**NATIONAL WHEAT CULTIVAR EVALUATION PROGRAMME UNDER IRRIGATION REPORT 2016**

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1. **INTRODUCTION AND BACKGROUND**

Irrigation wheat is increasingly becoming important to the South African wheat industry, as the area under dryland wheat in the summer rainfall area decreased significantly in the past few years. Generally, the irrigation wheat area of South Africa can be divided into four main geographic regions – the Cooler Central irrigation region in the Northern Cape, the Warmer Northern irrigation region in North West, Limpopo and Gauteng provinces, the Highveld region in Mpumalanga and Free State, and lastly, the KwaZulu-Natal region.

**Mandate of the ARC-SGI**

The ARC-Small Grain Institute has the mandate to conduct the National Cultivar Adaptation programme in all the major irrigation 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 all cultivars from 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 to get a reliable comparison of the longer term data.

**Objectives**

The specific objective of the study was to carry out wheat cultivar evaluation trials in all the major irrigation wheat production regions of South Africa, namely KwaZulu-Natal, Highveld, Cooler Central and Warmer Northern Irrigation areas, in line with the *National Cultivar Evaluation Protocol*. The end objective of the cultivar evaluation program under irrigation is to supply reliable guidelines for the choice of adapted cultivars to its clients and main benefactors, mainly wheat producers. The data presented in this report were generated from wheat cultivar adaptation trials under irrigation conditions in South Africa.

1. **SITE SELECTION AND CHARACTERISATION**

Trials were planted on farms of collaborators under commercial production conditions, where soil, climate and general production practices are representative of a specific area. In 2016, five trials were planted at various localities in KwaZulu-Natal, six in the Highveld, seven in the Warmer Northern irrigation areas and 14 in the Cooler central irrigation areas. All trials were carried out on the fields of wheat producers. Trials sites were prepared by the producers, who were simultaneously preparing the field for their own crops. The list of localities, GPS coordinates, farm names and previous crops on the sites are listed in the Tables below:

**KwaZulu-Natal**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Locality** | **GPS Coordinates** | **Farm Name** | **Farmer Details** | | **Previous crop on trial site** |
| **Name** | **Contact number** |
| Bergville (CB) | S28º46.106’/EO29º21.636 | Hongerspoort | C Britz | 0845833544 | Maize |
| Bergville (JP) | S28º47.320’/EO29º20.020’ | Voorspoed | J Potgieter | 0828064344 | Soybean |
| Winterton (PM) | S28º54.030’/EO29º29.349’ | Delta | P Mostert | 0829203554 | Soybean |
| Winterton(TM) | S28º55.394’/EO29º33.544’ | Gourton Farm | T Muirhead | 0834107090 | Soybean |
| Colenso | S28º44.842’/EO29º42.486’ | Riverside | Vickers | 0823300471 | Maize |

**Highveld**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Locality** | **GPS Coordinates** | **Farm Name** | **Farmer Details** | | **Previous crop on trial site** |
| **Name** | **Contact number** |
| Villiers | S26º58.028’/EO28º44.512’ | Wolwefontein | J Jordaan | 0827754817 | Maize |
| Welkom | S28º10.280’/EO26º23.822’ | Valsfontein | AJ du Bruyn | 0823382371 | Potatoes |
| Clarens | S28º26.488’/EO28º22.252’ | Miemiesrust | P Farrel | 0836278404 | Potatoes |
| Harrismith (JL) | S28º08.486’/EO28º53.803’ | Exccelsior | J Leslie | 0823396643 | Potatoes |
| Harrismith TF) | S28º09.657’/EO28º57.242’ | Grootdraai | T Ferreira | 0827757372 | Maize |
| Potchefstroom | S27º57,8”E24º50,4” | Buffelsvlei | W Oosthuizen | 0827098349 | Sunflower |

**Warmer Northern Irrigation area**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Locality** | **GPS Coordinates** | **Farm Name** | **Farmer Details** | | **Previous crop on trial site** |
| **Name** | **Contact number** |
| Ohrigstad | S24º33,,4 E30º39,9 | F.G.Marx | F Marx | 0829462333 | Dry bean |
| Skuinsdrift | S26º03,5 E28º05,6 | Skuinsdrift Bdy. | J Kalcic | 0825672729 | Soybean |
| Brits JvR | S25º35,5 E27º46,2 | HC Coetzee | J van Rensburg | 0823576147 | Soybean |
| Burgersfort | S24º47,7 E30º20,0 | Dirishana | W Potgieter | 0828297053 | Dry bean |
| Groblersdal | S25º17,1 E29º25,2 | N Botha | N Botha | 0832836006 | Soybean |
| Koedoeskop | S25º00,9 E27º32,7 | K Pieterse | K Pieterse | 0837727441 | Soybean |
| Makoppa | S24º31,7 E27º13,5 | Thaba Thole | R Ysell | 0814766158 | Maize |

**Cooler Central irrigation area**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Locality** | **GPS Coordinates** | **Farm Name** | **Farmer Details** | | **Previous crop on trial site** |
| **Name** | **Contact number** |
| Vaalharts 1 | S24º57,8 E024º50,4 | Research farm | B v Rensburg | 0828573994 | Fallow |
| Upington | S28º28,2 E021º14,8 | Research Farm | K Lategan | 0823530069 | Fallow |
| Vaalharts 2 | S27°57.8 E024°50.4 | Research Farm | B v Rensburg | 0828573994 | Fallow |
| Hartswater | S24°32.2 E027°13.9 | Perseel 6D2 | W Kruger | 0829482033 | Cotton |
| Prieska 1 | S29'32.4 E0 22'58.1 | Bloukrans | Mr Gery du Plessis | 0824138758 | Maize |
| Modderrivier 1 | S29’06.5 E024’35.1 | Klipdrift | Mr Alan Shergold | 0832837913 | Onion |
| Hopetown 1 | S29’38.0 E024’10.4 | Lilydale | Mr Koos de Wet | 0832664135 | Soybean |
| Modderrivier2 | S29’07.0 E024’38.4 | Perseel B 19 | Mr Stefan Voster | 0836267222 | Maize |
| Douglas | S29’16.8 E023’48.0 | Torquay | Mr Klasie Jacobs | 0828064446 | Maize |
| Barkley West | S28’35.0 E024’35.4 | Wildeklawer | Mr Martin Oosthuizen | 0794950164 | Potatoes |
| Prieska 2 | S29’33.1 E022’56.3 | Bloukrans | Mr Gery du Plessis | 0824138758 | Maize |
| Rama 1 | S29’52.9 E024’34.6 | Altemit | Mr Leon Burger | 0829482961 | Maize |
| Rama 2 | S29’46.9 E024’25.0 | Kalkplaat | Mr RP Strauss | 0827755454 | Maize |
| Hopetown 2 | S29’38.4 E024’10.8 | Lilydale | Mr Koos de Wet | 0832664135 | Maize |

**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 to collect 3 samples from each of the fields. The samples were bulked, air dried (visible organic debris removed), ground (< 2 mm) and analysed for the following: pH (KCl) and exchangeable acid (KCl), Cations - Mg, K, Ca, Na and S (Ammonium acetate) and available P (Bray 1).

