**THE NATIONAL SMALL GRAIN CULTIVAR EVALUATION PROGRAMME IN THE WINTER RAINFALL REGION**

**REPORT**

**2016**

**Research Team Manager**

**WH KILIAN**

**Project Leader**

**HAE SAUL**

**Technical Support**

**HA HATTING**

**C MILES**

**M DA GRACA**

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9. **INTRODUCTION AND BACKGROUND**

The Western Cape Province experiences a Mediterranean climate, characterised by cool, wet winters and hot dry summers. Mean annual rainfall varies from 200 – 450 mm and more than 80% of the rainfall occurs in winter between April and September, making the Western Cape predominantly a winter rainfall area. The arable land in this area covers approximately 1.5 million ha. Winter cereals are the major crop in the Western Cape and at present, the Western Cape accounts for nearly half of the wheat produced in South Africa. The Swartland (on the west coast) and the Rûens (Southern Cape) are the main distinguishable geographic regions of the winter rainfall area.

**Mandate of the ARC-SGI**

The ARC-Small Grain Institute has the mandate to conduct the National Cultivar Adaptation programme in all the major production areas in the Republic of South Africa. This is done to supply reliable guidelines for the choice of adapted cultivars to small grain producers and policy makers. Cultivar selection should be based on long-term scientific data and should be revised annually to make provision for new improved cultivars. ARC-Small Grain Institute has the specific task and function within its mandate to conduct field trials on a scientific basis, on all cultivars entered into the Programme by the different breeding institutions. To achieve this goal, the Small Grain Institute requests and enlists the co-operation and co-ordination of other institutions and role players within the industry to join and assist them with the task of gathering, combining and presenting the results to the small grain industry. Data collected over the current season may also be compared with historical data and in so doing a more reliable comparison of the data is achieved.

**Objectives**

The specific objective was to carry out wheat cultivar evaluation trials in all four sub regions of the Swartland and three sub regions of the Rûens at representative sites on farmers’ fields, in line with the *National Cultivar Evaluation Protocol*. The end objective of the cultivar evaluation program in the Western Cape is to supply reliable guidelines for the choice of adapted cultivars to its clients and main benefactors, namely the producers of wheat, barley and oats. The data presented in this report were generated from wheat cultivar adaptation trials under dryland conditions in the winter rainfall region (Swartland and Rûens areas of the Western Cape Province of South Africa).

**Statistical design and analyses**

During the meeting of the National Cultivar Evaluation Workgroup, held on 11 February 2016, it was decided to change the statistical layout of all field trials from the “Randomised Complete Block Design” to the “Row and Column Latinised Design”. The recommendation was made after comparing the two designs at three localities in the three major production areas, to increase the accuracy of interpretation of data.

This decision was implemented in all the production areas during the 2016 season. Where necessary fillers, using existing cultivars, were included in the field trials. In the Winter Rainfall area a total of 13 cultivars were entered by breeding companies and a layout of two rows and seven columns was implemented.

1. **SITE SELECTION AND CHARACTERISATION**

The Swartland region is divided into four sub regions, based on soil and climatic characteristics. Seventeen trials were planted at various localities in the Swartland in 2016. The ARC-SGI planted 12 of the 17 trials, using a DBS conservation tillage planter. The other five trials were planted by the Department of Agriculture: Western Cape, using a Rovic Gravity Feeder planter. Five of the trials were maintained by the Department of Agriculture: Western Cape.

Fifteen trials were planted in the Rûens, in three sub regions, of which the ARC-SGI planted nine. Six trials were planted by the Department of Agriculture: Western Cape and they were also responsible for maintaining these six trials.

The localities in the sub regions in the Swartland and Rûens are given in the following tables:

**Swartland**

|  |  |
| --- | --- |
| **Sub region** | **Locality** |
| High Rainfall | Moorreesburg (Langgewens) |
| Philadelphia (Altona) |
| Malmesbury ( Harmonie) |
| Darling ( Klipvlei) |
| Middle Swartland | Moorreesburg (Langrug) |
| Moorreesburg (Klein Swartfontein) |
| Piketberg (Kolsvlei) |
| Halfmanshof (Uitkoms) |
| Koringberg | Eendekuil (The Rest) |
| Koringberg ( Langkloof) |
| Porterville ( Latboskloof) |
| Pools ( Langvlei) |
| Sandveld | Hopefield (Dankbaar) |
| Koperfontein ( Waterboerskraal) |
| Velddrif ( Volstruiskuil) |
| Hopefield (Enkelvlei) |
| Vredenburg ( Holvlei) |

**Rûens**

|  |  |
| --- | --- |
| **Sub region** | **Locality** |
| Western Rûens | Roodebloem (Caledon) |
| Protem (Kleinfontein) |
| Riviersonderend (Tygerhoek) |
| De Vlei ( Caledon) |
| Uitvlug ( Celedon) |
| Southern Rûens | Klipdale (Alpha) |
| Protem (Volmoud) |
| Bredasdorp (Karsrivier) |
| Napier ( Bo- Schietpad) |
| Klipdale (Panorama) |
| Eastern Rûens | Riversdale (Uitkyk) |
| Witsand (Sandfontein) |
| Swellendam (Klippenrivier) |
| Heidelberg (Voorstekop) |
| Buffelsjag (Volmoed) |

The list of localities, GPS coordinates, farm names and previous crops on the sites are listed in Tables below:

**Swartland**

*Sites planted by the Agricultural Research Council*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Locality** | **GPS Coordinates** | **Farm Name** | **Farmer Details** | | **Previous crop** |
| Moorreesburg | S 33° 09`24.8", E018° 42`45.3" | Langgewens | Dept. Agric. | 0224332370 | Oats |
| Piketberg | S 32° 56`42.1", E018° 48`06.7" | Kolsvlei | Burger, PFB | 0229132004 | Medics |
| Hopefield | S 33° 09`49.8", E018° 26`55.9" | Dankbaar | Du Toit, J | 0227230416 | Lupines |
| Halfmanshof | S 33° 09`15.7", E018° 55`42.7" | Uitkoms | Kellerman, O | 0836564486 | Canola |
| Porterville | S 33° 03`44.9", E018°57`21.3" | Latboskloof | Knoetzen , H | 0836562241 | Oats |
| Koringberg | S 33° 02`15.7", E018° 35`39.2" | Langkloof | Warnich, H | 0224238183 | Medics |
| Malmesbury | S 33° 24`16.5", E018° 47`38.3" | Papkuilsfontein | Truter, P | 0836558322 | Medics |
| Moorreesburg | S 33° 09`24.8", E018° 42`45.3" | Klein Swartfontein | Bester, C | 0832291389 | Medics |
| Philadelphia | S 33° 41`44.4", E018° 38`33.2" | Altona | Loubser, V | 0833033591 | Medics |
| Hopefield | S 33° 09`49.8”, E018° 26`55.9" | Enkelvlei | Slabber, O | 0836020773 | Lupines |
| Koperfontein | S 33° 02`26.6", E018° 25`45.6" | Watersboerkraal | Melck, G | 0832311533 | Canola |
| Velddrif | S 32° 46`41.5”, E018° 16`37.9" | Volstruiskuil | Visser, G | 083308568 | Lupines |

*Sites planted by the Department of Agriculture*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Locality** | **GPS Coordinates** | **Farm Name** | **Farmer Details** | | **Previous crop** |
| Vredenburg | S 32° 56`54.9", E017° 55`59.4" | Holvlei | Loubser, K. | 0227153605 | Fallow |
| Pools | S 32° 49`17.1”, E018° 49`49.8” | Langvlei | Richter, A. | 0832258668 | Medics |
| Moorreesburg | S 33° 11`01.9”, E018° 37`51.1” | Langrug | Bester, J. |  | Medics |
| Eendekuil | S 32° 39`02.8”, E 018° 55`15.9” | The Rest | Rossouw, W |  | Lupines |
| Darling | S 33° 16`39.0”, E018° 22`06.1” | Klipvlei | Loubsher, N | 0798846100 | Canola |

**Rûens**

*Sites planted by the Agricultural Research Council*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Locality** | **GPS Coordinates** | **Farm Name** | **Farmer Details** | | **Previous crop** |
| Riviersonderend | S 34° 09`20.4", E019°54`42.5" | Tygerhoek | Dept. Agric. | 0282611392 | Lupines/  Fallow |
| Caledon | S 34° 18`02.9”, E019° 31`47.8" | Uitvlug | De Wet, HC | 0282122256 | Canola |
| Caledon | S 34° 14`20.0", E019° 31`47.8" | Roodebloem | CRK | 0282143813 | Fallow |
| Klipdale | S 34° 17`55.5", E019° 49`45.7" | Alpha | Eksteen, F | 0825727796 | Oats |
| Klipdale | S 34° 22`26.0", E019° 54`45.8" | Panorama | Klipdale Boerdery | 0828741372 | Canola |
| Protem | S 34° 08`51.3", E020° 15`42.1" | Kleinfontein | Cilliers, J | 0829483284 | Oats |
| Bredasdorp | S 34° 28`11.9", E020° 07`43.7" | Karsrivier | Wessels, B | 0829278320 | Fallow |
| Heidelberg | S 34° 08`26.6", E020° 44`40.0" | Voorstekop | Von Papendorp, D | 0285123761 | Coriander |
| Riversdal | S 34° 09`40.6", E021° 09`19.7" | Uitkyk | Joubert, F | 0824956423 | Canola /Cover |

*Sites planted by the Department of Agriculture*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Locality** | **GPS Coordinates** | **Farm Name** | **Farmer Details** | | **Previous crop** |
| Napier | S 34° 22`12.4”, E019° 48`44.9” | Bo-Schietpad | Van Deventer, J |  | Canola |
| Witsand | S 34° 19`42.5”, E020° 47`01.0” | Sandfontein | Uys, P | 0824930591 | Canola |
| Protem | S 34° 15`12.5”, E020° 09`42.8” | Volmoud | Du Toit, AJ | 0827777357 | Canola |
| Swellendam | S 34° 02`24.8”, E020° 23`17.0” | Klippenrivier | Uys, P | 0823163214 | Canola |
| Swellendam | S 34° 08`26.6”, E020° 44`40.0” | Volmoed | Franken, S | 0829274989 | Canola |
| Caledon | S 34° 10`22.2”, E019° 17`10.9” | De Vlei | Lotter, MG | 0828716588 | Lucern |

**Soil Analyses**

Soils samples were collected before planting from the 0 - 20 cm depths at all trial sites, using a graduated dutch auger. A simple random sampling procedure was also used. At least 3 random samples were collected from each of the fields and bulked to form a composite sample. The samples were air dried (visible organic debris removed), ground (< 2 mm) and analysed for the following: soil acidity (pH, acid saturation and exchangeable acidity), exchangeable bases (Mg, K, Ca and Na) and available phosphate (P-Bray 1). The soil analyses were done according to the Standard Methods of the Non-Affiliated Soil Analysis Working Committee (1990).

The soil analyses results obtained are summarised in the following table:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Locality** | **pH (KCl)** | **P (mg/kg)** | **K (mg/kg)** | **Ca (mg/kg)** | **Mg (mg/kg)** | **Na (mg/kg)** | **S (mg/kg)** | **Exch Acid** | **AS (%)** |
| Bredasdorp | 5.9 | 29 | 465.3 | 1305 | 157 | 47 | 28 | 0.00 | 0.00 |
| Alpha | 5.6 | 60 | 812.3 | 1888 | 350 | 81 | 45 | 0.00 | 0.00 |
| Voorstekop | 6.8 | 27 | 305.6 | 1772 | 233 | 52 | 15 | 0.00 | 0.00 |
| Panorama | 6.1 | 28 | 414.6 | 1283 | 134 | 45 | 30 | 0.00 | 0.00 |
| Kleinfontein | 6.6 | 18 | 219.0 | 1182 | 368 | 396 | 38 | 0.00 | 0.00 |
| Langgewens | 4.7 | 32 | 120.1 | 267 | 32 | 25 | 12 | 0.26 | 11.41 |
| Koperfontein | 5.4 | 32 | 61.3 | 142 | 36 | 14 | 8 | 0.00 | 0.00 |
| Malmesbury | 5.8 | 25 | 323.9 | 838 | 88 | 21 | 44 | 0.00 | 0.00 |
| Philadelphia | 5.8 | 24 | 121.6 | 779 | 63 | 47 | 12 | 0.00 | 0.00 |
| Velddrif | 5.6 | 23 | 101.3 | 264 | 73 | 10 | 2 | 0.00 | 0.00 |
| Piketberg | 7.7 | 19 | 243.8 | 3133 | 88 | 41 | 22 | 0.00 | 0.00 |
| Halfmanshof | 5.5 | 38 | 96.9 | 608 | 157 | 786 | 103 | 0.00 | 0.00 |
| Hopefield | 6.9 | 21 | 95.6 | 506 | 48 | 24 | 14 | 0.00 | 0.00 |
| Porterville | 5.5 | 35 | 150.5 | 844 | 112 | 63 | 23 | 0.00 | 0.00 |
| Riversdal | 5.9 | 40 | 384.4 | 970 | 103 | 51 | 27 | 0.00 | 0.00 |
| Langkloof | 5.6 | 21 | 221.5 | 627 | 103 | 127 | 40 | 0.00 | 0.00 |
| Moorreesburg | 5.1 | 22 | 328.1 | 732 | 80 | 32 | 22 | 0.00 | 0.00 |
| Tygerhoek | 4.6 | 20 | 184.5 | 566 | 158 | 59 | 16 | 0.25 | 4.89 |
| Darling | 6.0 | 34 | 30 | 218 | 56 | 21 | 6 | 0.00 | 0.00 |
| Vredenburg | 5.7 | 33 | 64 | 360 | 83 | 50 | 7 | 0.00 | 0.00 |
| Eendekuil | 5.4 | 48 | 83 | 292 | 79 | 25 | 8 | 0.44 | 0.44 |
| Pools | 6.0 | 67 | 85 | 742 | 67 | 41 | 5 | 0.00 | 0.00 |
| Langrug | 5.8 | 96 | 353 | 1178 | 68 | 59 | 2 | 0.00 | 0.00 |
| Napier | 5.8 | 33 | 242 | 1086 | 138 | 37 | 4 | 0.00 | 0.00 |
| Swellendam | 5.3 | 69 | 85 | 1226 | 239 | 63 | 5 | 0.85 | 0.00 |
| Buffeljags | 5.8 | 121 | 212 | 1396 | 124 | 38 | 8 | 0.00 | 0.00 |
| Protem | 5.3 | 70 | 225 | 1060 | 122 | 40 | 13 | 0.59 | 0.00 |
| De Vlei | 5.8 | 27 | 189. | 1173 | 191 | 55 | 19 | 0.00 | 0.00 |
| Witsand | 5.4 | 52 | 349 | 1692 | 115 | 55 | 11 | 0.52 | 0.00 |
| Dankbaar | 6.3 | 28 | 103 | 308 | 50 | 16 | 5 | 0.00 | 0.00 |

**Site preparation**

All trials were carried out on the fields of wheat producers or at experimental farms. Site preparation was done by the producers or farm managers, who were simultaneously preparing the field for their own crops.

1. **ENTRIES RECEIVED FOR THE 2016 PROGRAM**

Three institutions, namely ARC-SGI, Sensako and Pannar provided 13 entries for the 2016 program. SST 0137 (Sensako) was the only new entry into the programme, while the cultivars Kwartel and Tankwa (ARC-SGI) were withdrawn from the programme.

*Entries for the 2016 program*

|  |  |  |  |
| --- | --- | --- | --- |
| **Origin** | **Entry** | **Type** | **Released** |
| Small Grain Institute | Ratel | Pure Line | 2011 |
| Sensako | SST 88 | Pure Line | 2001 |
| Sensako | SST 015 | Pure Line | 2002 |
| Sensako | SST 027 | Pure Line | 2004 |
| Sensako | SST 056 | Pure Line | 2005 |
| Sensako | SST 087 | Pure Line | 1998 |
| Sensako | SST 096 | Pure Line | 2008 |
| Sensako | SST 0127 | Pure Line | 2009 |
| Sensako | SST 0117 | Pure Line | 2011 |
| Sensako | SST 0147 | Pure Line | 2014 |
| Sensako | SST 0137 \* | Pure Line | 2013 |
| Pannar | PAN 3471 | Pure Line | 2004 |
| Pannar | PAN 3408 | Pure Line | 2001 |

*\*New entry for the 2016 program*

The NCEP Protocol stipulates that all seed supplied by breeding companies must be either untreated or treated with the active Carboxin for smut diseases. All seed was tested for germination percentage and coleoptile length as received, in line with the protocol. The thousand kernel mass (g/1000 kernels) was also determined. The results obtained are summarised in the following table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Entry** | **Treatment** | **Germination (%)** | **Coleoptile length (mm)** | **TKM**  **(g/1000 kernels)** |
| Ratel | Untreated | 98 | 74 | 45.3 |
| SST 88 | Untreated | 96 | 67 | 38.5 |
| SST 015 | Untreated | 98 | 82 | 34.8 |
| SST 027 | Untreated | 93 | 70 | 40.8 |
| SST 056 | Untreated | 99 | 80 | 30.8 |
| SST 087 | Untreated | 99 | 80 | 38.5 |
| SST 096 | Untreated | 99 | 86 | 35.8 |
| SST 0127 | Untreated | 96 | 77 | 37.0 |
| SST 0117 | Untreated | 98 | 78 | 36.0 |
| SST 0147 | Untreated | 98 | 75 | 33.8 |
| SST 0137 | Vitavax | 96 | 79 | 35.3 |
| PAN 3471 | Untreated | 96 | 78 | 46.8 |
| PAN 3408 | Vitavax | 93 | 88 | 32.0 |

The germination percentage as well as the coleoptile length of all entries were well above the specifications for the seed. The thousand kernel mass values were used to calculate the amount of seed needed for the different planting rates, as described in the next chapter.

1. **PLANTING AND FERTILISER APPLICATION**

**Planting density**

Each cultivar was planted at a planting density as recommended by the cultivar owner. The thousand kernel mass (TKM) was used to realise equal plant population within the trials. The TKM values and planting densities (plants/m2) for the cultivars in the different sub regions in the Swartland and Rûens are presented in the table below:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cultivar** | **TKM** | **Sandveld** | **Koring-berg** | **Middle Swartland** | **High Rainfall** | **Western Rûens** | **Southern Rûens** | **Eastern Rûens** |
| Ratel | 45.3 | 200 | 200 | 225 | 225 | 225 | 200 | 200 |
| SST 88 | 38.5 | 175 | 175 | 200 | 225 | 225 | 200 | 200 |
| SST 015 | 34.8 | 175 | 175 | 200 | 225 | 225 | 200 | 200 |
| SST 027 | 40.8 | 175 | 175 | 200 | 225 | 225 | 200 | 200 |
| SST 056 | 30.8 | 175 | 175 | 200 | 225 | 225 | 200 | 200 |
| SST 087 | 38.5 | 175 | 175 | 200 | 225 | 225 | 200 | 200 |
| SST 096 | 35.8 | 175 | 175 | 200 | 225 | 225 | 200 | 200 |
| SST 0127 | 37.0 | 175 | 175 | 200 | 225 | 225 | 200 | 200 |
| SST 0117 | 36.0 | 175 | 175 | 200 | 225 | 225 | 200 | 200 |
| SST 0147 | 33.8 | 175 | 175 | 200 | 225 | 225 | 200 | 200 |
| SST 0137 | 35.3 | 175 | 175 | 200 | 225 | 225 | 200 | 200 |
| PAN 3408 | 32.0 | 175 | 200 | 225 | 225 | 225 | 200 | 200 |
| PAN 3471 | 46.8 | 175 | 200 | 225 | 225 | 225 | 200 | 200 |

**Planting dates**

*Swartland planting dates*

|  |  |  |
| --- | --- | --- |
| **Locality** | **Responsibility** | **Planting date** |
| Moorreesburg (Langgewens) | ARC-SGI | 17/05/2016 |
| Piketberg | ARC-SGI | 16/05/2016 |
| Hopefield (Enkelvlei) | ARC-SGI | 12/05/2016 |
| Halfmanshof | ARC-SGI | 11/05/2016 |
| Porterville | ARC-SGI | 16/05/2016 |
| Koringberg | ARC-SGI | 13/05/2016 |
| Malmesbury | ARC-SGI | 17/05/2016 |
| Moorreesburg (Klein Swartfontein) | ARC-SGI | 16/05/2016 |
| Philadelphia | ARC-SGI | 18/05/2016 |
| Koperfontein | ARC-SGI | 12/05/2016 |
| Velddrif | ARC-SGI | 11/05/2016 |
| Hopefield (Dankbaar) | ARC-SGI | 12/05/2016 |
| Pools | Department | 10/05/2106 |
| Vredenburg | Department | 11/05/2016 |
| Moorreesburg (Langrug) | Department | 05/05/2016 |
| Eendekuil | Department | 10/05/2016 |
| Darling | Department | 12/05/2016 |

*Rûens planting dates*

|  |  |  |
| --- | --- | --- |
| **Locality** | **Responsibility** | **Planting date** |
| Riviersonderend | ARC-SGI | 06/05/2016 |
| Caledon (Uitvlug) | ARC-SGI | 09/05/2016 |
| Caledon (Roodebloem) | ARC-SGI | 06/05/2016 |
| Klipdale (Alpha) | ARC-SGI | 05/05/2016 |
| Klipdale (Panorama) | ARC-SGI | 05/05/2016 |
| Protem (Kleinfontein) | ARC-SGI | 03/05/2016 |
| Bredasdorp | ARC-SGI | 05/05/2016 |
| Heidelberg | ARC-SGI | 04/05/2016 |
| Riversdal | ARC-SGI | 04/05/2016 |
| Napier | Department | 03/05/2016 |
| Witsand | Department | 02/05/2016 |
| Protem (Volmoed) | Department | 03/05/2016 |
| Swellendam (Buffeljags) | Department | 02/05/2016 |
| Swellendam (Klippenrivier) | Department | 02/05/2016 |
| Caledon (De Vlei) | Department | 13/05/2016 |

**Experimental design and trial layout**

All trials plans were Row and Column Latinised designs with four replications. The row spacing was 30 cm and seven rows of seven meters were planted. The plots were then reduced to 5 m post emergence, by spraying out a path of 2 m between the plots. Only five of the seven rows were harvested.

**Fertiliser application programme**

Basal N-based fertilizer was applied with planting with the balance at ±40 days. A mixture

(N: P: K) of 4:1:1(31) was used with planting and KAN (28) or Urea (46) as top dressing, depending on the amount of rain that fell on a specific location. The fertiliser application rates and application dates are presented in the tables below:

*Swartland fertiliser programme*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Locality** | **Before or at planting** | | | **Top dressings** | | | **Top dressings** | | |
| **Date** | **Fertiliser source** | **Rate (kg/ha)** | **Date** | **Fertiliser source** | **Rate**  **(kg/ha)** | **Date** | **Fertiliser source** | **Rate (kg/ha)** |
| Piketberg | 16/05/2016 | 4:1:1(31) | 40 kg/ha | 25/06/2016 | 4:1:1(31) | 20 kg/ha | 13/07/2016 | KAN | 10 kg/ha |
| Hopefield (Enkelvlei) | 12/05/2016 | 4:1:1(31) | 40 kg/ha | 11/07/2016 | 4:1:1(31) | 20 kg/ha | 29/07/2016 | Uruem | 10 kg/ha |
| Halfmanshof | 11/05/2016 | 4:1:1(31) | 40 kg/ha | 30/06/2016 | 4:1:1(31) | 20 kg/ha | 02/08/2016 | KAN | 10 kg/ha |
| Porterville | 16/05/2016 | 2:3:2(30) | 40 kg/ha | 25/06/2016 | 4:1:1(31) | 20 kg/ha | 02/08/2016 | KAN | 10 kg/ha |
| Koringberg | 13/05/2016 | 4:1:1(31) | 40 kg/ha | 25/07/2016 | 4:1:1(31) | 20 kg/ha | 05/08/2016 | KAN | 10 kg/ha |
| Malmesbury | 17/05/2016 | 2:3:2(30) | 40 kg/ha | 29/07/2016 | 4:1:1(31) | 20 kg/ha | 05/08/2016 | KAN | 10 kg/ha |
| Moorreesburg (Klein Swartfontein) | 16/05/2016 | 4:1:1(31) | 40 kg/ha | 25/08/2016 | 4:1:1(31) | 20 kg/ha | 02/08/2016 | KAN | 10 kg/ha |
| Philadelphia | 18/05/2016 | 4:1:1(31) | 40 kg/ha | 04/07/2016 | 4:1:1(31) | 20 kg/ha | 01/08/2016 | KAN | 10 kg/ha |
| Hopefield (Dankbaar) | 12/05/2016 | 4:1:1(31) | 40 kg/ha | 24/06/2016 | 4:1:1(31) | 30 kg/ha | 14/07/2016 | KAN | 26 kg/ha |
| Koperfontein | 12/05/2016 | 4:1:1(31) | 40 kg/ha | 04/07/2016 | 4:1:1(31) | 20 kg/ha | 04/08/2016 | KAN | 10 kg/ha |
| Velddrif | 11/05/2016 | 4:1:1(31) | 40 kg/ha | 27/07/2016 | 4:1:1(31) | 20 kg/ha | 04/08/2016 | Uruem | 10 kg/ha |
| Pools | 10/05/2106 | 3:1:0(27) | 24 kg/ha | 21/06/2016 | KAN | 30 kg/ha | 06/07/2016 | KAN | 26 kg/ha |
| Vredenburg | 11/05/2016 | 4:1:1(31) | 40 kg/ha | 22/06/2016 | KAN | 30 kg/ha | 18/07/2016 | KAN | 26 kg/ha |
| Moorreesburg (Langrug) | 05/05/2016 | 3:1:0(27) | 24 kg/ha | 24/06/2016 | KAN | 30 kg/ha | 15/07/2016 | KAN | 26 kg/ha |
| Eendekuil | 10/05/2016 | 3:1:0(27) | 24 kg/ha | 24/06/2016 | KAN | 30 kg/ha | 14/07/2016 | KAN | 26 kg/ha |
| Darling | 12/05/2016 | 3:1:0(27) | 24 kg/ha | 24/06/2016 | KAN | 30 kg/ha | 08/07/2016 | KAN | 26 kg/ha |
| Moorreesburg (Langgewens) | 17/05/2016 | 4:1:1(31) | 40 kg/ha | Trial written off on an early stage due to heavy weed infestation | | | | | |

*Rûens fertiliser programme*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Locality** | **Before or at planting** | | | **Top dressings** | | | **Top dressings** | | |
| **Date** | **Fertiliser source** | **Rates (kg/ha)** | **Date** | **Fertiliser source** | **Rates (kg/ha)** | **Date** | **Fertiliser source** | **Rates (kg/ha)** |
| Riviersonderend | 06/05/2016 | 4:1:1(31) | 40 kg/ha |  |  |  | 05/08/2016 | KAN | 10 kg/ha |
| Caledon (Uitvlug) | 09/05/2016 | 4:1:1(31) | 40 kg/ha | 23/06/2016 | 4:1:1(31) | 20 kg/ha | 05/08/2016 | KAN | 10 kg/ha |
| Caledon (Roodebloem) | 06/05/2016 | 4:1:1(31) | 40 kg/ha | 22/06/2016 | 4:1:1(31) | 20 kg/ha | 05/08/2016 | KAN | 10 kg/ha |
| Klipdale (Alpha) | 05/05/2016 | 4:1:1(31) | 40 kg/ha | 22/06/2016 | 4:1:1(31) | 20 kg/ha | 04/08/2016 | KAN | 10 kg/ha |
| Klipdale (Panorama) | 05/05/2016 | 4:1:1 (31) | 40 kg/ha | 22/06/2016 | 4:1:1 (31) | 20 kg/ha | 04/08/2016 | KAN | 10 kg/ha |
| Protem (Kleinfontein) | 03/05/2016 | 4:1:1(31) | 40 kg/ha | 21/06/2016 | 4:1:1(31) | 20 kg/ha |  |  |  |
| Bredasdorp | 05/05/2016 | 4:1:1 (31) | 40 kg/ha | 22/06/2016 | 4:1:1 (31) | 20 kg/ha | 04/08/2016 | KAN | 10 kg/ha |
| Heidelberg | 04/05/2016 | 4:1:1(31) | 40 kg/ha | 21/06/2016 | 4:1:1(31) | 20 kg/ha | 04/08/2016 | KAN | 10 kg/ha |
| Riversdal | 04/05/2016 | 4:1:1(31) | 40 kg/ha | 20/06/2016 | 4:1:1(31) | 20 kg/ha | 04/08/2016 | KAN | 10 kg/ha |
| Napier | 03/05/2016 | 3:1:0 (27) | 24 kg/ha | 28/6/2016 | KAN | 30 kg/ha | 21/07/2016 | KAN | 26 kg/ha |
| Witsand | 02/05/2016 | 3:1:0 (27) | 24 kg/ha | 9/06/2016 | KAN | 30 kg/ha | 28/06/2016 | KAN | 26 kg/ha |
| Protem (Volmoed) | 03/05/2016 | 3:1:0 (27) | 24 kg/ha | 7/06/2016 | KAN | 30 kg/ha | 30/06/2016 | KAN | 26 kg/ha |
| Swellendam (Buffeljags) | 02/05/2016 | 3:1:0 (27) | 24 kg/ha | 7/06/2016 | KAN | 30 kg/ha | 28/06/2016 | KAN | 26 kg/ha |
| Swellendam (Klippenrivier) | 02/05/2016 | 3:1:0 (27) | 24 kg/ha | 9/06/2016 | KAN | 40 kg/ha | 28/06/2016 | KAN | 26 kg/ha |
| Caledon (Klipfontein) | 13/05/2015 | 3:1:0 (27) | 24 kg/ha | 23/06/2016 | KAN | 40 kg/ha | 21/07/2016 | KAN | 26 kg/ha |

1. **WEED, DISEASE, INSECT AND PEST MANAGEMENT**

The aim with the pest and disease control programme in the field trials is to ensure that there are no such external factors that might influence cultivars differently.

In the following tables the control programmes put into place, as well as the outcomes of the measures, are indicated for each locality.

**Weed management**

*Swartland trials weed control programme*

| **Locality** | **Pre emergence application(s)** | | | **Post emergence application(s)** | | | **Comments** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Product** | **Dosage** | **Date** | **Product** | **Dosage** |
| Moorreesburg (Langgewens) | 17/05/2016 | Sakura | 118 g/ha | 12/07/2016 | Boxer  Logran  MCPA | 3 l/ha  30 g/ha  3 l/ha | Not Satisfactory |
| Piketberg | 16/05/2016 | Sakura | 118 g/ha | 13/07/2016 | Boxer  Logran  MCPA | 3 l/ha  30 g/ha  3 l/ha | Satisfactory |
| Hopefield (Enkelvlei) | 12/05/2016 | Sakura | 118 g/ha | 11/07/2016 | Boxer  Logran  MCPA | 3 l/ha  30 g/ha  3 l/ha | Not Satisfactory |
| Halfmanshof | 11/05/2016 | Sakura | 118 g/ha | 4/07/2016 | Boxer  Logran  MCPA | 3 l/ha  30 g/ha  3 l/ha | Satisfactory |
| Porterville | 16/05/2016 | Sakura | 118 g/ha | 4/07/2016  25/08/2016 | Boxer  Logran  MCPA  2.4D  Avadex | 3 l/ha  30 g/ha  3 l/ha  1.5 l/ha  1.7 l/ha | Second applications due to to *Bromus* and *Avena* |
| Koringberg | 13/05/2016 | Sakura | 118 g/ha | 11/07/2016 | Boxer  Logran  MCPA | 3 l/ha  30 g/ha  3 l/ha | Satisfactory |
| Malmesbury | 17/05/2016 | Sakura | 118 g/ha | 4/07/2016 | Boxer  Logran  MCPA | 3 l/ha  30 g/ha  3 l/ha | Satisfactory |
| Moorreesburg (Klein Swartfontein) | 16/05/2016 | Sakura | 118 g/ha | 13/07/2016 | Boxer  Logran  MCPA | 3 l/ha  30 g/ha  3 l/ha | Satisfactory |
| Philadelphia | 18/05/2016 | Sakura | 118 g/ha | 13/07/2016 | Boxer  Logran  MCPA | 3 l/ha  30 g/ha  3 l/ha | Satisfactory |
| Hopefield (Dankbaar) | 12/05/2016 | Sakura | 118 g/ha | 24/06/2016 | Enhancer  Logran  MCPA | 2.5 g/ha  15 g/ha  500 ml/ha | Satisfactory |
| Koperfontein | 12/05/2016 | Sakura | 118 g/ha | 11/07/2016 | Boxer  Logran  MCPA | 3 l/ha  30 g/ha  3 l/ha | Satisfactory |
| Velddrif | 11/05/2016 | Sakura | 118 g/ha | 11/07/2016 | Boxer  Logran  MCPA  2,4 D | 3 l/ha  30 g/ha  3 l/ha  1.5 l/ha | Satisfactory |
| Pools | 10/05/2016 | Sakura | 125 g/ha | 29/06/2016  06/07/2016 | Enhancer  Logran  MCPA  Axial | 2.5 g/ha  15 g/ha  500 ml/ha  780 ml/ha | Satisfactory |
| Vredenburg | 11/05/2016 | Sakura | 118 g/ha | 25/06/2016  18/07/2016 | Logran  Enhancer  MCPA  Axial | 15 g/ha  2.5 g/ha  500 ml/ha  780 ml/ha | Satisfactory |
| Moorreesburg (Langrug) | 05/05/2016 | Sakura | 125 g/ha | 25/06/2016 | Logran  Enhancer  MCPA | 15 g/ha  2.5 g/ha  500 ml/ha | Satisfactory |
| Eendekuil | 10/05/2016 | Sakura | 125 g/ha | 20/07/2016 | Axial | 780 ml/ha | Satisfactory |
| Darling | 12/05/2016 | Sakura | 118 g/ha | 23/06/2016  18/07/2016 | Logran  Enhancer  MCPA  Axial | 15 g/ha  2.5 g/ha  500 ml/ha  780 ml/ha | Satisfactory |

*Rûens trials weed control programme*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Locality** | **Pre emergence application(s)** | | | **Post emergence application(s)** | | | **Comments on control** |
| **Date** | **Product** | **Dosage** | **Date** | **Product** | **Dosage** |
| Riviersonderend | 06/05/2016 | Logran | 15 g/ha | 07/07/2016 | Cossack  Buctril | 250 g/ha  375 ml/ha | Satisfactory |
| Caledon (Uitvlug) | 09/05/2016 | Sakura | 118g/ha | 07/07/2016 | 2.4D  Express Super | 1.5 l/ha  25 g/ha | Satisfactory |
| Caledon (Roodebloem) | 06/05/2016 | Sakura | 118g/ha | 26/07/2016 | Axial  MCPA | 750 ml/ha  300 ml/ha | Satisfactory |
| Klipdale (Alpha) | 05/05/2016 | Sakura | 118g/ha | 07/07/2016 | Express super  2.4 D | 25 g/ha  1.5 l/ha | Satisfactory |
| Klipdale (Panorama) | 05/05/2016 | Sakura | 118g/ha | 07/07/2016 | Express super  2.4 D | 25 g/ha  1.5 l/ha | Satisfactory |
| Protem (Kleinfontein) | 03/05/2016 | Sakura | 118g/ha | 29/06/2016 | Glean | 15 g/ha | Satisfactory |
| Bredasdorp | 05/05/2016 | Sakura | 118g/ha | 30/06/2016 | Glean | 15 g/ha | Satisfactory |
| Heidelberg | 04/05/2016 | Sakura | 118g/ha | 29/06/2016 | Glean | 15 g/ha | Satisfactory |
| Riversdal | 04/05/2016 | Sakura | 118g/ha | 29/06/2016 | Express super | 25g/ha | Satisfactory |
| Napier | 03/05/2016 | Sakura | 125g/ha | 30/06/2016  14/07/2016 | Logran  Enhance  MCPA  Axial | 15 g/ha  2.5 g/ha  500 ml/ha  780 ml/ha | Satisfactory |
| Witsand | 02/05/2016 | Sakura | 118g/ha |  |  |  | Satisfactory |
| Protem (Volmoed) | 03/05/2016 | Sakura | 118g/ha | 30/06/2016 | Logran  Enhance  MCPA | 15 g/ha  2.5 g/ha  500 ml/ha | Satisfactory |
| Swellendam (Buffeljags) | 02/05/2016 | Sakura | 118g/ha | 02/08/2016 | Logran  Enhance  MCPA | 15 g/ha  2.5 g/ha  500 ml/ha | Satisfactory |
| Swellendam (Klippenrivier) | 02/05/2006 | Sakura | 118g/ha |  |  |  | Satisfactory |
| Caledon (Klipfontein) | 05/05/2016 | Sakura | 118g/ha | 04/07/2016 | Logran  Enhance  MCPA | 15 g/ha  2.5 g/ha  500 ml/ha | Satisfactory |

**Disease management**

*Swartland trails disease control programme*

| **Locality** | **Post emergence application(s)** | | | **Comments on control** |
| --- | --- | --- | --- | --- |
| **Date** | **Product(s)** | **Dosage** |
| Piketberg | 25/07/2016  28/08/2016  19/09/2016 | Duett  Prosaro  Prosaro | 1 l/ha  400 ml/ha  400 ml/ha | Satisfactory |
| Hopefield (Enkelvlei) | 27/07/2016  26/08/2016 | Duett  Prosaro | 1 l/ha  400 ml/ha | Satisfactory |
| Halfmanshof | 25/07/2016  25/08/2016  19/09/2016 | Duett  Prosaro  Prosaro | 1 l/ha  400 ml/ha  400 ml/ha | Satisfactory |
| Porterville | 27/07/2016  25/08/2016  19/09/2016 | Duett  Prosaro  Prosaro | 1 l/ha  400 ml/ha  400 ml/ha | Satisfactory |
| Koringberg | 25/07/2016  25/08/2016  19/09/2016 | Duett  Prosaro  Prosaro | 1 l/ha  400 ml/ha  400 ml/ha | Satisfactory |
| Malmesbury | 29/07/2016  26/08/2016  19/09/2016 | Duett  Prosaro  Prosaro | 1 l/ha  400 ml/ha  400 ml/ha | Satisfactory |
| Moorreesburg (Klein Swartfontein) | 25/07/2016  25/08/2016  19/09/2016 | Duett  Prosaro  Prosaro | 1 l/ha  400 ml/ha  400 ml/ha | Satisfactory |
| Philadelphia | 01/08/2016  26/08/2016  19/09/2016 | Duett  Prosaro  Prosaro | 1 l/ha  400 ml/ha  400 ml/ha | Satisfactory |
| Hopefield (Dankbaar) | 10/07/2016  18/08/2016  02/09/2016 | Amistar-X-tra  Artea  Artea | 600-800ml/ha  500ml/ha  500ml/ha | Satisfactory |
| Koperfontein | 27/07/2016  26/08/2016  19/09/2016 | Duett  Prosaro  Prosaro | 1 l/ha  400 ml/ha  400 ml/ha | Satisfactory |
| Velddrif | 27/07/2016  26/08/2016  19/09/2016 | Duett  Prosaro  Prosaro | 1 l/ha  400 ml/ha  400 ml/ha | Satisfactory |
| Pools | 29/07/2016  18/08/2016  02/09/2016 | Amistar-X-tra  Artea  Artea | 600-800ml/ha  500ml/ha  500ml/ha | Satisfactory |
| Vredenburg | 18/07/2016  24/08/2016  09/09/2016 | Amistar-X-tra  Artea  Artea | 600-800ml/ha  500ml/ha  500ml/ha | Satisfactory |
| Moorreesburg (Langrug) | 23/06/2016  27/08/2016  09/09/2016 | Amistar-X-tra  Artea  Artea | 600-800ml/ha  500ml/ha  500ml/ha | Satisfactory |
| Eendekuil | 10/07/2016  18/08/2016  02/09/2016 | Amistar-X-tra  Artea  Artea | 600-800ml/ha  500ml/ha  500ml/ha | Satisfactory |
| Darling | 08/07/2016  23/08/2016  09/09/2016 | Amistar-X-tra  Artea  Artea | 600-800ml/ha  500ml/ha  500ml/ha | Satisfactory |
| Moorreesburg (Langgewens) | Trial written off on an early stage due to heavy weed infestation | | | |

*Rûens trials disease control programme*

| **Locality** | **Post emergence application(s)** | | | **Comments** |
| --- | --- | --- | --- | --- |
| **Date** | **Product(s)** | **Dosage** |
| Riviersonderend | 18/07/2016 | Capitan | 400 ml/ha | Satisfactory |
| Caledon (Uitvlug) | 24/08/2016 | Prosaro  Prosaro | 1 l/ha  400 ml/ha  400 ml/ha | Satisfactory |
| Caledon (Roodebloem) | 24/08/2016 | Prosaro  Prosaro | 1 l/ha  400 ml/ha  400 ml/ha | Satisfactory |
| Klipdale (Alpha) | 24/08/2016 | Prosaro  Prosaro | 1 l/ha  400 ml/ha  400 ml/ha | Satisfactory |
| Klipdale (Panorama) | 24/08/2016 | Duett  Prosaro  Prosaro | 1 l/ha  400 ml/ha  400 ml/ha | Satisfactory |
| Protem (Kleinfontein) | 29/07/2016  25/08/2016 | Abacus  Prosaro  Prosaro | 1 l/ha  400 ml/ha  400 ml/ha | Satisfactory |
| Bredasdorp | 01/08/2016  24/08/2016 | Abacus  Prosaro  Prosaro | 1 l/ha  400 ml/ha  400 ml/ha | Satisfactory |
| Heidelberg | 29/07/2016  25/08/2016 | Abacus  Prosaro  Prosaro | 1 l/ha  400 ml/ha  400 ml/ha | Satisfactory |
| Riversdal | 29/07/2016  25/08/2016 | Abacus  Prosaro  Prosaro | 1 l/ha  400 ml/ha  400 ml/ha | Satisfactory |
| Napier | 26/07/2016  15/08/2016  19/09/2016 | Amistar Xtra  Artea  Artea | 600ml/ha  500ml/ha  500ml/ha | Satisfactory |
| Witsand | 27/07/2016  19/09/2016 | Amistar Xtra  Artea | 600ml/ha  500ml/ha | Satisfactory |
| Protem (Volmoed) | 01/08/2016  18/08/2016 | Amistar Xtra  Artea | 600ml/ha  500ml/ha | Satisfactory |
| Swellendam (Buffeljags) | 28/07/2016 | Amistar Xtra | 600ml/ha | Satisfactory |
| Swellendam (Klippenrivier) | 01/08/2016  16/08/2016 | Amistar Xtra  Artea | 600ml/ha  500ml/ha | Satisfactory |
| Caledon (Klipfontein) | 12/08/2016 | Artea | 500ml/ha | Satisfactory |

**Insect management**

*Swartland trials insect control program*

| **Locality** | **Post emergence application(s)** | | | **Comments** |
| --- | --- | --- | --- | --- |
| **Date** | **Product(s)** | **Dosage** |
| Piketberg | 25/07/2016 | Mospilan | 50 g/ha | Satisfactory |
| Hopefield (Enkelvlei) | 27/07/2016 | Mospilan | 50 g/ha | Satisfactory |
| Halfmanshof | 25/07/2016  17/10/2016 | Mospilan  Methomex | 50 g/ha  200 g/ha | Satisfactory |
| Porterville | 25/07/2016  17/10/2016 | Mospilan  Methomex | 50 g/ha  200 g/ha | Satisfactory |
| Koringberg | 25/07/2016  17/10/2016 | Mospilan  Methomex | 50 g/ha  200 g/ha | Satisfactory |
| Malmesbury | 29/07/2016  18/10/2016 | Mospilan  Methomex | 50 g/ha  200 g/ha | Satisfactory |
| Moorreesburg (Klein Swartfontein) | 25/07/2016  18/10/2016 | Mospilan  Methomex | 50 g/ha  200 g/ha | Satisfactory |
| Philadelphia | 01/08/2016  18/10/2016 | Mospilan  Methomex | 50 g/ha  200 g/ha | Satisfactory |
| Hopefield (Dankbaar) | 25/08/2016 | Imidore | 200ml/ha | Satisfactory |
| Koperfontein | 27/07/2016 | Mospilan | 50 g/ha | Satisfactory |
| Velddrif | 27/07/2016 | Mospilan | 50 g/ha | Satisfactory |
| Pools | 29/07/2016 | Imidore | 200ml/ha | Satisfactory |
| Vredenburg | 18/07/2016  24/08/2016 | Imidore | 200ml/ha | Satisfactory |
| Moorreesburg (Langrug) | 20/07/2016  24/08/2016 | Imidore | 200ml/ha | Satisfactory |
| Eendekuil | 18/08/2016 | Imidore | 200ml/ha | Satisfactory |
| Darling | 18/07/2016  23/08/2016 | Dimet  Imidore | 750 ml/ha  200ml/ha | Satisfactory |
| Moorreesburg (Langgewens) | Trial written off on an early stage due to heavy weed infestation | | | |

*Rûens trials insect control program*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Locality** | **Post emergence application(s)** | | | **Comments** |
| **Date** | **Product(s)** | **Dosage** |
| Riviersonderend | 18/08/2016 | Dimet | 85 ml/ha | Satisfactory |
| Caledon (Uitvlug) | 24/08/2016 | Dimet | 85 ml/ha | Satisfactory |
| Caledon (Roodebloem) | 24/08/2016 | Dimet | 85 ml/ha |  |
| Klipdale (Alpha) | 24/08/2016 | Dimet | 85 ml/ha | Satisfactory |
| Klipdale (Panorama) | 24/08/2016 | Dimet | 85 ml/ha | Satisfactory |
| Protem (Kleinfontein) | 29/06/2016  29/07/2016  25/08/2016 | Dimet  Dimet  Dimet | 85 ml/ha  85 ml/ha  85 ml/ha | Satisfactory |
| Bredasdorp | 30/06/2016 | Dimet | 85 ml/ha | Satisfactory |
| Heidelberg | 29/06/2016  29/07/2016  25/08/2016 | Dimet  Dimet  Dimet | 85 ml/ha  85 ml/ha | Satisfactory |
| Riversdal | 29/06/2016  29/07/2016  25/08/2016 | Dimet  Dimet  Dimet | 85 ml/ha  85 ml/ha  85 ml/ha | Satisfactory |
| Napier | None | | | |
| Witsand | None | | | |
| Protem (Volmoed) | None | | | |
| Swellendam (Buffeljags) | None | | | |
| Swellendam (Klippenrivier) | None | | | |
| Caledon (Klipfontein) | None | | | |

1. **CLIMATIC CONDITIONS**

***Swartland***

The pre planting conditions in the Swartland showed better prospects for a much-improved season compared to the 2015 season. During the first four months of 2016, the rainfall throughout the Swartland region was between 5 - 19% higher than the same time in 2015.

