
| Ventersdorp(3)10 | 4.75 | -0.01137 | 0.02054 |
| Viljoenskroon(1)12 | 4.83 | -0.05525 | -0.53981 |
| Viljoenskroon(6)12 | 4.49 | 0.38407 | 0.16049 |
| Viljoenskroon(3)10 | 9.91 | -0.65718 | -0.7317 |
| Viljoenskroon(5)10 | 8.36 | -0.34282 | -1.01743 |
| Viljoenskroon(6)11 | 5.39 | 0.35177 | 0.06397 |
| Viljoenskroon(6)10 | 4.06 | 0.01146 | 0.08424 |
| Viljoenskroon11 | 6.59 | 0.43243 | -0.31445 |
| Wesselsbron(3)12 | 6.52 | 0.10111 | 0.07353 |
| Wesselsbron(3)10 | 6.76 | 0.35707 | -0.09705 |
| Wesselsbron(9)10 | 5.65 | 0.41338 | 0.22459 |
| Wesselsbron11 | 8.33 | -0.4167 | 0.44128 |
| Wolmaranstad(5)12 | 4.90 | 0.03796 | 0.07927 |
| Wolmaranstad11 | 7.71 | -0.35281 | -0.43608 |

10=2010,11=2011 & 12=2012 season

1=Agricol, 3=GCI, 4=K2, 5=Link seeds, 6=Monsanto, 7=North West, 8=Pannar, 9=Pioneer,12=Capstone

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**Tabel 22** Gemiddelde opbrengs (t ha$^{-1}$), orde, IPCA1 en IPCA2- waardes en AMMI stabiliteits waarde (ASW) vir mielie genotipes geanaliseer volgens die AMMI model vir 70 westelike omgewings gedurende die 2009/10,2010/11 & 2011/2012 seisoene

**Table 22** Mean yield (tha$^{-1}$), rank, IPCA1 And IPCA2 scores and AMMI stability value (ASV) of maize genotypes analysed according to the AMMI model over 70 western environments during the 2009/10,2010/11 & 2011/2012seasons

| Genotipes Genotype | Gen.No. Gen.No. | Gem/Mean Opb./Yield (t.ha-1) | Orde Rank | IPCA 1 Waarde Score | IPCA 2 Waarde Score | ASW ASV | Orde Rank |
|---|---|---|---|---|---|---|---|
| PAN5Q-649R | 8 | 6.10 | 8 | -0.18051 | 0.17131 | 0.257 | 1 |
| PAN5Q-433B | 7 | 6.28 | 3 | -0.39833 | 0.29912 | 0.518 | 2 |
| IMP52-11 | 5 | 5.75 | 13 | 0.04467 | -0.72013 | 0.722 | 3 |
| DKC78-15B | 3 | 6.23 | 5 | 0.48849 | 0.55238 | 0.758 | 4 |
| CRN3505 | 1 | 6.19 | 6 | 0.79853 | 0.34029 | 0.915 | 5 |
| PAN6Q-508R | 12 | 5.77 | 12 | -0.63372 | 0.64201 | 0.931 | 6 |
| DKC78-35R | 4 | 6.24 | 4 | 0.86984 | -0.35943 | 0.992 | 7 |
| PAN6Q-708BR | 13 | 6.10 | 7 | 0.14141 | 0.99412 | 1.005 | 8 |
| Phb30Y79B | 14 | 6.49 | 2 | -0.44151 | -0.92418 | 1.037 | 9 |
| LS8518 | 6 | 6.10 | 9 | -0.39959 | -0.9594 | 1.049 | 10 |
| Phb32W72B | 15 | 5.63 | 15 | 0.53759 | -0.94726 | 1.106 | 11 |
| PAN6P-110 | 9 | 5.80 | 11 | -0.04008 | 1.14735 | 1.148 | 12 |
| PAN6Q-308B | 10 | 6.00 | 10 | -0.35237 | 1.12234 | 1.183 | 13 |
| DKC73-76R | 2 | 5.67 | 14 | 1.54229 | -0.65544 | 1.766 | 14 |
| PAN6Q-445B | 11 | 6.75 | 1 | -1.97671 | -0.70308 | 2.216 | 15 |