*Soil analyses results from various localities*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Locality** | **pH (KCl)** | **P (mg/kg)** | **K (mg/kg)** | **Ca (mg/kg)** | **Mg (mg/kg)** | **Na (mg/kg)** | **S (mg/kg)** | **Exch. acid (cmol/kg)** |
| Bergville (CF) | 5.6 | 66.7 | 371.5 | 1340 | 193.4 | 6.9 | 17.74 | 0.00 |
| Bergville (JP) | 4.8 | 9.3 | 149.5 | 1100 | 230.5 | 10.1 | 28.22 | 0.00 |
| Winterton (TM) | 4.6 | 33.2 | 120.6 | 899.0 | 170.9 | 6.6 | 28.35 | 0.40 |
| Winterton (PM) | 4.6 | 69.8 | 101.3 | 866 | 151.6 | 15.6 | 7.76 | 0 .41 |
| Colenso | 5.0 | 24 | 116 | 2927 | 1410.3 | 98.0 | 25.66 | 0.00 |
| Villiers | 7.0 | 69.2 | 167.9 | 809 | 185.6 | 29.8 | 11.39 | 0.00 |
| Welkom | 4.7 | 32 | 119 | 799 | 162 | 5.6 | 28 | 0.00 |
| Harrismith (JL) | 5.7 | 24 | 155.7 | 762 | 121 | 258.8 | 19 | 0.00 |
| Harrismith (TF) | 5.7 | 21.6 | 201 | 1037 | 226 | 4.0 | 5.51 | 0.00 |
| Clarens | 5.5 | 61.7 | 192.1 | 873 | 146.3 | 9 | 89.92 | 0.00 |
| Prieska 1 | 7.7 | 46.5 | 369.9 | 2013 | 447.3 | 65.0 | 39.87 | 0.0 |
| Modderrivier 1 | 5.7 | 59.1 | 266.1 | 559 | 113.2 | 6.5 | 9.31 | 0.0 |
| Hopetown | 6.1 | 41.7 | 241.6 | 2243 | 404.2 | 36.5 | 8.17 | 0.0 |
| Rietrivier PP1 | 5.2 | 34.3 | 110.8 | 300 | 76.2 | 7.6 | 2.37 | 0.0 |
| Modderrivier2 | 4.1 | 54.0 | 152.4 | 438 | 103.9 | 5.5 | 3.22 | 0.38 |
| Douglas Late | 4.0 | 77.3 | 249.9 | 2620 | 292.2 | 24.6 | 157.90 | 0.27 |
| Barkley west | 7.2 | 100.3 | 267.6 | 936 | 202.1 | 42.9 | 28.31 | 0.00 |
| Prieska2 | 5.6 | 41.0 | 75.3 | 1248 | 363.4 | 36.7 | 1.86 | 0.00 |
| Rama 1 | 5.8 | 53.4 | 298.2 | 2116 | 478.2 | 28.2 | 5.56 | 0.00 |
| Rama 2 | 6.2 | 42.1 | 129.1 | 2008 | 437.2 | 30.7 | 3.36 | 0.00 |
| Hopetown 2 | 6.8 | 80.1 | 428.8 | 3264 | 419.9 | 38.8 | 15.68 | 0.00 |
| Brits | 7.0 | 6.0 | 234.0 | 7800 | 1512.7 | 343.5 | 44.08 | 0.00 |
| Burgersfort | 7.6 | 69.5 | 257.5 | 837 | 363.6 | 26.6 | 7.34 | 0.00 |
| Groblersdal | 6.8 | 21.1 | 192.4 | 1023 | 558.2 | 116.3 | 47.55 | 0.00 |
| Hartswater | 7.1 | 46.9 | 410.7 | 1118 | 226.7 | 36.0 | 251.15 | 0.00 |
| Koedoeskop | 6.8 | 12.6 | 93.5 | 2431 | 895.6 | 189.9 | 35.33 | 0.00 |
| Makoppa | 7.5 | 39.9 | 233.4 | 1073 | 404.5 | 45.9 | 8.09 | 0.00 |
| Ohrigstad | 7.5 | 67.0 | 361.4 | 2779 | 840.1 | 51.1 | 9.24 | 0.00 |
| Potchefstroom | 7.0 | 21.9 | 51.1 | 768 | 255.7 | 35.1 | 56.89 | 0.00 |
| Skuinsdrif | 6.1 | 51.1 | 224.0 | 2253 | 803.9 | 40.6 | 13.40 | 0.00 |
| Upington | 6.4 | 50.6 | 304.2 | 2002 | 442.8 | 36.6 | 5.99 | 0.00 |
| Vaalharts | 6.2 | 43.4 | 226.5 | 583 | 193.0 | 23.9 | 13.44 | 0.00 |

1. **ENTRIES FOR THE 2016 PROGRAM**

Three institutions, namely ARC-SGI, Sensako and Pannar provided 20 entries for the 2016 program. New entries were SST 8154 and SST 8155.

*Entries for the 2016 program*

|  |  |  |  |
| --- | --- | --- | --- |
| **Institution** | **Name of cultivar** | **Type** | **Release date** |
| Small Grain Institute | Duzi | Pure line | 2004 |
| Krokodil | Pure line | 2004 |
| Sabie | Pure line | 2009 |
| Pannar | PAN 3400 | Pure line | 2011 |
| PAN 3471 | Pure line | 2008 |
| PAN 3515 | Pure line | 2012 |
| PAN 3497 | Pure line | 2010 |
| PAN 3623 | Pure line | 2013 |
| Sensako | SST 806 | Pure line | 2000 |
| SST 8125 | Pure line | 2012 |
| SST 8135 | Pure line | 2013 |
| \*SST 8154 | Pure line | 2015 |
| \*SST 8155 | Pure line | 2015 |
| SST 835 | Pure line | 2003 |
| SST 843 | Pure line | 2004 |
| SST 866 | Pure line | 2006 |
| SST 875 | Pure line | 2007 |
| SST 877 | Pure line | 2007 |
| SST 884 | Pure line | 2008 |
| SST 895 | Pure line | 2009 |

\*New entries for the 2016 program

*Seed treatment and germination percentage*

The NCEP protocol stipulates that seed for the field trials must either be untreated, or treated with Vitavax. In the table below the seed treatment of each cultivar is indicated as it was received.

All untreated seed batches were treated with Vitavax in order to standardise this procedure across cultivars.

The germination percentage of all the cultivars is also indicated in the table. All seed batches, with the exception of SST 875, had an excellent germination percentage of 89% or above.

|  |  |  |  |
| --- | --- | --- | --- |
| **Origin** | **Entry** | **Seed treatment** | **Germination (%)** |
| Small Grain Institute | Duzi | Untreated | 98% |
| Krokodil | Untreated | 98% |
| Sabie | Untreated | 92% |
| Pannar | PAN 3400 | Untreated | 98% |
| PAN 3471 | Untreated | 97% |
| PAN 3515 | Vitavax | 98% |
| PAN 3497 | Untreated | 97% |
| PAN 3623 | Untreated | 96% |
| Sensako | SST 806 | Untreated | 91% |
| SST 8125 | Untreated | 91% |
| SST 8135 | Untreated | 93% |
| \*SST 8154 | Untreated | 92% |
| \*SST 8155 | Untreated | 93% |
| SST 835 | Untreated | 93% |
| SST 843 | Untreated | 96% |
| SST 866 | Untreated | 89% |
| SST 875 | Untreated | 79% |
| SST 877 | Untreated | 89% |
| SST 884 | Untreated | 92% |
| SST 895 | Untreated | 94% |

The seed was tested for germination percentage and impurities in line with the protocol. The thousand kernel mass (TKM) was used to realise equal plant population within the trials. The TKM values for the different cultivars are shown in the table below. The TKM values were used to calculate the amount of seed per plot to obtain the required seeding densities. All cultivars were planted at the same number of plants/m2. Seeding density at the earlier plantings in the Cooler Areas, Highveld and Warmer Area were 225 plants/m2, with 275 plants/m2 at the later planting dates (July dates) and KwaZulu-Natal to compensate for reduced tillering. This increase in seeding density constitutes an increase of approximately 20 kg seed/ha or 50 plants/m2. Planting dates are chosen to cover the available planting spectrum in each area, also coinciding with the planting time of collaborators to simplify in season crop management.

*Thousand Kernel mass (g/1000 kernels) and seeding densities (g/plot)for all entries*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Cultivar** | **TKM** | **Seeding density (g/plot)** | | | | | |
| **Warmer and Cooler Areas** | | | **Highveld** | | **KwaZulu-Natal** |
| **Early planting** | **Late planting** | **Early planting** | | **Late planting** |
| *225 plants/m2* | *275 plants/m2* | *225 plants/m2* | | *275 plants/m2* | *275 plants/m2* |
| Duzi | 42,0 | 95,2 | 116,4 | 140.0 | | 171.1 | 171.1 |
| Krokodil | 50,0 | 113,3 | 138,5 | 166.7 | | 203.7 | 203.7 |
| PAN 3400 | 37,1 | 84,1 | 102,8 | 123.7 | | 151.2 | 151.2 |
| PAN 3471 | 44,8 | 101,4 | 124,0 | 149.2 | | 182.3 | 182.3 |
| PAN 3497 | 39,5 | 89,4 | 109,3 | 131.5 | | 160.7 | 160.7 |
| PAN 3515 | 36,6 | 82,8 | 101,3 | 121.8 | | 148.9 | 148.9 |
| PAN 3623 | 45,3 | 102,6 | 125,5 | 150.9 | | 184.5 | 184.5 |
| Sabie | 47,5 | 107,7 | 131,6 | 158.3 | | 193.5 | 193.5 |
| SST 806 | 27,2 | 61,7 | 75,4 | 90.8 | | 111.0 | 111.0 |
| SST 8125 | 30,6 | 69,3 | 84,7 | 101.9 | | 124.6 | 124.6 |
| SST 8135 | 29,9 | 67,8 | 82,9 | 99.7 | | 121.9 | 121.9 |
| SST 8154 | 28,3 | 64,1 | 78,4 | 94.3 | | 115.2 | 115.2 |
| SST 8155 | 30,4 | 68,9 | 84,3 | 101.4 | | 123.9 | 123.9 |
| SST 835 | 26,8 | 60,7 | 74,2 | 89.3 | | 109.1 | 109.1 |
| SST 843 | 30,9 | 70,0 | 85,6 | 102.9 | | 125.8 | 125.8 |
| SST 866 | 25,4 | 57,6 | 70,4 | 84.7 | | 103.5 | 103.5 |
| SST 875 | 23,4 | 53,1 | 64,9 | 78.1 | | 95.5 | 95.5 |
| SST 877 | 26,7 | 60,4 | 73,9 | 88.9 | | 108.6 | 108.6 |
| SST 884 | 29,2 | 66,2 | 80,9 | 97.3 | | 119.0 | 119.0 |
| SST 895 | 29,4 | 66,7 | 81,5 | 98.0 | | 119.8 | 119.8 |

1. **PLANTING AND TRIAL MONITORING**

**Planting and flowering dates**

*KwaZulu Natal planting and flowering dates*

|  |  |  |  |
| --- | --- | --- | --- |
| **Locality** | **Planting date** | **Planting (early/late)** | **Flowering dates** |
| Bergville (CB) | 24/05/2016 | --- | 19/09/2016 |
| Bergville (JP) | 24/05/2016 | --- | 24/09/2016 |
| Winterton (TM) | 25/05/2016 | --- | 24/09/2016 |
| Winterton (PM) | 02/06/2016 | --- | 05/10/2016 |
| Colenso | 14/06/2016 | --- | 10/10/2016 |