The good rains of the first four months did not continue into May, which is predominantly the month in which wheat planting commences. Planting conditions were challenging towards the middle of May, due to depleted soil moisture with most of the late plantings done with less or no soil moisture. The rainfall for May was 1.4% lower than the same time last year. This was a worrying factor for most of the producers as it reminds all of us about the very difficult year that was experienced in 2015. It was extremely dry between mid-May and the second week of June and this led to poor germination and poor stand for those crops who managed to germinate. The Pools-Piketberg region endured the worst conditions in the Swartland during this time and the yields that was realised at the end of the season is a reflection of that.

The last quarter of the growing season was more favourable for growing conditions, due to frequent rain and cooler temperatures towards grain filling

***Rûens***

Climatic conditions in the Rûens region was more favourable than the conditions experienced in the Swartland specifically during planting. The good rains during the summer months and the months leading to planting meant that the soil moisture was still sufficient for planting.

Germination and general stand of crops, especially around Caledon was not ideal. The Eastern Rûens had less rains than the Southern and Western Rûens towards the end of the planting season. As was the case for the Swartland, the conditions also improved in the Rûens towards the end of the season, as is reflected in the good yields.

1. **HARVESTING DATES AND OUTCOMES**

**Harvesting procedure**

The row spacing was 30 cm and seven rows of seven meters were planted. The plots were then reduced to 5 m post emergence, by spraying out a path of 2 m between the plots. Only five of the seven rows were harvested.

**Swartland**

*Swartland harvesting dates and trial outcomes*

|  |  |  |  |
| --- | --- | --- | --- |
| **Sub region** | **Locality** | **Harvesting date** | **Outcome** |
| High Rainfall | Moorreesburg (Langgewens) | --- | Not harvested: heavy weed infestation |
| Philadelphia (Altona) | 10/11/2016 | Processed and included |
| Malmesbury ( Harmonie) | 09/11/2016 | Processed and included |
| Darling ( Klipvlei) | 31/10/2016 | Processed and included |
| Middle Swartland | Moorreesburg (Langrug) | 09/11/2016 | Processed and included |
| Moorreesburg (Klein Swartfontein) | 08/11/2016 | Processed and included |
| Piketberg (Kolsvlei) | 16/11/2016 | Processed and included |
| Halfmanshof (Uitkoms) | 28/10/2016 | Processed and included |
| Koringberg | Eendekuil (The Rest) | 01/11/2016 | Processed and included |
| Koringberg ( Langkloof) | 31/10/2016 | Processed and included |
| Porterville ( Latboskloof) | 31/10/2016 | Processed and included |
| Pools ( Langvlei) | 01/11/2016 | Processed and included |
| Sandveld | Hopefield (Dankbaar) | 08/11/2016 | Processed and included |
| Koperfontein ( Waterboerskraal) | 08/11/2016 | Processed and included |
| Velddrif ( Volstruiskuil) | 07/11/2016 | Processed and included |
| Hopefield (Enkelvlei) |  | Not harvested: early drought conditions |
| Vredenburg ( Holvlei) | 10/11/2016 | Processed and not included, High CV |

**Rûens**

*Rûens harvesting dates and trial outcomes*

|  |  |  |  |
| --- | --- | --- | --- |
| **Sub region** | **Locality** | **Harvesting date** | **Outcome** |
| Western Rûens | Roodebloem (Caledon) | 15/11/2016 | Processed and included |
| Protem (Kleinfontein) | --- | Not harvested: porcupine damage |
| Riviersonderend (Tygerhoek) | 21/11/2016 | Processed and included |
| De Vlei ( Caledon) | 18/11/2016 | Processed and included |
| Uitvlug ( Celedon) | 14/11/2016 | Processed and included |
| Southern Rûens | Klipdale (Alpha) | 14/11/2016 | Processed and included |
| Protem (Volmoud) | 08/11/2016 | Processed and included |
| Bredasdorp (Karsrivier) | 02/11/2016 | Processed and included |
| Napier ( Bo- Schietpad) | 09/11/2016 | Processed and included |
| Klipdale (Panorama) | 03/11/2016 | Processed and included |
| Eastern Rûens | Riversdale (Uitkyk) | 01/11/2016 | Processed and included |
| Witsand (Sandfontein) | 26/10/2016 | Processed and not included, High CV |
| Swellendam (Klippenrivier) | 08/11/2016 | Processed and included |
| Heidelberg (Voorstekop) | 01/11/2016 | Processed and included |
| Buffelsjag (Volmoed) | 26/10/2016 | Processed and included |

1. **RESULTS**

**General**

The Swartland (on the west coast) and the Rûens (Southern Cape) are the main distinguishable geographic regions of the winter rainfall area. The Rûens generally receives higher rainfall than the Swartland, but some areas of the Swartland have better, deeper soils. These two separate wheat farming regions were divided into individual areas, according to their climatic, soils, geographic position and other criteria. The individual trial site results for 2016 (across each region) are presented as a combined analysis with the help of the G x E AMMI – analysis method.

The Swartland region is divided into the following areas:

* Sandveld
* Koringberg
* Middle Swartland
* High Rainfall Area

The Rûens region is divided into:

* Western Rûens
* Southern Rûens
* Eastern Rûens

**Cultivar performance in the Swartland**

***Yield***

The average yield of the combined trials in the Swartland for 2016 was 3.94 ton/ha, which is 1.73 ton/ha higher than that obtained in 2015. The reason for the higher yield is due to more favourable weather conditions during the growing season. The average yield of cultivars within the four areas of the Swartland are indicated in the tables below:

*Sandveld*

|  |  |
| --- | --- |
| **Locality** | **Yield (ton/ha)** |
| Hopefield (Dankbaar) | 4.89 |
| Koperfontein | 2.38 |
| Velddrif | 3.58 |
| Hopefield (Enkelvlei) | Not harvested |
| \*Vredenburg | Not included - of high CV |
| **Average: Sandveld** | **3.61** |

*Koringberg*

|  |  |
| --- | --- |
| **Locality** | **Yield (ton/ha)** |
| Eendekuil | 3.36 |
| Koringberg | 3.66 |
| Porterville | 3.29 |
| Pools | 4.08 |
| **Average: Koringberg** | **3.59** |

*Middle Swartland*

|  |  |
| --- | --- |
| **Locality** | **Yield (ton/ha)** |
| Moorreesburg (Langrug) | 4.92 |
| Moorreesburg (Klein Swartfontein) | 4.81 |
| Piketberg | 2.33 |
| Halfmanshof | 4.26 |
| **Average: Middle Swartland** | **4.08** |

*High rainfall*

|  |  |
| --- | --- |
| **Locality** | **Yield (ton/ha)** |
| Langgewens | Not harvested |
| Philadelphia | 5.14 |
| Malmesbury | 5.56 |
| Darling | 2.90 |
| **Average: High rainfall** | **4.53** |

The cultivar with the highest average yield in the Swartland in 2016 was SST 0117 with an average of 4.11 ton/ha. It was followed by SST 096 (4.02 ton/ha), SST 056 (4.00 ton/ha), SST 027 (3.99 ton/ha) and PAN 3471 (3.98 ton/ha). Based on the LSD (0.05), there were no statistically significant difference in yield between the top eight cultivars.

The best individual trial results for yield in 2016 in the Swartland were obtained at Malmesbury (5.56 ton/ha), Philadelphia (5.14 ton/ha), Moorreesburg (Langrug) (4.92 ton/ha) and Moorreesburg (4.81 ton/ha).

According to the AMMI analysis, SST 0117 performed the best in 2016, as it had high yield at 10 of the 14 localities included in the statistical analysis. The other top cultivars in terms of high yield and yield stability were SST 0137 (7/14), PAN 3471 (6/14) , SST 015 (6/14), SST 096 (4/14) and SST 027 (4/14).

From the AMMI analysis, the following cultivar selections per locality were calculated for the Swartland in 2015:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Environment** | **Yield (ton/ha** | **Cultivars** | | | |
| Darling (Klipvlei) | 2,90 | SST015 | PAN3471 | SST0137 | SST0117 |
| Eendekuil (The Rest) | 3,36 | SST0117 | SST0137 | SST015 | PAN3471 |
| Halfmanshof (Uitkoms) | 4,26 | SST027 | SST88 | SST056 | PAN3471 |
| Hopefield (Dankbaar) | 4,89 | SST015 | SST0137 | PAN3471 | SST0117 |
| Koperfontein (Waterboerskraal) | 2,38 | SST0117 | SST027 | SST056 | SST096 |
| Koringberg (Langkloof) | 3,66 | SST0117 | PAN3408 | SST096 | SST087 |
| Malmesbury (Harmonie) | 5,56 | SST087 | SST0137 | SST0117 | PAN3408 |
| Moorreesburg (Klein Swartfontein) | 4,81 | SST0137 | SST015 | PAN3471 | SST096 |
| Moorreesburg (Langrug) | 4,92 | SST0117 | SST056 | SST027 | PAN3408 |
| Philadelphia (Altona) | 5,14 | SST0137 | SST015 | SST0117 | SST0127 |
| Piketberg (Kolvlei) | 2,33 | SST087 | PAN3408 | SST0117 | SST0147 |
| Pools (Latboskloof) | 4,08 | SST027 | SST056 | SST88 | SST0117 |
| Porterville (Latboskloof) | 3,29 | SST087 | PAN3408 | SST0117 | SST0147 |
| Velddrift (Volstruiskuil) | 3,58 | SST015 | PAN3471 | SST0137 | SST096 |

***Hectolitre mass***

The average hectolitre mass of the Swartland in 2016 was 79.81 kg/hl. This is 0.62 kg/hl less than in 2015. The means of all cultivars evaluated were above 77.00 kg/hl (the requirement for Grade B1 wheat). The average hectolitre mass for the regions in the Swartland is as follows:

|  |  |
| --- | --- |
| **Region** | **Hectolitre mass (kg/hl)** |
| Sandveld | 79.80 |
| Koringberg | 80.47 |
| Middle Swartland | 79.64 |
| High rainfall | 79.18 |
| **Average** | **79.81** |

Moorreesburg graded the highest with 84.97 kg/hl of all the localities while PAN 3471 graded the highest with 82.45 kg/hl, of all the cultivars.

***Grain protein content***

The average protein content for the combined Swartland trials showed a slight increase from 12.37% in 2015 to 12.58% in 2016. The average protein content for the different Swartland regions was as follows:

|  |  |
| --- | --- |
| **Region** | **Protein content (%)** |
| Sandveld | 13.49 |
| Koringberg | 11.82 |
| Middle Swartland | 13.36 |
| High rainfall | 11.62 |
| **Average** | **12.58** |

The highest protein content recorded at an individual trial site was Koperfontein with a protein content of 16.01% followed by Halfmanshof with 14.24%. The lowest protein value for an individual site was 9.18%, recorded at Porterville, while the cultivar with the lowest protein content was SST 0147, with a protein content of 12.19%%. From the AMMI analysis the following protein percentage per locality were included:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Environment** | **Protein content**  **%** | **Cultivars** | | | |
| Darling (Klipvlei) | 12,78 | SST056 | PAN3408 | SST015 | SST0137 |
| Eendekuil (The Rest) | 13,66 | SST027 | Ratel | SST0137 | SST0117 |
| Halfmanshof (Uitkoms) | 14,24 | SST0137 | Ratel | PAN3408 | SST0147 |
| Hopefield (Dankbaar) | 12,51 | SST027 | Ratel | SST0117 | SST096 |
| Koperfontein (Waterboerskraal) | 16,01 | Ratel | SST0137 | SST027 | SST0127 |
| Koringberg (Langkloof) | 12,39 | SST027 | Ratel | SST0137 | SST0117 |
| Malmesbury (Harmonie) | 11,02 | SST027 | PAN3408 | SST0137 | SST0127 |
| Moorreesburg (Klein Swartfontein) | 12,30 | SST027 | Ratel | SST0117 | SST096 |
| Moorreesburg (Langrug) | 13,37 | SST027 | Ratel | SST0137 | SST0117 |
| Philadelphia (Altona) | 11,07 | SST027 | PAN3471 | SST096 | PAN3408 |
| Piketberg (Kolvlei) | 13,52 | Ratel | SST0137 | SST027 | SST0127 |
| Pools (Latboskloof) | 12,07 | Ratel | SST027 | SST0137 | PAN3408 |
| Porterville (Latboskloof) | 9,18 | SST027 | PAN3408 | PAN3471 | SST056 |
| Velddrift (Volstruiskuil) | 11,96 | SST027 | SST0137 | PAN3408 | Ratel |

The cultivars SST 027 (10/14), Ratel (10/14) SST 0137 (8/14), PAN 3408 (7/14), SST 0117 (5/14) consistently produced high protein values.

***Falling number***

The average falling number for the Swartland was 341 seconds. No problems with the falling number were experienced at any one of the trial sites. All the cultivars registered higher than the 220 seconds required falling number.

**Cultivar performance in the Rûens**

***Yield***

The average yield for the Rûens trials for 2016 was 4.35 ton/ha. This was better than the average of 2015 (3.89 ton/ha) and that of the Swartland, (3.94 ton/ha) for the 2016 season. The average yields of cultivars within the three regions of the Rûens are indicated in the tables below:

*Western Rûens*

|  |  |
| --- | --- |
| **Locality** | **Yield (ton/ha)** |
| Caledon (Roodebloem) | 3.89 |
| Caledon ( De Vlei) | 2.77 |
| Caledon (Uitvlug) | 5.15 |
| Riviersonderend (Tygerhoek) | 5.27 |
| Protem (Kleinfontein) | Not harvested: porcupine damage |
| **Average: Western Rûens** | **4.27** |

*Southern Rûens*

|  |  |
| --- | --- |
| **Locality** | **Yield (ton/ha)** |
| Klipdale (Alpha) | 4.05 |
| Protem (Volmoud) | 4.06 |
| Bredasdorp (Karsrivier) | 3.51 |
| Napier | 3.90 |
| Klipdale (Panorama) | 5.06 |
| **Average: Southern Rûens** | **4.12** |

*Eastern Rûens*

|  |  |
| --- | --- |
| **Locality** | **Yield (ton/ha)** |
| Riversdale (Uitkyk) | 5.34 |
| \*Witsand (Sandfontein) | Not included - high CV |
| Swellendam (Klippenrivier) | 4.02 |
| Heidelberg (Voorstekop) | 5.53 |
| Buffelsjag (Volmoed) | 4.05 |
| **Average: Eastern Rûens** | **4.73** |

The cultivar which performed the best in the combined trials in the Rûens, was SST 88 (4.72 ton/ha). The following cultivars exceeded the average yield for the combined analysis for yield in the Rûens: SST 0147 (4.61 ton/ha), SST 087 (4.53 ton/ha) SST 0117 (4.57 ton/ha), SST 0127 (4.38 ton/ha) and SST 0137 (4.58 ton/ha). The best individual trial results for 2016 were obtained at Heidelberg, where the average yields were 5.53 ton/ha.

From the AMMI analysis, the following cultivar selections for yield per locality were calculated:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Environment** | **Yield**  **Ton/ha** | **Cultivars** | | | |
| Bredasdorp (Karsrivier) | 3,51 | SST88 | SST0117 | SST0137 | SST0147 |
| Buffelsjag (Volmoed) | 4,05 | SST88 | SST0117 | SST0147 | SST0137 |
| Caledon (De Vlei) | 2,77 | SST0147 | SST0137 | SST087 | SST0117 |
| Caledon (Roodebloem) | 3,89 | SST0147 | SST88 | SST087 | PAN3408 |
| Caledon (Uitvlug) | 5,15 | SST0147 | SST015 | SST056 | PAN3408 |
| Heidelberg (Voorstekop) | 5,53 | SST88 | SST0147 | SST087 | PAN3471 |
| Klipdale (Alpha) | 4,05 | SST88 | SST0117 | SST0137 | SST0147 |
| Klipdale (Panorama) | 5,06 | SST0117 | SST88 | SST0137 | SST0147 |
| Napier (Bo-Schietpa) | 3,90 | SST88 | SST0117 | SST0137 | SST096 |
| Protem (Volmoud) | 4,06 | SST88 | SST0147 | SST0117 | SST0137 |
| Riversdal (Uitkyk) | 5,34 | SST0147 | SST0117 | SST0137 | SST0127 |
| Riviersonderend (Tygerhoek) | 5,27 | SST0117 | SST0137 | SST88 | SST0147 |
| Swellendam (Klippenrivier) | 4,02 | SST0147 | PAN3408 | PAN3471 | SST88 |

The top cultivars in terms of high yield and yield stability was, SST 0147 (12/13), SST 88 (10/13), SST 0117 (9/13) and PAN 3408 (3/13).

***Hectolitre mass***

The hectolitre mass for the combined trials in the Rûens for 2016 was lower than the previous year, with an average of 79.56 kg/hl, compared to the 80.01 kg/hl obtained in 2015. The average hectolitre mass of the combined trials is as follows:

|  |  |
| --- | --- |
| **Region** | **Hectolitre mass (kg/hl)** |
| Western Rûens | 80.87 |
| Southern Rûens | 78.73 |
| Eastern Rûens | 79.30 |
| **Average** | **79.56** |

The hectolitre mass of the combined trials in the Rûens was higher than the minimum standard of 77 kg/hl for Grade B1. All localities recorded a hectolitre mass above 77 kg/hl.

***Grain protein content***

|  |  |
| --- | --- |
| **Region** | **Protein content (%)** |
| Western Rûens | 12.30 |
| Southern Rûens | 12.72 |
| Eastern Rûens | 11.36 |
| **Average** | **12.17** |

The average protein content for 2016 in Rûens was 12.17%, which was slightly higher than that for 2015 (12.10%). However, all the trial sites achieved a protein content >11% except Riversdal (10.10%) and Heidelberg (10.65%). The best overall performing cultivars in terms of protein content in 13 localities across the Rûens were SST 027 (12/13), SST 096 (12/13), SST 0127 (7/13) and SST 015 (5/13).

From the AMMI analysis, the following cultivar selections for protein content per locality were calculated:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Environment** | **Protein content**  **%** | **Cultivars** | | | |
| Bredasdorp (Karsrivier) | 12.81 | SST027 | SST096 | SST015 | PAN3408 |
| Buffelsjag (Volmoed) | 12.58 | SST027 | SST015 | SST0127 | SST096 |
| Caledon (De Vlei) | 13.55 | Ratel | SST0127 | SST096 | SST087 |
| Caledon (Roodebloem) | 11.08 | SST027 | SST096 | SST0137 | PAN3408 |
| Caledon (Uitvlug) | 12.46 | SST027 | SST0127 | Ratel | SST096 |
| Heidelberg (Voorstekop) | 10.65 | SST027 | PAN3408 | SST0137 | SST096 |
| Klipdale (Alpha) | 13.84 | SST027 | SST096 | SST0127 | Ratel |
| Klipdale (Panorama) | 12.39 | SST027 | PAN3408 | SST0137 | SST096 |
| Napier (Bo-Schietpa) | 12.55 | SST027 | SST015 | SST0127 | SST096 |
| Protem (Volmoud) | 12.03 | SST027 | SST015 | PAN3471 | SST096 |
| Riversdal (Uitkyk) | 10.10 | SST027 | SST0127 | Ratel | SST0117 |
| Riviersonderend (Tygerhoek) | 12.11 | SST027 | SST015 | SST0127 | SST096 |
| Swellendam (Klippenrivier) | 12.10 | SST027 | SST096 | SST0127 | PAN3408 |

***Falling number***

The average falling number for the Rûens was 349 seconds. No problems with the falling number were experienced at any one of the trial sites. All the cultivars registered higher than the 220 seconds required falling number.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Swartland** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average yield (ton/ha) of entries for the Swartland area during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 2.10 | 13 | 3.67 | 14 | 4.26 | 12 |  |  |  |  |  |  |
| **PAN 3408** | 3.96 | 6 | 2.25 | 5 | 4.10 | 4 | 4.96 | 3 | 3.82 | 3 | 3.44 | 2 | 3.11 | 4 |
| **PAN 3471** | 3.98 | 5 | 2.22 | 6 | 4.00 | 10 | 4.64 | 9 | 3.71 | 8 | 3.40 | 6 | 3.10 | 5 |
| **PAN 3515** |  |  |  |  | 4.06 | 8 |  |  |  |  |  |  |  |  |
| **Ratel** | 3.69 | 13 | 2.08 | 14 | 3.93 | 12 | 4.75 | 8 | 3.61 | 9 | 3.23 | 10 | 2.89 | 12 |
| **SST 0117** | 4.11 | 1 | 2.35 | 1 |  |  |  |  |  |  |  |  | 3.23 | 1 |
| **SST 0127** | 3.78 | 12 | 2.18 | 8 | 4.24 | 1 |  |  |  |  | 3.40 | 7 | 2.98 | 11 |
| **SST 0137** | 3.94 | 7 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 3.93 | 9 | 2.30 | 3 |  |  |  |  |  |  |  |  | 3.12 | 3 |
| **SST 015** | 3.94 | 8 | 2.34 | 2 | 4.07 | 5 | 4.94 | 4 | 3.82 | 2 | 3.45 | 1 | 3.14 | 2 |
| **SST 027** | 3.99 | 4 | 2.18 | 9 | 4.10 | 3 | 4.76 | 6 | 3.76 | 5 | 3.42 | 4 | 3.08 | 8 |
| **SST 047** |  |  |  |  | 4.07 | 5 | 4.57 | 11 |  |  |  |  |  |  |
| **SST 056** | 4.00 | 3 | 2.15 | 11 | 4.04 | 9 | 4.78 | 5 | 3.74 | 6 | 3.40 | 8 | 3.07 | 9 |
| **SST 087** | 3.93 | 10 | 2.19 | 7 | 4.16 | 2 | 4.97 | 2 | 3.81 | 4 | 3.43 | 3 | 3.06 | 10 |
| **SST 096** | 4.02 | 2 | 2.17 | 10 | 4.07 | 5 | 5.16 | 1 | 3.85 | 1 | 3.42 | 5 | 3.10 | 6 |
| **SST 88** | 3.91 | 11 | 2.26 | 4 | 3.95 | 11 | 4.76 | 7 | 3.72 | 7 | 3.37 | 9 | 3.08 | 7 |
| **Tankwa** |  |  | 2.13 | 12 | 3.90 | 13 | 4.63 | 10 |  |  |  |  |  |  |
| **Mean** | **3.94** |  | **2.21** |  | **4.03** |  | **4.77** |  | **3.76** |  | **3.40** |  | **3.08** |  |
| **LSDt(0,05)** | **0.17** |  | **0.12** |  | **0.15** |  | **0.19** |  | **0.08** |  | **0.09** |  | **0.11** |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Swartland AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the yield of entries for the Swartland for 2016** | | | | | |  |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 727 | 911.2 | 1.253 |  |  |
| **Treatments** | | 181 | 797.1 | 4.404 | 26.40 | <0,001 |
| **Genotypes** | | 12 | 7.6 | 0.630 | 3.78 | <0,001 |
| **Environments** | | 13 | 722.1 | 55.545 | 77.48 | <0,001 |
| **Block** |  | 42 | 30.1 | 0.717 | 4.30 | <0,001 |
| **Interactions** | | 156 | 67.4 | 0.432 | 2.59 | <0,001 |
| **IPCA** |  | 24 | 25.8 | 1.074 | 6.44 | <0,001 |
| **IPCA** |  | 22 | 13.4 | 0.611 | 3.66 | <0,001 |
| **Residuals** | | 110 | 28.2 | 0.257 | 1.54 | 0.0011 |
| **Error** |  | 504 | 84.1 | 0.167 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for yield (ton/ha)** | | | | |  |  |
|  | | | | |  |  |
| **Entry** | **Genotype** | **Yield** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 3.96 | 6 | 0.11256 |  |  |
| 2 | PAN 3471 | 3.98 | 5 | -0.16043 |  |  |
| 3 | Ratel | 3.69 | 13 | 0.48363 |  |  |
| 4 | SST 0117 | 4.11 | 1 | -0.10309 |  |  |
| 5 | SST 0127 | 3.78 | 12 | 0.60582 |  |  |
| 6 | SST 0137 | 3.94 | 7 | 0.62149 |  |  |
| 7 | SST 0147 | 3.93 | 9 | 0.06899 |  |  |
| 8 | SST 015 | 3.94 | 8 | 0.26138 |  |  |
| 9 | SST 027 | 3.99 | 4 | -0.83308 |  |  |
| 10 | SST 056 | 4.00 | 3 | -0.52169 |  |  |
| 11 | SST 087 | 3.93 | 10 | 0.26675 |  |  |
| 12 | SST 096 | 4.02 | 2 | -0.21463 |  |  |
| 13 | SST 88 | 3.91 | 11 | -0.58771 |  |  |
| **Mean** |  | **3.94** |  |  |  |  |
| **Coefficient of variation (%)** | | **11.60** |  |  |  |  |
| **LSDt(0.05)** | | **0.17** |  |  |  |  |
|  | |  |  |  |  |  |
| **Environment means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Darling (Klipvlei) | 2.90 | 12 | 0.12448 |  |  |
| 2 | Eendekuil (The Rest) | 3.36 | 10 | 0.15466 |  |  |
| 3 | Halfmanshof (Uitkoms) | 4.26 | 6 | -1.19592 |  |  |
| 4 | Hopefield (Dankbaar) | 4.89 | 4 | 0.15435 |  |  |
| 5 | Koperfontein (Waterboerskraal) | 2.38 | 13 | -0.13849 |  |  |
| 6 | Koringberg (Langkloof) | 3.66 | 8 | 0.08564 |  |  |
| 7 | Malmesbury (Harmonie) | 5.56 | 1 | 0.38470 |  |  |
| 8 | Moorreesburg (Klein Swartfontein) | 4.81 | 5 | 0.35850 |  |  |
| 9 | Moorreesburg (Langrug) | 4.92 | 3 | -0.07929 |  |  |
| 10 | Philadelphia (Altona) | 5.14 | 2 | 0.38677 |  |  |
| 11 | Piketberg (Kolvlei) | 2.33 | 14 | -0.04757 |  |  |
| 12 | Pools (Latboskloof) | 4.08 | 7 | -0.67962 |  |  |
| 13 | Porterville (Latboskloof) | 3.29 | 11 | 0.26373 |  |  |
| 14 | Velddrift (Volstruiskuil) | 3.58 | 9 | 0.22807 |  |  |
| **Mean** | | **3.94** |  |  |  |  |
| **Coefficient of variation (%)** | | **11.60** |  |  |  |  |
| **LSDt(0.05)** | | **0.18** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Swartland** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average hectolitre mass (kg/hl) of entries for the Swartland area during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 80.67 | 6 | 76.49 | 12 | 75.28 | 12 |  |  |  |  |  |  |
| **PAN 3408** | 79.70 | 6 | 80.07 | 10 | 76.92 | 11 | 76.41 | 7 | 78.28 | 6 | 78.90 | 6 | 79.89 | 8 |
| **PAN 3471** | 82.45 | 1 | 80.84 | 3 | 79.39 | 2 | 78.78 | 1 | 80.37 | 1 | 80.89 | 1 | 81.65 | 2 |
| **PAN 3515** |  |  |  |  | 78.94 | 4 |  |  |  |  |  |  |  |  |
| **Ratel** | 78.78 | 11 | 80.22 | 9 | 76.08 | 14 | 76.01 | 10 | 77.77 | 8 | 78.36 | 9 | 79.50 | 9 |
| **SST 0117** | 79.45 | 8 | 80.59 | 7 |  |  |  |  |  |  |  |  | 80.02 | 7 |
| **SST 0127** | 79.44 | 9 | 79.30 | 13 | 77.15 | 10 |  |  |  |  | 78.63 | 7 | 79.37 | 10 |
| **SST 0137** | 78.70 | 12 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 79.66 | 7 | 80.69 | 5 |  |  |  |  |  |  |  |  | 80.18 | 4 |
| **SST 015** | 80.28 | 3 | 79.93 | 11 | 77.54 | 7 | 77.16 | 4 | 78.73 | 4 | 79.25 | 4 | 80.11 | 6 |
| **SST 027** | 81.66 | 2 | 81.82 | 1 | 79.20 | 3 | 77.69 | 3 | 80.09 | 2 | 80.89 | 1 | 81.74 | 1 |
| **SST 047** |  |  |  |  | 79.78 | 1 | 77.94 | 2 |  |  |  |  |  |  |
| **SST 056** | 79.25 | 10 | 79.25 | 14 | 77.25 | 9 | 76.26 | 9 | 78.00 | 7 | 78.58 | 8 | 79.25 | 11 |
| **SST 087** | 78.14 | 13 | 79.74 | 12 | 76.41 | 13 | 75.69 | 11 | 77.50 | 9 | 78.10 | 10 | 78.94 | 12 |
| **SST 096** | 79.92 | 5 | 80.42 | 8 | 77.32 | 8 | 76.35 | 8 | 78.50 | 5 | 79.22 | 5 | 80.17 | 5 |
| **SST 88** | 80.12 | 4 | 81.60 | 2 | 78.17 | 5 | 76.87 | 5 | 79.19 | 3 | 79.96 | 3 | 80.86 | 3 |
| **Tankwa** |  |  | 80.81 | 4 | 77.72 | 6 | 76.78 | 6 |  |  |  |  |  |  |
| **Mean** | **79.81** |  | **80.43** |  | **77.74** |  | **76.77** |  | **78.71** |  | **79.28** |  | **80.14** |  |
| **LSDt(0,05)** | **0.63** |  | **0.68** |  | **0.55** |  | **0.41** |  | **0.29** |  | **0.36** |  | **0.46** |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **Swartland AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the hectolitre mass of entries for the Swartland for 2016** | | | | | |  |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 727 | 16344 | 22.5 |  |  |
| **Treatments** | | 181 | 14778 | 81.6 | 30.22 | <0,001 |
| **Genotypes** | | 12 | 919 | 76.6 | 28.34 | <0,001 |
| **Environments** | | 13 | 13243 | 1018.7 | 209.60 | <0,001 |
| **Block** |  | 42 | 204 | 4.9 | 1.80 | 0.0021 |
| **Interactions** | | 156 | 616 | 3.9 | 1.46 | 0.0012 |
| **IPCA** |  | 24 | 247 | 10.3 | 3.80 | <0,001 |
| **IPCA** |  | 22 | 102 | 4.6 | 1.71 | 0.0239 |
| **Residuals** | | 110 | 268 | 2.4 | 0.90 | 0.7463 |
| **Error** |  | 504 | 1362 | 2.7 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for hectolitre mass (kg/hl)** | | | | | |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 79.70 | 6 | 0.81423 |  |  |
| 2 | PAN 3471 | 82.45 | 1 | -1.32524 |  |  |
| 3 | Ratel | 78.78 | 11 | 1.18614 |  |  |
| 4 | SST 0117 | 79.45 | 8 | -0.47539 |  |  |
| 5 | SST 0127 | 79.44 | 9 | -0.04021 |  |  |
| 6 | SST 0137 | 78.70 | 12 | 1.01652 |  |  |
| 7 | SST 0147 | 79.66 | 7 | 0.41429 |  |  |
| 8 | SST 015 | 80.28 | 3 | -0.57517 |  |  |
| 9 | SST 027 | 81.66 | 2 | -1.46826 |  |  |
| 10 | SST 056 | 79.25 | 10 | 0.17887 |  |  |
| 11 | SST 087 | 78.14 | 13 | -0.08389 |  |  |
| 12 | SST 096 | 79.92 | 5 | 0.13269 |  |  |
| 13 | SST 88 | 80.12 | 4 | 0.22541 |  |  |
| **Mean** |  | **79.81** |  |  |  |  |
| **Coefficient of variation (%)** | | **2.10** |  |  |  |  |
| **LSDt(0.05)** | | **0.63** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Darling (Klipvlei) | 71.32 | 14 | -1.06119 |  |  |
| 2 | Eendekuil (The Rest) | 76.53 | 11 | 0.56561 |  |  |
| 3 | Halfmanshof (Uitkoms) | 79.09 | 9 | -1.69181 |  |  |
| 4 | Hopefield (Dankbaar) | 82.68 | 5 | 0.02745 |  |  |
| 5 | Koperfontein (Waterboerskraal) | 73.21 | 13 | -1.10298 |  |  |
| 6 | Koringberg (Langkloof) | 82.42 | 7 | 0.11249 |  |  |
| 7 | Malmesbury (Harmonie) | 83.61 | 3 | 0.74310 |  |  |
| 8 | Moorreesburg (Klein Swartfontein) | 84.97 | 1 | 0.47365 |  |  |
| 9 | Moorreesburg (Langrug) | 74.28 | 12 | -0.14148 |  |  |
| 10 | Philadelphia (Altona) | 82.62 | 6 | 0.85033 |  |  |
| 11 | Piketberg (Kolvlei) | 80.22 | 8 | -0.25113 |  |  |
| 12 | Pools (Latboskloof) | 78.82 | 10 | 0.49632 |  |  |
| 13 | Porterville (Latboskloof) | 84.09 | 2 | 0.43667 |  |  |
| 14 | Velddrift (Volstruiskuil) | 83.52 | 4 | 0.54298 |  |  |
| **Mean** | | **79.81** |  |  |  |  |
| **Coefficient of variation (%)** | | **2.10** |  |  |  |  |
| **LSDt(0.05)** | | **0.65** |  |  |  |  |

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| **Swartland** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average protein content (%) of entries for the Swartland area during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 14.30 | 1 | 12.73 | 3 | 13.13 | 2 |  |  |  |  |  |  |
| **PAN 3408** | 12.68 | 4 | 13.76 | 8 | 12.33 | 9 | 12.75 | 6 | 12.88 | 3 | 12.92 | 4 | 13.22 | 4 |
| **PAN 3471** | 12.26 | 11 | 13.29 | 14 | 12.35 | 7 | 12.68 | 8 | 12.65 | 6 | 12.63 | 9 | 12.78 | 11 |
| **PAN 3515** |  |  |  |  | 11.97 | 13 |  |  |  |  |  |  |  |  |
| **Ratel** | 12.94 | 2 | 14.04 | 5 | 12.68 | 4 | 12.99 | 5 | 13.16 | 2 | 13.22 | 2 | 13.49 | 2 |
| **SST 0117** | 12.51 | 7 | 13.44 | 12 |  |  |  |  |  |  |  |  | 12.98 | 10 |
| **SST 0127** | 12.64 | 5 | 14.24 | 4 | 12.35 | 7 |  |  |  |  | 13.08 | 3 | 13.44 | 3 |
| **SST 0137** | 12.92 | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 12.19 | 13 | 13.36 | 13 |  |  |  |  |  |  |  |  | 12.78 | 11 |
| **SST 015** | 12.31 | 10 | 13.64 | 11 | 12.51 | 6 | 12.69 | 7 | 12.79 | 4 | 12.82 | 7 | 12.98 | 9 |
| **SST 027** | 13.32 | 1 | 14.29 | 2 | 12.63 | 5 | 13.12 | 3 | 13.34 | 1 | 13.41 | 1 | 13.80 | 1 |
| **SST 047** |  |  |  |  | 13.45 | 1 | 14.80 | 1 |  |  |  |  |  |  |
| **SST 056** | 12.25 | 12 | 13.72 | 9 | 11.88 | 14 | 12.15 | 10 | 12.50 | 9 | 12.62 | 10 | 12.99 | 8 |
| **SST 087** | 12.44 | 9 | 13.71 | 10 | 12.20 | 11 | 12.02 | 11 | 12.59 | 8 | 12.78 | 8 | 13.08 | 7 |
| **SST 096** | 12.54 | 6 | 13.77 | 7 | 12.28 | 10 | 12.56 | 9 | 12.79 | 4 | 12.86 | 5 | 13.16 | 5 |
| **SST 88** | 12.48 | 8 | 13.81 | 6 | 12.19 | 12 | 11.93 | 12 | 12.60 | 7 | 12.83 | 6 | 13.15 | 6 |
| **Tankwa** |  |  | 14.25 | 3 | 13.01 | 2 | 13.04 | 4 |  |  |  |  |  |  |
| **Mean** | **12.58** |  | **13.83** |  | **12.47** |  | **12.82** |  | **12.81** |  | **12.92** |  | **13.15** |  |
| **LSDt(0,05)** | **0.35** |  | **0.37** |  | **0.32** |  | **0.28** |  | **0.17** |  | **0.20** |  | **0.25** |  |