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**Tabel 23** Die AMMI model seleksie vir die beste vier genotipes se gemiddelde opbrengste in verhouding tot die omgewings geëvalueer gedurende die 2008/2009,2009/2010 & 2010/2011 seisoene

**Table 23** The AMMI model's best four maize genotype selections for mean yield in relation to the environments evaluated during the 2008/2009,2009/2010 & 2010/2011 seasons

| Omgewings Environment | Gem Mean | IPCA 1 waarde Score | AMMI seleksies/selection | | | |
|---|---|---|---|---|---|---|
| Bothaville(6)12 | 5.66 | 0.8489 | DKC78-35R | DKC73-76R | CRN3505 | DKC78-15B |
| Bothaville(8)12 | 6.84 | 0.073 | PAN6Q-708BR | DKC78-15B | PAN6Q-308B | CRN3505 |
| Bothaville(5)10 | 8.07 | -0.0789 | PAN6Q-445B | Phb30Y79B | LS8518 | DKC78-35R |
| Bothaville(5)11 | 6.68 | -0.3778 | PAN6Q-445B | Phb30Y79B | LS8518 | PAN5Q-433B |
| Bothaville(6)11 | 5.70 | 0.9025 | DKC73-76R | DKC78-35R | Phb32W72B | Phb30Y79B |
| Bothaville(8)10 | 9.50 | -0.6052 | PAN6Q-445B | Phb30Y79B | PAN5Q-433B | PAN6Q-308B |
| Bothaville11 | 8.35 | -0.541 | PAN6Q-445B | Phb30Y79B | PAN5Q-433B | LS8518 |
| Bultfontein11 | 8.08 | -0.3404 | PAN6Q-445B | Phb30Y79B | LS8518 | PAN5Q-433B |
| Coligny(3)11 | 5.22 | 0.2221 | PAN6Q-708BR | DKC78-15B | CRN3505 | PAN6Q-308B |
| Coligny(3)12 | 6.10 | 0.0015 | PAN6Q-445B | Phb30Y79B | DKC78-35R | PAN5Q-433B |
| Coligny(8)11 | 6.92 | 0.3001 | DKC78-15B | CRN3505 | PAN6Q-708BR | DKC78-35R |
| Coligny(3)10 | 7.00 | -0.0035 | PAN6Q-445B | Phb30Y79B | PAN5Q-433B | DKC78-35R |
| Coligny(8)10 | 5.07 | 0.2352 | Phb30Y79B | DKC78-35R | PAN6Q-445B | LS8518 |
| Delareyville(7)12 | 5.08 | 0.0167 | PAN6Q-445B | Phb30Y79B | PAN5Q-433B | DKC78-15B |
| Delareyville(7)10 | 3.28 | 0.2066 | DKC78-35R | Phb30Y79B | CRN3505 | PAN6Q-445B |
| Glaudina(6)12 | 3.59 | 0.3739 | CRN3505 | DKC78-15B | DKC78-35R | PAN6Q-708BR |
| Glaudina11 | 2.64 | 0.1869 | DKC78-15B | CRN3505 | DKC78-35R | PAN6Q-445B |
| Hartbeesfontein(3)10 | 4.20 | 0.1274 | PAN6Q-445B | Phb30Y79B | DKC78-35R | CRN3505 |
| Hoogekraal(8)12 | 3.73 | 0.0896 | PAN6Q-445B | Phb30Y79B | DKC78-15B | CRN3505 |
| Hoogekraal(8)10 | 9.52 | -0.1615 | PAN6Q-308B | PAN6Q-708BR | PAN6Q-445B | PAN5Q-433B |
| Hoogekraal11 | 9.01 | -0.6882 | PAN6Q-445B | PAN5Q-433B | PAN6Q-308B | Phb30Y79B |
| Kapsteel(6)12 | 5.68 | 0.2362 | DKC78-15B | CRN3505 | PAN6Q-708BR | DKC78-35R |
| Kapsteel(9)12 | 5.11 | 0.8011 | CRN3505 | DKC78-35R | DKC73-76R | DKC78-15B |
| Kapsteel(6)10 | 3.64 | 0.5414 | DKC78-35R | CRN3505 | DKC78-15B | DKC73-76R |
| Kapsteel(9)10 | 5.76 | -0.2872 | PAN6Q-445B | Phb30Y79B | PAN5Q-433B | PAN6Q-308B |
| Kapsteel(9)11 | 3.64 | 0.066 | PAN6Q-445B | Phb30Y79B | DKC78-35R | LS8518 |
| Kapsteel11 | 3.89 | 0.2367 | CRN3505 | DKC78-15B | DKC78-35R | PAN6Q-708BR |
| Koster(7)10 | 5.32 | -0.2207 | PAN6Q-445B | Phb30Y79B | LS8518 | PAN5Q-433B |
| Koster(7)11 | 4.62 | 0.4121 | PAN6Q-708BR | PAN6Q-308B | DKC78-15B | PAN6P-110 |
| Kroonstad(12)12 | 4.31 | 0.0708 | PAN6Q-445B | Phb30Y79B | DKC78-35R | PAN5Q-433B |
| Leeudoringstad(3)12 | 6.93 | -0.0509 | PAN6Q-445B | Phb30Y79B | PAN5Q-433B | DKC78-35R |
| Leeudoringstad(3)10 | 8.03 | -0.4177 | PAN6Q-445B | Phb30Y79B | PAN5Q-433B | PAN6Q-308B |
| Leeudoringstad11 | 11.67 | -1.0072 | PAN6Q-445B | PAN6Q-308B | PAN5Q-433B | PAN6Q-508R |