*Highveld planting and flowering dates*

|  |  |  |  |
| --- | --- | --- | --- |
| **Locality** | **Planting date** | **Planting (early/late)** | **Flowering dates** |
| Clarens | 10/06/2016 | Early | 26/10/2016 |
| Villiers | 20/06/2016 | Early | 10/10/2016 |
| Welkom | 30/06/2016 | Early | 10/10/2016 |
| Harrismith (JL) | 10/07/2016 | Late | 24/11/2016 |
| Harrismith (TF) | 12/07/2016 | Late | 24/11/2016 |
| Potchefstroom | 13/07/2016 | Late |  |

*Warmer Northern Irrigation areas planting dates*

|  |  |  |  |
| --- | --- | --- | --- |
| **Locality** | **Planting date** | **Planting (early/late)** | **Flowering dates** |
| Burgersfort | 24/05/2016 | Early |  |
| Groblersdal | 25/05/2016 | Early |  |
| Skuinsdrift | 27/05/2016 | Early |  |
| Ohrigstad | 02/06/2016 | Late |  |
| Brits JvR | 09/06/2016 | Late |  |
| Makoppa | 10/06/2016 | Late |  |
| Koedoeskop | 07/06/2016 | Late |  |

*Cooler Central irrigation areas planting and flowering dates*

|  |  |  |  |
| --- | --- | --- | --- |
| **Locality** | **Planting date** | **Planting (early/late)** | **Flowering dates** |
| Vaalharts 1 | 24/06/2016 | Early |  |
| Hartswater | 20/06/2016 | Early |  |
| Prieska 1 | 07/06/2016 | Early | 20/09/2016 |
| Modderrivier 1 | 15/06/2016 | Early | 29/09/2016 |
| Hopetown 1 | 21/06/2016 | Early | 12/10/2016 |
| Vaalharts 2 | 15/07/2016 | Late |  |
| Upington | 02/07/2016 | Late |  |
| Modderrivier2 | 29/06/2016 | Late | 15/10/2016 |
| Douglas Late | 30/06/2016 | Late | 28/10/2016 |
| Barkley west | 07/07/2016 | Late | 12/11/2016 |
| Prieska 2 | 06/07/2016 | Late | 11/10/2016 |
| Rama 1 | 07/07/2016 | Late | 12/10/2016 |
| Rama 2 | 19/07/2016 | Late | 19/11/2016 |
| Hopetown 2 | 22/07/2016 | Late | 02/11/2016 |

**Experimental design and trial layout**

The cultivars were planted in a randomised block design with four replicates, and plots consisted of eight rows of 5 m lengths. The row width in the Warmer Northern Irrigation Area and the Cooler Central Irrigation Area were 17 cm, while a row width of 25 cm were used in the Highveld Irrigation Area, as well as in the KwaZulu-Natal Irrigation Area. Seeding density (kg seed/ha) varied between cultivars dependant on relative thousand-kernel weight of seed batches, and seeding density recommendations for cultivars as supplied by respective owners were taken into consideration.

**Fertiliser application programs**

Fertilisation and irrigation scheduling was optimised (according to farmer practice) including the use of soil analyses, and adjustments were made within the growing season where needed. The main aim is to optimise the production environment so that accurate relative cultivar responses can be measured. Target total fertiliser application was 220 kg N/ha, 30 kg P/ha and 20 kg K/ha. The fertiliser application rates and application dates are presented in the tables below:

*KwaZulu-Natal fertiliser programme*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Locality** | **Before or at planting** | | **Top dressings** | |
| **Fertiliser source** | **Rates (kg/ha)** | **Fertiliser source** | **Rates (kg/ha)** |
| Bergville (CB) | 2.3.4(30)+Zn | 330 kg | KAN + Urea | 178 Kg (N) |
| Bergville (JP) | 2.3.4(30)+Zn | 330 Kg | KAN+ Urea | 178 Kg (N) |
| Winterton (TM) | 7.2.1(28)+Zn | 300 Kg | KAN+ Urea | 140 Kg (N) |
| Winterton (PM) | 7.2.1(28)+Zn | 300 Kg | KAN + Urea | 140 Kg (N) |
| Colenso | KCL+MAP | 300kg+250kg | KAN +Urea | 140Kg (N) |

*Highveld fertiliser programme*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Locality** | **Before or at planting** | | **Top dressings** | |
| **Fertiliser source** | **Rates (kg/ha)** | **Fertiliser source** | **Rates (kg/ha)** |
| Villiers | 4.2.1(28) + Zn | 160 Kg | KAN and Urea | 180 Kg |
| Welkom | 15.10.6(31) | 300 Kg | Urea | 110 Kg |
| Harrismith (TF) | 7.2.1(28) + Zn | 300 Kg | ASN | 200 Kg |
| Clarens | 10.8.20(30) + Zn | 350 Kg | Urea + KAN | 180 Kg |
| Harrismith (JL) | 15.10.6(30)+Zn | 300 Kg | ASN | 170 Kg |
| Potchefstroom | 4.2.1(28) Zn | 350 Kg | Urea | 200 Kg |

*Warmer irrigation areas fertiliser program*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Locality** | **Before or at planting** | | **Top dressings** | |
| **Fertiliser source** | **Rates (kg/ha)** | **Fertiliser source** | **Rates (kg/ha)** |
| Brits JvR | 12:8:8,8(31,6) Zn+S | 350 | Urea | 200 |
| Burgersfort | 13:7:10(30) Zn | 500 | 1:0:1(39) | 300 |
| Groblersdal | 3:2:1(32) Zn | 200 | KAN  Ammonium Sulphate | 150  200 |
| Koedoeskop | MAP  KCL | 250  80 | ASN(26)  Ammonium Sulphate | 60  60 |
| Makoppa | 4:2:3(30) | 500 | Urea | 250 |
| Ohrigstad | 2:3:4(30) Zn | 400 | Red Urea | 300 |
| Skuinsdrift | 4:3:4(40) Zn  KCL | 300  200 | KAN  Ammonium sulphate | 300  200 |

*Cooler Central Irrigation area fertiliser program*

| **Locality** | **Before or at planting** | | **Top dressings** | |
| --- | --- | --- | --- | --- |
| **Fertiliser source** | **Rates (kg/ha)** | **Fertiliser source** | **Rates (kg/ha)** |
| Vaalharts 1 | 13:7:10(30) Zn | 500 | Ammonium Sulphate | 350 |
| Upington | 13:7:10(30) Zn | 500 | Ammonium Sulphate | 300 |
| Vaalharts 2 | 13:7:10(30) Zn | 500 | Ammonium Sulphate | 350 |
| Hartswater | 2:3:4 (39) | 500 | Urea | 300 |
| Prieska 1 | 2:2:1(26) SiZnBCu 18% Org  Urea Granular  KCL Standard | 375  200  85 | Boron Acid  KCl Jap Fines  Urea Prills  Ammonium Sulphate  Multimicro | 4  60  300  100  6 |
| Modderrivier 1 | 2:3:2(35) Zn + S | 250 | --- | --- |
| Hopetown 1 | 1:1:1(29)+ 0,5% Zn+ 5% S+ 4% Ca+ 0,5%Mg | 300 | 1.0.0  MNSO4  4M  3W  Boor  8.1.3  Micro 7  CuSO4  C.U.A.N | 400  2  1  1  3  900  2  1  140 |
| Modderrivier2 | 2:3:2(35)+0.5%ZN+2.86%S | 240 | Opti Sul  Opti N  Ca Nitrate  Sidi Pot | 360  306  164  524 |
| Douglas | MAP  KCL | 200  100 | Ammonium Sulphate  Magnesium Sulphate  Boron  8.1.3(20)  Opti N  Sodium Molybdate  Sink chelate  Copper Chelate  Calcium nitrate  MAP | 400  3  3  500  75  0.05  0.3  0.3  2  2 |
| Barkley West | MAP  N110g/Kg P220g/Kg Zn 7.5g/Kg | 130  130 | Ammonium Sulphate  Ammonium Nitrate  6.1.3(20) | 800  250  200 |
| Prieska 2 | 2:2:1(26) SiZnBCu 18% Org  Urea Granular  KCL Standard | 375  200  85 | Boron Acid  KCl Jap Fines  Urea Prills  Ammonium Sulphate  Multimikro | 4  60  300  100  6 |
| Rama 1 | 2:3:4(40)  Urea | 400  200 | Ureum  Liquidmax D  Super Grow  Nutrigrow  ZMC Liquidmax K  Ammonium Sulphate  ZMC Mariphos  KCL  Boor | 115  1.2 L  1 L  10  2.5  18  500 ml  22  1 |
| Rama 2 | 3.0.1 (47)  2.3.2(35) + 0.4%zn = 2.9%S | 350  250 | Ammonium Sulphate  10.1.2 (24)  U.A.N | 150  400  100 |
| Hopetown 2 | 1:1:1(29)+ 0,5% Zn+ 5% S+ 4% Ca+ 0,5%Mg | 300 | Ammonium Sulphate  Ureum  1.0.0  MNSO4  Mirco 4M  3W  Boor  8.1.3  Micro 7  CuSO4  C.U.A.N | 50  50  400  2  1  1  4  900  2  1.5  140 |

**Weed, disease and insect management**

The objective of the NWECP is to have a weed, pest and disease free trials so that these do not compromise the yield of the entries in the trial. Pesticides were applied whenever necessary to keep the trials weed, insect and disease free. Since trials were planted inside the wheat crops of co-workers, much of the weed, pest and disease control was carried out by the co-workers. In addition, Bumper 250 EC was sprayed at a rate of 800 ml/ha on all trials against KB. Except for Harrismith (JL), where the wild oats infestation could not be controlled, there were no major problems with pests, weeds or diseases on all trials.