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| **Swartland AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the protein content of entries for the Swartland for 2016** | | | | | |  |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 727 | 2477.2 | 3.41 |  |  |
| **Treatments** | | 181 | 1983.7 | 10.96 | 16.95 | <0,001 |
| **Genotypes** | | 12 | 70.5 | 5.88 | 9.08 | <0,001 |
| **Environments** | | 13 | 1780.6 | 136.97 | 34.34 | <0,001 |
| **Block** |  | 42 | 167.5 | 3.99 | 6.17 | <0,001 |
| **Interactions** | | 156 | 132.6 | 0.85 | 1.31 | 0.0146 |
| **IPCA** |  | 24 | 55.2 | 2.30 | 3.55 | <0,001 |
| **IPCA** |  | 22 | 25.0 | 1.14 | 1.76 | 0.0182 |
| **Residuals** | | 110 | 52.4 | 0.48 | 0.74 | 0.9747 |
| **Error** |  | 504 | 326.0 | 0.65 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 12.68 | 4 | -0.04365 |  |  |
| 2 | PAN 3471 | 12.26 | 11 | 0.70258 |  |  |
| 3 | Ratel | 12.94 | 2 | -1.15358 |  |  |
| 4 | SST 0117 | 12.51 | 7 | 0.07534 |  |  |
| 5 | SST 0127 | 12.64 | 5 | -0.16072 |  |  |
| 6 | SST 0137 | 12.92 | 3 | -0.81632 |  |  |
| 7 | SST 0147 | 12.19 | 13 | -0.37180 |  |  |
| 8 | SST 015 | 12.31 | 10 | 0.33706 |  |  |
| 9 | SST 027 | 13.32 | 1 | 0.71268 |  |  |
| 10 | SST 056 | 12.25 | 12 | 0.58284 |  |  |
| 11 | SST 087 | 12.44 | 9 | -0.19177 |  |  |
| 12 | SST 096 | 12.54 | 6 | 0.16955 |  |  |
| 13 | SST 88 | 12.48 | 8 | 0.15779 |  |  |
| **Mean** |  | **12.58** |  |  |  |  |
| **Coefficient of variation (%)** | | **7.50** |  |  |  |  |
| **LSDt(0.05)** | | **0.35** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Darling (Klipvlei) | 12.78 | 6 | 0.47389 |  |  |
| 2 | Eendekuil (The Rest) | 13.66 | 3 | 0.22719 |  |  |
| 3 | Halfmanshof (Uitkoms) | 14.24 | 2 | -1.22829 |  |  |
| 4 | Hopefield (Dankbaar) | 12.51 | 7 | 0.27843 |  |  |
| 5 | Koperfontein (Waterboerskraal) | 16.01 | 1 | -0.52046 |  |  |
| 6 | Koringberg (Langkloof) | 12.39 | 8 | -0.12560 |  |  |
| 7 | Malmesbury (Harmonie) | 11.02 | 13 | 0.35013 |  |  |
| 8 | Moorreesburg (Klein Swartfontein) | 12.30 | 9 | 0.21882 |  |  |
| 9 | Moorreesburg (Langrug) | 13.37 | 5 | -0.07650 |  |  |
| 10 | Philadelphia (Altona) | 11.07 | 12 | 0.63949 |  |  |
| 11 | Piketberg (Kolvlei) | 13.52 | 4 | -0.75355 |  |  |
| 12 | Pools (Latboskloof) | 12.07 | 10 | -0.21352 |  |  |
| 13 | Porterville (Latboskloof) | 9.18 | 14 | 0.58844 |  |  |
| 14 | Velddrift (Volstruiskuil) | 11.96 | 11 | 0.14152 |  |  |
| **Mean** | | **12.58** |  |  |  |  |
| **Coefficient of variation (%)** | | **7.50** |  |  |  |  |
| **LSDt(0.05)** | | **0.36** |  |  |  |  |

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| **Swartland** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average falling number (s) of entries for the Swartland during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 399 | 1 | 364 | 5 | 365 | 2 |  |  |  |  |  |  |
| **PAN 3408** | 333 | 10 | 363 | 14 | 349 | 14 | 340 | 9 | 346 | 9 | 348 | 10 | 348 | 12 |
| **PAN 3471** | 353 | 2 | 395 | 4 | 364 | 4 | 356 | 4 | 367 | 2 | 371 | 2 | 374 | 2 |
| **PAN 3515** |  |  |  |  | 368 | 1 |  |  |  |  |  |  |  |  |
| **Ratel** | 362 | 1 | 398 | 2 | 367 | 2 | 375 | 1 | 376 | 1 | 376 | 1 | 380 | 1 |
| **SST 0117** | 344 | 4 | 385 | 9 |  |  |  |  |  |  |  |  | 364 | 5 |
| **SST 0127** | 342 | 5 | 391 | 6 | 362 | 8 |  |  |  |  | 365 | 4 | 366 | 4 |
| **SST 0137** | 340 | 8 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 330 | 12 | 376 | 12 |  |  |  |  |  |  |  |  | 353 | 10 |
| **SST 015** | 346 | 3 | 398 | 3 | 360 | 9 | 347 | 7 | 363 | 3 | 368 | 3 | 372 | 3 |
| **SST 027** | 342 | 7 | 385 | 8 | 357 | 12 | 345 | 8 | 357 | 5 | 361 | 6 | 363 | 7 |
| **SST 047** |  |  |  |  | 366 | 3 | 357 | 3 |  |  |  |  |  |  |
| **SST 056** | 342 | 6 | 386 | 7 | 363 | 7 | 347 | 6 | 360 | 4 | 364 | 5 | 364 | 5 |
| **SST 087** | 329 | 13 | 374 | 13 | 363 | 6 | 333 | 12 | 350 | 8 | 355 | 9 | 351 | 11 |
| **SST 096** | 331 | 11 | 379 | 10 | 359 | 10 | 340 | 9 | 353 | 6 | 357 | 8 | 355 | 9 |
| **SST 88** | 334 | 9 | 378 | 11 | 358 | 11 | 335 | 11 | 351 | 7 | 357 | 7 | 356 | 8 |
| **Tankwa** |  |  | 392 | 5 | 357 | 13 | 351 | 5 |  |  |  |  |  |  |
| **Mean** | **341** |  | **386** |  | **361** |  | **349** |  | **358** |  | **362** |  | **362** |  |
| **LSDt(0,05)** | **6.50** |  | **6.80** |  | **7.30** |  | **6.88** |  | **3.60** |  | **4.10** |  | **4.80** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  | |
| **Anova of the falling number of entries for the Swartland for 2016** | | | | | | |  | |
|  |  |  |  |  |  |  | |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** | |
| **Total** |  | 727 | 924276 | 1271 |  |  | |
| **Treatments** | | 181 | 755397 | 4173 | 15.04 | <0,001 | |
| **Genotypes** | | 12 | 60932 | 5078 | 18.29 | <0,001 | |
| **Environments** | | 13 | 638921 | 49148 | 71.19 | <0,001 | |
| **Block** |  | 42 | 28995 | 690 | 2.49 | <0,001 | |
| **Interactions** | | 156 | 55545 | 356 | 1.28 | 0.0236 | |
| **IPCA** |  | 24 | 19149 | 798 | 2.87 | <0,001 | |
| **IPCA** |  | 22 | 12191 | 554 | 2.00 | 0.0048 | |
| **Residuals** | | 110 | 24205 | 220 | 0.79 | 0.9316 | |
| **Error** |  | 504 | 139884 | 278 |  |  | |
|  |  |  |  |  |  |  | |
| **Genotype means and scores for falling number (s)** | | | | |  |  | |
|  |  |  |  |  |  |  | |
| **Entry** | **Genotype** | **Falling number** | **Rank** | **Score** |  |  | |
| 1 | PAN 3408 | 333 | 10 | 2.42309 |  |  | |
| 2 | PAN 3471 | 353 | 2 | -4.58048 |  |  | |
| 3 | Ratel | 362 | 1 | -3.97074 |  |  | |
| 4 | SST 0117 | 344 | 4 | -0.97228 |  |  | |
| 5 | SST 0127 | 342 | 5 | -0.68826 |  |  | |
| 6 | SST 0137 | 340 | 8 | -0.01206 |  |  | |
| 7 | SST 0147 | 330 | 12 | 1.27691 |  |  | |
| 8 | SST 015 | 346 | 3 | -1.66200 |  |  | |
| 9 | SST 027 | 342 | 7 | 0.31672 |  |  | |
| 10 | SST 056 | 342 | 6 | 0.22226 |  |  | |
| 11 | SST 087 | 329 | 13 | 2.16642 |  |  | |
| 12 | SST 096 | 331 | 11 | 3.41017 |  |  | |
| 13 | SST 88 | 334 | 9 | 2.07024 |  |  | |
| **Mean** |  | **341** |  |  |  |  | |
| **Coefficient of variation (%)** | | **5.10** |  |  |  |  | |
| **LSDt(0.05)** | | **6.50** |  |  |  |  | |
|  |  |  |  |  |  |  | |
| **Environment means and scores for falling number (s)** | | | | |  |  | |
|  |  |  |  |  |  |  | |
| **Entry** | **Environment** | **Falling number** | **Rank** | **Score** |  |  | |
| 1 | Darling (Klipvlei) | 313 | 11 | 0.28226 |  |  | |
| 2 | Eendekuil (The Rest) | 336 | 7 | 0.01053 |  |  | |
| 3 | Halfmanshof (Uitkoms) | 364 | 4 | -2.62059 |  |  | |
| 4 | Hopefield (Dankbaar) | 321 | 9 | 0.76396 |  |  | |
| 5 | Koperfontein (Waterboerskraal) | 359 | 5 | -0.66319 |  |  | |
| 6 | Koringberg (Langkloof) | 397 | 1 | -0.79628 |  |  | |
| 7 | Malmesbury (Harmonie) | 369 | 3 | -3.35952 |  |  | |
| 8 | Moorreesburg (Klein Swartfontein) | 314 | 10 | 0.32824 |  |  | |
| 9 | Moorreesburg (Langrug) | 386 | 2 | 3.91119 |  |  | |
| 10 | Philadelphia (Altona) | 358 | 6 | -4.28277 |  |  | |
| 11 | Piketberg (Kolvlei) | 324 | 8 | 0.50400 |  |  | |
| 12 | Pools (Latboskloof) | 305 | 14 | 1.35178 |  |  | |
| 13 | Porterville (Latboskloof) | 310 | 13 | 3.51504 |  |  | |
| 14 | Velddrift (Volstruiskuil) | 312 | 12 | 1.05535 |  |  | |
| **Mean** | | **341** |  |  |  |  | |
| **Coefficient of variation (%)** | | **5.10** |  |  |  |  | |
| **LSDt(0.05)** | | **6.70** |  |  |  |  | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Swartland: High Rainfall Area** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average yield (ton/ha) of entries during the full or partial period from 2013- 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 3.13 | 7 | 3.94 | 14 | 5.23 | 12 |  |  |  |  |  |  |
| **PAN 3408** | 4.35 | 12 | 3.12 | 9 | 4.46 | 5 | 5.92 | 5 | 4.46 | 5 | 3.98 | 6 | 3.73 | 10 |
| **PAN 3471** | 4.62 | 4 | 3.14 | 6 | 4.16 | 12 | 5.85 | 6 | 4.44 | 6 | 3.97 | 7 | 3.88 | 3 |
| **PAN 3515** |  |  |  |  | 4.26 | 10 |  |  |  |  |  |  |  |  |
| **Ratel** | 4.47 | 9 | 3.02 | 11 | 4.31 | 9 | 6.10 | 3 | 4.47 | 4 | 3.93 | 10 | 3.74 | 9 |
| **SST 0117** | 4.72 | 3 | 3.19 | 3 |  |  |  |  |  |  |  |  | 3.96 | 1 |
| **SST 0127** | 4.59 | 5 | 3.13 | 8 | 4.44 | 7 |  |  |  |  | 4.05 | 4 | 3.86 | 4 |
| **SST 0137** | 4.85 | 1 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 4.47 | 8 | 3.20 | 2 |  |  |  |  |  |  |  |  | 3.84 | 5 |
| **SST 015** | 4.42 | 11 | 3.19 | 4 | 4.56 | 1 | 5.60 | 9 | 4.44 | 7 | 4.05 | 3 | 3.80 | 8 |
| **SST 027** | 4.24 | 13 | 3.04 | 10 | 4.52 | 4 | 5.94 | 4 | 4.43 | 8 | 3.93 | 9 | 3.64 | 12 |
| **SST 047** |  |  |  |  | 4.14 | 13 | 5.28 | 11 |  |  |  |  |  |  |
| **SST 056** | 4.54 | 6 | 2.89 | 13 | 4.46 | 6 | 5.78 | 7 | 4.42 | 9 | 3.96 | 8 | 3.72 | 11 |
| **SST 087** | 4.73 | 2 | 2.92 | 12 | 4.53 | 2 | 6.17 | 2 | 4.59 | 2 | 4.06 | 2 | 3.82 | 6 |
| **SST 096** | 4.45 | 10 | 3.17 | 5 | 4.42 | 8 | 6.35 | 1 | 4.60 | 1 | 4.01 | 5 | 3.81 | 7 |
| **SST 88** | 4.50 | 7 | 3.29 | 1 | 4.53 | 2 | 5.74 | 8 | 4.51 | 3 | 4.10 | 1 | 3.89 | 2 |
| **Tankwa** |  |  | 2.85 | 14 | 4.24 | 11 | 5.53 | 10 |  |  |  |  |  |  |
| **Mean** | **4.53** |  | **3.09** |  | **4.35** |  | **5.79** |  | **4.49** |  | **4.01** |  | **3.81** |  |
| **LSDt(0,05)** | **0.35** |  | **0.27** |  | **0.28** |  | **0.40** |  | **0.18** |  | **0.19** |  | **0.22** |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Swartland High Rainfall Area: AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the yield of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 155 | 246.46 | 1.59 |  |  |
| **Treatments** | | 38 | 222.57 | 5.86 | 39.75 | <0,001 |
| **Genotypes** | | 12 | 3.99 | 0.33 | 2.26 | 0.0136 |
| **Environments** | | 2 | 213.73 | 106.86 | 120.59 | <0,001 |
| **Block** |  | 9 | 7.98 | 0.89 | 6.01 | <0,001 |
| **Interactions** | | 24 | 4.85 | 0.20 | 1.37 | 0.1389 |
| **IPCA** |  | 13 | 2.89 | 0.22 | 1.51 | 0.1251 |
| **IPCA** |  | 11 | 1.96 | 0.18 | 1.21 | 0.2912 |
| **Residuals** | | 0 | 0.00 |  |  |  |
| **Error** |  | 108 | 15.91 | 0.15 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for yield (ton/ha)** | | | | |  |  |
|  | | | | |  |  |
| **Entry** | **Genotype** | **Yield** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 4.35 | 12 | 0.45931 |  |  |
| 2 | PAN 3471 | 4.62 | 4 | 0.21125 |  |  |
| 3 | Ratel | 4.47 | 9 | -0.29972 |  |  |
| 4 | SST 0117 | 4.72 | 3 | 0.27394 |  |  |
| 5 | SST 0127 | 4.59 | 5 | -0.16890 |  |  |
| 6 | SST 0137 | 4.85 | 1 | -0.19103 |  |  |
| 7 | SST 0147 | 4.47 | 8 | 0.22844 |  |  |
| 8 | SST 015 | 4.42 | 11 | 0.13434 |  |  |
| 9 | SST 027 | 4.24 | 13 | 0.02556 |  |  |
| 10 | SST 056 | 4.54 | 6 | -0.32781 |  |  |
| 11 | SST 087 | 4.73 | 2 | -0.39464 |  |  |
| 12 | SST 096 | 4.45 | 10 | -0.09729 |  |  |
| 13 | SST 88 | 4.50 | 7 | 0.14653 |  |  |
| **Mean** |  | **4.53** |  |  |  |  |
| **Coefficient of variation (%)** | | **9.50** |  |  |  |  |
| **LSDt(0.05)** | | **0.35** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Darling | 2.90 | 3 | 0.44004 |  |  |
| 2 | Malmesbury | 5.56 | 1 | 0.30916 |  |  |
| 3 | Philadelphia | 5.14 | 2 | -0.74920 |  |  |
| **Mean** | | **4.53** |  |  |  |  |
| **Coefficient of variation (%)** | | **9.50** |  |  |  |  |
| **LSDt(0.05)** | | **0.17** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Swartland: High Raifall Area** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average hectolitre mass (kg/hl) of entries during the full or partial period from 2013- 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 83.84 | 4 | 79.59 | 10 | 74.94 | 12 |  |  |  |  |  |  |
| **PAN 3408** | 78.97 | 8 | 83.24 | 10 | 79.83 | 7 | 76.44 | 6 | 79.62 | 5 | 80.68 | 6 | 81.11 | 8 |
| **PAN 3471** | 81.07 | 2 | 84.84 | 1 | 81.99 | 2 | 78.60 | 1 | 81.63 | 1 | 82.63 | 1 | 82.96 | 2 |
| **PAN 3515** |  |  |  |  | 81.58 | 4 |  |  |  |  |  |  |  |  |
| **Ratel** | 78.38 | 11 | 82.78 | 11 | 79.51 | 11 | 76.18 | 8 | 79.21 | 7 | 80.22 | 7 | 80.58 | 10 |
| **SST 0117** | 78.97 | 8 | 83.55 | 6 |  |  |  |  |  |  |  |  | 81.26 | 6 |
| **SST 0127** | 79.00 | 6 | 82.62 | 12 | 79.03 | 14 |  |  |  |  | 80.22 | 8 | 80.81 | 9 |
| **SST 0137** | 79.00 | 6 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 78.85 | 10 | 83.64 | 5 |  |  |  |  |  |  |  |  | 81.25 | 7 |
| **SST 015** | 79.92 | 3 | 83.30 | 7 | 79.73 | 8 | 76.99 | 4 | 79.99 | 4 | 80.98 | 4 | 81.61 | 4 |
| **SST 027** | 81.27 | 1 | 84.80 | 2 | 81.65 | 3 | 77.53 | 3 | 81.31 | 2 | 82.57 | 2 | 83.04 | 1 |
| **SST 047** |  |  |  |  | 82.37 | 1 | 77.68 | 2 |  |  |  |  |  |  |
| **SST 056** | 77.99 | 12 | 82.30 | 14 | 79.50 | 12 | 76.29 | 7 | 79.02 | 8 | 79.93 | 9 | 80.15 | 11 |
| **SST 087** | 77.20 | 13 | 82.56 | 13 | 79.38 | 13 | 75.83 | 11 | 78.74 | 9 | 79.71 | 10 | 79.88 | 12 |
| **SST 096** | 79.27 | 5 | 83.29 | 8 | 79.72 | 9 | 75.90 | 10 | 79.55 | 6 | 80.76 | 5 | 81.28 | 5 |
| **SST 88** | 79.50 | 4 | 84.22 | 3 | 81.29 | 5 | 76.54 | 5 | 80.39 | 3 | 81.67 | 3 | 81.86 | 3 |
| **Tankwa** |  |  | 83.28 | 9 | 80.38 | 6 | 76.01 | 9 |  |  |  |  |  |  |
| **Mean** | **79.18** |  | **83.45** |  | **80.40** |  | **76.58** |  | **79.94** |  | **80.94** |  | **81.31** |  |
| **LSDt(0,05)** | **1.44** |  | **0.70** |  | **1.02** |  | **0.50** |  | **0.49** |  | **0.64** |  | **0.80** |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Swartland High Rainfall Area: AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the hectolitre mass of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 155 | 5524 | 35.6 |  |  |
| **Treatments** | | 38 | 5156 | 135.7 | 42.61 | <0,001 |
| **Genotypes** | | 12 | 178 | 14.8 | 4.65 | <0,001 |
| **Environments** | | 2 | 4853 | 2426.6 | 909.05 | <0,001 |
| **Block** |  | 9 | 24 | 2.7 | 0.84 | 0.5827 |
| **Interactions** | | 24 | 126 | 5.2 | 1.64 | 0.0446 |
| **IPCA** |  | 13 | 106 | 8.2 | 2.56 | 0.0041 |
| **IPCA** |  | 11 | 20 | 1.8 | 0.56 | 0.8558 |
| **Residuals** | | 0 | 0 |  |  |  |
| **Error** |  | 108 | 344 | 3.2 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for hectolitre mass (kg/hl)** | | | | | | |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 78.97 | 8 | 0.09382 |  |  |
| 2 | PAN 3471 | 81.07 | 2 | -0.69215 |  |  |
| 3 | Ratel | 78.38 | 11 | 0.96522 |  |  |
| 4 | SST 0117 | 78.97 | 8 | -0.38443 |  |  |
| 5 | SST 0127 | 79.00 | 6 | 0.13100 |  |  |
| 6 | SST 0137 | 79.00 | 6 | 0.37297 |  |  |
| 7 | SST 0147 | 78.85 | 10 | 0.02018 |  |  |
| 8 | SST 015 | 79.92 | 3 | -0.24346 |  |  |
| 9 | SST 027 | 81.27 | 1 | -1.38631 |  |  |
| 10 | SST 056 | 77.99 | 12 | 0.43060 |  |  |
| 11 | SST 087 | 77.20 | 13 | -0.55223 |  |  |
| 12 | SST 096 | 79.27 | 5 | 0.32382 |  |  |
| 13 | SST 88 | 79.50 | 4 | 0.92097 |  |  |
| **Mean** |  | **79.18** |  |  |  |  |
| **Coefficient of variation (%)** | | **2.20** |  |  |  |  |
| **LSDt(0.05)** | | **1.44** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Darling | 71.32 | 3 | -1.84563 |  |  |
| 2 | Malmesbury | 83.61 | 1 | 0.78318 |  |  |
| 3 | Philadelphia | 82.62 | 2 | 1.06245 |  |  |
| **Mean** | | **79.18** |  |  |  |  |
| **Coefficient of variation (%)** | | **2.20** |  |  |  |  |
| **LSDt(0.05)** | | **0.69** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Swartland: High Raifall Area** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average protein content (%) of entries during the full or partial period from 2013- 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 11.91 | 1 | 11.30 | 3 | 12.37 | 6 |  |  |  |  |  |  |
| **PAN 3408** | 11.79 | 3 | 11.23 | 9 | 10.74 | 8 | 12.24 | 8 | 11.50 | 2 | 11.25 | 3 | 11.51 | 4 |
| **PAN 3471** | 11.58 | 7 | 10.62 | 14 | 10.86 | 7 | 12.18 | 9 | 11.31 | 7 | 11.02 | 9 | 11.10 | 12 |
| **PAN 3515** |  |  |  |  | 10.66 | 9 |  |  |  |  |  |  |  |  |
| **Ratel** | 11.22 | 13 | 11.28 | 8 | 10.90 | 6 | 12.38 | 5 | 11.45 | 5 | 11.13 | 6 | 11.25 | 10 |
| **SST 0117** | 11.38 | 11 | 11.16 | 10 |  |  |  |  |  |  |  |  | 11.27 | 9 |
| **SST 0127** | 11.52 | 9 | 11.62 | 2 | 10.59 | 11 |  |  |  |  | 11.24 | 4 | 11.57 | 3 |
| **SST 0137** | 11.63 | 5 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 11.36 | 12 | 11.07 | 11 |  |  |  |  |  |  |  |  | 11.22 | 11 |
| **SST 015** | 11.59 | 6 | 10.96 | 13 | 10.66 | 9 | 12.40 | 4 | 11.40 | 6 | 11.07 | 8 | 11.28 | 8 |
| **SST 027** | 12.38 | 1 | 11.55 | 3 | 11.09 | 4 | 13.07 | 2 | 12.02 | 1 | 11.67 | 1 | 11.97 | 1 |
| **SST 047** |  |  |  |  | 12.64 | 1 | 14.70 | 1 |  |  |  |  |  |  |
| **SST 056** | 11.95 | 2 | 11.52 | 4 | 10.41 | 12 | 11.94 | 10 | 11.46 | 4 | 11.29 | 2 | 11.74 | 2 |
| **SST 087** | 11.48 | 10 | 11.49 | 5 | 10.35 | 13 | 11.48 | 11 | 11.20 | 8 | 11.11 | 7 | 11.49 | 5 |
| **SST 096** | 11.64 | 4 | 11.04 | 12 | 10.96 | 5 | 12.31 | 7 | 11.49 | 3 | 11.21 | 5 | 11.34 | 7 |
| **SST 88** | 11.54 | 8 | 11.32 | 7 | 10.11 | 14 | 11.12 | 12 | 11.02 | 9 | 10.99 | 10 | 11.43 | 6 |
| **Tankwa** |  |  | 11.44 | 6 | 11.61 | 2 | 12.67 | 3 |  |  |  |  |  |  |
| **Mean** | **11.62** |  | **11.30** |  | **10.92** |  | **12.41** |  | **11.43** |  | **11.20** |  | **11.43** |  |
| **LSDt(0,05)** | **0.89** |  | **0.60** |  | **0.48** |  | **0.45** |  | **0.32** |  | **0.39** |  | **0.55** |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **Swartland High Rainfall Area: AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the protein content of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 155 | 274.23 | 1.769 |  |  |
| **Treatments** | | 38 | 133.06 | 3.502 | 4.55 | <0,001 |
| **Genotypes** | | 12 | 12.50 | 1.041 | 1.35 | 0.2004 |
| **Environments** | | 2 | 103.52 | 51.758 | 8.03 | <0,001 |
| **Block** |  | 9 | 58.01 | 6.445 | 8.37 | <0,001 |
| **Interactions** | | 24 | 17.05 | 0.710 | 0.92 | 0.5719 |
| **IPCA** |  | 13 | 9.65 | 0.742 | 0.96 | 0.4913 |
| **IPCA** |  | 11 | 7.40 | 0.673 | 0.87 | 0.5682 |
| **Residuals** | | 0 | 0.00 |  |  |  |
| **Error** |  | 108 | 83.16 | 0.770 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 11.79 | 3 | 0.14376 |  |  |
| 2 | PAN 3471 | 11.58 | 7 | 0.08808 |  |  |
| 3 | Ratel | 11.22 | 13 | -0.09246 |  |  |
| 4 | SST 0117 | 11.38 | 11 | -0.41030 |  |  |
| 5 | SST 0127 | 11.52 | 9 | 0.09158 |  |  |
| 6 | SST 0137 | 11.63 | 5 | 0.16712 |  |  |
| 7 | SST 0147 | 11.36 | 12 | 0.36415 |  |  |
| 8 | SST 015 | 11.59 | 6 | 0.29624 |  |  |
| 9 | SST 027 | 12.38 | 1 | -0.70528 |  |  |
| 10 | SST 056 | 11.95 | 2 | 0.63311 |  |  |
| 11 | SST 087 | 11.48 | 10 | -0.26376 |  |  |
| 12 | SST 096 | 11.64 | 4 | -0.34931 |  |  |
| 13 | SST 88 | 11.54 | 8 | 0.03708 |  |  |
| **Mean** |  | **11.62** |  |  |  |  |
| **Coefficient of variation (%)** | | **9.50** |  |  |  |  |
| **LSDt(0.05)** | | **0.89** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Darling | 12.78 | 1 | 0.98951 |  |  |
| 2 | Malmesbury | 11.02 | 3 | -0.28917 |  |  |
| 3 | Philadelphia | 11.07 | 2 | -0.70034 |  |  |
| **Mean** | | **11.62** |  |  |  |  |
| **Coefficient of variation (%)** | | **9.50** |  |  |  |  |
| **LSDt(0.05)** | | **0.43** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Swartland: High Raifall Area** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average falling number (s) of entries during the full or partial period from 2013- 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 404 | 1 | 352 | 7 | 342 | 2 |  |  |  |  |  |  |
| **PAN 3408** | 335 | 11 | 381 | 12 | 348 | 10 | 324 | 7 | 347 | 6 | 355 | 8 | 358 | 9 |
| **PAN 3471** | 371 | 2 | 390 | 7 | 360 | 2 | 332 | 3 | 363 | 2 | 374 | 2 | 381 | 2 |
| **PAN 3515** |  |  |  |  | 359 | 4 |  |  |  |  |  |  |  |  |
| **Ratel** | 380 | 1 | 402 | 2 | 359 | 3 | 361 | 1 | 376 | 1 | 380 | 1 | 391 | 1 |
| **SST 0117** | 351 | 4 | 389 | 9 |  |  |  |  |  |  |  |  | 370 | 6 |
| **SST 0127** | 346 | 7 | 396 | 5 | 347 | 11 |  |  |  |  | 363 | 5 | 371 | 4 |
| **SST 0137** | 348 | 5 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 325 | 13 | 381 | 13 |  |  |  |  |  |  |  |  | 353 | 12 |
| **SST 015** | 360 | 3 | 398 | 3 | 352 | 6 | 315 | 8 | 356 | 3 | 370 | 3 | 379 | 3 |
| **SST 027** | 348 | 6 | 394 | 6 | 354 | 5 | 325 | 4 | 355 | 4 | 365 | 4 | 371 | 5 |
| **SST 047** |  |  |  |  | 363 | 1 | 325 | 5 |  |  |  |  |  |  |
| **SST 056** | 342 | 8 | 385 | 11 | 350 | 8 | 324 | 6 | 350 | 5 | 359 | 6 | 363 | 8 |
| **SST 087** | 335 | 10 | 378 | 14 | 349 | 9 | 306 | 12 | 342 | 9 | 354 | 9 | 357 | 11 |
| **SST 096** | 330 | 12 | 385 | 10 | 345 | 12 | 310 | 11 | 343 | 8 | 353 | 10 | 358 | 10 |
| **SST 88** | 339 | 9 | 390 | 8 | 345 | 12 | 311 | 10 | 346 | 7 | 358 | 7 | 364 | 7 |
| **Tankwa** |  |  | 398 | 3 | 345 | 14 | 312 | 9 |  |  |  |  |  |  |
| **Mean** | **347** |  | **391** |  | **352** |  | **324** |  | **353** |  | **363** |  | **368** |  |
| **LSDt(0,05)** | **13.60** |  | **15.30** |  | **8.30** |  | **15.27** |  | **6.80** |  | **7.50** |  | **10.30** |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Swartland High Rainfall Area: AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the falling number of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 155 | 172121 | 1110 |  |  |
| **Treatments** | | 38 | 133226 | 3506 | 17.24 | <0,001 |
| **Genotypes** | | 12 | 35960 | 2997 | 14.73 | <0,001 |
| **Environments** | | 2 | 89017 | 44508 | 23.66 | <0,001 |
| **Block** |  | 9 | 16930 | 1881 | 9.25 | <0,001 |
| **Interactions** | | 24 | 8249 | 344 | 1.69 | 0.0364 |
| **IPCA** |  | 13 | 5233 | 403 | 1.98 | 0.0292 |
| **IPCA** |  | 11 | 3017 | 274 | 1.35 | 0.2082 |
| **Residuals** | | 0 | 0 |  |  |  |
| **Error** |  | 108 | 21965 | 203 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 335 | 11 | -0.90601 |  |  |
| 2 | PAN 3471 | 371 | 2 | 1.00233 |  |  |
| 3 | Ratel | 380 | 1 | 3.71453 |  |  |
| 4 | SST 0117 | 351 | 4 | 1.66135 |  |  |
| 5 | SST 0127 | 346 | 7 | 0.34491 |  |  |
| 6 | SST 0137 | 348 | 5 | 0.66347 |  |  |
| 7 | SST 0147 | 325 | 13 | -3.34658 |  |  |
| 8 | SST 015 | 360 | 3 | 0.59722 |  |  |
| 9 | SST 027 | 348 | 6 | 0.10626 |  |  |
| 10 | SST 056 | 342 | 8 | -0.02811 |  |  |
| 11 | SST 087 | 335 | 10 | -0.72401 |  |  |
| 12 | SST 096 | 330 | 12 | -1.97481 |  |  |
| 13 | SST 88 | 339 | 9 | -1.11054 |  |  |
| **Mean** |  | **347** |  |  |  |  |
| **Coefficient of variation (%)** | | **4.80** |  |  |  |  |
| **LSDt(0.05)** | | **13.60** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Darling | 313 | 3 | -4.85432 |  |  |
| 2 | Malmesbury | 369 | 1 | 1.78624 |  |  |
| 3 | Philadelphia | 358 | 2 | 3.06808 |  |  |
| **Mean** | | **347** |  |  |  |  |
| **Coefficient of variation (%)** | | **4.80** |  |  |  |  |
| **LSDt(0.05)** | | **6.50** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **High rainfall** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Darling (Klipvlei) 2016-05-12** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 2.81 | bc | 10 | 9.54 | 70.90 | 6 | 13.10 | 2 | 305 | 13 |
| **PAN 3471** | 3.39 | a | 1 | 13.10 | 74.50 | 2 | 12.81 | 8 | 333 | 1 |
| **Ratel** | 2.70 | bc | 12 | 15.66 | 68.80 | 13 | 12.20 | 12 | 328 | 2 |
| **SST 0117** | 3.01 | abc | 3 | 5.51 | 71.80 | 4 | 12.09 | 13 | 311 | 6 |
| **SST 0127** | 2.85 | bc | 7 | 8.52 | 70.90 | 6 | 12.65 | 9 | 311 | 5 |
| **SST 0137** | 3.05 | ab | 2 | 12.83 | 70.45 | 9 | 12.92 | 5 | 310 | 9 |
| **SST 0147** | 2.90 | bc | 5 | 8.82 | 70.98 | 5 | 12.91 | 6 | 308 | 10 |
| **SST 015** | 2.82 | bc | 9 | 15.11 | 72.45 | 3 | 12.94 | 3 | 323 | 3 |
| **SST 027** | 2.75 | bc | 11 | 2.60 | 76.03 | 1 | 12.94 | 3 | 314 | 4 |
| **SST 056** | 2.86 | bc | 6 | 10.37 | 69.25 | 12 | 13.88 | 1 | 311 | 6 |
| **SST 087** | 2.84 | bc | 8 | 7.36 | 70.30 | 10 | 12.37 | 11 | 305 | 12 |
| **SST 096** | 2.65 | c | 13 | 12.13 | 70.80 | 8 | 12.49 | 10 | 307 | 11 |
| **SST 88** | 2.99 | bc | 4 | 12.34 | 69.98 | 11 | 12.84 | 7 | 310 | 8 |
| **Mean** | **2.90** |  |  |  | **71.32** |  | **12.78** |  | **313** |  |
| **Coefficient of variation (%)** | **8.61** |  |  |  | **1.94** |  | **5.69** |  | **2.26** |  |
| **LSDt(0,05)** | **0.39** |  |  |  | **2.16** |  | **1.13** |  | **11.04** |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **High rainfall** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Malmesbury (Harmonie) 2016-05-17** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 5.62 | bc | 4 | 10.72 | 83.84 | 6 | 11.01 | 6 | 360 | 9 |
| **PAN 3471** | 5.35 | cd | 12 | 4.80 | 84.69 | 2 | 10.97 | 7 | 391 | 2 |
| **Ratel** | 5.39 | cd | 10 | 10.54 | 82.90 | 12 | 10.94 | 9 | 410 | 1 |
| **SST 0117** | 6.06 | a | 1 | 5.06 | 83.20 | 10 | 10.9 | 10 | 370 | 6 |
| **SST 0127** | 5.58 | bc | 7 | 4.12 | 83.47 | 9 | 11.06 | 4 | 367 | 7 |
| **SST 0137** | 5.88 | ab | 2 | 0.55 | 83.64 | 7 | 10.86 | 11 | 382 | 4 |
| **SST 0147** | 5.60 | bc | 5 | 5.48 | 82.99 | 11 | 10.52 | 13 | 343 | 12 |
| **SST 015** | 5.51 | bcd | 8 | 6.00 | 84.70 | 1 | 11.61 | 2 | 384 | 3 |
| **SST 027** | 5.13 | d | 13 | 4.73 | 83.93 | 5 | 11.67 | 1 | 372 | 5 |
| **SST 056** | 5.37 | cd | 11 | 4.32 | 83.59 | 8 | 10.61 | 12 | 352 | 11 |
| **SST 087** | 5.73 | abc | 3 | 1.58 | 81.74 | 13 | 11.07 | 3 | 360 | 10 |
| **SST 096** | 5.60 | bc | 6 | 4.07 | 84.07 | 4 | 11.05 | 5 | 341 | 13 |
| **SST 88** | 5.50 | bcd | 9 | 7.86 | 84.20 | 3 | 10.96 | 8 | 361 | 8 |
| **Mean** | **5.56** |  |  |  | **83.61** |  | **11.02** |  | **369** |  |
| **Coefficient of variation (%)** | **4.98** |  |  |  | **1.07** |  | **2.82** |  | **4.63** |  |
| **LSDt(0,05)** | **0.43** |  |  |  | **1.39** |  | **0.48** |  | **26.57** |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **High rainfall** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Philadelphia (Altona) 2016-05-18** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 4.60 | b | 13 | 19.82 | 82.18 | 10 | 11.24 | 4 | 339 | 12 |
| **PAN 3471** | 5.11 | ab | 7 | 10.20 | 83.98 | 2 | 10.97 | 8 | 388 | 2 |
| **Ratel** | 5.30 | ab | 5 | 17.43 | 83.45 | 4 | 10.52 | 12 | 401 | 1 |
| **SST 0117** | 5.10 | ab | 8 | 8.86 | 81.90 | 11 | 11.12 | 5 | 372 | 3 |
| **SST 0127** | 5.32 | ab | 4 | 7.43 | 82.65 | 7 | 10.76 | 10 | 359 | 6 |
| **SST 0137** | 5.59 | a | 2 | 6.08 | 82.88 | 6 | 11.06 | 6 | 353 | 8 |
| **SST 0147** | 4.91 | ab | 11 | 13.80 | 82.58 | 9 | 10.63 | 11 | 323 | 13 |
| **SST 015** | 4.93 | ab | 10 | 18.59 | 82.63 | 8 | 10.29 | 13 | 371 | 4 |
| **SST 027** | 4.85 | ab | 12 | 20.93 | 83.85 | 3 | 12.57 | 1 | 357 | 7 |
| **SST 056** | 5.41 | a | 3 | 4.72 | 81.13 | 12 | 11.38 | 3 | 364 | 5 |
| **SST 087** | 5.62 | a | 1 | 6.44 | 79.55 | 13 | 11.03 | 7 | 341 | 11 |
| **SST 096** | 5.12 | ab | 6 | 4.49 | 82.95 | 5 | 11.43 | 2 | 342 | 10 |
| **SST 88** | 5.00 | ab | 9 | 8.44 | 84.30 | 1 | 10.93 | 9 | 345 | 9 |
| **Mean** | **5.14** |  |  |  | **82.62** |  | **11.07** |  | **358** |  |
| **Coefficient of variation (%)** | **10.05** |  |  |  | **1.33** |  | **4.11** |  | **3.94** |  |
| **LSDt(0,05)** | **0.80** |  |  |  | **1.71** |  | **0.71** |  | **21.88** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Middle Swartland** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average yield (ton/ha) of entries during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 1.94 | 14 | 3.13 | 14 | 3.83 | 12 |  |  |  |  |  |  |
| **PAN 3408** | 4.26 | 4 | 2.33 | 5 | 3.75 | 10 | 4.53 | 7 | 3.72 | 6 | 3.45 | 4 | 3.30 | 4 |
| **PAN 3471** | 4.07 | 8 | 2.41 | 3 | 3.93 | 7 | 4.43 | 10 | 3.71 | 7 | 3.47 | 3 | 3.24 | 5 |
| **PAN 3515** |  |  |  |  | 3.85 | 9 |  |  |  |  |  |  |  |  |
| **Ratel** | 3.56 | 13 | 2.17 | 11 | 3.33 | 13 | 4.15 | 11 | 3.30 | 9 | 3.02 | 10 | 2.86 | 12 |
| **SST 0117** | 4.34 | 2 | 2.43 | 2 |  |  |  |  |  |  |  |  | 3.39 | 1 |
| **SST 0127** | 3.87 | 11 | 2.09 | 13 | 4.09 | 4 |  |  |  |  | 3.35 | 8 | 2.98 | 11 |
| **SST 0137** | 3.92 | 10 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 4.16 | 6 | 2.45 | 1 |  |  |  |  |  |  |  |  | 3.31 | 3 |
| **SST 015** | 4.01 | 9 | 2.41 | 4 | 4.26 | 1 | 4.82 | 3 | 3.87 | 1 | 3.56 | 1 | 3.21 | 8 |
| **SST 027** | 4.38 | 1 | 2.29 | 8 | 3.95 | 6 | 4.47 | 9 | 3.77 | 2 | 3.54 | 2 | 3.33 | 2 |
| **SST 047** |  |  |  |  | 4.19 | 2 | 4.57 | 5 |  |  |  |  |  |  |
| **SST 056** | 4.23 | 5 | 2.21 | 10 | 3.91 | 8 | 4.62 | 4 | 3.74 | 5 | 3.45 | 5 | 3.22 | 7 |
| **SST 087** | 3.86 | 12 | 2.31 | 7 | 4.06 | 5 | 4.83 | 2 | 3.77 | 3 | 3.41 | 6 | 3.09 | 10 |
| **SST 096** | 4.29 | 3 | 2.16 | 12 | 3.70 | 11 | 4.86 | 1 | 3.75 | 4 | 3.38 | 7 | 3.22 | 6 |
| **SST 88** | 4.07 | 7 | 2.31 | 6 | 3.43 | 12 | 4.52 | 8 | 3.58 | 8 | 3.27 | 9 | 3.19 | 9 |
| **Tankwa** |  |  | 2.25 | 9 | 4.16 | 3 | 4.54 | 6 |  |  |  |  |  |  |
| **Mean** | **4.08** |  | **2.27** |  | **3.84** |  | **4.51** |  | **3.69** |  | **3.39** |  | **3.19** |  |
| **LSDt(0,05)** | **0.34** |  | **0.25** |  | **0.26** |  | **0.30** |  | **0.15** |  | **0.17** |  | **0.23** |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **Middle Swartland: AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the yield of entries for for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 207 | 301.59 | 1.457 |  |  |
| **Treatments** | | 51 | 263.59 | 5.168 | 25.73 | <0,001 |
| **Genotypes** | | 12 | 10.60 | 0.883 | 4.40 | <0,001 |
| **Environments** | | 3 | 225.53 | 75.176 | 99.49 | <0,001 |
| **Block** |  | 12 | 9.07 | 0.756 | 3.76 | <0,001 |
| **Interactions** | | 36 | 27.46 | 0.763 | 3.80 | <0,001 |
| **IPCA** |  | 14 | 16.14 | 1.153 | 5.74 | <0,001 |
| **IPCA** |  | 12 | 6.75 | 0.563 | 2.80 | 0.0018 |
| **Residuals** | | 10 | 4.56 | 0.456 | 2.27 | 0.0169 |
| **Error** |  | 144 | 28.93 | 0.201 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for yield (ton/ha)** | | | | |  |  |
|  | | | | |  |  |
| **Entry** | **Genotype** | **Yield** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 4.26 | 4 | 0.43211 |  |  |
| 2 | PAN 3471 | 4.07 | 8 | -0.30990 |  |  |
| 3 | Ratel | 3.56 | 13 | 0.25429 |  |  |
| 4 | SST 0117 | 4.34 | 2 | -0.00947 |  |  |
| 5 | SST 0127 | 3.87 | 11 | 0.50431 |  |  |
| 6 | SST 0137 | 3.92 | 10 | 0.46286 |  |  |
| 7 | SST 0147 | 4.16 | 6 | 0.42657 |  |  |
| 8 | SST 015 | 4.01 | 9 | -0.04434 |  |  |
| 9 | SST 027 | 4.38 | 1 | -0.67894 |  |  |
| 10 | SST 056 | 4.23 | 5 | -0.55817 |  |  |
| 11 | SST 087 | 3.86 | 12 | 0.13362 |  |  |
| 12 | SST 096 | 4.29 | 3 | -0.18232 |  |  |
| 13 | SST 88 | 4.07 | 7 | -0.43062 |  |  |
| **Mean** |  | **4.08** |  |  |  |  |
| **Coefficient of variation (%)** | | **12.10** |  |  |  |  |
| **LSDt(0.05)** | | **0.34** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Halfmanshof (Uitkoms) | 4.26 | 3 | -1.19460 |  |  |
| 2 | Moorreesburg (Klein Swartfontein) | 4.81 | 2 | 0.56596 |  |  |
| 3 | Moorreesburg (Langrug) | 4.92 | 1 | 0.13534 |  |  |
| 4 | Piketberg (Kolvlei) | 2.33 | 4 | 0.49330 |  |  |
| **Mean** |  | **4.08** |  |  |  |  |
| **Coefficient of variation (%)** | | **12.10** |  |  |  |  |
| **LSDt(0.05)** | | **0.19** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Middle Swartland** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average hectolitre mass (kg/hl) of entries during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 79.81 | 11 | 74.51 | 12 | 75.29 | 12 |  |  |  |  |  |  |
| **PAN 3408** | 79.64 | 7 | 80.13 | 9 | 74.39 | 13 | 76.27 | 8 | 77.61 | 6 | 78.05 | 6 | 79.89 | 8 |
| **PAN 3471** | 82.68 | 1 | 81.55 | 3 | 77.60 | 3 | 78.73 | 1 | 80.14 | 1 | 80.61 | 2 | 82.12 | 1 |
| **PAN 3515** |  |  |  |  | 76.76 | 4 |  |  |  |  |  |  |  |  |
| **Ratel** | 78.00 | 12 | 80.63 | 6 | 73.15 | 14 | 75.56 | 11 | 76.84 | 9 | 77.26 | 10 | 79.32 | 9 |
| **SST 0117** | 80.01 | 5 | 79.95 | 10 |  |  |  |  |  |  |  |  | 79.98 | 7 |
| **SST 0127** | 78.72 | 10 | 78.72 | 14 | 75.52 | 10 |  |  |  |  | 77.65 | 8 | 78.72 | 12 |
| **SST 0137** | 77.45 | 13 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 79.29 | 9 | 80.80 | 4 |  |  |  |  |  |  |  |  | 80.05 | 6 |
| **SST 015** | 80.10 | 3 | 80.27 | 8 | 75.98 | 6 | 76.74 | 6 | 78.27 | 5 | 78.78 | 5 | 80.19 | 5 |
| **SST 027** | 81.89 | 2 | 82.21 | 1 | 78.16 | 2 | 77.63 | 2 | 79.97 | 2 | 80.75 | 1 | 82.05 | 2 |
| **SST 047** |  |  |  |  | 79.08 | 1 | 77.61 | 3 |  |  |  |  |  |  |
| **SST 056** | 79.50 | 8 | 78.78 | 13 | 75.64 | 9 | 75.97 | 10 | 77.47 | 7 | 77.97 | 7 | 79.14 | 10 |
| **SST 087** | 78.05 | 11 | 79.54 | 12 | 75.29 | 11 | 76.05 | 9 | 77.23 | 8 | 77.63 | 9 | 78.80 | 11 |
| **SST 096** | 79.92 | 6 | 80.76 | 5 | 75.83 | 8 | 76.92 | 5 | 78.36 | 4 | 78.84 | 4 | 80.34 | 4 |
| **SST 88** | 80.02 | 4 | 82.19 | 2 | 75.89 | 7 | 77.10 | 4 | 78.80 | 3 | 79.37 | 3 | 81.11 | 3 |
| **Tankwa** |  |  | 80.51 | 7 | 76.64 | 5 | 76.73 | 7 |  |  |  |  |  |  |
| **Mean** | **79.64** |  | **80.42** |  | **76.03** |  | **76.72** |  | **78.30** |  | **78.69** |  | **80.14** |  |
| **LSDt(0,05)** | **1.38** |  | **1.07** |  | **1.02** |  | **0.71** |  | **0.54** |  | **0.69** |  | **0.90** |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Middle Swartland: AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the hectolitre mass of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 207 | 4179 | 20.2 |  |  |
| **Treatments** | | 51 | 3574 | 70.1 | 17.69 | <0,001 |
| **Genotypes** | | 12 | 415 | 34.5 | 8.72 | <0,001 |
| **Environments** | | 3 | 3003 | 1001.1 | 356.78 | <0,001 |
| **Block** |  | 12 | 34 | 2.8 | 0.71 | 0.7417 |
| **Interactions** | | 36 | 156 | 4.3 | 1.10 | 0.3427 |
| **IPCA** |  | 14 | 109 | 7.8 | 1.97 | 0.0237 |
| **IPCA** |  | 12 | 26 | 2.1 | 0.54 | 0.8865 |
| **Residuals** | | 10 | 21 | 2.1 | 0.54 | 0.8602 |
| **Error** |  | 144 | 571 | 4.0 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for hectolitre mass (kg/hl)** | | | | | | |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 79.64 | 7 | 0.97686 |  |  |
| 2 | PAN 3471 | 82.68 | 1 | -1.09980 |  |  |
| 3 | Ratel | 78.00 | 12 | -0.13303 |  |  |
| 4 | SST 0117 | 80.01 | 5 | -0.05172 |  |  |
| 5 | SST 0127 | 78.72 | 10 | -0.19484 |  |  |
| 6 | SST 0137 | 77.45 | 13 | 1.19577 |  |  |
| 7 | SST 0147 | 79.29 | 9 | 0.39211 |  |  |
| 8 | SST 015 | 80.10 | 3 | -0.64748 |  |  |
| 9 | SST 027 | 81.89 | 2 | -0.94338 |  |  |
| 10 | SST 056 | 79.50 | 8 | 0.27609 |  |  |
| 11 | SST 087 | 78.05 | 11 | 0.16637 |  |  |
| 12 | SST 096 | 79.92 | 6 | -0.04307 |  |  |
| 13 | SST 88 | 80.02 | 4 | 0.10612 |  |  |
| **Mean** |  | **79.64** |  |  |  |  |
| **Coefficient of variation (%)** | | **2.50** |  |  |  |  |
| **LSDt(0.05)** | | **1.38** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Halfmanshof (Uitkoms) | 79.09 | 3 | -1.96215 |  |  |
| 2 | Moorreesburg (Klein Swartfontein) | 84.97 | 1 | 0.90983 |  |  |
| 3 | Moorreesburg (Langrug) | 74.28 | 4 | 0.51079 |  |  |
| 4 | Piketberg (Kolvlei) | 80.22 | 2 | 0.54153 |  |  |
| **Mean** |  | **79.64** |  |  |  |  |
| **Coefficient of variation (%)** | | **2.50** |  |  |  |  |
| **LSDt(0.05)** | | **0.77** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Middle Swartland** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average protein content (%) of entries during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 13.87 | 4 | 13.60 | 8 | 14.09 | 2 |  |  |  |  |  |  |
| **PAN 3408** | 13.40 | 5 | 13.35 | 7 | 13.76 | 5 | 13.66 | 7 | 13.54 | 3 | 13.50 | 4 | 13.38 | 4 |
| **PAN 3471** | 12.87 | 11 | 12.44 | 14 | 13.29 | 11 | 13.91 | 4 | 13.13 | 8 | 12.87 | 9 | 12.66 | 12 |
| **PAN 3515** |  |  |  |  | 13.12 | 13 |  |  |  |  |  |  |  |  |
| **Ratel** | 14.25 | 1 | 13.93 | 3 | 13.90 | 3 | 14.02 | 3 | 14.03 | 1 | 14.03 | 1 | 14.09 | 1 |
| **SST 0117** | 13.34 | 8 | 12.81 | 12 |  |  |  |  |  |  |  |  | 13.08 | 9 |
| **SST 0127** | 13.35 | 7 | 13.79 | 5 | 13.46 | 10 |  |  |  |  | 13.53 | 3 | 13.57 | 3 |
| **SST 0137** | 14.03 | 2 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 13.21 | 10 | 12.50 | 13 |  |  |  |  |  |  |  |  | 12.86 | 11 |
| **SST 015** | 12.76 | 12 | 13.42 | 6 | 13.55 | 9 | 13.37 | 8 | 13.28 | 5 | 13.24 | 8 | 13.09 | 8 |
| **SST 027** | 13.76 | 3 | 13.95 | 2 | 13.79 | 4 | 13.83 | 5 | 13.83 | 2 | 13.83 | 2 | 13.86 | 2 |
| **SST 047** |  |  |  |  | 14.52 | 2 | 15.33 | 1 |  |  |  |  |  |  |
| **SST 056** | 12.59 | 13 | 13.18 | 9 | 12.74 | 14 | 12.67 | 11 | 12.80 | 9 | 12.84 | 10 | 12.89 | 10 |
| **SST 087** | 13.45 | 4 | 12.90 | 11 | 13.62 | 7 | 12.63 | 12 | 13.15 | 7 | 13.32 | 6 | 13.18 | 6 |
| **SST 096** | 13.38 | 6 | 13.28 | 8 | 13.22 | 12 | 13.27 | 9 | 13.29 | 4 | 13.29 | 7 | 13.33 | 5 |
| **SST 88** | 13.24 | 9 | 13.11 | 10 | 13.68 | 6 | 12.83 | 10 | 13.22 | 6 | 13.34 | 5 | 13.18 | 6 |
| **Tankwa** |  |  | 14.21 | 1 | 14.58 | 1 | 13.71 | 6 |  |  |  |  |  |  |
| **Mean** | **13.36** |  | **13.34** |  | **13.63** |  | **13.61** |  | **13.36** |  | **13.38** |  | **13.26** |  |
| **LSDt(0,05)** | **0.66** |  | **0.70** |  | **0.61** |  | **0.42** |  | **0.30** |  | **0.37** |  | **0.47** |  |