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**Table 23** Continue

| Omgewings Environment | Gem Mean | IPCA 1 waarde Score | AMMI seleksies/selection | | | |
|---|---|---|---|---|---|---|
| Lichtenburg(9)12 | 3.41 | 0.0125 | PAN6Q-445B | Phb30Y79B | LS8518 | DKC78-35R |
| Lichtenburg(6)10 | 5.93 | -0.0724 | PAN6Q-445B | PAN5Q-433B | Phb30Y79B | DKC78-15B |
| Lichtenburg(6)11 | 6.66 | -0.1076 | PAN6Q-445B | Phb30Y79B | PAN5Q-433B | DKC78-15B |
| Lichtenburg(7)10 | 5.59 | -0.0013 | PAN6Q-445B | DKC78-15B | PAN6Q-708BR | PAN5Q-433B |
| Lichtenburg(7)11 | 5.76 | 0.2401 | DKC78-15B | PAN6Q-708BR | CRN3505 | PAN6Q-308B |
| Lichtenburg(9)10 | 6.92 | -0.1051 | PAN6Q-445B | Phb30Y79B | LS8518 | DKC78-35R |
| Lichtenburg(9)11 | 4.41 | 0.0757 | PAN6Q-445B | Phb30Y79B | DKC78-35R | PAN5Q-433B |
| Nampo(3)12 | 2.66 | -0.0502 | PAN6Q-445B | Phb30Y79B | PAN5Q-433B | DKC78-15B |
| Nampo(3)10 | 6.63 | 0.1329 | PAN6Q-445B | Phb30Y79B | DKC78-35R | DKC78-15B |
| Nampo11 | 7.30 | 0.167 | Phb30Y79B | PAN6Q-445B | DKC78-35R | LS8518 |
| Ottosdal(3)12 | 3.91 | 0.1302 | PAN6Q-708BR | DKC78-15B | PAN6Q-308B | CRN3505 |
| Ottosdal(3)10 | 7.14 | -0.4432 | PAN6Q-445B | Phb30Y79B | PAN5Q-433B | LS8518 |
| Ottosdal11 | 8.27 | -0.1888 | PAN6Q-445B | Phb30Y79B | LS8518 | PAN5Q-433B |
| Potchefstroom(3)12 | 6.65 | -0.4411 | PAN6Q-445B | PAN6Q-308B | PAN5Q-433B | PAN6Q-708BR |
| potchefstroom(1)11 | 8.84 | 0.4441 | DKC78-35R | Phb30Y79B | DKC73-76R | CRN3505 |
| Potchefstroom(3)10 | 7.52 | -0.3977 | PAN6Q-445B | PAN5Q-433B | Phb30Y79B | PAN6Q-308B |
| Potchefstroom11 | 9.20 | -0.7293 | PAN6Q-445B | PAN6Q-308B | PAN5Q-433B | PAN6Q-508R |
| Rushof(3)12 | 3.95 | 0.1297 | DKC78-15B | CRN3505 | PAN6Q-708BR | PAN6Q-445B |