**Climatic conditions during 2016**

Temperature conditions in the 2016 season showed slight deviations to the long-term average in all of the production regions. Minimum and maximum temperatures in the KwaZulu-Natal region were below normal during July, which could explain the higher yields obtained in this region. In the Highveld region minimum temperatures during July and August were above the long-term average, whick could lead to less tillering, with an effect on the yield realised.

For the Warmer and Cooler Irrigation regions, the temperatures were very close to the long‑term average.

The figures below (one example for each region) give an indication of the 2016 figures compared to the long-term average.

**- - - - Long Term Min Temp**

**2016 Min Temp**

**- - - - Long Term Max Temp**

**2016 Max Temp**

**5 HARVESTING AND OUTCOMES**

All trials were harvested and processed except the Harrismith trial (Highveld), which had a wild oats infestation that could not be controlled and both Winterton trials, where hail damage occurred and the trials had to written off. The table below summarises harvesting dates and outcomes of the trials.

*KwaZulu-Natal and Highveld harvesting dates and trial outcomes*

|  |  |  |  |
| --- | --- | --- | --- |
| **Region** | **Locality** | **Harvesting date** | **Outcome of trial** |
| Cooler Central Irrigation Area | Vaalharts 1 | 06/12/2016 | Included |
| Upington | 12/12/2016 | Included |
| Vaalharts 2 | 07/11/2016 | Included |
| Hartswater | 05/12/2016 | Included |
| Prieska 1 | 2016-11-28 | Included |
| Modderrivier 1 | 2016-11-24 | Included |
| Hopetown 1 | 2016-12-06 | Included |
| Modderrivier2 | 2016-11-30 | Included |
| Douglas | 2016-11-28 | Included |
| Barkley West | 2016-11-30 | Included |
| Prieska 2 | 2016-12-07 | Included |
| Rama 1 | 2016-12-06 | Included |
| Rama 2 | 2016-12-06 | Included |
| Hopetown 2 | 2016-12-14 | Included |
| Warmer Northern Irrigation Area | Brits JvR | 29/10/2016 | Included |
| Burgersfort | 26/10/2016 | Included |
| Groblersdal | 02/11/2016 | Included |
| Koedoeskop | 28/10/2016 | Included |
| Makoppa | 01/11/2016 | Included |
| Ohrigstad | 27/10/2016 | Included |
| Skuinsdrift | 07/11/2016 | Included |
| Highveld Irrigation Area | Villiers | 02/12/2016 | Included |
| Welkom | 28/11/2016 | Included |
| Clarens | 16/12/2016 | Included |
| Harrismith (TF) | 21/12/2016 | Included |
| Harrismith (JL) | --- | Written off – wild oats |
| Potchefstroom | 07/12/2016 | Included |
| KwaZulu-Natal Irrigation Area | Bergville (CB) | 14/11/2016 | Included |
| Bergville (JP) | 14/11/2016 | Included |
| Winterton (TM) | --- | Written off – hail damage |
| Winterton (PM) | --- | Written off – hail damage |
| Colenso | 18/11/2016 | Included |

1. **STATISTICAL ANALYSIS**

Grain yield and quality measurements (hectolitre mass, protein content and falling number) for entries in the cultivar trials in the respective irrigation areas, AMMI analysis for genotype, cultivar x environment interaction (G x E), and combined analyses per region and over years are presented in this report. The empirical ranking of the entries is indicated in the tables, although this does not necessarily mean that the cultivars differ significantly. For this purpose the LSD’s (P ≤ 0.05) for a significant effect are also included.

The AMMI-model (Additive Main Effects and Multiplicative Interaction) follows a unitary approach by integrating the analysis of variance of the main effects with the G x E interaction principal components analysis. The power of this statistical tool (AMMI) lies in the biplot whereby environments and genotypes showing the same reaction patterns are grouped. From the AMMI analysis, the four highest ranked cultivars for the respective analysis were also calculated. By studying the biplot, certain patterns attributed to the main effects (G and E), as well as the interaction (G x E) can be seen. The biplot gives an indication of average yields as well as the yield stability of the cultivar. The mean additive main effects of a cultivar or environment are stipulated on the X-axis while the multiplicative interaction (G x E) is described on the Y-axis as an IPCA-1 score and can be a negative or a positive value. An IPCA-1 score of zero (horizontal line) implicates that a cultivar or environment shows little interaction and therefore a stable yield response.

1. **RESULTS**

**COOLER CENTRAL IRRIGATION AREAS**

***Combined analyses: Earlier plantings***

The average yield over localities and cultivars for the earlier plantings in 2016 was 9.38 ton/ha, slightly better than that of 2015 which was 9.11 ton/ha. From the combined analyses for the earlier plantings, PAN 3400 (10.12 ton/ha), PAN 3471 (10.08 ton/ha), Krokodil (10.06 ton/ha), PAN 3497 (9.88 ton/ha) and SST 806 (9.76 ton/ha) had the highest yields. The yields of these cultivars were not significantly different from each other. Four year average grain yields indicate that PAN 3400 produced the highest yield (9.43 ton/ha), followed by SST 806 (9.33 ton/ha), SST 835 (9.26 ton/ha) and PAN 3497 (9.21 ton/ha).

The average hectolitre mass values calculated over the years indicate acceptable high values for all cultivars, with 82.23 kg/hl recorded for 2016, similar to 82.52 in 2015.

Grain protein content was on average slightly higher during 2016 at 12.72% compared to 12.61% for the previous season.

Falling number values were high, with an average of 357 seconds for cultivars and localities combined.

From the AMMI analysis, the following cultivar selections per locality were provided for the earlier plantings:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Cooler central irrigation areas estimates (earlier planting) 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **First plantings** | **Yield** | **IPCA 1** | **Cultivars** | | | |
| **Ton/ha** | **score** |
| Hartwater | 9.31 | -0.3302 | PAN3400 | SST806 | Krokodil | PAN3497 |
| Hopetown | 10.73 | 0.1980 | PAN3471 | Krokodil | PAN3400 | PAN3497 |
| Modderrivier | 7.75 | -1.4351 | PAN3515 | SST895 | SST884 | PAN3623 |
| Prieska | 9.88 | 1.5401 | PAN3471 | PAN3497 | Krokodil | SST806 |
| Vaalharts | 9.24 | 0.0272 | PAN3400 | SST806 | PAN3497 | Krokodil |

***Combined analyses: Later plantings***

An average yield of 9.28 ton/ha was recorded for all cultivars and localities in 2016, and this was similar to the average of the earlier plantings (9.38 ton/ha). The combined analyses indicated that SST 895 (9.69 ton/ha) and PAN 3400 (9.67 ton/ha) produced the highest yield, followed by Duzi (9.58 ton/ha). Yields of the first 12 cultivars were not significantly different from each other. The four year average grain yields indicate that SST 895 (9.01 ton/ha), SST 884 (8.94 ton/ha) and PAN 3400 (8.84 ton/ha) produced the highest yield.

The average hectolitre mass values calculated over the years indicate acceptable high values for all cultivars, with 82.75 and 81.68 kg/hl recorded for 2016 and 2015 respectively.

Average grain protein content was 12.17% for 2016, and this was significantly lower than the 13.22 recorded in 2015.

Falling number values were generally high, with an average of 359 seconds for cultivars and localities combined.

From the AMMI analysis, the following cultivar selections per locality were provided for the later plantings:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Cooler central irrigation areas estimates (later planting) 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Second planting** | **Yield** | **IPCA 1** | **Cultivars** | | | |
| **Ton/ha** | **score** |
| Barkley-West | 9.72 | 0.4685 | SST875 | PAN3400 | Sabie | PAN3497 |
| Douglas | 8.06 | 1.2133 | Krokodil | PAN3471 | Sabie | PAN3497 |
| Hopetown | 10.11 | -0.5015 | SST895 | Krokodil | SST8154 | Duzi |
| Modderrivier | 11.12 | -0.2427 | SST895 | PAN3623 | PAN3400 | Duzi |
| Prieska | 10.55 | 0.5017 | PAN3400 | SST875 | PAN3497 | PAN3471 |
| Rama 1 | 8.25 | -0.9044 | PAN3623 | SST895 | SST8154 | SST884 |
| Rama 2 | 9.65 | -0.6867 | SST895 | PAN3623 | SST8154 | SST884 |
| Upington | 7.90 | -0.1683 | Krokodil | SST895 | Duzi | SST866 |
| Vaalharts | 8.19 | 0.3200 | Krokodil | PAN3471 | SST895 | SST866 |

**WARMER NORTHERN IRRIGATION AREAS**

***Combined analyses: Earlier plantings***

The average yield over localities and cultivars for the earlier plantings in 2016 was 7.26 ton/ha. From the combined analysis for the earlier plantings, Krokodil (8.14 ton/ha), SST 884 (8.01 ton/ha), PAN 3623 (7.79 ton/ha) and SST 886 (7.68 ton/ha) had the highest yields. Yields of the first two cultivars were not significantly different from each other. The four year average grain yields indicate that SST 884 (8.16 ton/ha) produced the highest yield, followed by SST 895 (8.13 ton/ha) and SST 806 (8.06 ton/ha).