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| **Middle Swartland: AMMI Analysis** | | | | | | | |
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| **Anova of the protein content of entries for 2016** | | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 207 | 316.05 | 1.527 |  |  |
| **Treatments** | | 51 | 178.46 | 3.499 | 4.32 | <0,001 |
| **Genotypes** | | 12 | 42.13 | 3.511 | 4.33 | <0,001 |
| **Environments** | | 3 | 100.00 | 33.334 | 19.15 | <0,001 |
| **Block** |  | 12 | 20.89 | 1.741 | 2.15 | 0.0173 |
| **Interactions** | | 36 | 36.33 | 1.009 | 1.25 | 0.1839 |
| **IPCA** |  | 14 | 26.58 | 1.898 | 2.34 | 0.0060 |
| **IPCA** |  | 12 | 7.19 | 0.599 | 0.74 | 0.7110 |
| **Residuals** | | 10 | 2.56 | 0.256 | 0.32 | 0.9759 |
| **Error** |  | 144 | 116.70 | 0.810 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 13.40 | 5 | 0.26938 |  |  |
| 2 | PAN 3471 | 12.87 | 11 | -0.48322 |  |  |
| 3 | Ratel | 14.25 | 1 | 0.46300 |  |  |
| 4 | SST 0117 | 13.34 | 8 | -0.30789 |  |  |
| 5 | SST 0127 | 13.35 | 7 | 0.03851 |  |  |
| 6 | SST 0137 | 14.03 | 2 | 0.80549 |  |  |
| 7 | SST 0147 | 13.21 | 10 | 0.47656 |  |  |
| 8 | SST 015 | 12.76 | 12 | 0.22789 |  |  |
| 9 | SST 027 | 13.76 | 3 | -0.85485 |  |  |
| 10 | SST 056 | 12.59 | 13 | -0.17192 |  |  |
| 11 | SST 087 | 13.45 | 4 | 0.20824 |  |  |
| 12 | SST 096 | 13.38 | 6 | -0.28997 |  |  |
| 13 | SST 88 | 13.24 | 9 | -0.38121 |  |  |
| **Mean** |  | **13.36** |  |  |  |  |
| **Coefficient of variation (%)** | | **7.10** |  |  |  |  |
| **LSDt(0.05)** | | **0.66** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Halfmanshof (Uitkoms) | 14.24 | 1 | 1.27596 |  |  |
| 2 | Moorreesburg (Klein Swartfontein) | 12.30 | 4 | -0.81735 |  |  |
| 3 | Moorreesburg (Langrug) | 13.37 | 3 | -0.52626 |  |  |
| 4 | Piketberg (Kolvlei) | 13.52 | 2 | 0.06766 |  |  |
| **Mean** |  | **13.36** |  |  |  |  |
| **Coefficient of variation (%)** | | **7.10** |  |  |  |  |
| **LSDt(0.05)** | | **0.37** |  |  |  |  |

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| **Middle Swartland** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average falling number (s) of entries during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 410 | 1 | 346 | 1 | 363 | 2 |  |  |  |  |  |  |
| **PAN 3408** | 339 | 11 | 369 | 14 | 303 | 14 | 318 | 12 | 332 | 9 | 337 | 10 | 354 | 12 |
| **PAN 3471** | 352 | 3 | 410 | 1 | 338 | 7 | 345 | 7 | 361 | 2 | 367 | 2 | 381 | 2 |
| **PAN 3515** |  |  |  |  | 346 | 1 |  |  |  |  |  |  |  |  |
| **Ratel** | 369 | 1 | 408 | 6 | 341 | 5 | 364 | 1 | 371 | 1 | 373 | 1 | 388 | 1 |
| **SST 0117** | 353 | 2 | 405 | 7 |  |  |  |  |  |  |  |  | 379 | 5 |
| **SST 0127** | 349 | 6 | 409 | 4 | 341 | 6 |  |  |  |  | 366 | 3 | 379 | 4 |
| **SST 0137** | 351 | 5 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 340 | 9 | 374 | 13 |  |  |  |  |  |  |  |  | 357 | 11 |
| **SST 015** | 352 | 3 | 409 | 4 | 324 | 12 | 347 | 5 | 358 | 4 | 362 | 5 | 380 | 3 |
| **SST 027** | 347 | 8 | 399 | 9 | 328 | 10 | 333 | 8 | 352 | 5 | 358 | 6 | 373 | 7 |
| **SST 047** |  |  |  |  | 344 | 3 | 351 | 3 |  |  |  |  |  |  |
| **SST 056** | 349 | 7 | 400 | 8 | 337 | 8 | 347 | 5 | 358 | 3 | 362 | 4 | 374 | 6 |
| **SST 087** | 337 | 13 | 379 | 12 | 343 | 4 | 326 | 10 | 346 | 7 | 353 | 8 | 358 | 10 |
| **SST 096** | 339 | 10 | 393 | 10 | 335 | 9 | 327 | 9 | 349 | 6 | 356 | 7 | 366 | 8 |
| **SST 88** | 337 | 12 | 388 | 11 | 323 | 13 | 325 | 11 | 343 | 8 | 349 | 9 | 363 | 9 |
| **Tankwa** |  |  | 410 | 3 | 327 | 11 | 350 | 4 |  |  |  |  |  |  |
| **Mean** | **347** |  | **397** |  | **334** |  | **341** |  | **352** |  | **358** |  | **371** |  |
| **LSDt(0,05)** | **13.50** |  | **10.20** |  | **17.90** |  | **10.78** |  | **7.30** |  | **9.10** |  | **9.00** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Middle Swartland: AMMI Analysis** | | | | | | | |
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| **Anova of the falling number of entries for 2016** | | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 207 | 263083 | 1271 |  |  |
| **Treatments** | | 51 | 205774 | 4035 | 11.64 | <0,001 |
| **Genotypes** | | 12 | 15090 | 1258 | 3.63 | <0,001 |
| **Environments** | | 3 | 176746 | 58915 | 95.83 | <0,001 |
| **Block** |  | 12 | 7377 | 615 | 1.77 | 0.0579 |
| **Interactions** | | 36 | 13938 | 387 | 1.12 | 0.3176 |
| **IPCA** |  | 14 | 12323 | 880 | 2.54 | 0.0028 |
| **IPCA** |  | 12 | 1173 | 98 | 0.28 | 0.9913 |
| **Residuals** | | 10 | 443 | 44 | 0.13 | 0.9994 |
| **Error** |  | 144 | 49931 | 347 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 339 | 11 | 1.69773 |  |  |
| 2 | PAN 3471 | 352 | 3 | -3.14560 |  |  |
| 3 | Ratel | 369 | 1 | -3.36429 |  |  |
| 4 | SST 0117 | 353 | 2 | 0.66548 |  |  |
| 5 | SST 0127 | 349 | 6 | 0.04195 |  |  |
| 6 | SST 0137 | 351 | 5 | 2.53381 |  |  |
| 7 | SST 0147 | 340 | 9 | -2.72215 |  |  |
| 8 | SST 015 | 352 | 3 | 0.11730 |  |  |
| 9 | SST 027 | 347 | 8 | -0.21965 |  |  |
| 10 | SST 056 | 349 | 7 | -1.03928 |  |  |
| 11 | SST 087 | 337 | 13 | 2.54035 |  |  |
| 12 | SST 096 | 339 | 10 | 3.08256 |  |  |
| 13 | SST 88 | 337 | 12 | -0.18819 |  |  |
| **Mean** |  | **347** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.60** |  |  |  |  |
| **LSDt(0.05)** | | **13.50** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Halfmanshof (Uitkoms) | 364 | 2 | -5.36898 |  |  |
| 2 | Moorreesburg (Klein Swartfontein) | 314 | 4 | -0.08553 |  |  |
| 3 | Moorreesburg (Langrug) | 386 | 1 | 5.15567 |  |  |
| 4 | Piketberg (Kolvlei) | 324 | 3 | 0.29883 |  |  |
| **Mean** |  | **347** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.60** |  |  |  |  |
| **LSDt(0.05)** | | **7.50** |  |  |  |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
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| **Middle Swartland** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Halfmanshof (Uitkoms) 2016-05-11** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 3.97 | cdef | 8 | 16.39 | 77.12 | 12 | 14.83 | 3 | 346 | 11 |
| **PAN 3471** | 4.66 | abcd | 5 | 16.50 | 84.35 | 1 | 13.13 | 13 | 384 | 2 |
| **Ratel** | 3.49 | ef | 12 | 8.16 | 77.90 | 10 | 15.51 | 2 | 405 | 1 |
| **SST 0117** | 4.59 | abcd | 6 | 16.53 | 79.50 | 4 | 13.81 | 9 | 366 | 6 |
| **SST 0127** | 3.35 | f | 13 | 2.08 | 78.58 | 7 | 14.29 | 6 | 364 | 7 |
| **SST 0137** | 3.66 | ef | 11 | 15.88 | 74.57 | 13 | 15.90 | 1 | 352 | 10 |
| **SST 0147** | 3.86 | cdef | 9 | 14.57 | 77.97 | 9 | 14.65 | 4 | 372 | 4 |
| **SST 015** | 4.15 | cdef | 7 | 3.52 | 80.77 | 3 | 14.03 | 7 | 370 | 5 |
| **SST 027** | 5.37 | a | 1 | 12.46 | 83.10 | 2 | 13.55 | 10 | 364 | 8 |
| **SST 056** | 5.08 | ab | 2 | 18.30 | 78.32 | 8 | 13.44 | 11 | 372 | 3 |
| **SST 087** | 3.81 | def | 10 | 3.68 | 77.27 | 11 | 14.64 | 5 | 341 | 13 |
| **SST 096** | 4.73 | abc | 3 | 17.03 | 79.47 | 5 | 13.91 | 8 | 344 | 12 |
| **SST 88** | 4.71 | abcd | 4 | 7.48 | 79.30 | 6 | 13.38 | 12 | 355 | 9 |
| **Mean** | **4.26** |  |  |  | **79.09** |  | **14.24** |  | **364** |  |
| **Coefficient of variation (%)** | **13.57** |  |  |  | **1.47** |  | **5.62** |  | **3.10** |  |
| **LSDt(0,05)** | **0.90** |  |  |  | **1.81** |  | **1.24** |  | **17.59** |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
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| **Middle Swartland** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Moorreesburg (Klein Swartfontein) 2016-05-16** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 5.00 | ab | 4 | 7.13 | 85.48 | 4 | 12.39 | 4 | 304 | 11 |
| **PAN 3471** | 5.03 | ab | 2 | 6.67 | 87.35 | 1 | 12.00 | 10 | 323 | 2 |
| **Ratel** | 4.79 | abc | 8 | 8.91 | 84.35 | 10 | 12.53 | 3 | 331 | 1 |
| **SST 0117** | 4.94 | abc | 7 | 8.48 | 84.78 | 7 | 12.38 | 5 | 321 | 3 |
| **SST 0127** | 4.71 | bcd | 9 | 8.23 | 83.97 | 13 | 12.37 | 6 | 317 | 6 |
| **SST 0137** | 5.28 | a | 1 | 9.39 | 84.00 | 12 | 12.11 | 9 | 313 | 8 |
| **SST 0147** | 4.96 | ab | 6 | 11.76 | 84.96 | 6 | 11.90 | 11 | 304 | 12 |
| **SST 015** | 4.97 | ab | 5 | 4.84 | 84.64 | 8 | 11.77 | 12 | 319 | 5 |
| **SST 027** | 4.67 | bcd | 10 | 6.90 | 85.67 | 3 | 13.49 | 1 | 315 | 7 |
| **SST 056** | 4.43 | cd | 11 | 23.12 | 84.38 | 9 | 11.77 | 12 | 320 | 4 |
| **SST 087** | 4.26 | d | 13 | 12.70 | 84.06 | 11 | 12.27 | 8 | 307 | 9 |
| **SST 096** | 5.02 | ab | 3 | 3.57 | 85.24 | 5 | 12.62 | 2 | 303 | 13 |
| **SST 88** | 4.42 | cd | 12 | 1.40 | 85.68 | 2 | 12.33 | 7 | 305 | 10 |
| **Mean** | **4.81** |  |  |  | **84.97** |  | **12.30** |  | **314** |  |
| **Coefficient of variation (%)** | **6.96** |  |  |  | **0.96** |  | **3.02** |  | **3.60** |  |
| **LSDt(0,05)** | **0.52** |  |  |  | **1.27** |  | **0.58** |  | **17.60** |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
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| **Middle Swartland** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Moorreesburg (Langrug ) 2016-05-05** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 5.09 | ab | 4 | 16.23 | 74.85 | 6 | 13.28 | 8 | 386 | 7 |
| **PAN 3471** | 4.78 | abcd | 11 | 13.05 | 76.35 | 2 | 13.42 | 6 | 376 | 11 |
| **Ratel** | 4.21 | d | 13 | 7.46 | 72.23 | 12 | 14.11 | 1 | 391 | 5 |
| **SST 0117** | 4.9 | abc | 10 | 17.15 | 74.98 | 4 | 13.73 | 4 | 395 | 3 |
| **SST 0127** | 5.26 | a | 2 | 6.57 | 72.73 | 11 | 13.16 | 10 | 386 | 8 |
| **SST 0137** | 4.44 | cd | 12 | 11.76 | 73.03 | 10 | 13.82 | 3 | 400 | 1 |
| **SST 0147** | 5.02 | abc | 6 | 8.59 | 74.95 | 5 | 12.69 | 12 | 365 | 13 |
| **SST 015** | 5.31 | a | 1 | 9.49 | 75.43 | 3 | 12.50 | 13 | 392 | 4 |
| **SST 027** | 5.12 | ab | 3 | 8.49 | 76.58 | 1 | 14.09 | 2 | 382 | 10 |
| **SST 056** | 4.92 | abc | 8 | 8.43 | 73.98 | 9 | 12.93 | 11 | 384 | 9 |
| **SST 087** | 4.94 | abc | 7 | 5.21 | 71.81 | 13 | 13.42 | 6 | 389 | 6 |
| **SST 096** | 4.91 | abc | 9 | 7.37 | 74.03 | 8 | 13.48 | 5 | 396 | 2 |
| **SST 88** | 5.05 | ab | 5 | 8.03 | 74.73 | 7 | 13.17 | 9 | 376 | 12 |
| **Mean** | **4.92** |  |  |  | **74.28** |  | **13.37** |  | **386** |  |
| **Coefficient of variation (%)** | **8.24** |  |  |  | **3.08** |  | **2.23** |  | **5.41** |  |
| **LSDt(0,05)** | **0.63** |  |  |  | **3.59** |  | **0.47** |  | **32.63** |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
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| **Middle Swartland** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Piketberg (Kolsvlei) 2016-05-16** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 3.02 | a | 1 | 15.07 | 81.15 | 4 | 13.11 | 10 | 321 | 8 |
| **PAN 3471** | 1.80 | def | 11 | 22.45 | 82.71 | 1 | 12.91 | 11 | 325 | 6 |
| **Ratel** | 1.71 | f | 12 | 14.53 | 77.48 | 13 | 14.96 | 1 | 350 | 1 |
| **SST 0117** | 2.91 | a | 2 | 6.51 | 80.77 | 6 | 13.45 | 9 | 330 | 3 |
| **SST 0127** | 2.16 | cd | 9 | 18.80 | 79.71 | 9 | 13.51 | 6 | 328 | 4 |
| **SST 0137** | 2.32 | c | 8 | 15.64 | 78.23 | 12 | 14.29 | 2 | 337 | 2 |
| **SST 0147** | 2.85 | ab | 3 | 19.72 | 79.22 | 10 | 13.61 | 5 | 317 | 10 |
| **SST 015** | 1.60 | f | 13 | 18.19 | 79.73 | 8 | 12.75 | 12 | 325 | 7 |
| **SST 027** | 2.36 | c | 7 | 23.94 | 82.20 | 2 | 13.90 | 4 | 326 | 5 |
| **SST 056** | 2.48 | bc | 4 | 15.42 | 81.25 | 3 | 12.25 | 13 | 319 | 9 |
| **SST 087** | 2.45 | c | 6 | 10.10 | 79.05 | 11 | 13.51 | 6 | 310 | 13 |
| **SST 096** | 2.48 | bc | 5 | 16.61 | 80.93 | 5 | 13.51 | 6 | 313 | 12 |
| **SST 88** | 2.11 | cde | 10 | 11.42 | 80.42 | 7 | 14.06 | 3 | 314 | 11 |
| **Mean** | **2.33** |  |  |  | **80.22** |  | **13.52** |  | **324** |  |
| **Coefficient of variation (%)** | **10.53** |  |  |  | **1.26** |  | **4.49** |  | **5.14** |  |
| **LSDt(0,05)** | **0.37** |  |  |  | **1.57** |  | **0.95** |  | **25.87** |  |

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| **Swartland: Koringberg** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average yield (ton/ha) of entries during the full or partial period from 2013- 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 1.81 | 4 | 4.26 | 7 | 4.01 | 12 |  |  |  |  |  |  |
| **PAN 3408** | 3.70 | 4 | 1.73 | 10 | 4.37 | 3 | 4.91 | 1 | 3.67 | 1 | 3.26 | 2 | 2.71 | 6 |
| **PAN 3471** | 3.59 | 8 | 1.62 | 14 | 4.04 | 12 | 4.34 | 10 | 3.40 | 9 | 3.08 | 10 | 2.61 | 10 |
| **PAN 3515** |  |  |  |  | 4.11 | 10 |  |  |  |  |  |  |  |  |
| **Ratel** | 3.44 | 11 | 1.69 | 11 | 4.26 | 6 | 4.56 | 4 | 3.49 | 7 | 3.13 | 8 | 2.57 | 11 |
| **SST 0117** | 3.70 | 2 | 1.81 | 3 |  |  |  |  |  |  |  |  | 2.76 | 2 |
| **SST 0127** | 3.28 | 13 | 1.78 | 7 | 4.45 | 2 |  |  |  |  | 3.17 | 6 | 2.53 | 12 |
| **SST 0137** | 3.44 | 11 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 3.70 | 3 | 1.80 | 5 |  |  |  |  |  |  |  |  | 2.75 | 3 |
| **SST 015** | 3.52 | 10 | 1.92 | 1 | 3.86 | 14 | 4.85 | 3 | 3.54 | 6 | 3.10 | 9 | 2.72 | 5 |
| **SST 027** | 3.67 | 5 | 1.74 | 9 | 4.46 | 1 | 4.36 | 8 | 3.56 | 4 | 3.29 | 1 | 2.71 | 7 |
| **SST 047** |  |  |  |  | 4.35 | 4 | 4.29 | 11 |  |  |  |  |  |  |
| **SST 056** | 3.67 | 6 | 1.82 | 2 | 4.14 | 9 | 4.54 | 5 | 3.54 | 5 | 3.21 | 4 | 2.75 | 4 |
| **SST 087** | 3.79 | 1 | 1.79 | 6 | 4.20 | 8 | 4.50 | 6 | 3.57 | 3 | 3.26 | 3 | 2.79 | 1 |
| **SST 096** | 3.58 | 9 | 1.66 | 13 | 4.31 | 5 | 4.86 | 2 | 3.60 | 2 | 3.18 | 5 | 2.62 | 9 |
| **SST 88** | 3.61 | 7 | 1.77 | 8 | 4.07 | 11 | 4.49 | 7 | 3.48 | 8 | 3.15 | 7 | 2.69 | 8 |
| **Tankwa** |  |  | 1.68 | 12 | 3.94 | 13 | 4.35 | 9 |  |  |  |  |  |  |
| **Mean** | **3.59** |  | **1.76** |  | **4.20** |  | **4.50** |  | **3.54** |  | **3.18** |  | **2.68** |  |
| **LSDt(0,05)** | **0.33** |  | **0.15** |  | **0.35** |  | **0.34** |  | **0.16** |  | **0.18** |  | **0.20** |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **Swartland Koringberg: AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the yield of entries for for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 207 | 72.96 | 0.352 |  |  |
| **Treatments** | | 51 | 37.19 | 0.729 | 3.76 | <0,001 |
| **Genotypes** | | 12 | 3.71 | 0.309 | 1.59 | 0.0996 |
| **Environments** | | 3 | 19.81 | 6.602 | 10.13 | <0,001 |
| **Block** |  | 12 | 7.82 | 0.652 | 3.36 | <0,001 |
| **Interactions** | | 36 | 13.68 | 0.380 | 1.96 | 0.0029 |
| **IPCA** |  | 14 | 9.40 | 0.671 | 3.46 | <0,001 |
| **IPCA** |  | 12 | 3.54 | 0.295 | 1.52 | 0.1234 |
| **Residuals** | | 10 | 0.74 | 0.074 | 0.38 | 0.9521 |
| **Error** |  | 144 | 27.95 | 0.194 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for yield (ton/ha)** | | | | |  |  |
|  | | | | |  |  |
| **Entry** | **Genotype** | **Yield** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 3.70 | 4 | 0.13409 |  |  |
| 2 | PAN 3471 | 3.59 | 8 | -0.14532 |  |  |
| 3 | Ratel | 3.44 | 11 | 0.14126 |  |  |
| 4 | SST 0117 | 3.70 | 2 | -0.00007 |  |  |
| 5 | SST 0127 | 3.28 | 13 | 0.36089 |  |  |
| 6 | SST 0137 | 3.44 | 11 | 0.13954 |  |  |
| 7 | SST 0147 | 3.70 | 3 | -0.22079 |  |  |
| 8 | SST 015 | 3.52 | 10 | 0.54162 |  |  |
| 9 | SST 027 | 3.67 | 5 | -0.38007 |  |  |
| 10 | SST 056 | 3.67 | 6 | -0.08823 |  |  |
| 11 | SST 087 | 3.79 | 1 | 0.38989 |  |  |
| 12 | SST 096 | 3.58 | 9 | -0.05134 |  |  |
| 13 | SST 88 | 3.61 | 7 | -0.82148 |  |  |
| **Mean** |  | **3.59** |  |  |  |  |
| **Coefficient of variation (%)** | | **13.30** |  |  |  |  |
| **LSDt(0.05)** | | **0.33** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Eendekuil (The Rest) | 3.36 | 3 | 0.18088 |  |  |
| 2 | Koringberg (Langkloof) | 3.66 | 2 | 0.14857 |  |  |
| 3 | Pools (Latboskloof) | 4.08 | 1 | -1.00838 |  |  |
| 4 | Porterville (Langvlei) | 3.29 | 4 | 0.67893 |  |  |
| **Mean** |  | **3.59** |  |  |  |  |
| **Coefficient of variation (%)** | | **13.30** |  |  |  |  |
| **LSDt(0.05)** | | **0.19** |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Swartland: Koringberg** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average hectolitre mass (kg/hl) of entries during the full or partial period from 2013- 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 79.99 | 7 | 77.08 | 14 | 75.51 | 11 |  |  |  |  |  |  |
| **PAN 3408** | 81.06 | 3 | 79.35 | 12 | 78.26 | 7 | 76.71 | 7 | 78.85 | 5 | 79.56 | 5 | 80.21 | 6 |
| **PAN 3471** | 82.76 | 1 | 79.98 | 8 | 79.51 | 3 | 78.99 | 1 | 80.31 | 1 | 80.75 | 1 | 81.37 | 1 |
| **PAN 3515** |  |  |  |  | 79.39 | 4 |  |  |  |  |  |  |  |  |
| **Ratel** | 80.34 | 7 | 79.28 | 13 | 77.21 | 13 | 76.30 | 10 | 78.28 | 8 | 78.94 | 9 | 79.81 | 9 |
| **SST 0117** | 79.47 | 11 | 80.10 | 5 |  |  |  |  |  |  |  |  | 79.79 | 10 |
| **SST 0127** | 80.29 | 8 | 79.24 | 14 | 77.64 | 10 |  |  |  |  | 79.06 | 8 | 79.77 | 11 |
| **SST 0137** | 79.32 | 12 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 80.70 | 4 | 80.80 | 3 |  |  |  |  |  |  |  |  | 80.75 | 3 |
| **SST 015** | 80.53 | 5 | 80.03 | 6 | 78.42 | 6 | 77.67 | 4 | 79.16 | 4 | 79.66 | 4 | 80.28 | 5 |
| **SST 027** | 81.94 | 2 | 80.28 | 4 | 79.66 | 1 | 77.89 | 3 | 79.94 | 2 | 80.63 | 2 | 81.11 | 2 |
| **SST 047** |  |  |  |  | 79.64 | 2 | 78.42 | 2 |  |  |  |  |  |  |
| **SST 056** | 80.04 | 10 | 79.78 | 10 | 77.68 | 9 | 76.62 | 9 | 78.53 | 7 | 79.17 | 7 | 79.91 | 8 |
| **SST 087** | 78.91 | 13 | 79.55 | 11 | 77.46 | 12 | 75.13 | 12 | 77.76 | 9 | 78.64 | 10 | 79.23 | 12 |
| **SST 096** | 80.49 | 6 | 79.92 | 9 | 77.92 | 8 | 76.69 | 8 | 78.76 | 6 | 79.44 | 6 | 80.21 | 6 |
| **SST 88** | 80.24 | 9 | 81.00 | 1 | 79.16 | 5 | 77.11 | 6 | 79.38 | 3 | 80.13 | 3 | 80.62 | 4 |
| **Tankwa** |  |  | 80.93 | 2 | 77.57 | 11 | 77.62 | 5 |  |  |  |  |  |  |
| **Mean** | **80.47** |  | **80.02** |  | **78.33** |  | **77.06** |  | **79.00** |  | **79.60** |  | **80.25** |  |
| **LSDt(0,05)** | **0.82** |  | **1.35** |  | **1.28** |  | **0.79** |  | **0.52** |  | **0.65** |  | **0.76** |  |