| Rushof(3)10 | 6.81 | -0.1987 | PAN6Q-445B | Phb30Y79B | PAN5Q-433B | LS8518 |
| Rushof11 | 8.71 | -0.0463 | PAN6Q-445B | Phb30Y79B | LS8518 | DKC78-35R |
| Tweebuffels(3)12 | 5.55 | -0.3608 | PAN6Q-445B | Phb30Y79B | PAN5Q-433B | PAN6Q-308B |
| Tweebuffels(3)10 | 3.91 | 0.1896 | Phb30Y79B | PAN6Q-445B | DKC78-35R | LS8518 |
| Tweebuffels11 | 2.39 | 0.1991 | DKC78-35R | Phb30Y79B | CRN3505 | DKC78-15B |
| Ventersdorp(3)10 | 4.75 | -0.0114 | PAN6Q-445B | Phb30Y79B | PAN5Q-433B | DKC78-15B |
| Viljoenskroon(1)12 | 4.83 | -0.0553 | PAN6Q-445B | Phb30Y79B | LS8518 | DKC78-35R |
| Viljoenskroon(6)12 | 4.49 | 0.3841 | CRN3505 | DKC78-35R | DKC78-15B | PAN6Q-708BR |
| Viljoenskroon(3)10 | 9.91 | -0.6572 | PAN6Q-445B | Phb30Y79B | LS8518 | PAN5Q-433B |
| Viljoenskroon(5)10 | 8.36 | -0.3428 | PAN6Q-445B | Phb30Y79B | LS8518 | IMP52-11 |
| Viljoenskroon(6)11 | 5.39 | 0.3518 | DKC78-35R | CRN3505 | DKC78-15B | Phb30Y79B |
| Viljoenskroon(6)10 | 4.06 | 0.0115 | PAN6Q-445B | Phb30Y79B | PAN5Q-433B | DKC78-15B |
| Viljoenskroon11 | 6.59 | 0.4324 | DKC78-35R | Phb30Y79B | DKC73-76R | CRN3505 |
| Wesselsbron(3)12 | 6.52 | 0.1011 | PAN6Q-445B | Phb30Y79B | DKC78-15B | DKC78-35R |
| Wesselsbron(3)10 | 6.76 | 0.3571 | DKC78-35R | CRN3505 | Phb30Y79B | DKC78-15B |
| Wesselsbron(9)10 | 5.65 | 0.4134 | CRN3505 | DKC78-15B | DKC78-35R | PAN6Q-708BR |
| Wesselsbron11 | 8.33 | -0.4167 | PAN6Q-445B | PAN6Q-308B | PAN5Q-433B | PAN6Q-708BR |
| Wolmaranstad(5)12 | 4.90 | 0.038 | PAN6Q-445B | Phb30Y79B | DKC78-15B | PAN5Q-433B |
| Wolmaranstad11 | 7.71 | -0.3528 | PAN6Q-445B | Phb30Y79B | LS8518 | PAN5Q-433B |

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**Tabel 24** Opsomming van alle eienskappe vir 2009/10,2010/11 & 2011/2012 siesoen