The average hectolitre mass values calculated over the years indicate acceptable high values for all cultivars, with 79.30 and 80.84 kg/hl recorded for 2016 and 2015 respectively.

Average grain protein content during 2016 was 12.60%, compared to 11.71% for the previous season.

Falling number values were an average of 310 seconds for cultivars and localities combined.

From the AMMI analysis, the following cultivar selections per locality were provided for the earlier plantings in the Warmer Northern Irrigation areas:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Warmer northern irrigation areas estimates (earlier planting) 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **First plantings** | **Yield** | **IPCA 1** | **Cultivars** | | | |
| **Ton/ha** | **score** |
| Burgersfort | 7.08 | 0.5209 | Krokodil | SST895 | Duzi | SST884 |
| Groblersdal | 8.08 | 0.7575 | Krokodil | SST843 | SST884 | PAN3623 |
| Skuinsdrift | 6.62 | -1.2784 | SST806 | SST866 | SST884 | PAN3623 |

***Combined analyses: Later plantings***

An average yield of 7.57 ton/ha was recorded for later plantings of the Warmer Northern Irrigation areas in 2016. This average yield was similar to the earlier plantings which had 7.26 ton/ha. The combined analysis indicated that PAN 3400 (8.22 ton/ha) produced the highest yield, followed by SST 895 (8.03 ton/ha) and PAN 3623 (8.00 ton/ha). The four year average grain yields indicate that PAN 3400 (7.97 ton/ha) produced the highest yield, followed by SST 895 (7.81 ton/ha) and SST 866 (7.68).

The average hectolitre mass values calculated over the years indicate acceptable high values for all cultivars, with 82.01 and 82.32 kg/hl recorded for 2016 and 2015, respectively.

Grain protein content was on average slightly lower during 2016 at 12.06%, compared to 12.72% for the previous season.

Falling number values were generally high, with an average of 356 seconds for cultivars and localities combined.

From the AMMI analysis, the following cultivar selections per locality were provided for the later plantings in the Warmer Northern Irrigation areas:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Warmer northern irrigation areas estimates (later planting) 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Second planting** | **Yield** | **IPCA 1** | **Cultivars** | | | |
| **Ton/ha** | **score** |
| Brits JvR | 6.81 | 0.9677 | PAN3400 | SST8135 | SST875 | Sabie |
| Koedoeskop | 8.74 | -1.5822 | PAN3400 | PAN3623 | SST8154 | SST8135 |
| Makoppa | 7.17 | 0.6392 | PAN3471 | Duzi | SST8125 | SST895 |
| Ohrigstad | 7.56 | -0.0247 | PAN3623 | Duzi | SST895 | SST8125 |

**HIGHVELD**

***Combined analyses earlier planting date***

The average yield over localities and cultivars for the Highveld in 2016 was 7.06 ton/ha, significantly lower than 2015 which had a yield of 8.55 ton/ha. From the combined analysis for the earlier plantings, PAN 3497 (8.38 ton/ha), SST 835 (7.40 ton/ha), PAN 3471 (7.34 ton/ha) and PAN 3400 (7.33 ton/ha) had the highest yields. The yield of PAN 3497 was significantly higher than the rest of the entries. The three year average grain yields indicate that PAN 3497 (8.71 ton/ha) produced the highest yield, followed by SST 835 (8.23 ton/ha) and SST 884 (8.18 ton/ha).

The average hectolitre mass values calculated over the years indicate acceptable high values for all cultivars, with 81.36 kg/hl and 83.39 kg/hl recorded for 2016 and 2015, respectively.

Average grain protein content was very high in 2016 at 13.46%, which is significantly higher than in 2015 (11.60%).

Falling number values were generally high, with an average of 304 seconds for cultivars and localities combined.

From the AMMI analysis, the following cultivar selections per locality were provided in the earlier planting in the Highveld Irrigation areas:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Highveld irrigation areas estimates (early planting date) 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **First plantings** | **Yield** | **IPCA 1** | **Cultivars** | | | |
| **Ton/ha** | **score** |
| Clarens | 6.59 | -1.1770 | PAN3497 | Sabie | PAN3400 | PAN3515 |
| Villiers | 8.59 | 1.1324 | SST8125 | PAN3497 | PAN3623 | PAN3471 |
| Welkom | 6.01 | 0.0446 | PAN3497 | Sabie | PAN3515 | PAN3471 |

***Combined analyses later planting date***

The average yield over localities and cultivars for the later planting in the Highveld in 2016 was 7.85 ton/ha. This was significantly higher than the 6.29 ton/ha recorded in 2015. From the combined analysis for the earlier plantings, PAN 3623 (9.38 ton/ha), Krokodil (8.57 ton/ha), SST 895 (8.32 ton/ha) and SST 835 (8.22 ton/ha) had the highest yields. The yield of PAN 3623 was significantly higher than all the other entries. The four year average grain yields indicate that SST 835 (7.85 ton/ha) produced the highest yield, followed by SST 895 (7.63 ton/ha) and Krokodil (7.60 ton/ha).

The average hectolitre mass values calculated over the years indicate acceptable high values for all cultivars, with 78.63 kg/hl and 81.44 kg/hl recorded for 2016 and 2015, respectively.

Average grain protein content was high in 2016 at 12.40%, lower than in 2015 (13.60%).

Falling number values were generally high, with an average of 316 seconds for cultivars and localities combined.

Since only two localities were available no AMMI analyses was done for the later planting in the Highveld Irrigation areas.

**KWAZULU NATAL**

***Combined analyses***

The average yield over localities and cultivars in 2016 was 6.61 ton/ha. From the combined analysis, SST 8154 (7.35 ton/ha), PAN 3515 (7.23 ton/ha), SST 8135 (7.21 ton/ha) and PAN 3400 (7.07 ton/ha) had the highest yields. The yields of these cultivars were not significantly different from each other. The four year average grain yields indicate that SST 806 (6.97 ton/ha) produced the highest yield, followed by SST 835 (6.92 ton/ha) and Krokodil (6.82 ton/ha).

The average hectolitre mass values for 2016 indicated high values for all cultivars, with an average of 79.45 kg/hl.

Grain protein content was high during 2016 at 12.58%.

Falling number values were generally high, with an average of 333 seconds for cultivars and localities combined.