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| **Swartland Koringberg: AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the hectolitre mass of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 207 | 2357.5 | 11.39 |  |  |
| **Treatments** | | 51 | 2139.0 | 41.94 | 33.27 | <0,001 |
| **Genotypes** | | 12 | 206.3 | 17.19 | 13.63 | <0,001 |
| **Environments** | | 3 | 1831.6 | 610.52 | 198.45 | <0,001 |
| **Block** |  | 12 | 36.9 | 3.08 | 2.44 | 0.0064 |
| **Interactions** | | 36 | 101.2 | 2.81 | 2.23 | <0,001 |
| **IPCA** |  | 14 | 51.9 | 3.71 | 2.94 | <0,001 |
| **IPCA** |  | 12 | 30.4 | 2.53 | 2.01 | 0.0273 |
| **Residuals** | | 10 | 19.0 | 1.90 | 1.50 | 0.1437 |
| **Error** |  | 144 | 181.5 | 1.26 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for hectolitre mass (kg/hl)** | | | | | | |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 81.06 | 3 | 0.18788 |  |  |
| 2 | PAN 3471 | 82.76 | 1 | 0.12188 |  |  |
| 3 | Ratel | 80.34 | 7 | -0.69102 |  |  |
| 4 | SST 0117 | 79.47 | 11 | 0.42176 |  |  |
| 5 | SST 0127 | 80.29 | 8 | 0.20874 |  |  |
| 6 | SST 0137 | 79.32 | 12 | 0.68871 |  |  |
| 7 | SST 0147 | 80.70 | 4 | 0.27739 |  |  |
| 8 | SST 015 | 80.53 | 5 | -0.25569 |  |  |
| 9 | SST 027 | 81.94 | 2 | -0.54698 |  |  |
| 10 | SST 056 | 80.04 | 10 | 0.32613 |  |  |
| 11 | SST 087 | 78.91 | 13 | 0.17197 |  |  |
| 12 | SST 096 | 80.49 | 6 | 0.37698 |  |  |
| 13 | SST 88 | 80.24 | 9 | -1.28775 |  |  |
| **Mean** |  | **80.47** |  |  |  |  |
| **Coefficient of variation (%)** | | **1.50** |  |  |  |  |
| **LSDt(0.05)** | | **0.82** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Eendekuil (The Rest) | 76.53 | 4 | -0.60304 |  |  |
| 2 | Koringberg (Langkloof) | 82.42 | 2 | -0.69271 |  |  |
| 3 | Pools (Latboskloof) | 78.82 | 3 | 1.62724 |  |  |
| 4 | Porterville (Langvlei) | 84.09 | 1 | -0.33149 |  |  |
| **Mean** |  | **80.47** |  |  |  |  |
| **Coefficient of variation (%)** | | **1.50** |  |  |  |  |
| **LSDt(0.05)** | | **0.48** |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Swartland: Koringberg** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average protein content (%) of entries during the full or partial period from 2013- 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 15.16 | 1 | 12.24 | 5 | 12.65 | 2 |  |  |  |  |  |  |
| **PAN 3408** | 11.76 | 8 | 14.40 | 8 | 11.76 | 10 | 12.13 | 6 | 12.51 | 5 | 12.64 | 7 | 13.08 | 7 |
| **PAN 3471** | 11.61 | 10 | 13.84 | 14 | 11.73 | 11 | 11.90 | 8 | 12.27 | 7 | 12.39 | 10 | 12.73 | 11 |
| **PAN 3515** |  |  |  |  | 11.15 | 14 |  |  |  |  |  |  |  |  |
| **Ratel** | 12.03 | 3 | 14.66 | 6 | 12.41 | 2 | 12.31 | 5 | 12.85 | 2 | 13.03 | 2 | 13.35 | 4 |
| **SST 0117** | 11.96 | 4 | 14.28 | 9 |  |  |  |  |  |  |  |  | 13.12 | 6 |
| **SST 0127** | 11.89 | 5 | 15.05 | 3 | 11.89 | 8 |  |  |  |  | 12.94 | 4 | 13.47 | 2 |
| **SST 0137** | 12.25 | 2 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 11.31 | 13 | 13.98 | 12 |  |  |  |  |  |  |  |  | 12.65 | 12 |
| **SST 015** | 11.83 | 6 | 13.92 | 13 | 12.70 | 1 | 12.07 | 7 | 12.63 | 3 | 12.82 | 5 | 12.88 | 8 |
| **SST 027** | 12.72 | 1 | 14.95 | 4 | 12.15 | 6 | 12.49 | 3 | 13.08 | 1 | 13.27 | 1 | 13.84 | 1 |
| **SST 047** |  |  |  |  | 12.38 | 3 | 14.19 | 1 |  |  |  |  |  |  |
| **SST 056** | 11.36 | 12 | 14.28 | 9 | 11.77 | 9 | 11.65 | 11 | 12.27 | 8 | 12.47 | 8 | 12.82 | 10 |
| **SST 087** | 11.45 | 11 | 14.24 | 11 | 11.52 | 13 | 11.71 | 10 | 12.23 | 9 | 12.40 | 9 | 12.85 | 9 |
| **SST 096** | 11.72 | 9 | 14.79 | 5 | 11.61 | 12 | 11.90 | 8 | 12.51 | 6 | 12.71 | 6 | 13.26 | 5 |
| **SST 88** | 11.82 | 7 | 15.11 | 2 | 12.04 | 7 | 11.50 | 12 | 12.62 | 4 | 12.99 | 3 | 13.47 | 3 |
| **Tankwa** |  |  | 14.51 | 7 | 12.32 | 4 | 12.44 | 4 |  |  |  |  |  |  |
| **Mean** | **11.82** |  | **14.51** |  | **11.98** |  | **12.25** |  | **12.55** |  | **12.77** |  | **13.12** |  |
| **LSDt(0,05)** | **0.53** |  | **1.48** |  | **0.76** |  | **0.60** |  | **0.33** |  | **0.40** |  | **0.44** |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **Swartland Koringberg: AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the protein content of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 207 | 708.9 | 3.42 |  |  |
| **Treatments** | | 51 | 609.4 | 11.95 | 27.41 | <0,001 |
| **Genotypes** | | 12 | 27.6 | 2.30 | 5.28 | <0,001 |
| **Environments** | | 3 | 559.6 | 186.54 | 60.78 | <0,001 |
| **Block** |  | 12 | 36.8 | 3.07 | 7.04 | <0,001 |
| **Interactions** | | 36 | 22.1 | 0.61 | 1.41 | 0.0818 |
| **IPCA** |  | 14 | 13.4 | 0.96 | 2.19 | 0.0105 |
| **IPCA** |  | 12 | 6.4 | 0.54 | 1.23 | 0.2690 |
| **Residuals** | | 10 | 2.3 | 0.23 | 0.52 | 0.8705 |
| **Error** |  | 144 | 62.8 | 0.44 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 11.76 | 8 | -0.13288 |  |  |
| 2 | PAN 3471 | 11.61 | 10 | -0.68575 |  |  |
| 3 | Ratel | 12.03 | 3 | 0.42430 |  |  |
| 4 | SST 0117 | 11.96 | 4 | 0.35523 |  |  |
| 5 | SST 0127 | 11.89 | 5 | 0.10302 |  |  |
| 6 | SST 0137 | 12.25 | 2 | 0.75366 |  |  |
| 7 | SST 0147 | 11.31 | 13 | -0.16979 |  |  |
| 8 | SST 015 | 11.83 | 6 | -0.56207 |  |  |
| 9 | SST 027 | 12.72 | 1 | 0.02144 |  |  |
| 10 | SST 056 | 11.36 | 12 | 0.23279 |  |  |
| 11 | SST 087 | 11.45 | 11 | -0.22585 |  |  |
| 12 | SST 096 | 11.72 | 9 | -0.06689 |  |  |
| 13 | SST 88 | 11.82 | 7 | -0.04722 |  |  |
| **Mean** |  | **11.82** |  |  |  |  |
| **Coefficient of variation (%)** | | **6.40** |  |  |  |  |
| **LSDt(0.05)** | | **0.53** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Eendekuil (The Rest) | 13.66 | 1 | 0.35391 |  |  |
| 2 | Koringberg (Langkloof) | 12.39 | 2 | 0.37404 |  |  |
| 3 | Pools (Latboskloof) | 12.07 | 3 | 0.44217 |  |  |
| 4 | Porterville (Langvlei) | 9.18 | 4 | -1.17012 |  |  |
| **Mean** |  | **11.82** |  |  |  |  |
| **Coefficient of variation (%)** | | **6.40** |  |  |  |  |
| **LSDt(0.05)** | | **0.29** |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Swartland: Koringberg** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average falling number (s) of entries during the full or partial period from 2013- 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 376 | 4 | 364 | 13 | 373 | 3 |  |  |  |  |  |  |
| **PAN 3408** | 335 | 9 | 359 | 14 | 366 | 12 | 364 | 6 | 356 | 8 | 353 | 10 | 347 | 11 |
| **PAN 3471** | 347 | 2 | 381 | 1 | 372 | 7 | 371 | 4 | 368 | 2 | 367 | 2 | 364 | 2 |
| **PAN 3515** |  |  |  |  | 372 | 7 |  |  |  |  |  |  |  |  |
| **Ratel** | 353 | 1 | 375 | 5 | 382 | 1 | 387 | 1 | 374 | 1 | 370 | 1 | 364 | 1 |
| **SST 0117** | 337 | 8 | 359 | 13 |  |  |  |  |  |  |  |  | 348 | 10 |
| **SST 0127** | 337 | 7 | 368 | 12 | 372 | 6 |  |  |  |  | 359 | 6 | 353 | 7 |
| **SST 0137** | 331 | 10 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 325 | 12 | 372 | 6 |  |  |  |  |  |  |  |  | 349 | 9 |
| **SST 015** | 340 | 5 | 379 | 2 | 378 | 2 | 358 | 9 | 364 | 3 | 366 | 3 | 360 | 3 |
| **SST 027** | 340 | 4 | 370 | 9 | 363 | 14 | 359 | 8 | 358 | 6 | 358 | 7 | 355 | 6 |
| **SST 047** |  |  |  |  | 370 | 10 | 376 | 2 |  |  |  |  |  |  |
| **SST 056** | 345 | 3 | 370 | 10 | 374 | 4 | 355 | 10 | 361 | 4 | 363 | 4 | 358 | 4 |
| **SST 087** | 322 | 13 | 371 | 8 | 374 | 3 | 353 | 11 | 355 | 9 | 356 | 9 | 346 | 12 |
| **SST 096** | 329 | 11 | 369 | 11 | 372 | 9 | 360 | 7 | 358 | 7 | 357 | 8 | 349 | 8 |
| **SST 88** | 339 | 6 | 372 | 7 | 373 | 5 | 349 | 12 | 358 | 5 | 361 | 5 | 356 | 5 |
| **Tankwa** |  |  | 376 | 3 | 368 | 11 | 366 | 5 |  |  |  |  |  |  |
| **Mean** | **337** |  | **371** |  | **371** |  | **364** |  | **361** |  | **361** |  | **354** |  |
| **LSDt(0,05)** | **10.50** |  | **11.50** |  | **19.00** |  | **12.57** |  | **7.10** |  | **8.40** |  | **7.90** |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **Swartland Koringberg: AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the falling number of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 207 | 338818 | 1637 |  |  |
| **Treatments** | | 51 | 303961 | 5960 | 26.04 | <0,001 |
| **Genotypes** | | 12 | 14100 | 1175 | 5.13 | <0,001 |
| **Environments** | | 3 | 276836 | 92279 | 582.80 | <0,001 |
| **Block** |  | 12 | 1900 | 158 | 0.69 | 0.7574 |
| **Interactions** | | 36 | 13025 | 362 | 1.58 | 0.0313 |
| **IPCA** |  | 14 | 9814 | 701 | 3.06 | <0,001 |
| **IPCA** |  | 12 | 2755 | 230 | 1.00 | 0.4493 |
| **Residuals** | | 10 | 456 | 46 | 0.20 | 0.9961 |
| **Error** |  | 144 | 32957 | 229 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 335 | 9 | 0.79002 |  |  |
| 2 | PAN 3471 | 347 | 2 | -1.47181 |  |  |
| 3 | Ratel | 353 | 1 | 0.92778 |  |  |
| 4 | SST 0117 | 337 | 8 | -1.29083 |  |  |
| 5 | SST 0127 | 337 | 7 | -2.25476 |  |  |
| 6 | SST 0137 | 331 | 10 | -3.10591 |  |  |
| 7 | SST 0147 | 325 | 12 | 0.79989 |  |  |
| 8 | SST 015 | 340 | 5 | -1.38780 |  |  |
| 9 | SST 027 | 340 | 4 | 0.09562 |  |  |
| 10 | SST 056 | 345 | 3 | -1.07415 |  |  |
| 11 | SST 087 | 322 | 13 | 2.72150 |  |  |
| 12 | SST 096 | 329 | 11 | 1.11436 |  |  |
| 13 | SST 88 | 339 | 6 | 4.13609 |  |  |
| **Mean** |  | **337** |  |  |  |  |
| **Coefficient of variation (%)** | | **4.50** |  |  |  |  |
| **LSDt(0.05)** | | **10.50** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Eendekuil (The Rest) | 336 | 2 | 0.20216 |  |  |
| 2 | Koringberg (Langkloof) | 397 | 1 | -4.51545 |  |  |
| 3 | Pools (Latboskloof) | 305 | 4 | -0.98977 |  |  |
| 4 | Porterville (Langvlei) | 310 | 3 | 5.30307 |  |  |
| **Mean** |  | **337** |  |  |  |  |
| **Coefficient of variation (%)** | | **4.50** |  |  |  |  |
| **LSDt(0.05)** | | **5.80** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Koringberg** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Eendekuil ( The Rest) 2016-05-10** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 3.59 | ab | 2 | 14.02 | 77.70 | 3 | 13.51 | 8 | 331 | 9 |
| **PAN 3471** | 3.40 | abcd | 6 | 1.96 | 78.38 | 2 | 13.61 | 7 | 362 | 1 |
| **Ratel** | 3.46 | abc | 4 | 19.79 | 77.53 | 4 | 13.85 | 4 | 350 | 2 |
| **SST 0117** | 3.32 | cdef | 9 | 7.81 | 74.28 | 13 | 14.4 | 2 | 332 | 8 |
| **SST 0127** | 3.09 | f | 13 | 10.94 | 76.88 | 6 | 13.29 | 11 | 336 | 6 |
| **SST 0137** | 3.25 | cdef | 10 | 17.47 | 74.63 | 11 | 14.31 | 3 | 325 | 11 |
| **SST 0147** | 3.33 | cde | 8 | 20.00 | 77.48 | 5 | 12.91 | 13 | 315 | 13 |
| **SST 015** | 3.62 | a | 1 | 12.66 | 76.48 | 8 | 13.37 | 9 | 337 | 5 |
| **SST 027** | 3.14 | ef | 12 | 6.54 | 78.83 | 1 | 14.55 | 1 | 334 | 7 |
| **SST 056** | 3.36 | bcde | 7 | 9.54 | 75.38 | 10 | 13.72 | 6 | 348 | 3 |
| **SST 087** | 3.42 | abcd | 5 | 5.36 | 74.45 | 12 | 12.95 | 12 | 320 | 12 |
| **SST 096** | 3.19 | def | 11 | 15.13 | 76.55 | 7 | 13.3 | 10 | 328 | 10 |
| **SST 88** | 3.47 | abc | 3 | 8.82 | 76.28 | 9 | 13.83 | 5 | 346 | 4 |
| **Mean** | **3.36** |  |  |  | **76.53** |  | **13.66** |  | **336** |  |
| **Coefficient of variation (%)** | **4.54** |  |  |  | **2.28** |  | **6.38** |  | **7.91** |  |
| **LSDt(0,05)** | **0.24** |  |  |  | **2.71** |  | **1.36** |  | **41.42** |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Koringberg** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Koringberg ( Langkloof) 2016-05-13** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 3.75 | ab | 4 | 11.93 | 82.90 | 4 | 12.12 | 7 | 393 | 9 |
| **PAN 3471** | 3.65 | abc | 7 | 9.71 | 84.65 | 1 | 12.01 | 10 | 410 | 1 |
| **Ratel** | 3.60 | abc | 11 | 11.52 | 81.82 | 8 | 12.92 | 3 | 410 | 1 |
| **SST 0117** | 3.58 | abc | 12 | 8.12 | 81.65 | 10 | 12.52 | 5 | 405 | 5 |
| **SST 0127** | 3.76 | a | 3 | 5.22 | 81.52 | 12 | 12.53 | 4 | 409 | 3 |
| **SST 0137** | 3.35 | c | 13 | 10.68 | 80.22 | 13 | 13.14 | 2 | 405 | 5 |
| **SST 0147** | 3.81 | a | 1 | 4.39 | 82.40 | 6 | 11.97 | 12 | 385 | 10 |
| **SST 015** | 3.73 | ab | 5 | 6.31 | 82.85 | 5 | 12.00 | 11 | 403 | 7 |
| **SST 027** | 3.63 | abc | 9 | 9.49 | 84.22 | 2 | 13.50 | 1 | 401 | 8 |
| **SST 056** | 3.76 | a | 2 | 7.48 | 82.40 | 6 | 11.78 | 13 | 407 | 4 |
| **SST 087** | 3.70 | abc | 6 | 6.16 | 81.60 | 11 | 12.12 | 7 | 369 | 13 |
| **SST 096** | 3.62 | abc | 10 | 5.07 | 81.77 | 9 | 12.43 | 6 | 382 | 11 |
| **SST 88** | 3.63 | abc | 8 | 8.20 | 83.50 | 3 | 12.03 | 9 | 379 | 12 |
| **Mean** | **3.66** |  |  |  | **82.42** |  | **12.39** |  | **397** |  |
| **Coefficient of variation (%)** | **6.48** |  |  |  | **0.92** |  | **3.56** |  | **3.04** |  |
| **LSDt(0,05)** | **0.37** |  |  |  | **1.18** |  | **0.69** |  | **18.73** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Koringberg** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Pools (Langvlei) 2016-05-10** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 4.08 | cde | 8 | 15.53 | 79.87 | 2 | 12.04 | 7 | 300 | 11 |
| **PAN 3471** | 4.21 | bcde | 5 | 7.82 | 81.28 | 1 | 11.05 | 13 | 307 | 5 |
| **Ratel** | 3.68 | efg | 11 | 16.47 | 77.51 | 12 | 12.46 | 4 | 320 | 1 |
| **SST 0117** | 4.37 | abcd | 4 | 22.74 | 78.40 | 10 | 12.00 | 8 | 307 | 6 |
| **SST 0127** | 3.28 | g | 13 | 10.25 | 78.95 | 6 | 12.64 | 3 | 305 | 8 |
| **SST 0137** | 3.87 | defg | 10 | 23.25 | 78.66 | 8 | 12.78 | 2 | 306 | 7 |
| **SST 0147** | 4.44 | abcd | 3 | 19.43 | 79.63 | 3 | 11.48 | 12 | 293 | 12 |
| **SST 015** | 3.37 | fg | 12 | 10.68 | 78.43 | 9 | 12.10 | 6 | 314 | 3 |
| **SST 027** | 4.61 | abc | 2 | 5.85 | 79.50 | 4 | 12.81 | 1 | 308 | 4 |
| **SST 056** | 4.20 | bcde | 6 | 4.77 | 78.86 | 7 | 11.63 | 11 | 314 | 2 |
| **SST 087** | 3.98 | cdef | 9 | 14.58 | 77.61 | 11 | 11.69 | 10 | 290 | 13 |
| **SST 096** | 4.16 | cde | 7 | 2.18 | 79.43 | 5 | 12.00 | 8 | 301 | 9 |
| **SST 88** | 4.83 | ab | 1 | 22.18 | 76.51 | 13 | 12.19 | 5 | 300 | 10 |
| **Mean** | **4.08** |  |  |  | **78.82** |  | **12.07** |  | **305** |  |
| **Coefficient of variation (%)** | **10.02** |  |  |  | **2.15** |  | **4.07** |  | **2.76** |  |
| **LSDt(0,05)** | **0.65** |  |  |  | **2.65** |  | **0.77** |  | **13.11** |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Koringberg** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Porterville (Latboskloof) 2016-05-16** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 3.43 | bc | 3 | 13.42 | 83.80 | 7 | 9.28 | 4 | 314 | 4 |
| **PAN 3471** | 3.13 | cd | 10 | 16.98 | 86.75 | 1 | 9.74 | 3 | 307 | 8 |
| **Ratel** | 3.03 | cd | 11 | 21.03 | 84.50 | 4 | 8.89 | 9 | 333 | 1 |
| **SST 0117** | 3.63 | ab | 2 | 3.39 | 83.47 | 10 | 8.88 | 10 | 306 | 10 |
| **SST 0127** | 3.00 | d | 12 | 14.80 | 83.77 | 8 | 9.15 | 7 | 300 | 12 |
| **SST 0137** | 3.34 | bcd | 6 | 5.28 | 83.77 | 8 | 8.72 | 12 | 289 | 13 |
| **SST 0147** | 3.26 | bcd | 9 | 10.97 | 83.30 | 12 | 8.87 | 11 | 307 | 9 |
| **SST 015** | 3.37 | bcd | 4 | 16.01 | 84.32 | 5 | 9.85 | 2 | 305 | 11 |
| **SST 027** | 3.31 | bcd | 8 | 16.00 | 85.25 | 2 | 10.04 | 1 | 316 | 3 |
| **SST 056** | 3.33 | bcd | 7 | 9.04 | 83.40 | 11 | 8.43 | 13 | 310 | 5 |
| **SST 087** | 4.04 | a | 1 | 18.87 | 81.92 | 13 | 9.07 | 8 | 310 | 6 |
| **SST 096** | 3.34 | bcd | 5 | 22.04 | 84.22 | 6 | 9.16 | 6 | 308 | 7 |
| **SST 88** | 2.52 | e | 13 | 12.16 | 84.72 | 3 | 9.23 | 5 | 332 | 2 |
| **Mean** | **3.29** |  |  |  | **84.09** |  | **9.18** |  | **310** |  |
| **Coefficient of variation (%)** | **8.21** |  |  |  | **0.56** |  | **5.56** |  | **2.54** |  |
| **LSDt(0,05)** | **0.42** |  |  |  | **0.73** |  | **0.81** |  | **12.33** |  |

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| **Swartland: Sandveld** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average yield (ton/ha) of entries during the full or partial period from 2013- 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **\* 2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 1.23 | 13 | 3.44 | 13 | 4.07 | 1 |  |  |  |  |  |  |
| **PAN 3408** | 3.55 | 8 | 1.59 | 2 | 3.90 | 8 | 3.97 | 4 | 3.25 | 3 | 3.01 | 5 | 2.57 | 5 |
| **PAN 3471** | 3.76 | 3 | 1.47 | 8 | 3.92 | 4 | 2.99 | 12 | 3.04 | 9 | 3.05 | 3 | 2.61 | 4 |
| **PAN 3515** |  |  |  |  | 4.06 | 1 |  |  |  |  |  |  |  |  |
| **Ratel** | 3.42 | 11 | 1.14 | 14 | 3.92 | 6 | 3.87 | 6 | 3.09 | 7 | 2.82 | 10 | 2.28 | 12 |
| **SST 0117** | 3.74 | 4 | 1.81 | 1 |  |  |  |  |  |  |  |  | 2.78 | 1 |
| **SST 0127** | 3.50 | 10 | 1.51 | 4 | 4.04 | 2 |  |  |  |  | 3.02 | 4 | 2.51 | 6 |
| **SST 0137** | 3.73 | 5 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 3.39 | 13 | 1.48 | 7 |  |  |  |  |  |  |  |  | 2.44 | 11 |
| **SST 015** | 3.92 | 1 | 1.59 | 2 | 3.71 | 10 | 3.87 | 6 | 3.27 | 2 | 3.07 | 1 | 2.76 | 2 |
| **SST 027** | 3.62 | 6 | 1.39 | 11 | 3.60 | 12 | 3.99 | 3 | 3.15 | 6 | 2.87 | 9 | 2.50 | 8 |
| **SST 047** |  |  |  |  | 3.60 | 11 | 3.62 | 9 |  |  |  |  |  |  |
| **SST 056** | 3.60 | 7 | 1.41 | 10 | 3.78 | 9 | 3.41 | 10 | 3.05 | 8 | 2.93 | 8 | 2.51 | 6 |
| **SST 087** | 3.41 | 12 | 1.51 | 4 | 3.96 | 3 | 3.83 | 8 | 3.18 | 4 | 2.96 | 6 | 2.46 | 9 |
| **SST 096** | 3.83 | 2 | 1.46 | 9 | 3.92 | 5 | 4.01 | 2 | 3.31 | 1 | 3.07 | 2 | 2.65 | 3 |
| **SST 88** | 3.52 | 9 | 1.37 | 12 | 3.91 | 7 | 3.89 | 5 | 3.17 | 5 | 2.93 | 7 | 2.44 | 10 |
| **Tankwa** |  |  | 1.51 | 4 | 3.35 | 14 | 3.39 | 11 |  |  |  |  |  |  |
| **Mean** | **3.61** |  | **1.46** |  | **3.79** |  | **3.74** |  | **3.17** |  | **2.97** |  | **2.54** |  |
| **LSDt(0,05)** | **0.29** |  | **0.19** |  | **0.28** |  | **0.63** |  | **0.17** |  | **0.17** |  | **0.20** |  |

**\* Only Hopefield (Enkelvlei) data**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Swartland Sandveld: AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the yield of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 155 | 189.67 | 1.224 |  |  |
| **Treatments** | | 38 | 173.15 | 4.557 | 43.68 | <0,001 |
| **Genotypes** | | 12 | 4.21 | 0.351 | 3.37 | <0,001 |
| **Environments** | | 2 | 162.45 | 81.226 | 139.39 | <0,001 |
| **Block** |  | 9 | 5.24 | 0.583 | 5.59 | <0,001 |
| **Interactions** | | 24 | 6.49 | 0.270 | 2.59 | <0,001 |
| **IPCA** |  | 13 | 4.56 | 0.351 | 3.36 | <0,001 |
| **IPCA** |  | 11 | 1.93 | 0.175 | 1.68 | 0.0880 |
| **Residuals** | | 0 | 0.00 |  |  |  |
| **Error** |  | 108 | 11.27 | 0.104 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for yield (ton/ha)** | | | | |  |  |
|  | | | | |  |  |
| **Entry** | **Genotype** | **Yield** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 3.55 | 8 | 0.23220 |  |  |
| 2 | PAN 3471 | 3.76 | 3 | -0.05287 |  |  |
| 3 | Ratel | 3.42 | 11 | -0.53427 |  |  |
| 4 | SST 0117 | 3.74 | 4 | 0.02894 |  |  |
| 5 | SST 0127 | 3.50 | 10 | 0.15415 |  |  |
| 6 | SST 0137 | 3.73 | 5 | -0.52617 |  |  |
| 7 | SST 0147 | 3.39 | 13 | -0.06983 |  |  |
| 8 | SST 015 | 3.92 | 1 | 0.03728 |  |  |
| 9 | SST 027 | 3.62 | 6 | -0.02866 |  |  |
| 10 | SST 056 | 3.60 | 7 | 0.35167 |  |  |
| 11 | SST 087 | 3.41 | 12 | 0.48696 |  |  |
| 12 | SST 096 | 3.83 | 2 | -0.20326 |  |  |
| 13 | SST 88 | 3.52 | 9 | 0.12386 |  |  |
| **Mean** |  | **3.61** |  |  |  |  |
| **Coefficient of variation (%)** | | **10.10** |  |  |  |  |
| **LSDt(0.05)** | | **0.29** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Dankbaar | 4.89 | 1 | 0.30464 |  |  |
| 2 | Koperfontein | 2.38 | 3 | 0.52921 |  |  |
| 3 | Velddrift | 3.58 | 2 | -0.83384 |  |  |
| **Mean** | | **3.61** |  |  |  |  |
| **Coefficient of variation (%)** | | **10.10** |  |  |  |  |
| **LSDt(0.05)** | | **0.14** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Swartland: Sandveld** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average hectolitre mass (kg/hl) of entries during the full or partial period from 2013- 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **\* 2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 78.24 | 2 | 75.56 | 12 | 75.30 | 11 |  |  |  |  |  |  |
| **PAN 3408** | 78.71 | 11 | 76.28 | 8 | 75.93 | 11 | 75.70 | 10 | 76.66 | 6 | 76.97 | 7 | 77.50 | 9 |
| **PAN 3471** | 83.12 | 1 | 75.06 | 12 | 79.09 | 1 | 78.60 | 1 | 78.97 | 1 | 79.09 | 2 | 79.09 | 3 |
| **PAN 3515** |  |  |  |  | 78.72 | 2 |  |  |  |  |  |  |  |  |
| **Ratel** | 78.16 | 13 | 77.19 | 6 | 75.29 | 13 | 76.20 | 5 | 76.71 | 5 | 76.88 | 8 | 77.68 | 7 |
| **SST 0117** | 79.15 | 9 | 77.84 | 3 |  |  |  |  |  |  |  |  | 78.50 | 4 |
| **SST 0127** | 79.73 | 6 | 75.28 | 11 | 76.87 | 7 |  |  |  |  | 77.29 | 5 | 77.51 | 8 |
| **SST 0137** | 79.23 | 8 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 79.60 | 7 | 75.92 | 10 |  |  |  |  |  |  |  |  | 77.76 | 6 |
| **SST 015** | 80.52 | 4 | 74.21 | 14 | 76.57 | 9 | 77.30 | 4 | 77.15 | 4 | 77.10 | 6 | 77.37 | 10 |
| **SST 027** | 81.36 | 2 | 79.05 | 1 | 77.95 | 4 | 77.50 | 3 | 78.97 | 2 | 79.45 | 1 | 80.21 | 1 |
| **SST 047** |  |  |  |  | 78.66 | 3 | 78.20 | 2 |  |  |  |  |  |  |
| **SST 056** | 79.12 | 10 | 74.58 | 13 | 76.74 | 8 | 75.80 | 9 | 76.56 | 8 | 76.81 | 9 | 76.85 | 12 |
| **SST 087** | 78.18 | 12 | 76.09 | 9 | 74.24 | 14 | 76.10 | 6 | 76.15 | 9 | 76.17 | 10 | 77.14 | 11 |
| **SST 096** | 79.79 | 5 | 76.38 | 7 | 76.39 | 10 | 74.00 | 12 | 76.64 | 7 | 77.52 | 4 | 78.09 | 5 |
| **SST 88** | 80.73 | 3 | 77.67 | 4 | 77.12 | 5 | 75.90 | 7 | 77.86 | 3 | 78.51 | 3 | 79.20 | 2 |
| **Tankwa** |  |  | 77.39 | 5 | 76.96 | 6 | 75.90 | 7 |  |  |  |  |  |  |
| **Mean** | **79.80** |  | **76.51** |  | **76.86** |  | **76.38** |  | **77.30** |  | **77.58** |  | **78.07** |  |
| **LSDt(0,05)** | **1.37** |  | **2.40** |  | **1.05** |  | **1.66** |  | **0.80** |  | **0.91** |  | **1.33** |  |

**\* Only Hopefield (Enkelvlei) data**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Swartland Sandveld: AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the hectolitre mass of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 155 | 4126 | 26.6 |  |  |
| **Treatments** | | 38 | 3751 | 98.7 | 40.15 | <0,001 |
| **Genotypes** | | 12 | 271 | 22.6 | 9.18 | <0,001 |
| **Environments** | | 2 | 3398 | 1698.8 | 139.61 | <0,001 |
| **Block** |  | 9 | 110 | 12.2 | 4.95 | <0,001 |
| **Interactions** | | 24 | 82 | 3.4 | 1.39 | 0.1274 |
| **IPCA** |  | 13 | 65 | 5.0 | 2.04 | 0.0235 |
| **IPCA** |  | 11 | 17 | 1.5 | 0.62 | 0.8046 |
| **Residuals** | | 0 | 0 |  |  |  |
| **Error** |  | 108 | 265 | 2.5 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for hectolitre mass (kg/hl)** | | | | | | |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 78.71 | 11 | 0.47375 |  |  |
| 2 | PAN 3471 | 83.12 | 1 | -0.92614 |  |  |
| 3 | Ratel | 78.16 | 13 | 1.24928 |  |  |
| 4 | SST 0117 | 79.15 | 9 | 0.16746 |  |  |
| 5 | SST 0127 | 79.73 | 6 | -0.67909 |  |  |
| 6 | SST 0137 | 79.23 | 8 | 0.08842 |  |  |
| 7 | SST 0147 | 79.60 | 7 | 0.22997 |  |  |
| 8 | SST 015 | 80.52 | 4 | -0.26069 |  |  |
| 9 | SST 027 | 81.36 | 2 | -0.82126 |  |  |
| 10 | SST 056 | 79.12 | 10 | 0.07449 |  |  |
| 11 | SST 087 | 78.18 | 12 | 0.29678 |  |  |
| 12 | SST 096 | 79.79 | 5 | 0.11182 |  |  |
| 13 | SST 88 | 80.73 | 3 | -0.00480 |  |  |
| **Mean** |  | **79.80** |  |  |  |  |
| **Coefficient of variation (%)** | | **2.10** |  |  |  |  |
| **LSDt(0.05)** | | **1.37** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Dankbaar | 82.68 | 2 | 0.07353 |  |  |
| 2 | Koperfontein | 73.21 | 3 | -1.45684 |  |  |
| 3 | Velddrift | 83.52 | 1 | 1.38331 |  |  |
| **Mean** | | **79.80** |  |  |  |  |
| **Coefficient of variation (%)** | | **2.10** |  |  |  |  |
| **LSDt(0.05)** | | **0.66** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Swartland: Sandveld** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average protein content (%) of entries during the full or partial period from 2013- 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **\* 2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 17.27 | 8 | 13.42 | 2 | 13.48 | 3 |  |  |  |  |  |  |
| **PAN 3408** | 13.85 | 3 | 17.21 | 9 | 12.67 | 10 | 13.16 | 6 | 14.22 | 3 | 14.58 | 6 | 15.53 | 4 |
| **PAN 3471** | 13.01 | 12 | 17.72 | 3 | 13.14 | 4 | 12.39 | 11 | 14.07 | 6 | 14.62 | 4 | 15.37 | 6 |
| **PAN 3515** |  |  |  |  | 12.62 | 12 |  |  |  |  |  |  |  |  |
| **Ratel** | 14.14 | 2 | 17.43 | 7 | 13.05 | 6 | 13.39 | 4 | 14.50 | 2 | 14.87 | 2 | 15.79 | 2 |
| **SST 0117** | 13.29 | 8 | 16.52 | 14 |  |  |  |  |  |  |  |  | 14.91 | 12 |
| **SST 0127** | 13.80 | 4 | 17.63 | 4 | 13.02 | 7 |  |  |  |  | 14.82 | 3 | 15.72 | 3 |
| **SST 0137** | 13.63 | 5 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 12.85 | 13 | 17.13 | 10 |  |  |  |  |  |  |  |  | 14.99 | 10 |
| **SST 015** | 13.08 | 11 | 17.60 | 5 | 12.65 | 11 | 13.29 | 5 | 14.16 | 5 | 14.44 | 8 | 15.34 | 7 |
| **SST 027** | 14.41 | 1 | 17.89 | 2 | 13.11 | 5 | 12.90 | 8 | 14.58 | 1 | 15.14 | 1 | 16.15 | 1 |
| **SST 047** |  |  |  |  | 14.03 | 1 | 15.42 | 1 |  |  |  |  |  |  |
| **SST 056** | 13.27 | 10 | 16.97 | 12 | 12.23 | 14 | 12.69 | 9 | 13.79 | 8 | 14.16 | 9 | 15.12 | 9 |
| **SST 087** | 13.38 | 7 | 17.49 | 6 | 12.87 | 9 | 12.39 | 11 | 14.03 | 7 | 14.58 | 5 | 15.44 | 5 |
| **SST 096** | 13.42 | 6 | 17.10 | 11 | 12.99 | 8 | 13.14 | 7 | 14.16 | 4 | 14.50 | 7 | 15.26 | 8 |
| **SST 88** | 13.28 | 9 | 16.63 | 13 | 12.40 | 13 | 12.44 | 10 | 13.69 | 9 | 14.10 | 10 | 14.96 | 11 |
| **Tankwa** |  |  | 18.15 | 1 | 13.20 | 3 | 13.83 | 2 |  |  |  |  |  |  |
| **Mean** | **13.49** |  | **17.34** |  | **12.96** |  | **13.21** |  | **14.13** |  | **14.58** |  | **15.38** |  |
| **LSDt(0,05)** | **0.79** |  | **0.90** |  | **0.63** |  | **0.82** |  | **0.40** |  | **0.43** |  | **0.60** |  |