**Table 24** Summary of mean values for all characteristics for 2009/10,2010/11 & 2011/2012 season

| Genotipes<br>Genotypes | Omval %<br>Logded | Spruite %<br>Tillering | Koppe plant$^{-1}$<br>Ears plant$^{-1}$ | Graan vog%<br>Grain moist.% | Graan opbrengs<br>Grain yield (t.ha$^{-1}$) |
|---|---|---|---|---|---|
| CRN3505 | 1.09 | 31.31 | 2.14 | 14.13 | 6.19 |
| DKC73-76R | 0.33 | 21.68 | 1.35 | 12.52 | 5.67 |
| DKC78-15B | 0.77 | 30.12 | 2.10 | 13.87 | 6.23 |
| DKC78-35R | 1.02 | 30.59 | 2.10 | 14.07 | 6.24 |
| IMP52-11 | 1.03 | 58.37 | 1.15 | 12.38 | 5.75 |
| LS8518 | 1.73 | 37.63 | 1.32 | 14.11 | 6.10 |
| PAN5Q-433B | 2.12 | 23.33 | 2.18 | 13.47 | 6.28 |
| PAN5Q-649R | 2.02 | 25.19 | 2.17 | 13.60 | 6.10 |
| PAN6P-110 | 1.29 | 31.48 | 1.55 | 13.03 | 5.80 |
| PAN6Q-308B | 0.97 | 12.46 | 2.03 | 12.60 | 6.00 |
| PAN6Q-445B | 0.54 | 21.59 | 1.95 | 13.65 | 6.75 |
| PAN6Q-508R | 0.93 | 26.31 | 2.06 | 13.40 | 5.77 |
| PAN6Q-708BR | 1.40 | 28.41 | 2.09 | 14.19 | 6.10 |
| Phb30Y79B | 2.15 | 46.59 | 2.42 | 13.05 | 6.49 |
| Phb32W72B | 1.92 | 28.20 | 1.68 | 13.52 | 5.63 |
| Gem/Mean | 1.29 | 30.22 | 1.88 | 13.44 | 6.07 |

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## AANHANGSEL A / APPENDIX A

**Die interpretasie van die " Additive Main Effects and Multiplicative Interactions (AMMI)" model en opbrengstabiliteit.**

Die effek van genotipe by omgewing (G x O) interaksies in die interpretasie van resultate van opbrengste is welbekend. 'n Gekombineerde variansie-analise kan die interaksie kwantifiseer maar beskryf slegs die hoof effekte. Die klassieke ANOVA help nie veel om die interaksies te verstaan of te interpreteer nie. Dit is dan ook die rede hoekom stabiliteits-analises, verskeie vorme van liniêre regressies en afgeleide G x O prosedures tekort skiet in definiëring van hoofeffekte, betekenisvolle interaksies of te min verklaar van interaksievariasies. AMMI bied 'n baie beter alternatiewe statistiese benadering vir veldproewe waar 'n G x O interaksie relevant kan wees. Multivariasie-analises het drie hoof doelwitte:

a) Om die akkuraatheid van analises en datapatrone te verbeter
b) Om die data op te som.
c) Om die genotipe – omgewingsinteraksie te kwalifiseer.

Met behulp van multivariansie-analise kan genotipes met ooreenstemmende reaksies gekombineer word waardeur analises makliker uitgevoer kan word. Die doel van verskillende multivariansie metodes is om genotipes in te deel in kwalitatiewe homogene en stabiele subgroepe. Binne sulke subgroepe bestaan daar geen betekenisvolle G x O interaksies nie, terwyl daar wel verskille tussen subgroepe bestaan. 'n XY- grafiek help baie vir modellering of om genotipes, omgewing of die interaksie te verstaan. Die basiese prinsiep van so 'n AMMI XY – grafiek is dat die punte op die X-as die hoof effekte aandui terwyl die Y-as die interaksie aandui. 'n Genotipe en omgewingskombinasie met beide negatiewe of positiewe waardes het 'n positiewe interaksie en andersins 'n negatiewe interaksie. Genotipes naby die bopunt van 'n XY – grafiek presteer goed in dienooreenkomstige omgewings en dieselfde geld vir genotipes aan die onderkant. Genotipes of omgewings naby die nul lyn op die Y – as het klein interaksies en is dus relatief stabiel. Genotipes met hoë opbrengspotensiale lê aan die regterkant van so 'n grafiek.

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## DEFINISIES

**Interaksie Prinsiep Komponent Analise (IPCA)**

IPCA van genotipes in die AMMI analise gee ‘n aanduiding van die stabiliteit daarvan oor omgewings. Hoe groter die waarde, beide positief en negatief, hoe meer is ‘n genotipe aangepas vir ‘n spesifieke omgewing. Hoe nader die IPCA-waarde aan nul kom hoe meer stabiel is ‘n genotipe oor alle gemete omgewings.