From the AMMI analysis, the following cultivar selections per locality were provided KwaZulu-Natal Irrigation areas:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **KwaZulu Natal estimates 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Locality** | **Yield** | **IPCA 1** | **Cultivars** | | | |
| **Ton/ha** | **score** |
| Bergville (Britz) | 7.53 | 1.0781 | Duzi | SST884 | SST806 | PAN3400 |
| Bergville (Potgieter) | 6.07 | -1.2173 | SST8154 | PAN3515 | SST895 | PAN3400 |
| Colenso | 6.22 | 0.1392 | SST8135 | PAN3497 | PAN3471 | PAN3623 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cooler Central Irrigation Area (earlier planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 8.06 | 22 | 7.27 | 19 | 8.77 | 17 |  |  |  |  |  |  |
| **Duzi** | 9.36 | 12 | 8.28 | 21 | 7.52 | 18 | 8.93 | 10 | 8.52 | 13 | 8.39 | 15 | 8.82 | 17 |
| **Koedoes** |  |  | 9.25 | 11 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 10.06 | 3 | 9.20 | 13 | 8.57 | 8 | 8.86 | 13 | 9.17 | 5 | 9.28 | 5 | 9.63 | 5 |
| **PAN 3400** | 10.12 | 1 | 9.90 | 1 | 8.51 | 10 | 9.20 | 2 | 9.43 | 1 | 9.51 | 1 | 10.01 | 1 |
| **PAN 3471** | 10.08 | 2 | 8.81 | 18 | 8.49 | 11 | 9.17 | 3 | 9.13 | 8 | 9.12 | 8 | 9.44 | 9 |
| **PAN 3478** |  |  |  |  |  |  | 8.82 | 15 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 8.58 | 7 | 9.05 | 5 |  |  |  |  |  |  |
| **PAN 3497** | 9.88 | 4 | 9.44 | 8 | 8.30 | 12 | 9.22 | 1 | 9.21 | 4 | 9.21 | 7 | 9.66 | 3 |
| **PAN 3515** | 9.15 | 14 | 9.18 | 14 | 8.69 | 6 |  |  |  |  | 9.01 | 10 | 9.17 | 13 |
| **PAN 3623** | 8.71 | 19 | 9.45 | 7 | 8.74 | 5 |  |  |  |  | 8.97 | 11 | 9.08 | 14 |
| **Renoster** |  |  | 8.90 | 16 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 9.09 | 16 | 9.06 | 15 | 7.75 | 17 | 8.79 | 16 | 8.67 | 11 | 8.63 | 13 | 9.07 | 15 |
| **SST 806** | 9.76 | 5 | 9.70 | 3 | 8.90 | 3 | 8.97 | 7 | 9.33 | 2 | 9.45 | 2 | 9.73 | 2 |
| **SST 8125** | 9.56 | 9 | 9.74 | 2 |  |  |  |  |  |  |  |  | 9.65 | 4 |
| **SST 8134** |  |  | 9.31 | 10 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 9.63 | 7 | 9.55 | 5 |  |  |  |  |  |  |  |  | 9.59 | 6 |
| **SST 8154** | 8.95 | 18 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 9.13 | 15 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 7.75 | 23 |  |  |  |  |  |  |
| **SST 835** | 9.57 | 8 | 9.56 | 4 | 8.86 | 4 | 9.07 | 4 | 9.26 | 3 | 9.33 | 3 | 9.56 | 7 |
| **SST 843** | 7.62 | 20 | 8.02 | 23 | 7.97 | 15 | 7.70 | 24 | 7.83 | 14 | 7.87 | 16 | 7.82 | 18 |
| **SST 866** | 9.64 | 6 | 8.79 | 19 | 8.17 | 13 | 8.90 | 11 | 8.87 | 10 | 8.87 | 12 | 9.21 | 12 |
| **SST 867** |  |  | 8.53 | 20 | 8.10 | 14 | 8.42 | 20 |  |  |  |  |  |  |
| **SST 875** | 9.35 | 13 | 9.21 | 12 | 8.57 | 8 | 8.99 | 6 | 9.03 | 9 | 9.04 | 9 | 9.28 | 11 |
| **SST 876** |  |  |  |  |  |  | 8.85 | 14 |  |  |  |  |  |  |
| **SST 877** | 9.09 | 17 | 8.83 | 17 | 7.96 | 16 | 8.43 | 19 | 8.58 | 12 | 8.63 | 14 | 8.96 | 16 |
| **SST 884** | 9.45 | 10 | 9.50 | 6 | 8.95 | 2 | 8.66 | 18 | 9.14 | 7 | 9.30 | 4 | 9.47 | 8 |
| **SST 895** | 9.45 | 10 | 9.32 | 9 | 9.01 | 1 | 8.88 | 12 | 9.16 | 6 | 9.26 | 6 | 9.38 | 10 |
| **SST 896** |  |  |  |  |  |  | 8.96 | 8 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 8.93 | 9 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 8.16 | 22 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 8.32 | 21 |  |  |  |  |  |  |
| **Mean** | **9.38** |  | **9.11** |  | **8.36** |  | **8.74** |  | **8.95** |  | **8.99** |  | **9.31** |  |
| **LSDt(0,05)** | **0.44** |  | **0.26** |  | **0.22** |  | **0.24** |  | **0.15** |  | **0.18** |  | **0.26** |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Cooler Central Irrigation Area (earlier planting) AMMI Analysis** | | | | | | |
| **Anova of the yield of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 399 | 780.8 | 1.96 |  |  |
| **Treatments** | | 99 | 630.5 | 6.37 | 14.47 | <0,001 |
| **Genotypes** | | 19 | 122.8 | 6.47 | 14.69 | <0,001 |
| **Environments** | | 4 | 382.1 | 95.53 | 57.57 | <0,001 |
| **Block** |  | 15 | 24.9 | 1.66 | 3.77 | <0,001 |
| **Interactions** | | 76 | 125.5 | 1.65 | 3.75 | <0,001 |
| **IPCA** |  | 22 | 83.9 | 3.81 | 8.67 | <0,001 |
| **IPCA** |  | 20 | 24.9 | 1.24 | 2.83 | <0,001 |
| **Residuals** |  | 34 | 16.7 | 0.49 | 1.12 | 0.3047 |
| **Error** |  | 285 | 125.4 | 0.44 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Duzi | 9.36 | 12 | 0.38527 |  |  |
| 2 | Krokodil | 10.06 | 3 | 0.26352 |  |  |
| 3 | PAN 3400 | 10.12 | 1 | 0.28511 |  |  |
| 4 | PAN 3471 | 10.08 | 2 | 0.60188 |  |  |
| 5 | PAN 3497 | 9.88 | 4 | 0.50176 |  |  |
| 6 | PAN 3515 | 9.15 | 14 | -0.41424 |  |  |
| 7 | PAN 3623 | 8.71 | 19 | -1.01652 |  |  |
| 8 | Sabie | 9.09 | 16 | 0.13575 |  |  |
| 9 | SST 806 | 9.76 | 5 | 0.58355 |  |  |
| 10 | SST 8125 | 9.56 | 9 | 0.14854 |  |  |
| 11 | SST 8135 | 9.63 | 7 | 0.25590 |  |  |
| 12 | SST 8154 | 8.95 | 18 | -0.85163 |  |  |
| 13 | SST 8155 | 9.13 | 15 | 0.20263 |  |  |
| 14 | SST 835 | 9.57 | 8 | 0.09629 |  |  |
| 15 | SST 843 | 7.62 | 20 | -0.93962 |  |  |
| 16 | SST 866 | 9.64 | 6 | 0.42478 |  |  |
| 17 | SST 875 | 9.35 | 13 | -0.06085 |  |  |
| 18 | SST 877 | 9.09 | 17 | -0.23676 |  |  |
| 19 | SST 884 | 9.45 | 10 | -0.34107 |  |  |
| 20 | SST 895 | 9.45 | 10 | -0.02428 |  |  |
| **Mean** |  | **9.38** |  |  |  |  |
| **Coefficient of variation (%)** | | **7.40** |  |  |  |  |
| **LSDt(0,05)** |  | **0.44** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Hartwater | 9.31 | 3 | -0.33016 |  |  |
| 2 | Hopetown | 10.73 | 1 | 0.19803 |  |  |
| 3 | Modderrivier | 7.75 | 5 | -1.43509 |  |  |
| 4 | Prieska | 9.88 | 2 | 1.54006 |  |  |
| 5 | Vaalharts | 9.24 | 4 | 0.02716 |  |  |
| **Mean** |  | **9.38** |  |  |  |  |
| **Coefficient of variation (%)** | | **7.40** |  |  |  |  |
| **LSDt(0,05)** |  | **0.22** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cooler Central Irrigation Area (earlier planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 81.17 | 22 | 79.12 | 17 | 78.51 | 23 |  |  |  |  |  |  |
| **Duzi** | 81.70 | 18 | 81.62 | 20 | 78.90 | 19 | 79.32 | 22 | 80.39 | 14 | 80.74 | 16 | 81.66 | 16 |
| **Koedoes** |  |  | 81.83 | 19 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 81.81 | 17 | 82.00 | 16 | 80.47 | 10 | 78.49 | 24 | 80.69 | 11 | 81.43 | 12 | 81.91 | 15 |
| **PAN 3400** | 82.50 | 8 | 83.49 | 3 | 80.22 | 13 | 80.77 | 9 | 81.75 | 5 | 82.07 | 5 | 83.00 | 5 |
| **PAN 3471** | 82.53 | 6 | 83.77 | 1 | 81.11 | 4 | 81.25 | 5 | 82.17 | 2 | 82.47 | 2 | 83.15 | 2 |
| **PAN 3478** |  |  |  |  |  |  | 81.33 | 3 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 82.46 | 1 | 81.73 | 1 |  |  |  |  |  |  |
| **PAN 3497** | 82.68 | 3 | 83.44 | 5 | 81.03 | 5 | 81.09 | 7 | 82.06 | 3 | 82.38 | 3 | 83.06 | 3 |
| **PAN 3515** | 82.31 | 10 | 82.38 | 13 | 79.74 | 15 |  |  |  |  | 81.48 | 11 | 82.35 | 12 |
| **PAN 3623** | 82.10 | 14 | 82.99 | 9 | 80.83 | 6 |  |  |  |  | 81.97 | 7 | 82.55 | 10 |