**\* Only Hopefield (Enkelvlei) data**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Swartland Sandveld: AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the protein content of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 155 | 659.4 | 4.25 |  |  |
| **Treatments** | | 38 | 544.3 | 14.32 | 24.42 | <0,001 |
| **Genotypes** | | 12 | 29.8 | 2.48 | 4.23 | <0,001 |
| **Environments** | | 2 | 498.9 | 249.45 | 43.33 | <0,001 |
| **Block** |  | 9 | 51.8 | 5.76 | 9.82 | <0,001 |
| **Interactions** | | 24 | 15.6 | 0.65 | 1.11 | 0.3495 |
| **IPCA** |  | 13 | 9.5 | 0.73 | 1.25 | 0.2581 |
| **IPCA** |  | 11 | 6.1 | 0.55 | 0.94 | 0.5035 |
| **Residuals** | | 0 | 0.0 |  |  |  |
| **Error** |  | 108 | 63.3 | 0.59 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 13.85 | 3 | -0.01049 |  |  |
| 2 | PAN 3471 | 13.01 | 12 | 0.34551 |  |  |
| 3 | Ratel | 14.14 | 2 | -0.98234 |  |  |
| 4 | SST 0117 | 13.29 | 8 | 0.00729 |  |  |
| 5 | SST 0127 | 13.80 | 4 | 0.03299 |  |  |
| 6 | SST 0137 | 13.63 | 5 | 0.14264 |  |  |
| 7 | SST 0147 | 12.85 | 13 | -0.41674 |  |  |
| 8 | SST 015 | 13.08 | 11 | 0.23982 |  |  |
| 9 | SST 027 | 14.41 | 1 | 0.28928 |  |  |
| 10 | SST 056 | 13.27 | 10 | 0.01532 |  |  |
| 11 | SST 087 | 13.38 | 7 | 0.22321 |  |  |
| 12 | SST 096 | 13.42 | 6 | 0.23479 |  |  |
| 13 | SST 88 | 13.28 | 9 | -0.12129 |  |  |
| **Mean** |  | **13.49** |  |  |  |  |
| **Coefficient of variation (%)** | | **7.20** |  |  |  |  |
| **LSDt(0.05)** | | **0.79** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Dankbaar | 12.51 | 2 | 0.31123 |  |  |
| 2 | Koperfontein | 16.01 | 1 | -0.99091 |  |  |
| 3 | Velddrift | 11.96 | 3 | 0.67968 |  |  |
| **Mean** | | **13.49** |  |  |  |  |
| **Coefficient of variation (%)** | | **7.20** |  |  |  |  |
| **LSDt(0.05)** | | **0.38** |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Swartland: Sandveld** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average falling number (s) of entries during the full or partial period from 2013- 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **\* 2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 409 | 2 | 390 | 2 | 410 | 1 |  |  |  |  |  |  |
| **PAN 3408** | 322 | 12 | 333 | 14 | 377 | 14 | 387 | 11 | 355 | 9 | 344 | 10 | 328 | 12 |
| **PAN 3471** | 344 | 2 | 402 | 4 | 384 | 9 | 410 | 1 | 385 | 2 | 377 | 2 | 373 | 2 |
| **PAN 3515** |  |  |  |  | 391 | 1 |  |  |  |  |  |  |  |  |
| **Ratel** | 349 | 1 | 410 | 1 | 384 | 8 | 410 | 1 | 388 | 1 | 381 | 1 | 379 | 1 |
| **SST 0117** | 333 | 5 | 385 | 7 |  |  |  |  |  |  |  |  | 359 | 6 |
| **SST 0127** | 336 | 3 | 389 | 6 | 385 | 6 |  |  |  |  | 370 | 4 | 363 | 4 |
| **SST 0137** | 329 | 8 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 327 | 9 | 377 | 9 |  |  |  |  |  |  |  |  | 352 | 8 |
| **SST 015** | 335 | 4 | 408 | 3 | 382 | 11 | 397 | 8 | 380 | 3 | 375 | 3 | 371 | 3 |
| **SST 027** | 332 | 6 | 373 | 10 | 382 | 12 | 397 | 9 | 371 | 5 | 362 | 6 | 352 | 7 |
| **SST 047** |  |  |  |  | 386 | 5 | 407 | 5 |  |  |  |  |  |  |
| **SST 056** | 330 | 7 | 391 | 5 | 389 | 3 | 388 | 10 | 374 | 4 | 370 | 5 | 360 | 5 |
| **SST 087** | 324 | 11 | 362 | 12 | 384 | 10 | 364 | 12 | 358 | 8 | 356 | 8 | 343 | 10 |
| **SST 096** | 325 | 10 | 366 | 11 | 381 | 13 | 405 | 6 | 369 | 6 | 357 | 7 | 345 | 9 |
| **SST 88** | 320 | 13 | 356 | 13 | 387 | 4 | 398 | 7 | 365 | 7 | 354 | 9 | 338 | 11 |
| **Tankwa** |  |  | 380 | 8 | 385 | 7 | 407 | 4 |  |  |  |  |  |  |
| **Mean** | **331** |  | **382** |  | **385** |  | **398** |  | **372** |  | **365** |  | **355** |  |
| **LSDt(0,05)** | **14.70** |  | **18.30** |  | **6.10** |  | **16.61** |  | **6.70** |  | **7.10** |  | **11.40** |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **\* Only Hopefield (Enkelvlei) data** | | | |  |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Swartland Sandveld: AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the falling number of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 155 | 118224 | 763 |  |  |
| **Treatments** | | 38 | 80406 | 2116 | 6.52 | <0,001 |
| **Genotypes** | | 12 | 10136 | 845 | 2.60 | 0.0044 |
| **Environments** | | 2 | 64292 | 32146 | 103.77 | <0,001 |
| **Block** |  | 9 | 2788 | 310 | 0.96 | 0.4813 |
| **Interactions** | | 24 | 5977 | 249 | 0.77 | 0.7681 |
| **IPCA** |  | 13 | 5231 | 402 | 1.24 | 0.2612 |
| **IPCA** |  | 11 | 746 | 68 | 0.21 | 0.9967 |
| **Residuals** | | 0 | 0 |  |  |  |
| **Error** |  | 108 | 35031 | 324 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 322 | 12 | 2.16077 |  |  |
| 2 | PAN 3471 | 344 | 2 | -2.02146 |  |  |
| 3 | Ratel | 349 | 1 | 0.70181 |  |  |
| 4 | SST 0117 | 333 | 5 | -1.78488 |  |  |
| 5 | SST 0127 | 336 | 3 | -0.87215 |  |  |
| 6 | SST 0137 | 329 | 8 | 1.50002 |  |  |
| 7 | SST 0147 | 327 | 9 | -1.61882 |  |  |
| 8 | SST 015 | 335 | 4 | -1.94701 |  |  |
| 9 | SST 027 | 332 | 6 | 2.33391 |  |  |
| 10 | SST 056 | 330 | 7 | 1.52778 |  |  |
| 11 | SST 087 | 324 | 11 | -1.05805 |  |  |
| 12 | SST 096 | 325 | 10 | -1.01443 |  |  |
| 13 | SST 88 | 320 | 13 | 2.09251 |  |  |
| **Mean** |  | **331** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.50** |  |  |  |  |
| **LSDt(0.05)** | | **14.70** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Dankbaar | 321 | 2 | 2.29409 |  |  |
| 2 | Koperfontein | 359 | 1 | -4.90669 |  |  |
| 3 | Velddrift | 312 | 3 | 2.6126 |  |  |
| **Mean** | | **331** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.50** |  |  |  |  |
| **LSDt(0.05)** | | **7.00** |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Sandveld** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Hopefield (Dankbaar) 2016-05-12** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 4.95 | abcd | 5 | 8.61 | 82.11 | 8 | 12.70 | 4 | 311 | 12 |
| **PAN 3471** | 5.19 | a | 1 | 7.92 | 85.73 | 1 | 12.34 | 10 | 328 | 3 |
| **Ratel** | 4.48 | e | 13 | 5.32 | 80.71 | 13 | 12.96 | 2 | 341 | 1 |
| **SST 0117** | 4.85 | abcd | 9 | 11.13 | 80.94 | 12 | 12.39 | 6 | 322 | 7 |
| **SST 0127** | 5.07 | ab | 3 | 4.33 | 83.10 | 5 | 12.43 | 5 | 325 | 5 |
| **SST 0137** | 5.02 | abc | 4 | 4.00 | 82.08 | 10 | 12.38 | 7 | 322 | 6 |
| **SST 0147** | 4.59 | de | 12 | 2.65 | 82.78 | 6 | 11.84 | 13 | 312 | 11 |
| **SST 015** | 5.08 | ab | 2 | 5.01 | 83.39 | 4 | 12.73 | 3 | 318 | 8 |
| **SST 027** | 4.80 | bcde | 11 | 6.80 | 83.69 | 2 | 13.87 | 1 | 327 | 4 |
| **SST 056** | 4.83 | abcde | 10 | 3.27 | 82.11 | 8 | 12.01 | 12 | 329 | 2 |
| **SST 087** | 4.90 | abcd | 6 | 9.11 | 81.87 | 11 | 12.22 | 11 | 310 | 13 |
| **SST 096** | 4.87 | abcd | 8 | 10.17 | 82.62 | 7 | 12.35 | 9 | 314 | 10 |
| **SST 88** | 4.90 | abcd | 7 | 1.70 | 83.68 | 3 | 12.36 | 8 | 316 | 9 |
| **Mean** | **4.89** |  |  |  | **82.68** |  | **12.51** |  | **321** |  |
| **Coefficient of variation (%)** | **4.73** |  |  |  | **0.67** |  | **3.71** |  | **5.33** |  |
| **LSDt(0,05)** | **0.36** |  |  |  | **0.87** |  | **0.73** |  | **26.76** |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Sandveld** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Koperfontein (Waterboerskraal) 2016-05-12** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 2.38 | abcde | 6 | 13.92 | 71.15 | 11 | 16.46 | 3 | 342 | 12 |
| **PAN 3471** | 2.32 | bcde | 8 | 7.91 | 77.90 | 1 | 15.14 | 13 | 380 | 1 |
| **Ratel** | 1.94 | ef | 13 | 15.09 | 69.92 | 13 | 17.61 | 1 | 379 | 2 |
| **SST 0117** | 2.67 | abc | 3 | 14.70 | 72.66 | 7 | 15.83 | 7 | 369 | 4 |
| **SST 0127** | 2.15 | def | 11 | 14.53 | 74.09 | 4 | 16.38 | 4 | 368 | 5 |
| **SST 0137** | 2.06 | def | 12 | 14.45 | 72.54 | 9 | 16.06 | 5 | 349 | 10 |
| **SST 0147** | 2.21 | cdef | 10 | 20.84 | 72.59 | 8 | 15.65 | 11 | 364 | 6 |
| **SST 015** | 2.83 | a | 1 | 7.85 | 74.24 | 3 | 15.27 | 12 | 373 | 3 |
| **SST 027** | 2.43 | abcd | 5 | 18.61 | 76.26 | 2 | 16.53 | 2 | 349 | 11 |
| **SST 056** | 2.69 | ab | 2 | 18.91 | 72.50 | 10 | 15.78 | 9 | 349 | 9 |
| **SST 087** | 2.38 | abcde | 7 | 13.62 | 70.74 | 12 | 15.80 | 8 | 357 | 8 |
| **SST 096** | 2.66 | abc | 4 | 13.80 | 73.06 | 6 | 15.72 | 10 | 358 | 7 |
| **SST 88** | 2.27 | bcdef | 9 | 9.96 | 74.05 | 5 | 15.96 | 6 | 336 | 13 |
| **Mean** | **2.38** |  |  |  | **73.21** |  | **16.01** |  | **359** |  |
| **Coefficient of variation (%)** | **12.86** |  |  |  | **1.47** |  | **3.84** |  | **6.11** |  |
| **LSDt(0,05)** | **0.47** |  |  |  | **1.68** |  | **0.96** |  | **34.15** |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Sandveld** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Velddrift ( Volstruiskuil) 2016-05-11** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 3.34 | cde | 9 | 10.48 | 83.22 | 9 | 12.13 | 5 | 315 | 4 |
| **PAN 3471** | 3.78 | abcd | 5 | 17.87 | 85.58 | 1 | 11.51 | 11 | 323 | 2 |
| **Ratel** | 3.84 | abcd | 4 | 6.78 | 83.70 | 4 | 11.92 | 9 | 331 | 1 |
| **SST 0117** | 3.69 | abcd | 6 | 16.71 | 83.30 | 8 | 11.95 | 8 | 306 | 9 |
| **SST 0127** | 3.33 | de | 10 | 14.26 | 82.54 | 12 | 12.37 | 2 | 315 | 5 |
| **SST 0137** | 4.12 | a | 1 | 4.48 | 83.21 | 10 | 12.35 | 3 | 313 | 7 |
| **SST 0147** | 3.44 | bcde | 8 | 9.52 | 83.57 | 6 | 10.90 | 13 | 305 | 10 |
| **SST 015** | 3.86 | abcd | 3 | 10.53 | 83.56 | 7 | 11.51 | 11 | 314 | 6 |
| **SST 027** | 3.63 | abcd | 7 | 12.47 | 84.14 | 3 | 12.83 | 1 | 320 | 3 |
| **SST 056** | 3.30 | de | 12 | 14.25 | 82.86 | 11 | 11.99 | 7 | 311 | 8 |
| **SST 087** | 2.98 | e | 13 | 18.09 | 82.20 | 13 | 12.00 | 6 | 303 | 12 |
| **SST 096** | 3.98 | abc | 2 | 9.23 | 83.64 | 5 | 12.23 | 4 | 302 | 13 |
| **SST 88** | 3.31 | de | 11 | 8.63 | 84.29 | 2 | 11.73 | 10 | 304 | 11 |
| **Mean** | **3.58** |  |  |  | **83.52** |  | **11.96** |  | **312** |  |
| **Coefficient of variation (%)** | **12.34** |  |  |  | **1.34** |  | **6.45** |  | **3.54** |  |
| **LSDt(0,05)** | **0.65** |  |  |  | **1.62** |  | **1.12** |  | **16.00** |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Sandveld** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Vredenburg ( Holvlei) 2016-05-11** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 3.02 | a | 11 | 22.91 | 75.81 | 8 | 10.65 | 6 | 339 | 2 |
| **PAN 3471** | 3.07 | a | 9 | 26.73 | 75.56 | 11 | 10.86 | 4 | 335 | 3 |
| **Ratel** | 2.91 | a | 12 | 25.45 | 75.03 | 13 | 10.59 | 8 | 378 | 1 |
| **SST 0117** | 3.73 | a | 1 | 24.47 | 76.89 | 3 | 9.83 | 12 | 326 | 7 |
| **SST 0127** | 3.05 | a | 10 | 28.66 | 75.56 | 11 | 10.69 | 5 | 329 | 6 |
| **SST 0137** | 3.20 | a | 8 | 25.31 | 75.71 | 9 | 10.90 | 3 | 322 | 8 |
| **SST 0147** | 3.25 | a | 7 | 7.22 | 76.82 | 4 | 9.76 | 13 | 297 | 13 |
| **SST 015** | 3.71 | a | 2 | 11.97 | 75.70 | 10 | 10.95 | 2 | 331 | 5 |
| **SST 027** | 2.89 | a | 13 | 20.98 | 78.07 | 1 | 11.58 | 1 | 321 | 9 |
| **SST 056** | 3.69 | a | 3 | 11.12 | 75.97 | 7 | 10.32 | 10 | 334 | 4 |
| **SST 087** | 3.43 | a | 5 | 33.08 | 76.33 | 5 | 10.22 | 11 | 320 | 10 |
| **SST 096** | 3.45 | a | 4 | 21.06 | 76.23 | 6 | 10.41 | 9 | 315 | 12 |
| **SST 88** | 3.33 | a | 6 | 25.27 | 78.00 | 2 | 10.61 | 7 | 318 | 11 |
| **Mean** | **3.29** |  |  |  | **76.28** |  | **10.57** |  | **328** |  |
| **Coefficient of variation (%)** | **17.96** |  |  |  | **1.14** |  | **3.31** |  | **3.94** |  |
| **LSDt(0,05)** | **0.93** |  |  |  | **1.36** |  | **0.54** |  | **20.11** |  |
|  |  |  |  |  |  |  |  |  |  |  |
| **Not included in analyses** |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Rûens** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average yield (ton/ha) of entries for the Rûens area during the full or partial period from 2013- 2016** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 3.49 | 14 | 3.01 | 10 | 3.38 | 11 |  |  |  |  |  |  |
| **PAN 3408** | 4.33 | 8 | 3.88 | 8 | 3.02 | 8 | 3.56 | 8 | 3.70 | 6 | 3.74 | 5 | 4.11 | 7 |
| **PAN 3471** | 4.03 | 12 | 3.82 | 9 | 3.23 | 5 | 3.73 | 4 | 3.70 | 5 | 3.69 | 8 | 3.92 | 11 |
| **PAN 3515** |  |  |  |  | 2.75 | 13 |  |  |  |  |  |  |  |  |
| **Ratel** | 4.12 | 11 | 3.73 | 12 | 3.26 | 4 | 3.79 | 2 | 3.73 | 4 | 3.70 | 7 | 3.93 | 10 |
| **SST 0117** | 4.57 | 4 | 4.23 | 1 |  |  |  |  |  |  |  |  | 4.40 | 1 |
| **SST 0127** | 4.38 | 7 | 3.96 | 6 | 3.61 | 1 |  |  |  |  | 3.98 | 2 | 4.17 | 6 |
| **SST 0137** | 4.58 | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 4.61 | 2 | 4.18 | 2 |  |  |  |  |  |  |  |  | 4.40 | 2 |
| **SST 015** | 3.87 | 13 | 3.81 | 10 | 3.23 | 5 | 3.33 | 12 | 3.56 | 9 | 3.64 | 10 | 3.84 | 12 |
| **SST 027** | 4.24 | 9 | 3.79 | 11 | 3.01 | 9 | 3.67 | 6 | 3.68 | 7 | 3.68 | 9 | 4.01 | 9 |
| **SST 047** |  |  |  |  | 3.20 | 7 | 3.51 | 9 |  |  |  |  |  |  |
| **SST 056** | 4.18 | 10 | 3.98 | 4 | 3.30 | 3 | 3.65 | 7 | 3.78 | 2 | 3.82 | 3 | 4.08 | 8 |
| **SST 087** | 4.53 | 5 | 4.18 | 3 | 3.31 | 2 | 4.30 | 1 | 4.08 | 1 | 4.00 | 1 | 4.35 | 3 |
| **SST 096** | 4.44 | 6 | 3.96 | 5 | 2.92 | 12 | 3.75 | 3 | 3.77 | 3 | 3.78 | 4 | 4.20 | 5 |
| **SST 88** | 4.72 | 1 | 3.88 | 7 | 2.54 | 14 | 3.48 | 10 | 3.65 | 8 | 3.71 | 6 | 4.30 | 4 |
| **Tankwa** |  |  | 3.57 | 13 | 2.98 | 11 | 3.71 | 5 |  |  |  |  |  |  |
| **Mean** | **4.35** |  | **3.89** |  | **3.10** |  | **3.66** |  | **3.74** |  | **3.77** |  | **4.14** |  |
| **LSDt(0,05)** | **0.17** |  | **0.17** |  | **0.16** |  | **0.14** |  | **0.08** |  | **0.10** |  | **0.12** |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Rûens - AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the yield of entries for the Rûens for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 675 | 627.1 | 0.929 |  |  |
| **Treatments** | | 168 | 529.5 | 3.152 | 19.01 | <0,001 |
| **Genotypes** | | 12 | 40.4 | 3.368 | 20.32 | <0,001 |
| **Environments** | | 12 | 433.0 | 36.079 | 70.21 | <0,001 |
| **Block** |  | 39 | 20.0 | 0.514 | 3.10 | <0,001 |
| **Interactions** | | 144 | 56.2 | 0.390 | 2.35 | <0,001 |
| **IPCA** |  | 23 | 31.6 | 1.373 | 8.28 | <0,001 |
| **IPCA** |  | 21 | 9.9 | 0.471 | 2.84 | <0,001 |
| **Residuals** | | 100 | 14.7 | 0.147 | 0.89 | 0.7673 |
| **Error** |  | 468 | 77.6 | 0.166 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for yield (ton/ha)** | | | | |  |  |
|  | | | | |  |  |
| **Entry** | **Genotype** | **Yield** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 4.33 | 8 | -0.26555 |  |  |
| 2 | PAN 3471 | 4.03 | 12 | 0.03858 |  |  |
| 3 | Ratel | 4.12 | 11 | -0.21877 |  |  |
| 4 | SST 0117 | 4.57 | 4 | 0.51706 |  |  |
| 5 | SST 0127 | 4.38 | 7 | -0.14672 |  |  |
| 6 | SST 0137 | 4.58 | 3 | 0.31751 |  |  |
| 7 | SST 0147 | 4.61 | 2 | 0.03936 |  |  |
| 8 | SST 015 | 3.87 | 13 | -1.11144 |  |  |
| 9 | SST 027 | 4.24 | 9 | 0.16125 |  |  |
| 10 | SST 056 | 4.18 | 10 | -0.53633 |  |  |
| 11 | SST 087 | 4.53 | 5 | 0.10853 |  |  |
| 12 | SST 096 | 4.44 | 6 | 0.28660 |  |  |
| 13 | SST 88 | 4.72 | 1 | 0.80991 |  |  |
| **Mean** |  | **4.35** |  |  |  |  |
| **Coefficient of variation (%)** | | **10.10** |  |  |  |  |
| **LSDt(0.05)** | | **0.17** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Bredasdorp (Karsrivier) | 3.51 | 12 | 0.26673 |  |  |
| 2 | Buffelsjag (Volmoed) | 4.05 | 7 | -0.12859 |  |  |
| 3 | Caledon (De Vlei) | 2.77 | 13 | -0.38071 |  |  |
| 4 | Caledon (Roodebloem) | 3.89 | 11 | -0.18745 |  |  |
| 5 | Caledon (Uitvlug) | 5.15 | 4 | -0.62553 |  |  |
| 6 | Heidelberg (Voorstekop) | 5.53 | 1 | 0.14530 |  |  |
| 7 | Klipdale (Alpha) | 4.05 | 8 | 0.12788 |  |  |
| 8 | Klipdale (Panorama) | 5.06 | 5 | 0.10574 |  |  |
| 9 | Napier (Bo-Schietpa) | 3.90 | 10 | 1.37791 |  |  |
| 10 | Protem (Volmoud) | 4.06 | 6 | 0.00902 |  |  |
| 11 | Riversdal (Uitkyk) | 5.34 | 2 | -0.38029 |  |  |
| 12 | Riviersonderend (Tygerhoek) | 5.27 | 3 | -0.11795 |  |  |
| 13 | Swellendam (Klippenrivier) | 4.02 | 9 | -0.21206 |  |  |
| **Mean** |  | **4.35** |  |  |  |  |
| **Coefficient of variation (%)** | | **10.10** |  |  |  |  |
| **LSDt(0.05)** | | **0.17** |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Rûens** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average hectolitre mass (kg/hl) of entries for the Rûens area during the full or partial period from 2013- 2016** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 79.79 | 7 | 77.69 | 11 | 72.96 | 12 |  |  |  |  |  |  |
| **PAN 3408** | 79.09 | 8 | 79.41 | 13 | 77.41 | 13 | 74.98 | 5 | 77.72 | 7 | 78.64 | 9 | 79.25 | 10 |
| **PAN 3471** | 81.72 | 1 | 81.27 | 1 | 79.06 | 3 | 76.48 | 1 | 79.63 | 1 | 80.68 | 1 | 81.50 | 1 |
| **PAN 3515** |  |  |  |  | 78.53 | 5 |  |  |  |  |  |  |  |  |
| **Ratel** | 79.02 | 11 | 79.57 | 11 | 77.86 | 7 | 74.15 | 10 | 77.65 | 8 | 78.82 | 8 | 79.30 | 9 |
| **SST 0117** | 79.54 | 5 | 80.18 | 6 |  |  |  |  |  |  |  |  | 79.86 | 5 |
| **SST 0127** | 79.04 | 10 | 79.34 | 14 | 78.39 | 6 |  |  |  |  | 78.92 | 5 | 79.19 | 11 |
| **SST 0137** | 78.45 | 13 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 79.68 | 4 | 80.20 | 5 |  |  |  |  |  |  |  |  | 79.94 | 4 |
| **SST 015** | 79.33 | 6 | 79.58 | 10 | 77.63 | 12 | 75.11 | 4 | 77.91 | 4 | 78.85 | 7 | 79.46 | 7 |
| **SST 027** | 80.95 | 2 | 80.87 | 3 | 79.01 | 4 | 75.95 | 2 | 79.20 | 2 | 80.28 | 2 | 80.91 | 2 |
| **SST 047** |  |  |  |  | 79.44 | 1 | 75.31 | 3 |  |  |  |  |  |  |
| **SST 056** | 79.21 | 7 | 79.63 | 8 | 77.78 | 9 | 74.32 | 8 | 77.74 | 6 | 78.87 | 6 | 79.42 | 8 |
| **SST 087** | 78.57 | 12 | 79.45 | 12 | 77.84 | 8 | 74.68 | 6 | 77.64 | 9 | 78.62 | 10 | 79.01 | 12 |
| **SST 096** | 79.09 | 8 | 80.34 | 4 | 77.78 | 9 | 74.02 | 11 | 77.81 | 5 | 79.07 | 4 | 79.72 | 6 |
| **SST 88** | 80.60 | 3 | 80.98 | 2 | 79.19 | 2 | 74.41 | 7 | 78.80 | 3 | 80.26 | 3 | 80.79 | 3 |
| **Tankwa** |  |  | 79.59 | 9 | 77.06 | 14 | 74.23 | 9 |  |  |  |  |  |  |
| **Mean** | **79.56** |  | **80.01** |  | **78.19** |  | **74.72** |  | **78.23** |  | **79.30** |  | **79.86** |  |
| **LSDt(0,05)** | **0.38** |  | **0.45** |  | **0.79** |  | **0.32** |  | **0.23** |  | **0.28** |  | **0.29** |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **Rûens - AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the hectolitre mass of entries for the Rûens for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 675 | 3737 | 5.54 |  |  |
| **Treatments** | | 168 | 3250 | 19.34 | 23.87 | <0,001 |
| **Genotypes** | | 12 | 576 | 48.03 | 59.28 | <0,001 |
| **Environments** | | 12 | 2429 | 202.38 | 73.38 | <0,001 |
| **Block** |  | 39 | 108 | 2.76 | 3.40 | <0,001 |
| **Interactions** | | 144 | 245 | 1.70 | 2.10 | <0,001 |
| **IPCA** |  | 23 | 78 | 3.40 | 4.20 | <0,001 |
| **IPCA** |  | 21 | 55 | 2.62 | 3.24 | <0,001 |
| **Residuals** | | 100 | 112 | 1.12 | 1.38 | 0.0154 |
| **Error** |  | 468 | 379 | 0.81 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 79.09 | 8 | -0.08035 |  |  |
| 2 | PAN 3471 | 81.72 | 1 | -0.06206 |  |  |
| 3 | Ratel | 79.02 | 11 | 0.12282 |  |  |
| 4 | SST 0117 | 79.54 | 5 | 0.05436 |  |  |
| 5 | SST 0127 | 79.04 | 10 | 0.03371 |  |  |
| 6 | SST 0137 | 78.45 | 13 | 0.84781 |  |  |
| 7 | SST 0147 | 79.68 | 4 | -0.18041 |  |  |
| 8 | SST 015 | 79.33 | 6 | -1.52527 |  |  |
| 9 | SST 027 | 80.95 | 2 | -0.50105 |  |  |
| 10 | SST 056 | 79.21 | 7 | 0.28196 |  |  |
| 11 | SST 087 | 78.57 | 12 | 0.83569 |  |  |
| 12 | SST 096 | 79.09 | 8 | -0.28108 |  |  |
| 13 | SST 88 | 80.60 | 3 | 0.45386 |  |  |
| **Mean** |  | **79.56** |  |  |  |  |
| **Coefficient of variation (%)** | | **1.20** |  |  |  |  |
| **LSDt(0.05)** | | **0.38** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Bredasdorp (Karsrivier) | 79.58 | 7 | -0.25731 |  |  |
| 2 | Buffelsjag (Volmoed) | 77.22 | 13 | 0.15193 |  |  |
| 3 | Caledon (De Vlei) | 78.19 | 9 | -0.45400 |  |  |
| 4 | Caledon (Roodebloem) | 82.28 | 2 | 0.03647 |  |  |
| 5 | Caledon (Uitvlug) | 79.63 | 6 | -0.93357 |  |  |
| 6 | Heidelberg (Voorstekop) | 81.34 | 3 | 0.50140 |  |  |
| 7 | Klipdale (Alpha) | 77.90 | 11 | 0.05815 |  |  |
| 8 | Klipdale (Panorama) | 79.98 | 5 | 0.14490 |  |  |
| 9 | Napier (Bo-Schietpa) | 77.96 | 10 | 1.35186 |  |  |
| 10 | Protem (Volmoud) | 78.21 | 8 | 0.17959 |  |  |
| 11 | Riversdal (Uitkyk) | 81.18 | 4 | -1.03944 |  |  |
| 12 | Riviersonderend (Tygerhoek) | 83.37 | 1 | 0.09068 |  |  |
| 13 | Swellendam (Klippenrivier) | 77.45 | 12 | 0.16934 |  |  |
| **Mean** |  | **79.56** |  |  |  |  |
| **Coefficient of variation (%)** | | **1.20** |  |  |  |  |
| **LSDt(0.05)** | | **0.38** |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Rûens** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average protein content (%) of entries for the Rûens area during the full or partial period from 2013- 2016** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 12.34 | 4 | 12.02 | 7 | 13.28 | 5 |  |  |  |  |  |  |
| **PAN 3408** | 12.26 | 5 | 11.97 | 8 | 11.79 | 9 | 13.24 | 7 | 12.32 | 3 | 12.01 | 5 | 12.12 | 5 |
| **PAN 3471** | 12.08 | 8 | 11.97 | 8 | 11.69 | 10 | 12.98 | 9 | 12.18 | 5 | 11.91 | 6 | 12.03 | 6 |
| **PAN 3515** |  |  |  |  | 12.09 | 5 |  |  |  |  |  |  |  |  |
| **Ratel** | 12.29 | 4 | 12.13 | 6 | 11.86 | 8 | 12.87 | 10 | 12.29 | 4 | 12.09 | 4 | 12.21 | 4 |
| **SST 0117** | 12.00 | 9 | 12.04 | 7 |  |  |  |  |  |  |  |  | 12.02 | 7 |
| **SST 0127** | 12.41 | 3 | 12.16 | 5 | 12.07 | 6 |  |  |  |  | 12.21 | 3 | 12.29 | 3 |
| **SST 0137** | 12.13 | 6 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 11.80 | 12 | 11.43 | 13 |  |  |  |  |  |  |  |  | 11.62 | 11 |
| **SST 015** | 12.13 | 6 | 11.79 | 10 | 11.49 | 12 | 13.13 | 8 | 12.14 | 6 | 11.80 | 7 | 11.96 | 8 |
| **SST 027** | 13.14 | 1 | 13.14 | 1 | 12.11 | 4 | 13.98 | 3 | 13.09 | 1 | 12.80 | 1 | 13.14 | 1 |
| **SST 047** |  |  |  |  | 13.72 | 1 | 15.71 | 1 |  |  |  |  |  |  |
| **SST 056** | 11.91 | 10 | 11.77 | 11 | 11.46 | 13 | 13.28 | 5 | 12.11 | 7 | 11.71 | 8 | 11.84 | 9 |
| **SST 087** | 11.76 | 13 | 11.34 | 14 | 11.60 | 11 | 12.31 | 11 | 11.75 | 8 | 11.57 | 10 | 11.55 | 12 |
| **SST 096** | 12.48 | 2 | 12.43 | 3 | 12.50 | 3 | 13.51 | 4 | 12.73 | 2 | 12.47 | 2 | 12.46 | 2 |
| **SST 88** | 11.88 | 11 | 11.70 | 12 | 11.33 | 14 | 12.01 | 12 | 11.73 | 9 | 11.64 | 9 | 11.79 | 10 |
| **Tankwa** |  |  | 13.13 | 2 | 12.88 | 2 | 14.49 | 2 |  |  |  |  |  |  |
| **Mean** | **12.17** |  | **12.10** |  | **12.04** |  | **13.40** |  | **12.26** |  | **12.02** |  | **12.08** |  |
| **LSDt(0,05)** | **0.26** |  | **0.22** |  | **0.30** |  | **0.25** |  | **0.12** |  | **0.14** |  | **0.17** |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Rûens - AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the protein content of entries for the Rûens for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 675 | 1112.1 | 1.647 |  |  |
| **Treatments** | | 168 | 885.5 | 5.271 | 14.05 | <0,001 |
| **Genotypes** | | 12 | 83.7 | 6.977 | 18.59 | <0,001 |
| **Environments** | | 12 | 695.0 | 57.919 | 44.35 | <0,001 |
| **Block** |  | 39 | 50.9 | 1.306 | 3.48 | <0,001 |
| **Interactions** | | 144 | 106.8 | 0.741 | 1.98 | <0,001 |
| **IPCA** |  | 23 | 32.6 | 1.415 | 3.77 | <0,001 |
| **IPCA** |  | 21 | 24.6 | 1.170 | 3.12 | <0,001 |
| **Residuals** | | 100 | 49.6 | 0.496 | 1.32 | 0.0299 |
| **Error** |  | 468 | 175.6 | 0.375 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 12.26 | 5 | 0.55818 |  |  |
| 2 | PAN 3471 | 12.08 | 8 | 0.68492 |  |  |
| 3 | Ratel | 12.29 | 4 | -0.71462 |  |  |
| 4 | SST 0117 | 12.00 | 9 | -0.43359 |  |  |
| 5 | SST 0127 | 12.41 | 3 | -0.40790 |  |  |
| 6 | SST 0137 | 12.13 | 6 | 0.04110 |  |  |
| 7 | SST 0147 | 11.80 | 12 | -0.01934 |  |  |
| 8 | SST 015 | 12.13 | 6 | 0.80362 |  |  |
| 9 | SST 027 | 13.14 | 1 | 0.39690 |  |  |
| 10 | SST 056 | 11.91 | 10 | 0.03280 |  |  |
| 11 | SST 087 | 11.76 | 13 | -0.49478 |  |  |
| 12 | SST 096 | 12.48 | 2 | -0.05689 |  |  |
| 13 | SST 88 | 11.88 | 11 | -0.39041 |  |  |
| **Mean** |  | **12.17** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.50** |  |  |  |  |
| **LSDt(0.05)** | | **0.26** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Bredasdorp (Karsrivier) | 12.81 | 3 | 0.34138 |  |  |
| 2 | Buffelsjag (Volmoed) | 12.58 | 4 | 0.24082 |  |  |
| 3 | Caledon (De Vlei) | 13.55 | 2 | -1.24702 |  |  |
| 4 | Caledon (Roodebloem) | 11.08 | 11 | -0.20009 |  |  |
| 5 | Caledon (Uitvlug) | 12.46 | 6 | -0.25411 |  |  |
| 6 | Heidelberg (Voorstekop) | 10.65 | 12 | 0.41454 |  |  |
| 7 | Klipdale (Alpha) | 13.84 | 1 | -0.23362 |  |  |
| 8 | Klipdale (Panorama) | 12.39 | 7 | 0.37423 |  |  |
| 9 | Napier (Bo-Schietpa) | 12.55 | 5 | 0.28642 |  |  |
| 10 | Protem (Volmoud) | 12.03 | 10 | 0.46281 |  |  |
| 11 | Riversdal (Uitkyk) | 10.10 | 13 | -0.52656 |  |  |
| 12 | Riviersonderend (Tygerhoek) | 12.11 | 8 | 0.27134 |  |  |
| 13 | Swellendam (Klippenrivier) | 12.10 | 9 | 0.06986 |  |  |
| **Mean** |  | **12.17** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.50** |  |  |  |  |
| **LSDt(0.05)** | | **0.26** |  |  |  |  |

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| **Rûens** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average falling number (s) of entries for the Rûens area during the full or partial period from 2013- 2016** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 364 | 5 | 353 | 5 | 312 | 2 |  |  |  |  |  |  |
| **PAN 3408** | 335 | 13 | 353 | 14 | 338 | 13 | 249 | 12 | 318 | 9 | 342 | 10 | 344 | 12 |
| **PAN 3471** | 360 | 3 | 370 | 1 | 354 | 3 | 278 | 11 | 340 | 3 | 361 | 3 | 365 | 3 |
| **PAN 3515** |  |  |  |  | 347 | 6 |  |  |  |  |  |  |  |  |
| **Ratel** | 369 | 1 | 369 | 3 | 356 | 2 | 307 | 3 | 350 | 1 | 365 | 1 | 369 | 1 |
| **SST 0117** | 347 | 7 | 364 | 7 |  |  |  |  |  |  |  |  | 355 | 7 |
| **SST 0127** | 353 | 4 | 365 | 4 | 346 | 7 |  |  |  |  | 355 | 4 | 359 | 4 |
| **SST 0137** | 343 | 10 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 338 | 12 | 353 | 13 |  |  |  |  |  |  |  |  | 345 | 11 |
| **SST 015** | 362 | 2 | 369 | 2 | 353 | 4 | 306 | 4 | 348 | 2 | 361 | 2 | 366 | 2 |
| **SST 027** | 351 | 5 | 361 | 9 | 342 | 10 | 297 | 6 | 338 | 6 | 351 | 6 | 356 | 6 |
| **SST 047** |  |  |  |  | 356 | 1 | 297 | 7 |  |  |  |  |  |  |
| **SST 056** | 349 | 6 | 364 | 6 | 343 | 8 | 296 | 8 | 338 | 5 | 352 | 5 | 357 | 5 |
| **SST 087** | 345 | 8 | 361 | 8 | 339 | 12 | 299 | 5 | 336 | 7 | 348 | 7 | 353 | 8 |
| **SST 096** | 344 | 9 | 356 | 12 | 334 | 14 | 295 | 9 | 332 | 8 | 345 | 9 | 350 | 10 |
| **SST 88** | 342 | 11 | 360 | 10 | 340 | 11 | 315 | 1 | 339 | 4 | 347 | 8 | 351 | 9 |
| **Tankwa** |  |  | 359 | 11 | 342 | 9 | 281 | 10 |  |  |  |  |  |  |
| **Mean** | **349** |  | **362** |  | **346** |  | **294** |  | **338** |  | **353** |  | **356** |  |
| **LSDt(0,05)** | **6.50** |  | **5.00** |  | **9.00** |  | **10.38** |  | **4.00** |  | **3.90** |  | **4.10** |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **Rûens - AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the falling number of entries for the Rûens for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 675 | 802918 | 1190 |  |  |
| **Treatments** | | 168 | 656650 | 3909 | 13.56 | <0,001 |
| **Genotypes** | | 12 | 62043 | 5170 | 17.94 | <0,001 |
| **Environments** | | 12 | 550646 | 45887 | 157.41 | <0,001 |
| **Block** |  | 39 | 11369 | 292 | 1.01 | 0.4545 |
| **Interactions** | | 144 | 43961 | 305 | 1.06 | 0.3257 |
| **IPCA** |  | 23 | 11958 | 520 | 1.80 | 0.0130 |
| **IPCA** |  | 21 | 9024 | 430 | 1.49 | 0.0751 |
| **Residuals** | | 100 | 22979 | 230 | 0.80 | 0.9168 |
| **Error** |  | 468 | 134898 | 288 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 335 | 13 | -2.88118 |  |  |
| 2 | PAN 3471 | 360 | 3 | -2.08279 |  |  |
| 3 | Ratel | 369 | 1 | 3.82260 |  |  |
| 4 | SST 0117 | 347 | 7 | 0.55739 |  |  |
| 5 | SST 0127 | 353 | 4 | 0.97751 |  |  |
| 6 | SST 0137 | 343 | 10 | -0.59504 |  |  |
| 7 | SST 0147 | 338 | 12 | -3.50129 |  |  |
| 8 | SST 015 | 362 | 2 | 2.93276 |  |  |
| 9 | SST 027 | 351 | 5 | 1.23809 |  |  |
| 10 | SST 056 | 349 | 6 | 0.94405 |  |  |
| 11 | SST 087 | 345 | 8 | 0.63916 |  |  |
| 12 | SST 096 | 344 | 9 | -0.96139 |  |  |
| 13 | SST 88 | 342 | 11 | -1.08988 |  |  |
| **Mean** |  | **349** |  |  |  |  |
| **Coefficient of variation (%)** | | **4.90** |  |  |  |  |
| **LSDt(0.05)** | | **6.50** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Bredasdorp (Karsrivier) | 319 | 10 | -0.66697 |  |  |
| 2 | Buffelsjag (Volmoed) | 323 | 9 | -0.88031 |  |  |
| 3 | Caledon (De Vlei) | 378 | 4 | 1.13520 |  |  |
| 4 | Caledon (Roodebloem) | 317 | 11 | -1.13941 |  |  |
| 5 | Caledon (Uitvlug) | 316 | 12 | -2.23162 |  |  |
| 6 | Heidelberg (Voorstekop) | 360 | 6 | 0.89874 |  |  |
| 7 | Klipdale (Alpha) | 331 | 8 | -1.31403 |  |  |
| 8 | Klipdale (Panorama) | 315 | 13 | -3.41788 |  |  |
| 9 | Napier (Bo-Schietpa) | 389 | 1 | 0.74628 |  |  |
| 10 | Protem (Volmoud) | 384 | 3 | 0.32868 |  |  |
| 11 | Riversdal (Uitkyk) | 365 | 5 | 5.46996 |  |  |
| 12 | Riviersonderend (Tygerhoek) | 385 | 2 | 0.02862 |  |  |
| 13 | Swellendam (Klippenrivier) | 356 | 7 | 1.04275 |  |  |
| **Mean** |  | **349** |  |  |  |  |
| **Coefficient of variation (%)** | | **4.90** |  |  |  |  |
| **LSDt(0.05)** | | **6.50** |  |  |  |  |

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| **Eastern Rûens** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average yield (ton/ha) of entries during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 3.30 | 14 | 3.56 | 2 | 3.02 | 11 |  |  |  |  |  |  |
| **PAN 3408** | 4.93 | 3 | 3.85 | 6 | 3.02 | 13 | 3.23 | 8 | 3.76 | 5 | 3.93 | 6 | 4.39 | 4 |
| **PAN 3471** | 4.40 | 12 | 3.48 | 13 | 3.38 | 5 | 3.38 | 4 | 3.66 | 7 | 3.75 | 8 | 3.94 | 11 |
| **PAN 3515** |  |  |  |  | 3.11 | 11 |  |  |  |  |  |  |  |  |
| **Ratel** | 4.60 | 11 | 3.74 | 8 | 3.50 | 3 | 3.37 | 5 | 3.80 | 4 | 3.95 | 5 | 4.17 | 9 |
| **SST 0117** | 4.73 | 7 | 3.93 | 3 |  |  |  |  |  |  |  |  | 4.33 | 6 |
| **SST 0127** | 4.89 | 6 | 3.92 | 4 | 3.73 | 1 |  |  |  |  | 4.18 | 1 | 4.41 | 3 |
| **SST 0137** | 4.71 | 8 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 4.91 | 5 | 4.04 | 2 |  |  |  |  |  |  |  |  | 4.48 | 2 |
| **SST 015** | 4.21 | 13 | 3.52 | 11 | 3.28 | 6 | 2.96 | 12 | 3.49 | 9 | 3.67 | 10 | 3.87 | 12 |
| **SST 027** | 4.69 | 9 | 3.60 | 9 | 3.24 | 7 | 3.22 | 9 | 3.69 | 6 | 3.85 | 7 | 4.15 | 10 |
| **SST 047** |  |  |  |  | 3.23 | 8 | 3.13 | 10 |  |  |  |  |  |  |
| **SST 056** | 4.66 | 10 | 3.90 | 5 | 3.45 | 4 | 3.24 | 7 | 3.81 | 3 | 4.00 | 3 | 4.28 | 7 |
| **SST 087** | 4.96 | 1 | 4.09 | 1 | 3.22 | 9 | 3.76 | 1 | 4.01 | 1 | 4.09 | 2 | 4.52 | 1 |
| **SST 096** | 4.92 | 4 | 3.85 | 6 | 3.14 | 10 | 3.36 | 6 | 3.82 | 2 | 3.97 | 4 | 4.39 | 5 |
| **SST 88** | 4.93 | 2 | 3.60 | 10 | 2.68 | 14 | 3.40 | 3 | 3.65 | 8 | 3.74 | 9 | 4.26 | 8 |
| **Tankwa** |  |  | 3.51 | 12 | 3.05 | 12 | 3.42 | 2 |  |  |  |  |  |  |
| **Mean** | **4.73** |  | **3.74** |  | **3.26** |  | **3.29** |  | **3.74** |  | **3.91** |  | **4.26** |  |
| **LSDt(0,05)** | **0.36** |  | **0.26** |  | **0.41** |  | **0.24** |  | **0.16** |  | **0.19** |  | **0.22** |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **Eastern Rûens - AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the yield of entries for the Eastern Rûens for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 207 | 165.14 | 0.798 |  |  |
| **Treatments** | | 51 | 122.61 | 2.404 | 10.05 | <0,001 |
| **Genotypes** | | 12 | 10.08 | 0.840 | 3.51 | <0,001 |
| **Environments** | | 3 | 101.70 | 33.901 | 50.28 | <0,001 |
| **Block** |  | 12 | 8.09 | 0.674 | 2.82 | 0.0017 |
| **Interactions** | | 36 | 10.83 | 0.301 | 1.26 | 0.1736 |
| **IPCA** |  | 14 | 7.38 | 0.527 | 2.20 | 0.0101 |
| **IPCA** |  | 12 | 2.77 | 0.231 | 0.97 | 0.4848 |
| **Residuals** | | 10 | 0.68 | 0.068 | 0.28 | 0.9840 |
| **Error** |  | 144 | 34.44 | 0.239 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for yield (ton/ha)** | | | | |  |  |
|  | | | | |  |  |
| **Entry** | **Genotype** | **Yield** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 4.93 | 3 | -0.08812 |  |  |
| 2 | PAN 3471 | 4.40 | 12 | -0.69005 |  |  |
| 3 | Ratel | 4.60 | 11 | -0.14928 |  |  |
| 4 | SST 0117 | 4.73 | 7 | 0.29694 |  |  |
| 5 | SST 0127 | 4.89 | 6 | 0.54664 |  |  |
| 6 | SST 0137 | 4.71 | 8 | -0.02274 |  |  |
| 7 | SST 0147 | 4.91 | 5 | 0.03451 |  |  |
| 8 | SST 015 | 4.21 | 13 | 0.51903 |  |  |
| 9 | SST 027 | 4.69 | 9 | 0.00568 |  |  |
| 10 | SST 056 | 4.66 | 10 | -0.07143 |  |  |
| 11 | SST 087 | 4.96 | 1 | 0.04240 |  |  |
| 12 | SST 096 | 4.92 | 4 | 0.00888 |  |  |
| 13 | SST 88 | 4.93 | 2 | -0.43247 |  |  |
| **Mean** |  | **4.73** |  |  |  |  |
| **Coefficient of variation (%)** | | **11.00** |  |  |  |  |
| **LSDt(0,05)** | | **0.36** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Buffelsjag (Volmoed) | 4.05 | 3 | 0.33612 |  |  |
| 2 | Heidelberg (Voorstekop) | 5.53 | 1 | -0.79311 |  |  |
| 3 | Riversdal (Uitkyk) | 5.34 | 2 | 0.73442 |  |  |
| 4 | Swellendam (Klippenrivier) | 4.02 | 4 | -0.27743 |  |  |
| **Mean** |  | **4.73** |  |  |  |  |
| **Coefficient of variation (%)** | | **11.00** |  |  |  |  |
| **LSDt(0,05)** | | **0.20** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Eastern Rûens** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average hectolitre mass (kg/hl) of entries during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 77.31 | 12 | 78.76 | 4 | 73.50 | 12 |  |  |  |  |  |  |
| **PAN 3408** | 79.08 | 7 | 76.99 | 14 | 77.15 | 12 | 74.66 | 5 | 76.97 | 8 | 77.74 | 10 | 78.04 | 11 |
| **PAN 3471** | 81.43 | 1 | 79.01 | 2 | 78.88 | 3 | 75.84 | 1 | 78.79 | 1 | 79.77 | 1 | 80.22 | 1 |
| **PAN 3515** |  |  |  |  | 78.12 | 7 |  |  |  |  |  |  |  |  |
| **Ratel** | 79.10 | 6 | 77.47 | 9 | 78.59 | 5 | 73.82 | 10 | 77.25 | 5 | 78.39 | 4 | 78.29 | 8 |
| **SST 0117** | 79.06 | 9 | 78.66 | 4 |  |  |  |  |  |  |  |  | 78.86 | 4 |
| **SST 0127** | 79.00 | 10 | 77.35 | 10 | 78.41 | 6 |  |  |  |  | 78.25 | 5 | 78.18 | 10 |
| **SST 0137** | 78.02 | 13 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 78.89 | 11 | 77.74 | 5 |  |  |  |  |  |  |  |  | 78.32 | 6 |
| **SST 015** | 79.21 | 5 | 77.16 | 13 | 77.90 | 8 | 75.03 | 3 | 77.33 | 4 | 78.09 | 7 | 78.19 | 9 |
| **SST 027** | 80.46 | 2 | 78.79 | 3 | 79.71 | 2 | 75.23 | 2 | 78.55 | 2 | 79.65 | 3 | 79.63 | 3 |
| **SST 047** |  |  |  |  | 76.84 | 13 | 74.94 | 4 |  |  |  |  |  |  |
| **SST 056** | 79.23 | 4 | 77.69 | 6 | 77.79 | 9 | 73.92 | 8 | 77.16 | 6 | 78.24 | 6 | 78.46 | 5 |
| **SST 087** | 78.41 | 12 | 77.32 | 11 | 77.62 | 10 | 74.35 | 7 | 76.93 | 9 | 77.78 | 9 | 77.87 | 12 |
| **SST 096** | 79.08 | 7 | 77.54 | 7 | 77.47 | 11 | 73.84 | 9 | 76.98 | 7 | 78.03 | 8 | 78.31 | 7 |
| **SST 88** | 79.89 | 3 | 79.48 | 1 | 79.80 | 1 | 74.56 | 6 | 78.43 | 3 | 79.72 | 2 | 79.69 | 2 |
| **Tankwa** |  |  | 77.49 | 8 | 75.09 | 14 | 73.71 | 11 |  |  |  |  |  |  |
| **Mean** | **79.30** |  | **77.86** |  | **78.01** |  | **74.45** |  | **77.60** |  | **78.57** |  | **78.67** |  |
| **LSDt(0,05)** | **0.61** |  | **0.75** |  | **2.64** |  | **0.50** |  | **0.37** |  | **0.48** |  | **0.48** |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **Eastern Rûens - AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the hectolitre mass of entries for the Eastern Rûens for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 207 | 1129.2 | 5.46 |  |  |
| **Treatments** | | 51 | 1006.2 | 19.73 | 27.66 | <0,001 |
| **Genotypes** | | 12 | 145.7 | 12.14 | 17.02 | <0,001 |
| **Environments** | | 3 | 796.6 | 265.55 | 156.71 | <0,001 |
| **Block** |  | 12 | 20.3 | 1.69 | 2.38 | 0.008 |
| **Interactions** | | 36 | 63.8 | 1.77 | 2.49 | <0,001 |
| **IPCA** |  | 14 | 40.2 | 2.87 | 4.02 | <0,001 |
| **IPCA** |  | 12 | 18.4 | 1.54 | 2.15 | 0.0170 |
| **Residuals** | | 10 | 5.2 | 0.52 | 0.73 | 0.6915 |
| **Error** |  | 144 | 102.7 | 0.71 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for hectolitre mass (kg/hl)** | | | | | | |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 79.08 | 7 | -0.75169 |  |  |
| 2 | PAN 3471 | 81.43 | 1 | -0.48283 |  |  |
| 3 | Ratel | 79.10 | 6 | -0.56171 |  |  |
| 4 | SST 0117 | 79.06 | 9 | 0.30194 |  |  |
| 5 | SST 0127 | 79.00 | 10 | 0.05512 |  |  |
| 6 | SST 0137 | 78.02 | 13 | 0.49036 |  |  |
| 7 | SST 0147 | 78.89 | 11 | 0.15233 |  |  |
| 8 | SST 015 | 79.21 | 5 | -0.70397 |  |  |
| 9 | SST 027 | 80.46 | 2 | -0.14302 |  |  |
| 10 | SST 056 | 79.23 | 4 | 0.38633 |  |  |
| 11 | SST 087 | 78.41 | 12 | 0.73705 |  |  |
| 12 | SST 096 | 79.08 | 7 | -0.16034 |  |  |
| 13 | SST 88 | 79.89 | 3 | 0.68043 |  |  |
| **Mean** |  | **79.30** |  |  |  |  |
| **Coefficient of variation (%)** | | **1.10** |  |  |  |  |
| **LSDt(0,05)** | | **0.61** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Buffelsjag (Volmoed) | 77.22 | 4 | 0.89063 |  |  |
| 2 | Heidelberg (Voorstekop) | 81.34 | 1 | 0.58724 |  |  |
| 3 | Riversdal (Uitkyk) | 81.18 | 2 | -1.42401 |  |  |
| 4 | Swellendam (Klippenrivier) | 77.45 | 3 | -0.05386 |  |  |
| **Mean** |  | **79.30** |  |  |  |  |
| **Coefficient of variation (%)** | | **1.10** |  |  |  |  |
| **LSDt(0,05)** | | **0.34** |  |  |  |  |