**AMMI Stabiliteits Waarde (ASW)**

Figuur 1a is ‘n voorbeeld van die AMMI model se klassifikasie vir genotipes se aanpasbaarheid en stabiliteitskarakteristieke. Indien die letters A tot E verskillende genotipes verteenwoordig kan die volgende afleidings gemaak word. Genotipe A is baie goed aangepas vir hoë potensiaal toestande, maar is nie baie stabiel nie. Onder swak heersende toestande kan die genotipe swak presteer. Genotipes B en C is stabiel vir die meeste omgewings alhoewel hulle opbrengste laer kan wees as A onder hoë potensiaal kondisies. Genotipe C is meer stabiel as Genotipe B omdat dit nader aan die nul waarde van IPCA lê. Genotipe D word ook as relatief stabiel geklassifiseer, maar slegs vir lae potensiaal omgewings. Genotipe E is onstabiel en slegs aangepas vir lae potensiaal omgewings. In die algemeen word genotipes wat geleë is tussen IPCA-waardes van 1 en –1 gereken as stabiel maar hulle aanpasbaarheids-karakteristieke kan wissel tussen hoë en lae potensiaal omgewings.

**The interpretation of the Additive Main Effects And Multiplicative Interactions (AMMI) model and yield stability**

The effect of genotype by environment (GxE) interactions in the interpretation of results of yield trials, are well known. A combined analysis of variance can quantify the interactions, but as an additive statistical model describes only the main effects. The classical ANOVA does little to help understand or interpret the interactions.

That is why stability analysis, various forms of joint linear regression, and related GxE statistical procedures can be deficient in defining main effects, incorrectly declaring interactions insignificantly, or explaining too little of the interaction variance. AMMI offers a more appropriate first statistical analysis of yield trials that may have a GxE interaction.

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Multivariate analysis has three main purposes:

a) To increase the accuracy of data pattern and analysis

b) To summarize the data

c) To clarify the genotype–environment interactions.

Through multivariate analysis, genotypes with similar responses can be clustered, and the data can be summarized and anlaysed more easily. The aim of various multivariate classification methods are therefore to allocate genotypes to qualitatively homogeneous stability subsets. Within subsets, no significant GxE interactions occur, while differences among subsets are due to GxE interactions. A bi-plot is helpful for modelling or understanding the genotypes, the environments, and the interaction. The basic interpretive principle for such bi-plots is that bi-plots points displaced along the X-axis differ in main effects, whereas points displaced along the Y-axis differ in interaction. The joint structure of genotype and environment points in a bi-plot show the interaction. A genotype and environment combination with both negative scores or both positive scores, has a positive interaction, and otherwise a negative interaction. Hence genotypes near the top of a bi-plot do especially well in environments near the top, and likewise for the bottom genotypes and environments. Genotypes or environments near zero on the Y-axis have small interactions – they are relatively stable. Genotypes with high yield over the growing region of the trial are located to the right.

## DEFINITIONS

### Interaction Principle Component Analysis (IPCA)

The Principle Component Interaction Analysis (IPCA) of genotypes in the AMMI analysis is an indication of the stability of a genotype over environments. The greater the IPCA scores, either negative or positive, the more specifically adapted a genotype is to a certain environment.

The closer IPCA scores approach zero the more stable the genotype is over all environments sampled.

### AMMI Stability Value (ASV)

AMMI Stability Value (ASV) is the distance from zero in a two dimensional scatter gram of IPCA 1 scores against IPCA 2 scores. As the ASV nearing zero the genotype can be