| **Renoster** |  |  | 81.06 | 23 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 82.05 | 15 | 82.09 | 15 | 79.06 | 18 | 79.44 | 21 | 80.66 | 12 | 81.07 | 14 | 82.07 | 13 |
| **SST 806** | 82.93 | 1 | 83.64 | 2 | 81.14 | 3 | 81.45 | 2 | 82.29 | 1 | 82.57 | 1 | 83.29 | 1 |
| **SST 8125** | 82.69 | 2 | 83.28 | 6 |  |  |  |  |  |  |  |  | 82.99 | 6 |
| **SST 8134** |  |  | 82.13 | 14 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 82.54 | 5 | 83.48 | 4 |  |  |  |  |  |  |  |  | 83.01 | 4 |
| **SST 8154** | 82.28 | 11 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 81.23 | 20 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 80.59 | 12 |  |  |  |  |  |  |
| **SST 835** | 82.57 | 4 | 83.28 | 6 | 80.33 | 11 | 81.29 | 4 | 81.87 | 4 | 82.06 | 6 | 82.93 | 7 |
| **SST 843** | 82.22 | 12 | 83.18 | 8 | 80.48 | 8 | 80.96 | 8 | 81.71 | 7 | 81.96 | 8 | 82.70 | 8 |
| **SST 866** | 82.11 | 13 | 81.87 | 18 | 80.72 | 7 | 80.52 | 13 | 81.31 | 9 | 81.57 | 10 | 81.99 | 14 |
| **SST 867** |  |  | 82.90 | 10 | 80.31 | 12 | 80.17 | 14 |  |  |  |  |  |  |
| **SST 875** | 82.53 | 6 | 82.47 | 12 | 80.48 | 8 | 80.67 | 11 | 81.54 | 8 | 81.83 | 9 | 82.50 | 11 |
| **SST 876** |  |  |  |  |  |  | 81.15 | 6 |  |  |  |  |  |  |
| **SST 877** | 82.01 | 16 | 81.26 | 21 | 79.26 | 16 | 79.63 | 17 | 80.54 | 13 | 80.84 | 15 | 81.64 | 18 |
| **SST 884** | 81.42 | 19 | 81.89 | 17 | 79.94 | 14 | 79.64 | 16 | 80.72 | 10 | 81.08 | 13 | 81.66 | 17 |
| **SST 895** | 82.42 | 9 | 82.67 | 11 | 81.17 | 2 | 80.71 | 10 | 81.74 | 6 | 82.09 | 4 | 82.55 | 9 |
| **SST 896** |  |  |  |  |  |  | 79.49 | 20 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 79.51 | 19 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 79.58 | 18 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 79.73 | 15 |  |  |  |  |  |  |
| **Mean** | **82.23** |  | **82.52** |  | **80.36** |  | **80.29** |  | **81.39** |  | **81.73** |  | **82.50** |  |
| **LSDt(0,05)** | **0.62** |  | **0.61** |  | **0.46** |  | **0.63** |  | **0.27** |  | **0.33** |  | **0.44** |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Cooler Central Irrigation Area (earlier planting) AMMI Analysis** | | | | | | |
| **Anova of the hectolitre mass of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 399 | 3557 | 8.92 |  |  |
| **Treatments** | | 99 | 3264 | 32.97 | 35.59 | <0,001 |
| **Genotypes** | | 19 | 73 | 3.83 | 4.14 | <0,001 |
| **Environments** | | 4 | 2917 | 729.27 | 369.48 | <0,001 |
| **Block** |  | 15 | 30 | 1.97 | 2.13 | 0.0089 |
| **Interactions** | | 76 | 274 | 3.61 | 3.89 | <0,001 |
| **IPCA** |  | 22 | 236 | 10.71 | 11.56 | <0,001 |
| **IPCA** |  | 20 | 16 | 0.82 | 0.89 | 0.6064 |
| **Residuals** |  | 34 | 22 | 0.65 | 0.70 | 0.8953 |
| **Error** |  | 285 | 264 | 0.93 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Duzi | 81.70 | 18 | -0.36299 |  |  |
| 2 | Krokodil | 81.81 | 17 | -0.20472 |  |  |
| 3 | PAN 3400 | 82.50 | 8 | 0.32987 |  |  |
| 4 | PAN 3471 | 82.53 | 6 | -0.13083 |  |  |
| 5 | PAN 3497 | 82.68 | 3 | 0.60642 |  |  |
| 6 | PAN 3515 | 82.31 | 10 | 0.08332 |  |  |
| 7 | PAN 3623 | 82.10 | 14 | -1.18968 |  |  |
| 8 | Sabie | 82.05 | 15 | 0.39006 |  |  |
| 9 | SST 806 | 82.93 | 1 | 0.61214 |  |  |
| 10 | SST 8125 | 82.69 | 2 | 0.51265 |  |  |
| 11 | SST 8135 | 82.54 | 5 | 0.32947 |  |  |
| 12 | SST 8154 | 82.28 | 11 | -0.66894 |  |  |
| 13 | SST 8155 | 81.23 | 20 | 1.10932 |  |  |
| 14 | SST 835 | 82.57 | 4 | 0.35126 |  |  |
| 15 | SST 843 | 82.22 | 12 | -1.43049 |  |  |
| 16 | SST 866 | 82.11 | 13 | 0.12017 |  |  |
| 17 | SST 875 | 82.53 | 6 | 0.19729 |  |  |
| 18 | SST 877 | 82.01 | 16 | 0.42933 |  |  |
| 19 | SST 884 | 81.42 | 19 | -0.62308 |  |  |
| 20 | SST 895 | 82.42 | 9 | -0.46056 |  |  |
| **Mean** |  | **82.23** |  |  |  |  |
| **Coefficient of variation (%)** | | **1.20** |  |  |  |  |
| **LSDt(0,05)** |  | **0.62** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Hartwater | 83.60 | 2 | 1.12540 |  |  |
| 2 | Hopetown | 85.36 | 1 | -0.04925 |  |  |
| 3 | Modderrivier | 77.51 | 5 | -2.35980 |  |  |
| 4 | Prieska | 83.45 | 3 | 0.71964 |  |  |
| 5 | Vaalharts | 81.24 | 4 | 0.56401 |  |  |
| **Mean** |  | **82.23** |  |  |  |  |
| **Coefficient of variation (%)** | | **1.20** |  |  |  |  |
| **LSDt(0,05)** |  | **0.31** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cooler Central Irrigation Area (earlier planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 12.74 | 5 | 12.75 | 7 | 12.24 | 8 |  |  |  |  |  |  |
| **Duzi** | 12.83 | 8 | 12.45 | 18 | 12.94 | 3 | 12.35 | 4 | 12.64 | 4 | 12.74 | 7 | 12.64 | 10 |
| **Koedoes** |  |  | 12.88 | 3 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 11.72 | 20 | 11.59 | 23 | 11.82 | 19 | 11.37 | 24 | 11.63 | 14 | 11.71 | 16 | 11.66 | 18 |
| **PAN 3400** | 12.90 | 6 | 12.51 | 17 | 12.84 | 6 | 12.27 | 7 | 12.63 | 5 | 12.75 | 6 | 12.71 | 7 |
| **PAN 3471** | 12.65 | 12 | 12.73 | 7 | 12.58 | 13 | 11.91 | 20 | 12.47 | 8 | 12.65 | 9 | 12.69 | 8 |
| **PAN 3478** |  |  |  |  |  |  | 12.07 | 16 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 12.56 | 14 | 11.73 | 22 |  |  |  |  |  |  |
| **PAN 3497** | 12.48 | 13 | 12.55 | 15 | 12.70 | 9 | 11.74 | 21 | 12.37 | 11 | 12.58 | 10 | 12.52 | 11 |
| **PAN 3515** | 11.97 | 19 | 12.44 | 19 | 12.15 | 17 |  |  |  |  | 12.19 | 15 | 12.21 | 16 |
| **PAN 3623** | 13.42 | 2 | 12.94 | 2 | 13.15 | 2 |  |  |  |  | 13.17 | 2 | 13.18 | 2 |
| **Renoster** |  |  | 12.61 | 13 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 12.84 | 7 | 12.64 | 12 | 12.88 | 5 | 12.29 | 6 | 12.66 | 3 | 12.79 | 4 | 12.74 | 6 |
| **SST 806** | 12.68 | 11 | 12.33 | 20 | 12.65 | 12 | 12.10 | 14 | 12.44 | 9 | 12.55 | 11 | 12.51 | 12 |
| **SST 8125** | 12.32 | 15 | 12.54 | 16 |  |  |  |  |  |  |  |  | 12.43 | 14 |
| **SST 8134** |  |  | 12.73 | 7 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 12.71 | 10 | 12.65 | 10 |  |  |  |  |  |  |  |  | 12.68 | 6 |
| **SST 8154** | 13.20 | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 12.26 | 16 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 12.94 | 2 |  |  |  |  |  |  |
| **SST 835** | 12.22 | 17 | 12.7 | 9 | 12.67 | 11 | 12.06 | 17 | 12.41 | 10 | 12.53 | 12 | 12.46 | 13 |
| **SST 843** | 14.70 | 1 | 13.79 | 1 | 14.36 | 1 | 13.76 | 1 | 14.15 | 1 | 14.28 | 1 | 14.25 | 1 |
| **SST 866** | 12.15 | 18 | 12.18 | 22 | 12.47 | 16 | 11.97 | 19 | 12.19 | 12 | 12.27 | 13 | 12.17 | 17 |
| **SST 867** |  |  | 12.65 | 10 | 12.94 | 3 | 12.08 | 15 |  |  |  |  |  |  |
| **SST 875** | 12.42 | 14 | 12.29 | 21 | 12.06 | 18 | 11.58 | 23 | 12.09 | 13 | 12.26 | 14 | 12.36 | 15 |
| **SST 876** |  |  |  |  |  |  | 12.21 | 9 |  |  |  |  |  |  |
| **SST 877** | 12.81 | 9 | 12.74 | 5 | 12.72 | 8 | 12.19 | 10 | 12.62 | 6 | 12.76 | 5 | 12.78 | 5 |
| **SST 884** | 13.03 | 5 | 12.56 | 14 | 12.55 | 15 | 12.01 | 18 | 12.54 | 7 | 12.71 | 8 | 12.80 | 4 |
| **SST 895** | 13.15 | 4 | 12.85 | 4 | 12.68 | 10 | 12.18 | 11 | 12.72 | 2 | 12.89 | 3 | 13.00 | 3 |