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| **Eastern Rûens** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average protein content (%) of entries during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 11.97 | 3 | 11.57 | 6 | 13.90 | 7 |  |  |  |  |  |  |
| **PAN 3408** | 11.23 | 8 | 11.45 | 8 | 11.41 | 8 | 14.09 | 6 | 12.05 | 4 | 11.36 | 5 | 11.34 | 7 |
| **PAN 3471** | 11.52 | 4 | 11.23 | 12 | 11.14 | 12 | 13.52 | 10 | 11.85 | 6 | 11.30 | 6 | 11.38 | 6 |
| **PAN 3515** |  |  |  |  | 11.33 | 10 |  |  |  |  |  |  |  |  |
| **Ratel** | 11.58 | 3 | 11.70 | 5 | 11.63 | 5 | 13.70 | 8 | 12.15 | 3 | 11.64 | 3 | 11.64 | 3 |
| **SST 0117** | 11.24 | 7 | 11.53 | 7 |  |  |  |  |  |  |  |  | 11.39 | 5 |
| **SST 0127** | 11.48 | 5 | 11.59 | 6 | 11.51 | 7 |  |  |  |  | 11.53 | 4 | 11.54 | 4 |
| **SST 0137** | 11.46 | 6 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 10.94 | 12 | 11.16 | 13 |  |  |  |  |  |  |  |  | 11.05 | 11 |
| **SST 015** | 11.17 | 9 | 11.42 | 9 | 10.67 | 14 | 13.61 | 9 | 11.72 | 7 | 11.09 | 9 | 11.30 | 8 |
| **SST 027** | 12.54 | 1 | 12.55 | 2 | 11.96 | 3 | 14.78 | 3 | 12.96 | 1 | 12.35 | 1 | 12.55 | 1 |
| **SST 047** |  |  |  |  | 13.43 | 1 | 16.26 | 1 |  |  |  |  |  |  |
| **SST 056** | 11.13 | 10 | 11.41 | 10 | 11.17 | 11 | 14.21 | 5 | 11.98 | 5 | 11.24 | 7 | 11.27 | 9 |
| **SST 087** | 10.58 | 13 | 11.02 | 14 | 11.37 | 9 | 13.17 | 11 | 11.54 | 8 | 10.99 | 10 | 10.80 | 12 |
| **SST 096** | 11.67 | 2 | 11.95 | 4 | 11.79 | 4 | 14.27 | 4 | 12.42 | 2 | 11.80 | 2 | 11.81 | 2 |
| **SST 88** | 11.12 | 11 | 11.26 | 11 | 10.99 | 13 | 12.60 | 12 | 11.49 | 9 | 11.12 | 8 | 11.19 | 10 |
| **Tankwa** |  |  | 12.80 | 1 | 12.75 | 2 | 15.26 | 2 |  |  |  |  |  |  |
| **Mean** | **11.36** |  | **11.65** |  | **11.62** |  | **14.11** |  | **12.02** |  | **11.44** |  | **11.44** |  |
| **LSDt(0,05)** | **0.55** |  | **0.43** |  | **0.80** |  | **0.43** |  | **0.25** |  | **0.32** |  | **0.35** |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **Eastern Rûens - AMMI Analysis** | | | | | | |
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| **Anova of the protein content of entries for the Eastern Rûens for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 207 | 388.7 | 1.878 |  |  |
| **Treatments** | | 51 | 283.7 | 5.562 | 10.61 | <0,001 |
| **Genotypes** | | 12 | 40.7 | 3.390 | 6.46 | <0,001 |
| **Environments** | | 3 | 213.6 | 71.193 | 28.89 | <0,001 |
| **Block** |  | 12 | 29.6 | 2.464 | 4.70 | <0,001 |
| **Interactions** | | 36 | 29.4 | 0.817 | 1.56 | 0.0358 |
| **IPCA** |  | 14 | 20.3 | 1.450 | 2.77 | 0.0012 |
| **IPCA** |  | 12 | 4.8 | 0.401 | 0.76 | 0.6862 |
| **Residuals** | | 10 | 4.3 | 0.429 | 0.82 | 0.6110 |
| **Error** |  | 144 | 75.5 | 0.524 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 11.23 | 8 | 0.53707 |  |  |
| 2 | PAN 3471 | 11.52 | 4 | 0.41030 |  |  |
| 3 | Ratel | 11.58 | 3 | -0.64953 |  |  |
| 4 | SST 0117 | 11.24 | 7 | -0.29082 |  |  |
| 5 | SST 0127 | 11.48 | 5 | -0.79185 |  |  |
| 6 | SST 0137 | 11.46 | 6 | 0.49515 |  |  |
| 7 | SST 0147 | 10.94 | 12 | 0.18649 |  |  |
| 8 | SST 015 | 11.17 | 9 | -0.41431 |  |  |
| 9 | SST 027 | 12.54 | 1 | 0.22287 |  |  |
| 10 | SST 056 | 11.13 | 10 | -0.12310 |  |  |
| 11 | SST 087 | 10.58 | 13 | -0.02161 |  |  |
| 12 | SST 096 | 11.67 | 2 | 0.37670 |  |  |
| 13 | SST 88 | 11.12 | 11 | 0.06263 |  |  |
| **Mean** |  | **11.36** |  |  |  |  |
| **Coefficient of variation (%)** | | **6.90** |  |  |  |  |
| **LSDt(0,05)** | | **0.55** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Buffelsjag (Volmoed) | 12.58 | 1 | -0.11724 |  |  |
| 2 | Heidelberg (Voorstekop) | 10.65 | 3 | 1.07695 |  |  |
| 3 | Riversdal (Uitkyk) | 10.10 | 4 | -1.03615 |  |  |
| 4 | Swellendam (Klippenrivier) | 12.10 | 2 | 0.07644 |  |  |
| **Mean** |  | **11.36** |  |  |  |  |
| **Coefficient of variation (%)** | | **6.90** |  |  |  |  |
| **LSDt(0,05)** | | **0.31** |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Eastern Rûens** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average falling number (s) of entries during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 331 | 8 | 360 | 2 | 323 | 1 |  |  |  |  |  |  |
| **PAN 3408** | 335 | 12 | 317 | 14 | 345 | 6 | 225 | 12 | 305 | 9 | 332 | 9 | 326 | 12 |
| **PAN 3471** | 355 | 5 | 343 | 3 | 353 | 4 | 253 | 11 | 326 | 7 | 350 | 3 | 349 | 3 |
| **PAN 3515** |  |  |  |  | 341 | 9 |  |  |  |  |  |  |  |  |
| **Ratel** | 377 | 1 | 344 | 2 | 367 | 1 | 314 | 2 | 350 | 1 | 363 | 1 | 360 | 1 |
| **SST 0117** | 346 | 8 | 334 | 6 |  |  |  |  |  |  |  |  | 340 | 8 |
| **SST 0127** | 351 | 6 | 340 | 4 | 329 | 13 |  |  |  |  | 340 | 7 | 345 | 5 |
| **SST 0137** | 345 | 11 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 331 | 13 | 322 | 13 |  |  |  |  |  |  |  |  | 327 | 11 |
| **SST 015** | 370 | 2 | 346 | 1 | 354 | 3 | 293 | 8 | 341 | 2 | 357 | 2 | 358 | 2 |
| **SST 027** | 358 | 3 | 331 | 9 | 344 | 7 | 299 | 5 | 333 | 3 | 344 | 4 | 344 | 6 |
| **SST 047** |  |  |  |  | 347 | 5 | 304 | 4 |  |  |  |  |  |  |
| **SST 056** | 356 | 4 | 337 | 5 | 335 | 12 | 286 | 9 | 328 | 6 | 343 | 5 | 346 | 4 |
| **SST 087** | 349 | 7 | 333 | 7 | 343 | 8 | 295 | 6 | 330 | 5 | 342 | 6 | 341 | 7 |
| **SST 096** | 346 | 10 | 325 | 11 | 315 | 14 | 294 | 7 | 320 | 8 | 329 | 10 | 335 | 10 |
| **SST 88** | 346 | 8 | 328 | 10 | 338 | 11 | 311 | 3 | 331 | 4 | 337 | 8 | 337 | 9 |
| **Tankwa** |  |  | 324 | 12 | 339 | 10 | 285 | 10 |  |  |  |  |  |  |
| **Mean** | **351** |  | **332** |  | **344** |  | **290** |  | **329** |  | **344** |  | **342** |  |
| **LSDt(0,05)** | **12.40** |  | **9.80** |  | **28.60** |  | **16.27** |  | **7.90** |  | **8.10** |  | **7.90** |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **Eastern Rûens - AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the falling number of entries for the Eastern Rûens for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 207 | 149040 | 720 |  |  |
| **Treatments** | | 51 | 99985 | 1960 | 6.24 | <0,001 |
| **Genotypes** | | 12 | 29705 | 2475 | 7.88 | <0,001 |
| **Environments** | | 3 | 57520 | 19173 | 60.10 | <0,001 |
| **Block** |  | 12 | 3828 | 319 | 1.02 | 0.4376 |
| **Interactions** | | 36 | 12760 | 354 | 1.13 | 0.3031 |
| **IPCA** |  | 14 | 6930 | 495 | 1.58 | 0.0926 |
| **IPCA** |  | 12 | 4302 | 359 | 1.14 | 0.3315 |
| **Residuals** | | 10 | 1527 | 153 | 0.49 | 0.8968 |
| **Error** |  | 144 | 45226 | 314 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 335 | 12 | 2.08412 |  |  |
| 2 | PAN 3471 | 355 | 5 | 1.24792 |  |  |
| 3 | Ratel | 377 | 1 | -3.73031 |  |  |
| 4 | SST 0117 | 346 | 8 | -1.71387 |  |  |
| 5 | SST 0127 | 351 | 6 | 0.76006 |  |  |
| 6 | SST 0137 | 345 | 11 | -0.11321 |  |  |
| 7 | SST 0147 | 331 | 13 | 0.53751 |  |  |
| 8 | SST 015 | 370 | 2 | 1.26014 |  |  |
| 9 | SST 027 | 358 | 3 | -1.31878 |  |  |
| 10 | SST 056 | 356 | 4 | 0.69385 |  |  |
| 11 | SST 087 | 349 | 7 | -2.94880 |  |  |
| 12 | SST 096 | 346 | 10 | 1.27909 |  |  |
| 13 | SST 88 | 346 | 8 | 1.96228 |  |  |
| **Mean** |  | **351** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.00** |  |  |  |  |
| **LSDt(0,05)** | | **12.40** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Buffelsjag (Volmoed) | 323 | 4 | 1.79242 |  |  |
| 2 | Heidelberg (Voorstekop) | 360 | 2 | -2.05118 |  |  |
| 3 | Riversdal (Uitkyk) | 365 | 1 | -4.00401 |  |  |
| 4 | Swellendam (Klippenrivier) | 356 | 3 | 4.26278 |  |  |
| **Mean** |  | **351** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.00** |  |  |  |  |
| **LSDt(0,05)** | | **6.90** |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Eastern Rûens** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Buffelsjag (Volmoed) 2016-05-02** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 4.25 | abcd | 5 | 6.40 | 75.66 | 13 | 12.86 | 4 | 314 | 12 |
| **PAN 3471** | 3.38 | i | 13 | 9.95 | 78.54 | 1 | 12.94 | 3 | 329 | 3 |
| **Ratel** | 3.79 | gh | 11 | 6.31 | 76.50 | 11 | 13.10 | 2 | 335 | 2 |
| **SST 0117** | 4.29 | abc | 4 | 1.69 | 77.60 | 4 | 12.48 | 8 | 320 | 8 |
| **SST 0127** | 4.44 | a | 1 | 9.17 | 77.00 | 9 | 12.53 | 6 | 324 | 5 |
| **SST 0137** | 4.17 | bcde | 6 | 10.80 | 75.70 | 12 | 12.29 | 10 | 319 | 9 |
| **SST 0147** | 4.16 | bcde | 7 | 7.48 | 77.23 | 7 | 11.78 | 12 | 313 | 13 |
| **SST 015** | 3.65 | h | 12 | 10.00 | 76.86 | 10 | 12.77 | 5 | 338 | 1 |
| **SST 027** | 3.88 | fgh | 10 | 10.76 | 78.54 | 1 | 13.87 | 1 | 322 | 6 |
| **SST 056** | 3.99 | efg | 9 | 6.83 | 77.59 | 5 | 12.23 | 11 | 325 | 4 |
| **SST 087** | 4.01 | defg | 8 | 9.73 | 77.04 | 8 | 11.73 | 13 | 322 | 7 |
| **SST 096** | 4.36 | ab | 2 | 7.90 | 77.42 | 6 | 12.53 | 6 | 319 | 10 |
| **SST 88** | 4.34 | ab | 3 | 16.65 | 78.21 | 3 | 12.48 | 8 | 318 | 11 |
| **Mean** | **4.05** |  |  |  | **77.22** |  | **12.58** |  | **323** |  |
| **Coefficient of variation (%)** | **3.91** |  |  |  | **0.97** |  | **1.82** |  | **3.30** |  |
| **LSDt(0,05)** | **0.25** |  |  |  | **1.17** |  | **0.36** |  | **16.59** |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Eastern Rûens** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Heidelberg (Voorstekop) 2016-05-04** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 5.63 | ab | 5 | 13.59 | 80.97 | 9 | 10.81 | 5 | 342 | 13 |
| **PAN 3471** | 5.63 | ab | 6 | 14.49 | 83.23 | 1 | 11.32 | 3 | 374 | 2 |
| **Ratel** | 5.56 | ab | 8 | 17.67 | 80.84 | 11 | 10.10 | 11 | 397 | 1 |
| **SST 0117** | 5.34 | abc | 11 | 14.09 | 80.88 | 10 | 10.18 | 9 | 358 | 7 |
| **SST 0127** | 5.20 | bc | 12 | 14.92 | 81.10 | 6 | 9.92 | 12 | 350 | 11 |
| **SST 0137** | 5.78 | ab | 2 | 13.90 | 81.05 | 7 | 11.18 | 4 | 352 | 10 |
| **SST 0147** | 5.64 | ab | 4 | 14.47 | 80.99 | 8 | 10.52 | 7 | 347 | 12 |
| **SST 015** | 4.60 | c | 13 | 4.99 | 80.56 | 13 | 9.85 | 13 | 365 | 4 |
| **SST 027** | 5.51 | abc | 10 | 11.56 | 82.09 | 3 | 12.06 | 1 | 373 | 3 |
| **SST 056** | 5.51 | abc | 9 | 13.12 | 81.45 | 4 | 10.42 | 8 | 358 | 6 |
| **SST 087** | 5.58 | ab | 7 | 10.08 | 80.66 | 12 | 10.12 | 10 | 361 | 5 |
| **SST 096** | 5.70 | ab | 3 | 7.28 | 81.20 | 5 | 11.38 | 2 | 355 | 8 |
| **SST 88** | 6.18 | a | 1 | 16.39 | 82.34 | 2 | 10.58 | 6 | 354 | 9 |
| **Mean** | **5.53** |  |  |  | **81.34** |  | **10.65** |  | **360** |  |
| **Coefficient of variation (%)** | **10.97** |  |  |  | **0.71** |  | **7.50** |  | **3.49** |  |
| **LSDt(0,05)** | **0.95** |  |  |  | **0.91** |  | **1.24** |  | **19.55** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Eastern Rûens** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Riversdal (Uitkyk) 2016-05-04** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 5.38 | ab | 8 | 4.51 | 81.72 | 5 | 9.13 | 13 | 338 | 12 |
| **PAN 3471** | 4.50 | cd | 13 | 10.35 | 83.75 | 1 | 9.84 | 9 | 354 | 9 |
| **Ratel** | 5.14 | bc | 11 | 4.09 | 81.83 | 4 | 10.77 | 3 | 405 | 1 |
| **SST 0117** | 5.48 | ab | 4 | 5.61 | 80.57 | 11 | 10.29 | 4 | 368 | 7 |
| **SST 0127** | 5.84 | a | 1 | 4.90 | 80.84 | 7 | 11.14 | 1 | 369 | 6 |
| **SST 0137** | 5.39 | ab | 7 | 7.63 | 78.94 | 13 | 9.67 | 10 | 359 | 8 |
| **SST 0147** | 5.57 | ab | 3 | 13.85 | 80.75 | 8 | 9.67 | 10 | 334 | 13 |
| **SST 015** | 5.26 | ab | 9 | 1.72 | 82.19 | 3 | 10.16 | 5 | 387 | 2 |
| **SST 027** | 5.39 | ab | 6 | 12.92 | 82.63 | 2 | 11.04 | 2 | 377 | 3 |
| **SST 056** | 5.18 | ab | 10 | 9.16 | 80.59 | 10 | 10.11 | 6 | 373 | 5 |
| **SST 087** | 5.73 | ab | 2 | 6.36 | 79.17 | 12 | 9.62 | 12 | 376 | 4 |
| **SST 096** | 5.46 | ab | 5 | 5.24 | 81.69 | 6 | 9.99 | 7 | 354 | 10 |
| **SST 88** | 5.11 | bc | 12 | 4.90 | 80.69 | 9 | 9.90 | 8 | 349 | 11 |
| **Mean** | **5.34** |  |  |  | **81.18** |  | **10.10** |  | **365** |  |
| **Coefficient of variation (%)** | **8.19** |  |  |  | **1.12** |  | **7.84** |  | **5.23** |  |
| **LSDt(0,05)** | **0.68** |  |  |  | **1.42** |  | **1.24** |  | **29.81** |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Eastern Rûens** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Swellendam (Klippenrivier) 2016-05-02** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 4.45 | abc | 2 | 8.74 | 77.96 | 4 | 12.14 | 6 | 346 | 10 |
| **PAN 3471** | 4.04 | cde | 7 | 14.26 | 80.18 | 1 | 11.91 | 9 | 362 | 5 |
| **Ratel** | 3.93 | def | 10 | 11.78 | 77.22 | 6 | 12.35 | 5 | 370 | 2 |
| **SST 0117** | 3.80 | ef | 11 | 16.72 | 77.20 | 8 | 12.02 | 7 | 341 | 11 |
| **SST 0127** | 4.13 | bcde | 6 | 7.05 | 77.06 | 9 | 12.36 | 4 | 362 | 6 |
| **SST 0137** | 3.56 | fg | 12 | 14.31 | 76.34 | 12 | 12.69 | 3 | 347 | 9 |
| **SST 0147** | 4.28 | abcd | 3 | 8.98 | 76.62 | 11 | 11.77 | 10 | 330 | 13 |
| **SST 015** | 3.36 | g | 13 | 6.01 | 77.22 | 6 | 11.94 | 8 | 387 | 1 |
| **SST 027** | 3.98 | def | 8 | 4.67 | 78.57 | 2 | 13.16 | 1 | 360 | 7 |
| **SST 056** | 3.95 | def | 9 | 11.26 | 77.26 | 5 | 11.71 | 11 | 368 | 3 |
| **SST 087** | 4.52 | ab | 1 | 7.91 | 76.82 | 10 | 10.86 | 13 | 338 | 12 |
| **SST 096** | 4.19 | bcde | 4 | 22.03 | 76.10 | 13 | 12.73 | 2 | 357 | 8 |
| **SST 88** | 4.13 | bcde | 5 | 4.56 | 78.35 | 3 | 11.62 | 12 | 363 | 4 |
| **Mean** | **4.02** |  |  |  | **77.45** |  | **12.10** |  | **356** |  |
| **Coefficient of variation (%)** | **6.77** |  |  |  | **1.37** |  | **3.79** |  | **5.24** |  |
| **LSDt(0,05)** | **0.43** |  |  |  | **1.65** |  | **0.71** |  | **29.09** |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Eastern Rûens** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Witsand (Sandfontein) 2016-05-02** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 2.76 | abcd | 7 | 23.19 | 74.41 | 10 | 13.68 | 3 | 371 | 11 |
| **PAN 3471** | 2.44 | abcd | 10 | 35.51 | 78.24 | 1 | 13.22 | 10 | 386 | 5 |
| **Ratel** | 2.65 | abcd | 9 | 30.72 | 74.81 | 9 | 13.54 | 6 | 402 | 1 |
| **SST 0117** | 2.90 | abc | 4 | 14.68 | 74.89 | 8 | 13.53 | 7 | 389 | 4 |
| **SST 0127** | 2.80 | abcd | 6 | 26.27 | 75.54 | 6 | 13.55 | 5 | 399 | 2 |
| **SST 0137** | 3.16 | abc | 2 | 25.71 | 73.43 | 12 | 13.42 | 8 | 343 | 13 |
| **SST 0147** | 2.95 | abc | 3 | 14.32 | 75.14 | 7 | 13.15 | 11 | 374 | 9 |
| **SST 015** | 1.84 | d | 13 | 72.60 | 77.51 | 2 | 12.87 | 13 | 396 | 3 |
| **SST 027** | 2.66 | abcd | 8 | 8.44 | 76.89 | 4 | 14.31 | 1 | 385 | 6 |
| **SST 056** | 2.90 | abc | 4 | 19.12 | 77.00 | 3 | 13.29 | 9 | 380 | 7 |
| **SST 087** | 2.24 | cd | 12 | 21.37 | 72.28 | 13 | 12.90 | 12 | 379 | 8 |
| **SST 096** | 2.32 | bcd | 11 | 59.86 | 73.68 | 11 | 14.05 | 2 | 372 | 10 |
| **SST 88** | 3.41 | a | 1 | 23.19 | 76.39 | 5 | 13.59 | 4 | 369 | 12 |
| **Mean** | **2.69** |  |  |  | **75.40** |  | **13.47** |  | **380** |  |
| **Coefficient of variation (%)** | **23.09** |  |  |  | **1.65** |  | **3.56** |  | **4.76** |  |
| **LSDt(0,05)** | **0.98** |  |  |  | **1.94** |  | **0.75** |  | **28.14** |  |
|  |  |  |  |  |  |  |  |  |  |  |
| **Not included in analyses** |  |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Southern Rûens** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average yield (ton/ha) of entries during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 3.85 | 13 | 2.67 | 11 | 3.65 | 10 |  |  |  |  |  |  |
| **PAN 3408** | 3.94 | 9 | 3.93 | 12 | 2.75 | 10 | 3.68 | 9 | 3.58 | 9 | 3.54 | 9 | 3.94 | 9 |
| **PAN 3471** | 3.73 | 11 | 4.09 | 10 | 2.87 | 8 | 3.95 | 4 | 3.66 | 7 | 3.56 | 7 | 3.91 | 10 |
| **PAN 3515** |  |  |  |  | 2.45 | 12 |  |  |  |  |  |  |  |  |
| **Ratel** | 3.79 | 10 | 3.99 | 11 | 2.89 | 7 | 4.10 | 3 | 3.69 | 6 | 3.56 | 8 | 3.89 | 11 |
| **SST 0117** | 4.67 | 2 | 4.65 | 1 |  |  |  |  |  |  |  |  | 4.66 | 1 |
| **SST 0127** | 4.05 | 7 | 4.27 | 8 | 3.45 | 1 |  |  |  |  | 3.92 | 2 | 4.16 | 6 |
| **SST 0137** | 4.54 | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 4.45 | 4 | 4.60 | 2 |  |  |  |  |  |  |  |  | 4.52 | 3 |
| **SST 015** | 3.29 | 13 | 4.27 | 7 | 2.97 | 5 | 3.82 | 8 | 3.59 | 8 | 3.51 | 10 | 3.78 | 12 |
| **SST 027** | 4.02 | 8 | 4.24 | 9 | 2.94 | 6 | 4.17 | 2 | 3.84 | 3 | 3.74 | 6 | 4.13 | 7 |
| **SST 047** |  |  |  |  | 3.08 | 4 | 3.64 | 11 |  |  |  |  |  |  |
| **SST 056** | 3.71 | 12 | 4.30 | 5 | 3.19 | 3 | 3.88 | 7 | 3.77 | 5 | 3.74 | 5 | 4.01 | 8 |
| **SST 087** | 4.29 | 5 | 4.48 | 3 | 3.33 | 2 | 4.78 | 1 | 4.22 | 1 | 4.03 | 1 | 4.38 | 4 |
| **SST 096** | 4.25 | 6 | 4.30 | 6 | 2.84 | 9 | 3.89 | 6 | 3.82 | 4 | 3.80 | 4 | 4.27 | 5 |
| **SST 88** | 4.77 | 1 | 4.43 | 4 | 2.37 | 13 | 3.92 | 5 | 3.87 | 2 | 3.86 | 3 | 4.60 | 2 |
| **Tankwa** |  |  | 3.88 | 14 | 2.74 | 12 | 3.95 | 5 |  |  |  |  |  |  |
| **Mean** | **4.12** |  | **4.23** |  | **2.90** |  | **3.95** |  | **3.78** |  | **3.72** |  | **4.19** |  |
| **LSDt(0,05)** | **0.28** |  | **0.27** |  | **0.21** |  | **0.26** |  | **0.13** |  | **0.15** |  | **0.20** |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **Southern Rûens - AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the yield of entries for the Southern Rûens for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 259 | 169.61 | 0.655 |  |  |
| **Treatments** | | 64 | 130.68 | 2.042 | 12.91 | <0,001 |
| **Genotypes** | | 12 | 44.28 | 3.690 | 23.32 | <0,001 |
| **Environments** | | 4 | 67.80 | 16.950 | 24.32 | <0,001 |
| **Block** |  | 15 | 10.45 | 0.697 | 4.40 | <0,001 |
| **Interactions** | | 48 | 18.60 | 0.388 | 2.45 | <0,001 |
| **IPCA** |  | 15 | 15.17 | 1.011 | 6.39 | <0,001 |
| **IPCA** |  | 13 | 1.92 | 0.148 | 0.93 | 0.5194 |
| **Residuals** | | 20 | 1.51 | 0.076 | 0.48 | 0.9719 |
| **Error** |  | 180 | 28.48 | 0.158 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for yield (ton/ha)** | | | | |  |  |
|  | | | | |  |  |
| **Entry** | **Genotype** | **Yield** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 3.94 | 9 | 0.15527 |  |  |
| 2 | PAN 3471 | 3.73 | 11 | -0.14662 |  |  |
| 3 | Ratel | 3.79 | 10 | 0.26083 |  |  |
| 4 | SST 0117 | 4.67 | 2 | -0.28553 |  |  |
| 5 | SST 0127 | 4.05 | 7 | -0.07387 |  |  |
| 6 | SST 0137 | 4.54 | 3 | -0.19593 |  |  |
| 7 | SST 0147 | 4.45 | 4 | 0.00351 |  |  |
| 8 | SST 015 | 3.29 | 13 | 0.94229 |  |  |
| 9 | SST 027 | 4.02 | 8 | -0.14932 |  |  |
| 10 | SST 056 | 3.71 | 12 | 0.52960 |  |  |
| 11 | SST 087 | 4.29 | 5 | -0.12245 |  |  |
| 12 | SST 096 | 4.25 | 6 | -0.25695 |  |  |
| 13 | SST 88 | 4.77 | 1 | -0.66082 |  |  |
| **Mean** |  | **4.12** |  |  |  |  |
| **Coefficient of variation (%)** | | **10.90** |  |  |  |  |
| **LSDt(0.05)** | | **0.28** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Bredasdorp (Karsrivier) | 3.51 | 5 | 0.12388 |  |  |
| 2 | Klipdale (Alpha) | 4.05 | 3 | 0.32534 |  |  |
| 3 | Klipdale (Panorama) | 5.06 | 1 | 0.37241 |  |  |
| 4 | Napier (Bo-Schietpa) | 3.90 | 4 | -1.23239 |  |  |
| 5 | Protem (Volmoud) | 4.06 | 2 | 0.41077 |  |  |
| **Mean** |  | **4.12** |  |  |  |  |
| **Coefficient of variation (%)** | | **10.90** |  |  |  |  |
| **LSDt(0.05)** | | **0.17** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Southern Rûens** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average hectolitre mass (kg/hl) of entries during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 79.96 | 6 | 76.15 | 13 | 72.23 | 11 |  |  |  |  |  |  |
| **PAN 3408** | 78.05 | 10 | 79.49 | 11 | 76.34 | 12 | 75.01 | 3 | 77.22 | 8 | 77.96 | 10 | 78.77 | 11 |
| **PAN 3471** | 81.11 | 1 | 81.34 | 1 | 77.54 | 5 | 76.47 | 1 | 79.12 | 1 | 80.00 | 1 | 81.23 | 1 |
| **PAN 3515** |  |  |  |  | 77.45 | 6 |  |  |  |  |  |  |  |  |
| **Ratel** | 78.17 | 8 | 79.58 | 10 | 76.35 | 11 | 74.04 | 9 | 77.04 | 9 | 78.03 | 9 | 78.88 | 8 |
| **SST 0117** | 78.82 | 5 | 79.92 | 7 |  |  |  |  |  |  |  |  | 79.37 | 6 |
| **SST 0127** | 78.24 | 7 | 79.40 | 13 | 77.63 | 4 |  |  |  |  | 78.42 | 5 | 78.82 | 9 |
| **SST 0137** | 77.81 | 12 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 79.14 | 4 | 80.27 | 5 |  |  |  |  |  |  |  |  | 79.71 | 4 |
| **SST 015** | 77.86 | 11 | 79.75 | 8 | 76.55 | 10 | 74.90 | 4 | 77.27 | 6 | 78.05 | 8 | 78.81 | 10 |
| **SST 027** | 79.97 | 2 | 80.81 | 3 | 77.71 | 3 | 75.67 | 2 | 78.54 | 2 | 79.50 | 3 | 80.39 | 2 |
| **SST 047** |  |  |  |  | 79.21 | 1 | 74.54 | 6 |  |  |  |  |  |  |
| **SST 056** | 78.46 | 6 | 79.70 | 9 | 76.84 | 9 | 74.08 | 8 | 77.27 | 5 | 78.33 | 6 | 79.08 | 7 |
| **SST 087** | 77.78 | 13 | 79.41 | 12 | 77.03 | 7 | 74.68 | 5 | 77.23 | 7 | 78.07 | 7 | 78.60 | 12 |
| **SST 096** | 78.17 | 8 | 81.00 | 2 | 76.97 | 8 | 73.34 | 10 | 77.37 | 4 | 78.71 | 4 | 79.59 | 5 |
| **SST 88** | 79.89 | 3 | 80.53 | 4 | 78.13 | 2 | 74.32 | 7 | 78.22 | 3 | 79.52 | 2 | 80.21 | 3 |
| **Tankwa** |  |  | 79.60 | 11 | 76.57 | 11 | 73.67 | 11 |  |  |  |  |  |  |
| **Mean** | **78.73** |  | **80.05** |  | **77.18** |  | **74.41** |  | **77.70** |  | **78.66** |  | **79.45** |  |
| **LSDt(0,05)** | **0.56** |  | **0.80** |  | **1.08** |  | **0.58** |  | **0.42** |  | **0.50** |  | **0.51** |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **Southern Rûens - AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the hectolitre mass of entries for the Southern Rûens for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 259 | 683.8 | 2.640 |  |  |
| **Treatments** | | 64 | 518.3 | 8.098 | 10.33 | <0,001 |
| **Genotypes** | | 12 | 252.2 | 21.020 | 26.81 | <0,001 |
| **Environments** | | 4 | 198.8 | 49.710 | 30.60 | <0,001 |
| **Block** |  | 15 | 24.4 | 1.624 | 2.07 | 0.0131 |
| **Interactions** | | 48 | 67.2 | 1.400 | 1.79 | 0.0035 |
| **IPCA** |  | 15 | 38.1 | 2.539 | 3.24 | <0,001 |
| **IPCA** |  | 13 | 13.8 | 1.064 | 1.36 | 0.1844 |
| **Residuals** | | 20 | 15.3 | 0.765 | 0.98 | 0.4930 |
| **Error** |  | 180 | 141.1 | 0.784 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for hectolitre mass (kg/hl)** | | | | | | |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 78.05 | 10 | -0.53076 |  |  |
| 2 | PAN 3471 | 81.11 | 1 | -0.05171 |  |  |
| 3 | Ratel | 78.17 | 8 | -0.48059 |  |  |
| 4 | SST 0117 | 78.82 | 5 | 0.13390 |  |  |
| 5 | SST 0127 | 78.24 | 7 | 0.32250 |  |  |
| 6 | SST 0137 | 77.81 | 12 | -0.58637 |  |  |
| 7 | SST 0147 | 79.14 | 4 | 0.14967 |  |  |
| 8 | SST 015 | 77.86 | 11 | 1.35633 |  |  |
| 9 | SST 027 | 79.97 | 2 | 0.12585 |  |  |
| 10 | SST 056 | 78.46 | 6 | -0.07644 |  |  |
| 11 | SST 087 | 77.78 | 13 | -0.16735 |  |  |
| 12 | SST 096 | 78.17 | 8 | 0.19723 |  |  |
| 13 | SST 88 | 79.89 | 3 | -0.39227 |  |  |
| **Mean** |  | **78.73** |  |  |  |  |
| **Coefficient of variation (%)** | | **1.10** |  |  |  |  |
| **LSDt(0.05)** | | **0.56** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Bredasdorp (Karsrivier) | 79.58 | 2 | 0.79225 |  |  |
| 2 | Klipdale (Alpha) | 77.90 | 5 | 0.07911 |  |  |
| 3 | Klipdale (Panorama) | 79.98 | 1 | 0.38119 |  |  |
| 4 | Napier (Bo-Schietpa) | 77.96 | 4 | -1.49861 |  |  |
| 5 | Protem (Volmoud) | 78.21 | 3 | 0.24606 |  |  |
| **Mean** |  | **78.73** |  |  |  |  |
| **Coefficient of variation (%)** | | **1.10** |  |  |  |  |
| **LSDt(0.05)** | | **0.35** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Southern Rûens** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average protein content (%) of entries during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 12.62 | 3 | 12.51 | 3 | 13.37 | 8 |  |  |  |  |  |  |
| **PAN 3408** | 12.99 | 3 | 12.21 | 8 | 12.03 | 8 | 13.46 | 7 | 12.67 | 3 | 12.41 | 5 | 12.60 | 4 |
| **PAN 3471** | 12.66 | 6 | 12.44 | 5 | 11.79 | 10 | 13.53 | 5 | 12.61 | 5 | 12.30 | 7 | 12.55 | 6 |
| **PAN 3515** |  |  |  |  | 12.45 | 5 |  |  |  |  |  |  |  |  |
| **Ratel** | 12.54 | 8 | 12.45 | 4 | 12.27 | 6 | 12.99 | 9 | 12.56 | 6 | 12.42 | 4 | 12.50 | 7 |
| **SST 0117** | 12.41 | 10 | 12.26 | 7 |  |  |  |  |  |  |  |  | 12.34 | 8 |
| **SST 0127** | 12.98 | 4 | 12.44 | 5 | 12.49 | 4 |  |  |  |  | 12.64 | 3 | 12.71 | 3 |
| **SST 0137** | 12.64 | 7 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 12.38 | 12 | 11.55 | 13 |  |  |  |  |  |  |  |  | 11.97 | 12 |
| **SST 015** | 13.14 | 2 | 12.04 | 11 | 11.89 | 9 | 13.60 | 4 | 12.67 | 4 | 12.36 | 6 | 12.59 | 5 |
| **SST 027** | 13.52 | 1 | 13.60 | 1 | 12.15 | 7 | 14.14 | 2 | 13.35 | 1 | 13.09 | 1 | 13.56 | 1 |
| **SST 047** |  |  |  |  | 13.78 | 1 | 16.10 | 1 |  |  |  |  |  |  |
| **SST 056** | 12.54 | 8 | 12.08 | 10 | 11.56 | 13 | 13.48 | 6 | 12.42 | 7 | 12.06 | 8 | 12.31 | 9 |
| **SST 087** | 12.39 | 11 | 11.60 | 12 | 11.79 | 10 | 12.17 | 10 | 11.99 | 9 | 11.93 | 10 | 12.00 | 11 |
| **SST 096** | 12.90 | 5 | 12.78 | 2 | 12.75 | 2 | 13.72 | 3 | 13.04 | 2 | 12.81 | 2 | 12.84 | 2 |
| **SST 88** | 12.33 | 13 | 12.09 | 9 | 11.63 | 12 | 12.15 | 11 | 12.05 | 8 | 12.02 | 9 | 12.21 | 10 |
| **Tankwa** |  |  | 13.41 | 3 | 12.96 | 3 | 14.71 | 3 |  |  |  |  |  |  |
| **Mean** | **12.72** |  | **12.40** |  | **12.29** |  | **13.62** |  | **12.59** |  | **12.40** |  | **12.51** |  |
| **LSDt(0,05)** | **0.31** |  | **0.32** |  | **0.37** |  | **0.35** |  | **0.16** |  | **0.18** |  | **0.22** |  |

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| **Southern Rûens - AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the protein content of entries for the Southern Rûens for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 259 | 200.17 | 0.773 |  |  |
| **Treatments** | | 64 | 152.74 | 2.387 | 9.530 | <0,001 |
| **Genotypes** | | 12 | 30.61 | 2.551 | 10.190 | <0,001 |
| **Environments** | | 4 | 97.68 | 24.421 | 155.790 | <0,001 |
| **Block** |  | 15 | 2.35 | 0.157 | 0.630 | 0.8511 |
| **Interactions** | | 48 | 24.45 | 0.509 | 2.030 | <0,001 |
| **IPCA** |  | 15 | 12.43 | 0.829 | 3.310 | <0,001 |
| **IPCA** |  | 13 | 9.04 | 0.695 | 2.780 | 0.0013 |
| **Residuals** | | 20 | 2.98 | 0.149 | 0.590 | 0.9129 |
| **Error** |  | 180 | 45.07 | 0.250 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 12.99 | 3 | -0.20391 |  |  |
| 2 | PAN 3471 | 12.66 | 6 | 0.05671 |  |  |
| 3 | Ratel | 12.54 | 8 | 0.01566 |  |  |
| 4 | SST 0117 | 12.41 | 10 | 0.40586 |  |  |
| 5 | SST 0127 | 12.98 | 4 | 0.26237 |  |  |
| 6 | SST 0137 | 12.64 | 7 | -0.78730 |  |  |
| 7 | SST 0147 | 12.38 | 12 | 0.00239 |  |  |
| 8 | SST 015 | 13.14 | 2 | -0.05588 |  |  |
| 9 | SST 027 | 13.52 | 1 | 0.77198 |  |  |
| 10 | SST 056 | 12.54 | 8 | 0.18870 |  |  |
| 11 | SST 087 | 12.39 | 11 | -0.44387 |  |  |
| 12 | SST 096 | 12.90 | 5 | -0.03522 |  |  |
| 13 | SST 88 | 12.33 | 13 | -0.17749 |  |  |
| **Mean** |  | **12.72** |  |  |  |  |
| **Coefficient of variation (%)** | | **3.90** |  |  |  |  |
| **LSDt(0.05)** | | **0.31** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Bredasdorp (Karsrivier) | 12.82 | 2 | -0.04411 |  |  |
| 2 | Klipdale (Alpha) | 13.84 | 1 | -0.16646 |  |  |
| 3 | Klipdale (Panorama) | 12.39 | 4 | -0.99942 |  |  |
| 4 | Napier (Bo-Schietpa) | 12.55 | 3 | 0.63931 |  |  |
| 5 | Protem (Volmoud) | 12.03 | 5 | 0.57069 |  |  |
| **Mean** |  | **12.72** |  |  |  |  |
| **Coefficient of variation (%)** | | **3.90** |  |  |  |  |
| **LSDt(0.05)** | | **0.19** |  |  |  |  |

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| **Southern Rûens** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average falling number (s) of entries during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 382 | 2 | 367 | 5 | 286 | 6 |  |  |  |  |  |  |
| **PAN 3408** | 335 | 13 | 371 | 13 | 352 | 14 | 259 | 12 | 329 | 9 | 353 | 10 | 353 | 12 |
| **PAN 3471** | 359 | 2 | 384 | 1 | 367 | 5 | 287 | 5 | 349 | 2 | 370 | 1 | 372 | 2 |
| **PAN 3515** |  |  |  |  | 367 | 4 |  |  |  |  |  |  |  |  |
| **Ratel** | 363 | 1 | 382 | 3 | 362 | 8 | 281 | 8 | 347 | 4 | 369 | 3 | 372 | 1 |
| **SST 0117** | 344 | 8 | 377 | 7 |  |  |  |  |  |  |  |  | 361 | 8 |
| **SST 0127** | 354 | 4 | 377 | 8 | 368 | 3 |  |  |  |  | 366 | 4 | 365 | 4 |
| **SST 0137** | 340 | 12 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 340 | 11 | 373 | 12 |  |  |  |  |  |  |  |  | 357 | 11 |
| **SST 015** | 359 | 3 | 380 | 4 | 369 | 2 | 303 | 2 | 353 | 1 | 370 | 2 | 370 | 3 |
| **SST 027** | 346 | 6 | 377 | 8 | 356 | 12 | 280 | 9 | 340 | 7 | 360 | 6 | 361 | 6 |
| **SST 047** |  |  |  |  | 374 | 1 | 274 | 10 |  |  |  |  |  |  |
| **SST 056** | 347 | 5 | 378 | 5 | 361 | 10 | 293 | 4 | 345 | 5 | 362 | 5 | 363 | 5 |
| **SST 087** | 345 | 7 | 378 | 6 | 355 | 13 | 299 | 3 | 344 | 6 | 359 | 8 | 361 | 7 |
| **SST 096** | 344 | 9 | 371 | 14 | 357 | 11 | 285 | 7 | 339 | 8 | 357 | 9 | 357 | 10 |
| **SST 88** | 341 | 10 | 376 | 10 | 362 | 9 | 310 | 1 | 347 | 3 | 359 | 7 | 358 | 9 |
| **Tankwa** |  |  | 374 | 11 | 363 | 7 | 271 | 11 |  |  |  |  |  |  |
| **Mean** | **348** |  | **377** |  | **363** |  | **286** |  | **344** |  | **362** |  | **362** |  |
| **LSDt(0,05)** | **12.00** |  | **7.00** |  | **11.50** |  | **19.87** |  | **6.60** |  | **6.20** |  | **6.70** |  |