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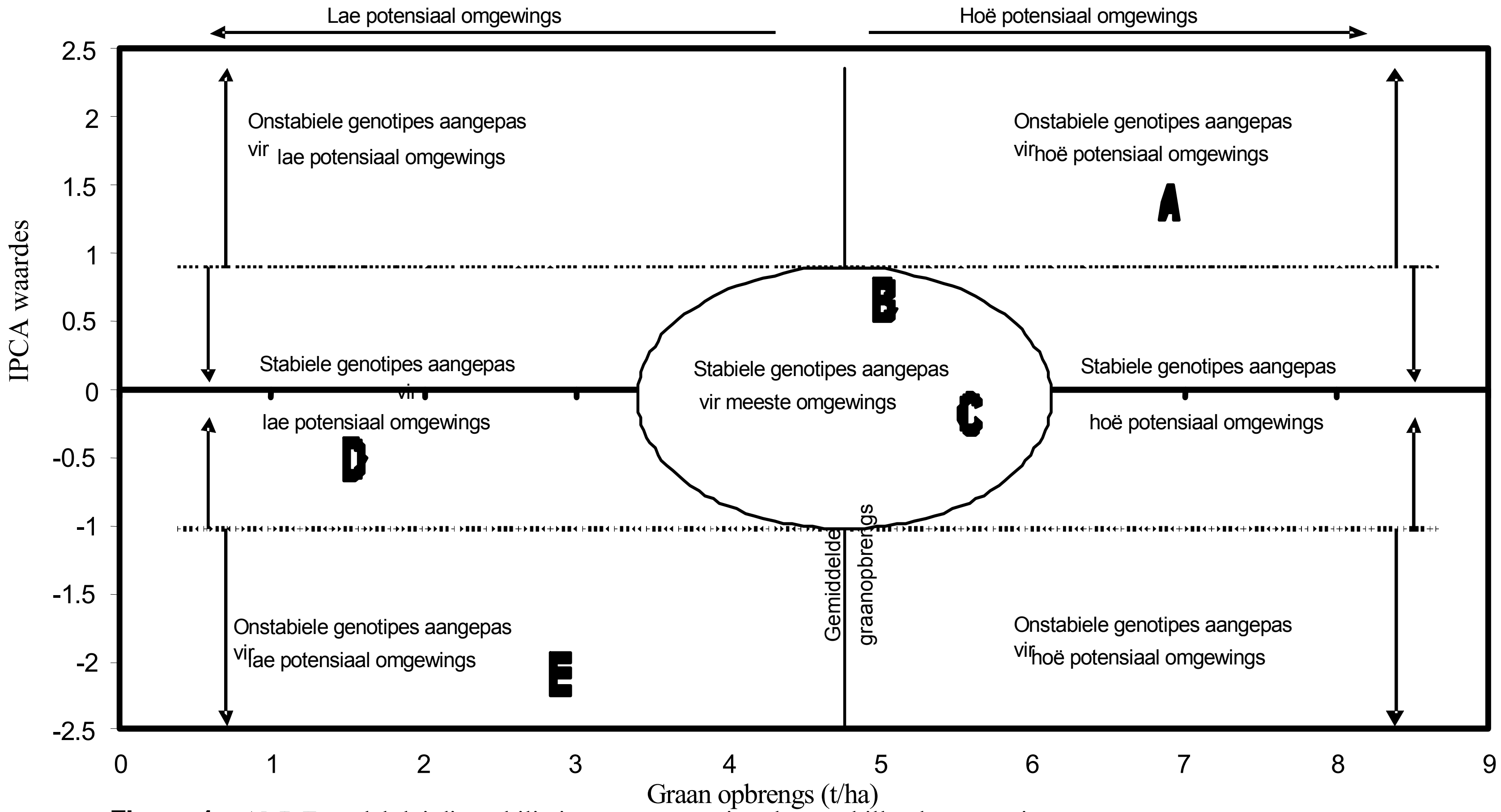
considered more stable for most of the environments.

Figure 1b is an example of the AMMI model's classification of genotypes adaptability and stability characteristics. If the letters A to E represent genotypes the following conclusions could be made. Genotype A is very good adapted towards high potential conditions but is not stable. Therefore, under poor prevailing conditions this genotype may yield poorly. Genotypes B and C are stable for most environmental potential conditions although their yields will be lower compared to genotype A under high potential conditions. Genotype C is more stable than genotype B because it is lying closer to the IPCA value of zero. Genotype D is also considered stable but only for low potential environments. Genotype E is unstable and only adapted to low potential environments. In general, genotypes that are falling between IPCA values of 1 and –1 are considered stable but their adaptabilities can range between low and high potential environments.




**Figuur 1a**. AMMI model dui die stabiliteit aan van genotipes by verskillende omgewings

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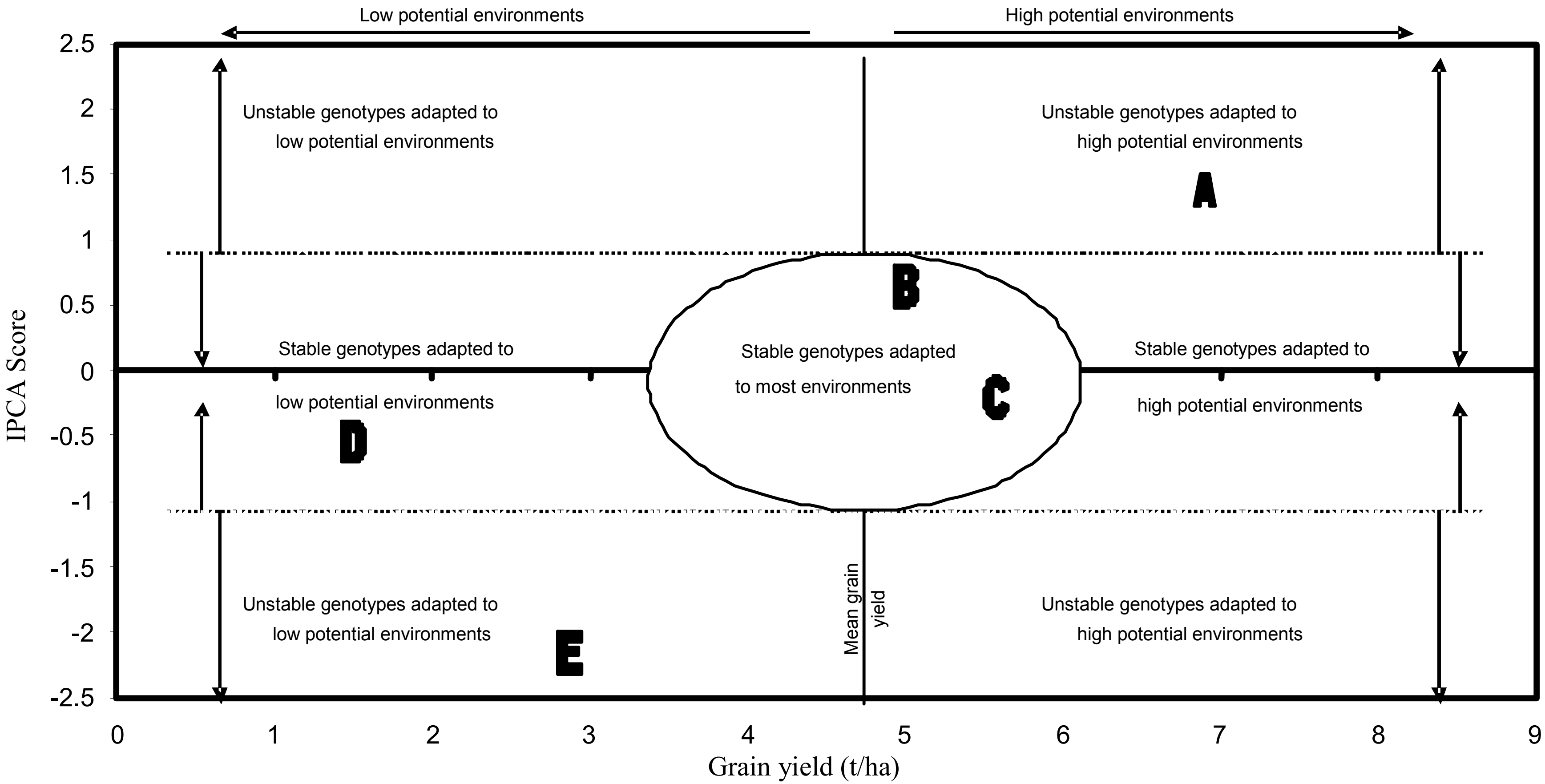


**Figure 1b** AMMI model indicates the stability of genotypes at different environments