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| **Southern Rûens - AMMI Analysis** | | | | | | |
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| **Anova of the falling number of entries for the Southern Rûens for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 259 | 378039 | 1460 |  |  |
| **Treatments** | | 64 | 304570 | 4759 | 12.48 | <0,001 |
| **Genotypes** | | 12 | 18274 | 1523 | 4.00 | <0,001 |
| **Environments** | | 4 | 269062 | 67265 | 207.79 | <0,001 |
| **Block** |  | 15 | 4856 | 324 | 0.85 | 0.6218 |
| **Interactions** | | 48 | 17235 | 359 | 0.94 | 0.5846 |
| **IPCA** |  | 15 | 6709 | 447 | 1.17 | 0.2961 |
| **IPCA** |  | 13 | 5881 | 452 | 1.19 | 0.2920 |
| **Residuals** | | 20 | 4644 | 232 | 0.61 | 0.9028 |
| **Error** |  | 180 | 68613 | 381 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 335 | 13 | 2.63165 |  |  |
| 2 | PAN 3471 | 359 | 2 | -2.73690 |  |  |
| 3 | Ratel | 363 | 1 | -1.26338 |  |  |
| 4 | SST 0117 | 344 | 8 | -0.01028 |  |  |
| 5 | SST 0127 | 354 | 4 | -1.01105 |  |  |
| 6 | SST 0137 | 340 | 12 | 1.16663 |  |  |
| 7 | SST 0147 | 340 | 11 | 0.20776 |  |  |
| 8 | SST 015 | 359 | 3 | -3.92834 |  |  |
| 9 | SST 027 | 346 | 6 | 0.42802 |  |  |
| 10 | SST 056 | 347 | 5 | 0.96327 |  |  |
| 11 | SST 087 | 345 | 7 | 0.52203 |  |  |
| 12 | SST 096 | 344 | 9 | 2.25944 |  |  |
| 13 | SST 88 | 341 | 10 | 0.77116 |  |  |
| **Mean** |  | **348** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.50** |  |  |  |  |
| **LSDt(0.05)** | | **12.00** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Bredasdorp (Karsrivier) | 319 | 4 | 0.37697 |  |  |
| 2 | Klipdale (Alpha) | 331 | 3 | -2.53100 |  |  |
| 3 | Klipdale (Panorama) | 315 | 5 | 5.30146 |  |  |
| 4 | Napier (Bo-Schietpa) | 389 | 1 | -0.75292 |  |  |
| 5 | Protem (Volmoud) | 384 | 2 | -2.39451 |  |  |
| **Mean** |  | **348** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.50** |  |  |  |  |
| **LSDt(0.05)** | | **7.50** |  |  |  |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
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| **Southern Rûens** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Bredasdorp (Karsrivier) 2016-05-05** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 3.16 | h | 12 | 11.45 | 78.13 | 12 | 13.30 | 3 | 303 | 13 |
| **PAN 3471** | 3.46 | def | 7 | 4.39 | 82.69 | 1 | 12.81 | 6 | 323 | 4 |
| **Ratel** | 3.19 | gh | 11 | 10.04 | 78.86 | 10 | 12.78 | 8 | 333 | 3 |
| **SST 0117** | 3.92 | ab | 4 | 3.67 | 80.13 | 4 | 12.60 | 10 | 309 | 11 |
| **SST 0127** | 3.41 | efg | 8 | 7.20 | 79.40 | 7 | 13.01 | 4 | 318 | 6 |
| **SST 0137** | 3.93 | ab | 3 | 8.84 | 77.92 | 13 | 12.79 | 7 | 311 | 9 |
| **SST 0147** | 3.94 | ab | 2 | 6.38 | 79.63 | 5 | 12.09 | 13 | 311 | 10 |
| **SST 015** | 2.72 | i | 13 | 15.21 | 79.62 | 6 | 13.49 | 1 | 340 | 1 |
| **SST 027** | 3.31 | fgh | 10 | 9.56 | 81.05 | 2 | 13.43 | 2 | 307 | 12 |
| **SST 056** | 3.37 | efgh | 9 | 8.67 | 79.38 | 8 | 12.68 | 9 | 313 | 8 |
| **SST 087** | 3.70 | bcd | 5 | 3.54 | 78.34 | 11 | 12.32 | 12 | 334 | 2 |
| **SST 096** | 3.59 | cde | 6 | 3.30 | 78.98 | 9 | 13.01 | 4 | 323 | 5 |
| **SST 88** | 4.00 | a | 1 | 8.64 | 80.40 | 3 | 12.33 | 11 | 317 | 7 |
| **Mean** | **3.51** |  |  |  | **79.58** |  | **12.82** |  | **319** |  |
| **Coefficient of variation (%)** | **4.51** |  |  |  | **0.63** |  | **1.78** |  | **4.73** |  |
| **LSDt(0,05)** | **0.25** |  |  |  | **0.79** |  | **0.36** |  | **23.57** |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Southern Rûens** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Klipdale (Alpha) 2016-05-05** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 3.96 | bcd | 7 | 13.81 | 77.47 | 7 | 13.66 | 7 | 317 | 12 |
| **PAN 3471** | 3.64 | d | 12 | 17.06 | 80.30 | 1 | 13.46 | 12 | 354 | 1 |
| **Ratel** | 3.80 | cd | 11 | 21.48 | 77.07 | 10 | 13.52 | 11 | 349 | 3 |
| **SST 0117** | 4.58 | a | 2 | 6.94 | 77.87 | 5 | 13.86 | 5 | 332 | 5 |
| **SST 0127** | 3.84 | cd | 10 | 15.17 | 76.67 | 12 | 14.40 | 2 | 323 | 9 |
| **SST 0137** | 4.30 | abc | 4 | 10.84 | 76.92 | 11 | 14.06 | 4 | 320 | 11 |
| **SST 0147** | 4.43 | ab | 3 | 6.97 | 79.57 | 2 | 13.42 | 13 | 331 | 6 |
| **SST 015** | 3.51 | d | 13 | 12.53 | 77.22 | 9 | 13.69 | 6 | 353 | 2 |
| **SST 027** | 3.84 | cd | 9 | 6.61 | 79.15 | 4 | 14.27 | 3 | 327 | 8 |
| **SST 056** | 3.92 | bcd | 8 | 6.87 | 77.67 | 6 | 13.61 | 8 | 321 | 10 |
| **SST 087** | 4.26 | abc | 5 | 5.61 | 76.37 | 13 | 13.58 | 10 | 328 | 7 |
| **SST 096** | 3.96 | bcd | 6 | 13.12 | 77.27 | 8 | 14.77 | 1 | 313 | 13 |
| **SST 88** | 4.60 | a | 1 | 2.58 | 79.20 | 3 | 13.60 | 9 | 333 | 4 |
| **Mean** | **4.05** |  |  |  | **77.90** |  | **13.84** |  | **331** |  |
| **Coefficient of variation (%)** | **9.03** |  |  |  | **1.33** |  | **3.04** |  | **8.37** |  |
| **LSDt(0,05)** | **0.58** |  |  |  | **1.62** |  | **0.65** |  | **43.13** |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Southern Rûens** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Klipdale (Panorama) 2016-05-05** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 4.82 | cdef | 9 | 9.31 | 79.29 | 10 | 13.00 | 3 | 319 | 3 |
| **PAN 3471** | 4.28 | f | 13 | 16.82 | 82.07 | 1 | 12.41 | 6 | 315 | 7 |
| **Ratel** | 4.76 | def | 11 | 4.07 | 78.77 | 13 | 12.23 | 8 | 324 | 1 |
| **SST 0117** | 5.76 | a | 1 | 6.69 | 80.02 | 5 | 11.45 | 13 | 312 | 10 |
| **SST 0127** | 4.99 | bcde | 7 | 21.25 | 80.08 | 4 | 12.25 | 7 | 317 | 6 |
| **SST 0137** | 5.41 | abc | 3 | 15.53 | 79.33 | 9 | 13.03 | 1 | 314 | 8 |
| **SST 0147** | 5.40 | abcd | 4 | 5.03 | 79.87 | 6 | 12.22 | 10 | 312 | 10 |
| **SST 015** | 4.79 | cdef | 10 | 10.92 | 79.82 | 7 | 13.02 | 2 | 304 | 13 |
| **SST 027** | 4.99 | bcde | 8 | 4.37 | 81.05 | 3 | 12.57 | 4 | 317 | 5 |
| **SST 056** | 4.71 | ef | 12 | 4.86 | 79.24 | 11 | 12.00 | 12 | 322 | 2 |
| **SST 087** | 5.10 | bcde | 6 | 7.92 | 79.23 | 12 | 12.57 | 4 | 310 | 12 |
| **SST 096** | 5.23 | abcde | 5 | 5.34 | 79.62 | 8 | 12.23 | 8 | 319 | 3 |
| **SST 88** | 5.53 | ab | 2 | 12.50 | 81.40 | 2 | 12.12 | 11 | 313 | 9 |
| **Mean** | **5.06** |  |  |  | **79.98** |  | **12.39** |  | **315** |  |
| **Coefficient of variation (%)** | **7.96** |  |  |  | **0.78** |  | **4.61** |  | **5.64** |  |
| **LSDt(0,05)** | **0.64** |  |  |  | **0.97** |  | **0.89** |  | **27.73** |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
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| **Southern Rûens** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Napier (Bo-Schietpad) 2016-05-03** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 3.58 | a | 10 | 17.57 | 77.95 | 6 | 12.59 | 4 | 375 | 11 |
| **PAN 3471** | 3.63 | de | 9 | 8.262 | 80.64 | 1 | 12.58 | 5 | 406 | 3 |
| **Ratel** | 3.25 | de | 11 | 13.42 | 78.23 | 4 | 12.44 | 8 | 410 | 1 |
| **SST 0117** | 4.85 | ef | 2 | 14.13 | 77.96 | 5 | 12.56 | 6 | 391 | 6 |
| **SST 0127** | 3.91 | ab | 8 | 15.12 | 77.06 | 12 | 13.01 | 2 | 408 | 2 |
| **SST 0137** | 4.58 | cde | 3 | 6.863 | 77.83 | 7 | 12.10 | 11 | 379 | 10 |
| **SST 0147** | 4.20 | bc | 5 | 16.08 | 77.83 | 7 | 12.11 | 10 | 367 | 13 |
| **SST 015** | 1.94 | bcd | 13 | 19.39 | 74.98 | 13 | 13.01 | 2 | 397 | 5 |
| **SST 027** | 4.00 | g | 7 | 6.416 | 79.04 | 3 | 13.87 | 1 | 397 | 4 |
| **SST 056** | 2.81 | cd | 12 | 14.94 | 77.80 | 9 | 12.43 | 9 | 386 | 7 |
| **SST 087** | 4.18 | f | 6 | 17.85 | 77.34 | 10 | 11.82 | 13 | 385 | 8 |
| **SST 096** | 4.36 | bcd | 4 | 6.926 | 77.10 | 11 | 12.55 | 7 | 384 | 9 |
| **SST 88** | 5.37 | bc | 1 | 9.05 | 79.72 | 2 | 12.10 | 11 | 373 | 12 |
| **Mean** | **3.90** |  |  |  | **77.96** |  | **12.55** |  | **389** |  |
| **Coefficient of variation (%)** | **11.68** |  |  |  | **2.03** |  | **2.35** |  | **3.44** |  |
| **LSDt(0,05)** | **0.72** |  |  |  | **2.47** |  | **0.46** |  | **20.81** |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
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| **Southern Rûens** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Protem (Volmoed) 2016-05-03** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 4.20 | bcde | 5 | 3.49 | 77.38 | 12 | 12.38 | 3 | 363 | 13 |
| **PAN 3471** | 3.61 | g | 12 | 14.26 | 79.77 | 1 | 12.06 | 5 | 399 | 4 |
| **Ratel** | 3.97 | ef | 9 | 6.14 | 77.97 | 7 | 11.79 | 9 | 402 | 3 |
| **SST 0117** | 4.24 | bcde | 4 | 8.10 | 78.09 | 6 | 11.61 | 11 | 376 | 8 |
| **SST 0127** | 4.09 | de | 8 | 8.63 | 77.90 | 9 | 12.23 | 4 | 405 | 1 |
| **SST 0137** | 4.45 | ab | 1 | 6.29 | 76.98 | 13 | 11.27 | 13 | 375 | 9 |
| **SST 0147** | 4.26 | bcd | 3 | 9.79 | 78.77 | 4 | 12.05 | 6 | 378 | 7 |
| **SST 015** | 3.56 | g | 13 | 18.75 | 77.63 | 11 | 12.45 | 2 | 404 | 2 |
| **SST 027** | 3.96 | ef | 10 | 5.73 | 79.60 | 2 | 13.40 | 1 | 383 | 6 |
| **SST 056** | 3.77 | fg | 11 | 9.28 | 78.17 | 5 | 12.02 | 7 | 393 | 5 |
| **SST 087** | 4.18 | bcde | 6 | 9.93 | 77.75 | 10 | 11.68 | 10 | 369 | 12 |
| **SST 096** | 4.12 | cde | 7 | 8.17 | 77.94 | 8 | 11.99 | 8 | 374 | 10 |
| **SST 88** | 4.39 | abc | 2 | 10.60 | 78.82 | 3 | 11.43 | 12 | 370 | 11 |
| **Mean** | **4.06** |  |  |  | **78.21** |  | **12.03** |  | **384** |  |
| **Coefficient of variation (%)** | **4.43** |  |  |  | **0.91** |  | **5.04** |  | **4.88** |  |
| **LSDt(0,05)** | **0.28** |  |  |  | **1.11** |  | **0.94** |  | **29.12** |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Western Rûens** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average yield (ton/ha) of entries during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 3.04 | 14 | 3.20 | 10 | 3.50 | 10 |  |  |  |  |  |  |
| **PAN 3408** | 4.22 | 9 | 3.80 | 2 | 3.47 | 5 | 3.84 | 6 | 3.83 | 3 | 3.83 | 2 | 4.01 | 4 |
| **PAN 3471** | 4.04 | 13 | 3.72 | 3 | 3.75 | 2 | 3.89 | 4 | 3.85 | 2 | 3.84 | 1 | 3.88 | 5 |
| **PAN 3515** |  |  |  |  | 3.01 | 11 |  |  |  |  |  |  |  |  |
| **Ratel** | 4.06 | 11 | 3.19 | 10 | 3.73 | 3 | 3.94 | 3 | 3.73 | 5 | 3.66 | 7 | 3.62 | 11 |
| **SST 0117** | 4.30 | 5 | 3.80 | 1 |  |  |  |  |  |  |  |  | 4.05 | 1 |
| **SST 0127** | 4.27 | 7 | 3.38 | 8 | 3.80 | 1 |  |  |  |  | 3.82 | 3 | 3.83 | 8 |
| **SST 0137** | 4.50 | 2 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 4.53 | 1 | 3.55 | 5 |  |  |  |  |  |  |  |  | 4.04 | 3 |
| **SST 015** | 4.24 | 8 | 3.25 | 9 | 3.64 | 4 | 3.19 | 11 | 3.58 | 7 | 3.71 | 5 | 3.75 | 10 |
| **SST 027** | 4.05 | 12 | 3.14 | 12 | 2.97 | 12 | 3.61 | 9 | 3.44 | 8 | 3.39 | 10 | 3.60 | 12 |
| **SST 047** |  |  |  |  | 3.37 | 7 | 3.83 | 7 |  |  |  |  |  |  |
| **SST 056** | 4.27 | 6 | 3.45 | 6 | 3.37 | 6 | 3.88 | 5 | 3.74 | 4 | 3.70 | 6 | 3.86 | 6 |
| **SST 087** | 4.39 | 4 | 3.70 | 4 | 3.34 | 9 | 4.36 | 1 | 3.95 | 1 | 3.81 | 4 | 4.04 | 2 |
| **SST 096** | 4.21 | 10 | 3.44 | 7 | 2.92 | 13 | 4.05 | 2 | 3.65 | 6 | 3.52 | 8 | 3.83 | 7 |
| **SST 88** | 4.43 | 3 | 3.17 | 11 | 2.72 | 14 | 3.04 | 12 | 3.34 | 9 | 3.44 | 9 | 3.80 | 9 |
| **Tankwa** |  |  | 3.05 | 13 | 3.34 | 8 | 3.77 | 8 |  |  |  |  |  |  |
| **Mean** | **4.27** |  | **3.41** |  | **3.33** |  | **3.74** |  | **3.68** |  | **3.67** |  | **3.86** |  |
| **LSDt(0,05)** | **0.23** |  | **0.35** |  | **0.28** |  | **0.23** |  | **0.13** |  | **0.16** |  | **0.20** |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Western Rûens - AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the yield of entries for the Western Rûens for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 207 | 246.15 | 1.189 |  |  |
| **Treatments** | | 51 | 229.99 | 4.510 | 44.29 | <0,001 |
| **Genotypes** | | 12 | 4.96 | 0.413 | 4.06 | <0,001 |
| **Environments** | | 3 | 217.21 | 72.403 | 580.46 | <0,001 |
| **Block** |  | 12 | 1.50 | 0.125 | 1.23 | 0.2714 |
| **Interactions** | | 36 | 7.82 | 0.217 | 2.13 | <0,001 |
| **IPCA** |  | 14 | 4.63 | 0.331 | 3.25 | <0,001 |
| **IPCA** |  | 12 | 2.69 | 0.224 | 2.20 | 0.0145 |
| **Residuals** | | 10 | 0.51 | 0.051 | 0.50 | 0.8893 |
| **Error** |  | 144 | 14.66 | 0.102 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for yield (ton/ha)** | | | | |  |  |
|  | | | | |  |  |
| **Entry** | **Genotype** | **Yield** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 4.22 | 9 | 0.34391 |  |  |
| 2 | PAN 3471 | 4.04 | 13 | 0.42267 |  |  |
| 3 | Ratel | 4.06 | 11 | 0.05641 |  |  |
| 4 | SST 0117 | 4.30 | 5 | -0.14606 |  |  |
| 5 | SST 0127 | 4.27 | 7 | 0.30525 |  |  |
| 6 | SST 0137 | 4.50 | 2 | -0.01441 |  |  |
| 7 | SST 0147 | 4.53 | 1 | 0.25804 |  |  |
| 8 | SST 015 | 4.24 | 8 | 0.22945 |  |  |
| 9 | SST 027 | 4.05 | 12 | -0.24940 |  |  |
| 10 | SST 056 | 4.27 | 6 | -0.05473 |  |  |
| 11 | SST 087 | 4.39 | 4 | -0.53281 |  |  |
| 12 | SST 096 | 4.21 | 10 | -0.28140 |  |  |
| 13 | SST 88 | 4.43 | 3 | -0.33692 |  |  |
| **Mean** |  | **4.27** |  |  |  |  |
| **Coefficient of variation (%)** | | **7.60** |  |  |  |  |
| **LSDt(0.05)** | | **0.23** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Caledon (De Vlei) | 2.77 | 4 | 0.07591 |  |  |
| 2 | Caledon (Roodebloem) | 3.89 | 3 | 0.14719 |  |  |
| 3 | Caledon (Uitvlug) | 5.15 | 2 | 0.60383 |  |  |
| 4 | Riviersonderend (Tygerhoek) | 5.27 | 1 | -0.82692 |  |  |
| **Mean** |  | **4.27** |  |  |  |  |
| **Coefficient of variation (%)** | | **7.60** |  |  |  |  |
| **LSDt(0.05)** | | **0.13** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Western Rûens** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average hectolitre mass (kg/hl) of entries during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 82.77 | 5 | 79.54 | 8 | 73.19 | 12 |  |  |  |  |  |  |
| **PAN 3408** | 80.41 | 7 | 82.48 | 8 | 79.37 | 9 | 75.35 | 6 | 79.40 | 5 | 80.75 | 6 | 81.45 | 8 |
| **PAN 3471** | 82.77 | 1 | 84.13 | 1 | 81.72 | 1 | 77.30 | 1 | 81.48 | 1 | 82.87 | 1 | 83.45 | 1 |
| **PAN 3515** |  |  |  |  | 80.62 | 4 |  |  |  |  |  |  |  |  |
| **Ratel** | 80.00 | 11 | 82.36 | 12 | 79.89 | 6 | 74.72 | 10 | 79.24 | 7 | 80.75 | 7 | 81.18 | 9 |
| **SST 0117** | 80.93 | 6 | 82.73 | 7 |  |  |  |  |  |  |  |  | 81.83 | 6 |
| **SST 0127** | 80.08 | 10 | 81.89 | 14 | 79.65 | 7 |  |  |  |  | 80.54 | 8 | 80.99 | 12 |
| **SST 0137** | 79.67 | 13 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 81.15 | 5 | 83.32 | 4 |  |  |  |  |  |  |  |  | 82.24 | 4 |
| **SST 015** | 81.28 | 4 | 82.48 | 8 | 79.26 | 13 | 75.46 | 5 | 79.62 | 4 | 81.01 | 4 | 81.88 | 5 |
| **SST 027** | 82.67 | 2 | 83.78 | 3 | 80.71 | 3 | 77.20 | 2 | 81.09 | 2 | 82.39 | 2 | 83.23 | 2 |
| **SST 047** |  |  |  |  | 81.55 | 2 | 76.74 | 3 |  |  |  |  |  |  |
| **SST 056** | 80.13 | 9 | 82.08 | 13 | 79.34 | 10 | 75.11 | 7 | 79.17 | 8 | 80.52 | 9 | 81.11 | 10 |
| **SST 087** | 79.71 | 12 | 82.37 | 11 | 79.34 | 10 | 75.11 | 7 | 79.13 | 9 | 80.47 | 10 | 81.04 | 11 |
| **SST 096** | 80.26 | 8 | 82.74 | 6 | 79.32 | 12 | 75.09 | 9 | 79.35 | 6 | 80.77 | 5 | 81.50 | 7 |
| **SST 88** | 82.20 | 3 | 83.89 | 2 | 80.54 | 5 | 74.31 | 11 | 80.24 | 3 | 82.21 | 3 | 83.05 | 3 |
| **Tankwa** |  |  | 82.39 | 10 | 79.18 | 14 | 75.59 | 4 |  |  |  |  |  |  |
| **Mean** | **80.87** |  | **82.82** |  | **80.00** |  | **75.43** |  | **79.86** |  | **81.23** |  | **81.91** |  |
| **LSDt(0,05)** | **0.75** |  | **0.46** |  | **0.78** |  | **0.57** |  | **0.31** |  | **0.38** |  | **0.43** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Western Rûens - AMMI Analysis** | | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the hectolitre mass of entries for the Western Rûens for 2016** | | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 207 | 1374.3 | 6.64 |  |  |
| **Treatments** | | 51 | 1176.1 | 23.06 | 24.52 | <0,001 |
| **Genotypes** | | 12 | 226.8 | 18.90 | 20.10 | <0,001 |
| **Environments** | | 3 | 883.8 | 294.59 | 56.24 | <0,001 |
| **Block** |  | 12 | 62.9 | 5.24 | 5.57 | <0,001 |
| **Interactions** | | 36 | 65.5 | 1.82 | 1.94 | 0.0034 |
| **IPCA** |  | 14 | 30.5 | 2.18 | 2.32 | 0.0067 |
| **IPCA** |  | 12 | 19.0 | 1.58 | 1.68 | 0.0760 |
| **Residuals** | | 10 | 16.0 | 1.60 | 1.71 | 0.0846 |
| **Error** |  | 144 | 135.4 | 0.94 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for hectolitre mass (kg/hl)** | | | | | | | |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 80.41 | 7 | 0.18410 |  |  |
| 2 | PAN 3471 | 82.77 | 1 | 0.72219 |  |  |
| 3 | Ratel | 80.00 | 11 | 0.30418 |  |  |
| 4 | SST 0117 | 80.93 | 6 | 0.13218 |  |  |
| 5 | SST 0127 | 80.08 | 10 | -0.20504 |  |  |
| 6 | SST 0137 | 79.67 | 13 | -0.34415 |  |  |
| 7 | SST 0147 | 81.15 | 5 | 0.22444 |  |  |
| 8 | SST 015 | 81.28 | 4 | 0.12038 |  |  |
| 9 | SST 027 | 82.67 | 2 | 0.22889 |  |  |
| 10 | SST 056 | 80.13 | 9 | 0.35105 |  |  |
| 11 | SST 087 | 79.71 | 12 | -1.24955 |  |  |
| 12 | SST 096 | 80.26 | 8 | -0.34059 |  |  |
| 13 | SST 88 | 82.20 | 3 | -0.12808 |  |  |
| **Mean** |  | **80.87** |  |  |  |  |
| **Coefficient of variation (%)** | | **1.30** |  |  |  |  |
| **LSDt(0.05)** | | **0.75** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Caledon (De Vlei) | 78.19 | 4 | -0.66659 |  |  |
| 2 | Caledon (Roodebloem) | 82.28 | 2 | -0.71419 |  |  |
| 3 | Caledon (Uitvlug) | 79.63 | 3 | 1.34327 |  |  |
| 4 | Riviersonderend (Tygerhoek) | 83.37 | 1 | 0.03752 |  |  |
| **Mean** |  | **80.87** |  |  |  |  |
| **Coefficient of variation (%)** | | **1.30** |  |  |  |  |
| **LSDt(0.05)** | | **0.42** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Western Rûens** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average protein content (%) of entries during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 12.28 | 5 | 11.50 | 9 | 12.38 | 4 |  |  |  |  |  |  |
| **PAN 3408** | 12.39 | 5 | 12.18 | 7 | 11.65 | 8 | 11.91 | 7 | 12.03 | 3 | 12.07 | 4 | 12.29 | 5 |
| **PAN 3471** | 11.90 | 11 | 12.03 | 9 | 11.88 | 6 | 11.63 | 10 | 11.86 | 5 | 11.94 | 6 | 11.97 | 7 |
| **PAN 3515** |  |  |  |  | 11.98 | 5 |  |  |  |  |  |  |  |  |
| **Ratel** | 12.68 | 3 | 12.08 | 8 | 11.33 | 13 | 11.70 | 9 | 11.95 | 4 | 12.03 | 5 | 12.38 | 4 |
| **SST 0117** | 12.26 | 6 | 12.28 | 5 |  |  |  |  |  |  |  |  | 12.27 | 6 |
| **SST 0127** | 12.63 | 4 | 12.34 | 4 | 11.75 | 7 |  |  |  |  | 12.24 | 3 | 12.49 | 3 |
| **SST 0137** | 12.16 | 7 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 11.94 | 10 | 11.53 | 12 |  |  |  |  |  |  |  |  | 11.74 | 11 |
| **SST 015** | 11.81 | 13 | 11.77 | 10 | 11.37 | 12 | 11.93 | 6 | 11.72 | 7 | 11.65 | 8 | 11.79 | 8 |
| **SST 027** | 13.27 | 1 | 13.02 | 1 | 12.15 | 4 | 12.79 | 3 | 12.81 | 1 | 12.81 | 1 | 13.15 | 1 |
| **SST 047** |  |  |  |  | 13.82 | 1 | 14.55 | 1 |  |  |  |  |  |  |
| **SST 056** | 11.89 | 12 | 11.64 | 11 | 11.50 | 9 | 11.87 | 8 | 11.73 | 6 | 11.68 | 7 | 11.77 | 10 |
| **SST 087** | 12.15 | 8 | 11.23 | 14 | 11.44 | 11 | 11.41 | 11 | 11.56 | 8 | 11.61 | 9 | 11.69 | 12 |
| **SST 096** | 12.76 | 2 | 12.36 | 3 | 12.54 | 3 | 12.28 | 5 | 12.49 | 2 | 12.55 | 2 | 12.56 | 2 |
| **SST 88** | 12.07 | 9 | 11.51 | 13 | 11.04 | 14 | 11.09 | 12 | 11.43 | 9 | 11.54 | 10 | 11.79 | 8 |
| **Tankwa** |  |  | 12.98 | 2 | 12.83 | 2 | 13.26 | 2 |  |  |  |  |  |  |
| **Mean** | **12.30** |  | **12.09** |  | **11.91** |  | **12.23** |  | **11.95** |  | **12.01** |  | **12.16** |  |
| **LSDt(0,05)** | **0.48** |  | **0.35** |  | **0.58** |  | **0.51** |  | **0.24** |  | **0.26** |  | **0.31** |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Western Rûens - AMMI Analysis** | | | | | | |
|  |  |  |  |  |  |  |
| **Anova of the protein content of entries for the Western Rûens for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 207 | 303.07 | 1.464 |  |  |
| **Treatments** | | 51 | 229.04 | 4.491 | 11.75 | <0,001 |
| **Genotypes** | | 12 | 35.09 | 2.925 | 7.65 | <0,001 |
| **Environments** | | 3 | 163.70 | 54.565 | 34.44 | <0,001 |
| **Block** |  | 12 | 19.01 | 1.584 | 4.15 | <0,001 |
| **Interactions** | | 36 | 30.25 | 0.840 | 2.20 | <0,001 |
| **IPCA** |  | 14 | 18.00 | 1.286 | 3.37 | <0,001 |
| **IPCA** |  | 12 | 7.57 | 0.631 | 1.65 | 0.0838 |
| **Residuals** | | 10 | 4.67 | 0.467 | 1.22 | 0.2810 |
| **Error** |  | 144 | 55.02 | 0.382 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 12.39 | 5 | -0.18736 |  |  |
| 2 | PAN 3471 | 11.90 | 11 | -0.55534 |  |  |
| 3 | Ratel | 12.68 | 3 | 0.45816 |  |  |
| 4 | SST 0117 | 12.26 | 6 | 0.15142 |  |  |
| 5 | SST 0127 | 12.63 | 4 | 0.01105 |  |  |
| 6 | SST 0137 | 12.16 | 7 | 0.20253 |  |  |
| 7 | SST 0147 | 11.94 | 10 | 0.14416 |  |  |
| 8 | SST 015 | 11.81 | 13 | -0.68167 |  |  |
| 9 | SST 027 | 13.27 | 1 | -0.48250 |  |  |
| 10 | SST 056 | 11.89 | 12 | 0.05520 |  |  |
| 11 | SST 087 | 12.15 | 8 | 0.64882 |  |  |
| 12 | SST 096 | 12.76 | 2 | -0.29093 |  |  |
| 13 | SST 88 | 12.07 | 9 | 0.52645 |  |  |
| **Mean** |  | **12.30** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.60** |  |  |  |  |
| **LSDt(0.05)** | | **0.48** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Caledon (De Vlei) | 13.55 | 1 | 1.11821 |  |  |
| 2 | Caledon (Roodebloem) | 11.08 | 4 | 0.03366 |  |  |
| 3 | Caledon (Uitvlug) | 12.46 | 2 | -0.25450 |  |  |
| 4 | Riviersonderend (Tygerhoek) | 12.11 | 3 | -0.89736 |  |  |
| **Mean** |  | **12.30** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.60** |  |  |  |  |
| **LSDt(0.05)** | | **0.27** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Western Rûens** | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Average falling number (s) of entries during the full or partial period from 2013 - 2016** | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **2013** | **R** | **4 year average** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2013 - 2016** | **2014 - 2016** | **2015 - 2016** |
| **Kwartel** |  |  | 373 | 7 | 324 | 5 | 330 | 2 |  |  |  |  |  |  |
| **PAN 3408** | 334 | 13 | 363 | 13 | 309 | 12 | 265 | 12 | 318 | 9 | 335 | 10 | 348 | 11 |
| **PAN 3471** | 365 | 2 | 381 | 1 | 333 | 2 | 297 | 10 | 344 | 3 | 360 | 2 | 373 | 1 |
| **PAN 3515** |  |  |  |  | 319 | 7 |  |  |  |  |  |  |  |  |
| **Ratel** | 369 | 1 | 377 | 4 | 337 | 1 | 331 | 1 | 353 | 1 | 361 | 1 | 373 | 2 |
| **SST 0117** | 352 | 5 | 377 | 3 |  |  |  |  |  |  |  |  | 364 | 5 |
| **SST 0127** | 355 | 4 | 376 | 5 | 320 | 6 |  |  |  |  | 350 | 4 | 366 | 4 |
| **SST 0137** | 346 | 7 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 0147** | 341 | 10 | 354 | 14 |  |  |  |  |  |  |  |  | 347 | 12 |
| **SST 015** | 359 | 3 | 379 | 2 | 325 | 4 | 325 | 4 | 347 | 2 | 354 | 3 | 369 | 3 |
| **SST 027** | 350 | 6 | 371 | 9 | 316 | 9 | 316 | 6 | 338 | 4 | 345 | 5 | 360 | 6 |
| **SST 047** |  |  |  |  | 333 | 2 | 317 | 5 |  |  |  |  |  |  |
| **SST 056** | 345 | 8 | 371 | 8 | 319 | 8 | 313 | 7 | 337 | 5 | 345 | 6 | 358 | 7 |
| **SST 087** | 340 | 11 | 367 | 12 | 310 | 10 | 306 | 9 | 331 | 8 | 339 | 8 | 353 | 10 |
| **SST 096** | 341 | 9 | 370 | 11 | 309 | 13 | 308 | 8 | 332 | 7 | 340 | 7 | 355 | 8 |
| **SST 88** | 338 | 12 | 370 | 10 | 306 | 14 | 326 | 3 | 335 | 6 | 338 | 9 | 354 | 9 |
| **Tankwa** |  |  | 374 | 6 | 310 | 11 | 288 | 11 |  |  |  |  |  |  |
| **Mean** | **349** |  | **371** |  | **319** |  | **310** |  | **337** |  | **347** |  | **360** |  |
| **LSDt(0,05)** | **8.70** |  | **9.90** |  | **11.00** |  | **17.09** |  | **5.90** |  | **5.40** |  | **6.30** |  |

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| **Western Rûens - AMMI Analysis** | | | | | | |
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| **Anova of the falling number of entries for the Western Rûens for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 207 | 274383 | 1326 |  |  |
| **Treatments** | | 51 | 250639 | 4914 | 33.60 | <0,001 |
| **Genotypes** | | 12 | 21868 | 1822 | 12.46 | <0,001 |
| **Environments** | | 3 | 222608 | 74203 | 331.65 | <0,001 |
| **Block** |  | 12 | 2685 | 224 | 1.53 | 0.1197 |
| **Interactions** | | 36 | 6163 | 171 | 1.17 | 0.2554 |
| **IPCA** |  | 14 | 3920 | 280 | 1.91 | 0.0292 |
| **IPCA** |  | 12 | 1245 | 104 | 0.71 | 0.7402 |
| **Residuals** | | 10 | 998 | 100 | 0.68 | 0.7398 |
| **Error** |  | 144 | 21060 | 146 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | PAN 3408 | 334 | 13 | 2.26885 |  |  |
| 2 | PAN 3471 | 365 | 2 | 0.89085 |  |  |
| 3 | Ratel | 369 | 1 | -2.36164 |  |  |
| 4 | SST 0117 | 352 | 5 | -2.52073 |  |  |
| 5 | SST 0127 | 355 | 4 | -1.82975 |  |  |
| 6 | SST 0137 | 346 | 7 | 0.58114 |  |  |
| 7 | SST 0147 | 341 | 10 | -0.02917 |  |  |
| 8 | SST 015 | 359 | 3 | -1.35566 |  |  |
| 9 | SST 027 | 350 | 6 | 1.13516 |  |  |
| 10 | SST 056 | 345 | 8 | 0.04164 |  |  |
| 11 | SST 087 | 340 | 11 | 2.48430 |  |  |
| 12 | SST 096 | 341 | 9 | 0.66672 |  |  |
| 13 | SST 88 | 338 | 12 | 0.02828 |  |  |
| **Mean** |  | **349** |  |  |  |  |
| **Coefficient of variation (%)** | | **3.60** |  |  |  |  |
| **LSDt(0.05)** | | **8.70** |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Caledon (De Vlei) | 378 | 2 | -4.60706 |  |  |
| 2 | Caledon (Roodebloem) | 317 | 3 | 0.95399 |  |  |
| 3 | Caledon (Uitvlug) | 316 | 4 | 2.94388 |  |  |
| 4 | Riviersonderend (Tygerhoek) | 385 | 1 | 0.70918 |  |  |
| **Mean** |  | **349** |  |  |  |  |
| **Coefficient of variation (%)** | | **3.60** |  |  |  |  |
| **LSDt(0.05)** | | **4.80** |  |  |  |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
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| **Western Rûens** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Caledon (De Vlei) 2016-05-09** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 2.76 | ab | 9 | 7.65 | 77.76 | 9 | 13.26 | 10 | 351 | 13 |
| **PAN 3471** | 2.47 | c | 12 | 5.54 | 79.09 | 3 | 12.67 | 12 | 392 | 4 |
| **Ratel** | 2.46 | c | 13 | 7.39 | 76.14 | 13 | 14.77 | 1 | 406 | 1 |
| **SST 0117** | 2.92 | a | 4 | 4.69 | 78.04 | 8 | 13.70 | 6 | 393 | 3 |
| **SST 0127** | 2.95 | a | 1 | 1.85 | 78.15 | 6 | 13.79 | 5 | 392 | 4 |
| **SST 0137** | 2.94 | a | 3 | 7.35 | 77.04 | 12 | 13.54 | 8 | 371 | 8 |
| **SST 0147** | 2.95 | a | 2 | 5.56 | 78.63 | 5 | 13.32 | 9 | 370 | 9 |
| **SST 015** | 2.84 | a | 6 | 2.76 | 78.95 | 4 | 12.26 | 13 | 394 | 2 |
| **SST 027** | 2.55 | bc | 11 | 4.11 | 80.40 | 1 | 14.07 | 3 | 374 | 6 |
| **SST 056** | 2.76 | ab | 9 | 3.34 | 77.08 | 11 | 13.10 | 11 | 373 | 7 |
| **SST 087** | 2.80 | ab | 7 | 6.80 | 77.44 | 10 | 14.08 | 2 | 357 | 12 |
| **SST 096** | 2.77 | ab | 8 | 3.43 | 78.09 | 7 | 13.64 | 7 | 366 | 11 |
| **SST 88** | 2.85 | a | 5 | 4.56 | 79.63 | 2 | 13.95 | 4 | 368 | 10 |
| **Mean** | **2.77** |  |  |  | **78.19** |  | **13.55** |  | **378** |  |
| **Coefficient of variation (%)** | **6.33** |  |  |  | **0.62** |  | **4.15** |  | **4.02** |  |
| **LSDt(0,05)** | **0.27** |  |  |  | **0.76** |  | **0.88** |  | **23.64** |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
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| **Western Rûens** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Caledon (Roodebloem) 2016-05-06** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 3.87 | b | 8 | 4.40 | 81.38 | 10 | 11.62 | 3 | 302 | 13 |
| **PAN 3471** | 3.95 | b | 5 | 7.62 | 84.03 | 2 | 10.32 | 13 | 326 | 2 |
| **Ratel** | 3.82 | b | 11 | 5.39 | 81.91 | 9 | 10.96 | 7 | 335 | 1 |
| **SST 0117** | 3.83 | b | 10 | 1.93 | 82.16 | 7 | 10.62 | 10 | 317 | 8 |
| **SST 0127** | 3.97 | b | 4 | 7.46 | 80.56 | 13 | 11.65 | 2 | 322 | 3 |
| **SST 0137** | 4.02 | ab | 2 | 4.52 | 81.13 | 11 | 11.44 | 4 | 318 | 5 |
| **SST 0147** | 4.39 | a | 1 | 5.63 | 82.34 | 6 | 10.79 | 9 | 312 | 9 |
| **SST 015** | 3.35 | c | 13 | 13.36 | 82.49 | 4 | 10.52 | 12 | 317 | 7 |
| **SST 027** | 3.66 | bc | 12 | 5.28 | 83.85 | 3 | 12.18 | 1 | 319 | 4 |
| **SST 056** | 3.85 | b | 9 | 15.01 | 81.06 | 12 | 10.86 | 8 | 318 | 6 |
| **SST 087** | 3.91 | b | 7 | 10.63 | 82.36 | 5 | 11.17 | 6 | 311 | 10 |
| **SST 096** | 4.02 | ab | 3 | 13.57 | 82.15 | 8 | 11.27 | 5 | 309 | 12 |
| **SST 88** | 3.91 | b | 6 | 18.00 | 84.17 | 1 | 10.62 | 10 | 310 | 11 |
| **Mean** | **3.89** |  |  |  | **82.28** |  | **11.08** |  | **317** |  |
| **Coefficient of variation (%)** | **6.85** |  |  |  | **0.90** |  | **3.32** |  | **2.76** |  |
| **LSDt(0,05)** | **0.41** |  |  |  | **1.15** |  | **0.57** |  | **13.59** |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
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| **Western Rûens** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Riviersonderend (Tygerhoek) 2016-05-** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 4.94 | de | 12 | 2.24 | 83.20 | 7 | 12.27 | 6 | 377 | 11 |
| **PAN 3471** | 4.67 | e | 13 | 1.33 | 85.58 | 1 | 12.38 | 4 | 400 | 3 |
| **Ratel** | 5.01 | de | 10 | 6.38 | 82.85 | 10 | 12.54 | 3 | 410 | 1 |
| **SST 0117** | 5.39 | abcd | 4 | 3.47 | 83.65 | 4 | 11.84 | 8 | 384 | 6 |
| **SST 0127** | 4.95 | de | 11 | 10.31 | 83.30 | 5 | 12.34 | 5 | 387 | 4 |
| **SST 0137** | 5.57 | abc | 3 | 4.35 | 82.73 | 11 | 11.73 | 9 | 383 | 7 |
| **SST 0147** | 5.28 | bcd | 7 | 5.55 | 83.15 | 9 | 11.49 | 10 | 373 | 12 |
| **SST 015** | 5.19 | cd | 9 | 2.63 | 83.30 | 5 | 12.19 | 7 | 401 | 2 |
| **SST 027** | 5.24 | cd | 8 | 10.15 | 84.48 | 2 | 13.78 | 1 | 387 | 5 |
| **SST 056** | 5.32 | bcd | 6 | 6.76 | 83.18 | 8 | 11.42 | 11 | 380 | 8 |
| **SST 087** | 5.85 | a | 1 | 6.29 | 82.35 | 12 | 11.4 | 12 | 379 | 10 |
| **SST 096** | 5.34 | bcd | 5 | 8.05 | 82.05 | 13 | 12.73 | 2 | 380 | 8 |
| **SST 88** | 5.76 | ab | 2 | 7.90 | 83.93 | 3 | 11.37 | 13 | 369 | 13 |
| **Mean** | **5.27** |  |  |  | **83.37** |  | **12.11** |  | **385** |  |
| **Coefficient of variation (%)** | **5.85** |  |  |  | **0.59** |  | **3.98** |  | **4.66** |  |
| **LSDt(0,05)** | **0.48** |  |  |  | **0.77** |  | **0.75** |  | **27.85** |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Western Rûens** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Caledon (Uitvlug) 2016-05-09** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **PAN 3408** | 5.29 | abc | 4 | 6.03 | 79.37 | 7 | 12.30 | 7 | 306 | 13 |
| **PAN 3471** | 5.11 | cd | 8 | 5.61 | 82.43 | 1 | 12.24 | 10 | 343 | 1 |
| **Ratel** | 4.96 | cde | 11 | 3.75 | 79.08 | 9 | 12.42 | 5 | 324 | 2 |
| **SST 0117** | 5.05 | cde | 9 | 10.41 | 79.79 | 6 | 12.85 | 3 | 314 | 6 |
| **SST 0127** | 5.22 | abc | 5 | 6.15 | 78.30 | 11 | 12.78 | 4 | 318 | 5 |
| **SST 0137** | 5.48 | ab | 3 | 1.36 | 77.64 | 12 | 11.96 | 12 | 311 | 8 |
| **SST 0147** | 5.50 | ab | 2 | 5.09 | 80.41 | 4 | 12.22 | 11 | 308 | 11 |
| **SST 015** | 5.57 | a | 1 | 0.78 | 80.37 | 5 | 12.28 | 8 | 324 | 3 |
| **SST 027** | 4.76 | de | 12 | 7.73 | 81.98 | 2 | 13.03 | 2 | 321 | 4 |
| **SST 056** | 5.11 | cd | 7 | 7.83 | 79.24 | 8 | 12.27 | 9 | 310 | 9 |
| **SST 087** | 5.00 | cde | 10 | 9.28 | 76.63 | 13 | 11.93 | 13 | 313 | 7 |
| **SST 096** | 4.71 | e | 13 | 8.15 | 78.86 | 10 | 13.33 | 1 | 309 | 10 |
| **SST 88** | 5.19 | bc | 6 | 11.51 | 81.09 | 3 | 12.32 | 6 | 307 | 12 |
| **Mean** | **5.15** |  |  |  | **79.63** |  | **12.46** |  | **316** |  |
| **Coefficient of variation (%)** | **4.45** |  |  |  | **1.34** |  | **5.24** |  | **2.60** |  |
| **LSDt(0,05)** | **0.36** |  |  |  | **1.67** |  | **1.02** |  | **12.77** |  |