| **SST 896** |  |  |  |  |  |  | 12.34 | 5 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 12.15 | 12 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 12.15 | 12 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 12.37 | 3 |  |  |  |  |  |  |
| **Mean** | **12.72** |  | **12.61** |  | **12.71** |  | **12.17** |  | **12.54** |  | **12.68** |  | **12.65** |  |
| **LSDt(0,05)** | **0.34** |  | **0.52** |  | **0.35** |  | **0.36** |  | **0.20** |  | **0.24** |  | **0.31** |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **Cooler Central Irrigation Area (earlier planting) AMMI Analysis** | | | | | | |
| **Anova of the protein content of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 399 | 1205.4 | 3.02 |  |  |
| **Treatments** | | 99 | 1114.1 | 11.25 | 48.52 | <0,001 |
| **Genotypes** | | 19 | 152.9 | 8.05 | 34.70 | <0,001 |
| **Environments** | | 4 | 923.8 | 230.96 | 137.64 | <0,001 |
| **Block** |  | 15 | 25.2 | 1.68 | 7.23 | <0,001 |
| **Interactions** | | 76 | 37.3 | 0.49 | 2.12 | <0,001 |
| **IPCA** |  | 22 | 24.6 | 1.12 | 4.83 | <0,001 |
| **IPCA** |  | 20 | 6.4 | 0.32 | 1.38 | 0.1293 |
| **Residuals** |  | 34 | 6.3 | 0.19 | 0.80 | 0.7839 |
| **Error** |  | 285 | 66.1 | 0.23 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Duzi | 12.83 | 8 | 0.40285 |  |  |
| 2 | Krokodil | 11.72 | 20 | 0.08317 |  |  |
| 3 | PAN 3400 | 12.90 | 6 | -0.21433 |  |  |
| 4 | PAN 3471 | 12.65 | 12 | -0.20654 |  |  |
| 5 | PAN 3497 | 12.48 | 13 | -0.61729 |  |  |
| 6 | PAN 3515 | 11.97 | 19 | -0.01183 |  |  |
| 7 | PAN 3623 | 13.42 | 2 | 0.38477 |  |  |
| 8 | Sabie | 12.84 | 7 | -0.26133 |  |  |
| 9 | SST 806 | 12.68 | 11 | -0.42793 |  |  |
| 10 | SST 8125 | 12.32 | 15 | -0.32133 |  |  |
| 11 | SST 8135 | 12.71 | 10 | -0.19085 |  |  |
| 12 | SST 8154 | 13.20 | 3 | 0.26511 |  |  |
| 13 | SST 8155 | 12.26 | 16 | -0.12690 |  |  |
| 14 | SST 835 | 12.22 | 17 | -0.53929 |  |  |
| 15 | SST 843 | 14.70 | 1 | 0.70167 |  |  |
| 16 | SST 866 | 12.15 | 18 | 0.05266 |  |  |
| 17 | SST 875 | 12.42 | 14 | -0.08689 |  |  |
| 18 | SST 877 | 12.81 | 9 | 0.40310 |  |  |
| 19 | SST 884 | 13.03 | 5 | 0.29213 |  |  |
| 20 | SST 895 | 13.15 | 4 | 0.41904 |  |  |
| **Mean** |  | **12.72** |  |  |  |  |
| **Coefficient of variation (%)** | | **4.30** |  |  |  |  |
| **LSDt(0,05)** |  | **0.34** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Hartwater | 13.07 | 2 | 0.14605 |  |  |
| 2 | Hopetown | 12.52 | 3 | 0.10751 |  |  |
| 3 | Modderrivier | 15.24 | 1 | -1.33978 |  |  |
| 4 | Prieska | 12.28 | 4 | 0.72145 |  |  |
| 5 | Vaalharts | 10.51 | 5 | 0.36477 |  |  |
| **Mean** |  | **12.72** |  |  |  |  |
| **Coefficient of variation (%)** | | **4.30** |  |  |  |  |
| **LSDt(0,05)** |  | **0.17** |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cooler Central Irrigation Area (earlier planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 338 | 15 | 359 | 4 | 334 | 11 |  |  |  |  |  |  |
| **Duzi** | 343 | 18 | 331 | 20 | 351 | 16 | 326 | 18 | 338 | 12 | 342 | 14 | 337 | 16 |
| **Koedoes** |  |  | 339 | 13 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 318 | 20 | 323 | 23 | 329 | 19 | 303 | 24 | 318 | 14 | 323 | 16 | 320 | 18 |
| **PAN 3400** | 359 | 11 | 335 | 18 | 356 | 11 | 322 | 20 | 343 | 11 | 350 | 10 | 347 | 13 |
| **PAN 3471** | 350 | 16 | 349 | 5 | 354 | 12 | 330 | 13 | 346 | 8 | 351 | 9 | 349 | 11 |
| **PAN 3478** |  |  |  |  |  |  | 329 | 16 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 358 | 7 | 335 | 10 |  |  |  |  |  |  |
| **PAN 3497** | 351 | 15 | 345 | 8 | 358 | 6 | 326 | 19 | 345 | 9 | 351 | 8 | 348 | 12 |
| **PAN 3515** | 357 | 12 | 333 | 19 | 349 | 17 |  |  |  |  | 346 | 13 | 345 | 14 |
| **PAN 3623** | 355 | 13 | 346 | 7 | 347 | 18 |  |  |  |  | 349 | 11 | 350 | 9 |
| **Renoster** |  |  | 330 | 21 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 348 | 17 | 339 | 14 | 359 | 5 | 330 | 13 | 344 | 10 | 349 | 12 | 344 | 15 |
| **SST 806** | 371 | 1 | 352 | 2 | 361 | 3 | 340 | 2 | 356 | 1 | 361 | 1 | 361 | 1 |
| **SST 8125** | 371 | 2 | 342 | 11 |  |  |  |  |  |  |  |  | 357 | 5 |
| **SST 8134** |  |  | 354 | 1 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 370 | 4 | 350 | 3 |  |  |  |  |  |  |  |  | 360 | 2 |
| **SST 8154** | 359 | 10 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 353 | 14 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 308 | 22 |  |  |  |  |  |  |
| **SST 835** | 368 | 5 | 344 | 9 | 357 | 9 | 332 | 12 | 350 | 7 | 356 | 5 | 356 | 7 |
| **SST 843** | 365 | 6 | 342 | 12 | 363 | 2 | 339 | 5 | 352 | 4 | 356 | 4 | 353 | 8 |
| **SST 866** | 363 | 9 | 337 | 16 | 364 | 1 | 338 | 6 | 350 | 6 | 355 | 7 | 350 | 10 |
| **SST 867** |  |  | 337 | 17 | 352 | 15 | 320 | 21 |  |  |  |  |  |  |
| **SST 875** | 371 | 3 | 343 | 10 | 358 | 8 | 337 | 7 | 352 | 3 | 357 | 2 | 357 | 4 |
| **SST 876** |  |  |  |  |  |  | 330 | 15 |  |  |  |  |  |  |
| **SST 877** | 340 | 19 | 327 | 22 | 352 | 14 | 308 | 23 | 332 | 13 | 340 | 15 | 334 | 17 |
| **SST 884** | 364 | 8 | 348 | 6 | 353 | 13 | 340 | 3 | 351 | 5 | 355 | 6 | 356 | 6 |
| **SST 895** | 364 | 7 | 350 | 4 | 356 | 10 | 344 | 1 | 353 | 2 | 357 | 3 | 357 | 3 |
| **SST 896** |  |  |  |  |  |  | 337 | 8 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 327 | 17 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 336 | 9 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 340 | 4 |  |  |  |  |  |  |
| **Mean** | **357** |  | **341** |  | **354** |  | **330** |  | **345** |  | **350** |  | **349** |  |
| **LSDt(0,05)** | **10.20** |  | **10.95** |  | **7.96** |  | **8.22** |  | **4.50** |  | **5.70** |  | **7.40** |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Cooler Central Irrigation Area (earlier planting) AMMI Analysis** | | | | | | |
| **Anova of the falling number of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 399 | 684932 | 1717 |  |  |
| **Treatments** | | 99 | 603698 | 6098 | 23.31 | <0,001 |
| **Genotypes** | | 19 | 63659 | 3350 | 12.81 | <0,001 |
| **Environments** | | 4 | 506618 | 126655 | 284.80 | <0,001 |
| **Block** |  | 15 | 6671 | 445 | 1.70 | 0.0503 |
| **Interactions** | | 76 | 33421 | 440 | 1.68 | 0.0013 |
| **IPCA** |  | 22 | 15335 | 697 | 2.66 | <0,001 |
| **IPCA** |  | 20 | 9654 | 483 | 1.85 | 0.0163 |
| **Residuals** |  | 34 | 8432 | 248 | 0.95 | 0.5552 |
| **Error** |  | 285 | 74563 | 262 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Duzi | 343 | 18 | 0.02884 |  |  |
| 2 | Krokodil | 318 | 20 | -0.80884 |  |  |
| 3 | PAN 3400 | 359 | 11 | 1.87900 |  |  |
| 4 | PAN 3471 | 350 | 16 | 0.58111 |  |  |
| 5 | PAN 3497 | 351 | 15 | -0.87097 |  |  |
| 6 | PAN 3515 | 357 | 12 | -1.57445 |  |  |
| 7 | PAN 3623 | 355 | 13 | -5.23986 |  |  |
| 8 | Sabie | 348 | 17 | -2.33171 |  |  |
| 9 | SST 806 | 371 | 1 | 1.74019 |  |  |
| 10 | SST 8125 | 371 | 2 | 0.91150 |  |  |
| 11 | SST 8135 | 370 | 4 | 0.64862 |  |  |
| 12 | SST 8154 | 359 | 10 | -0.73936 |  |  |
| 13 | SST 8155 | 353 | 14 | -1.07086 |  |  |
| 14 | SST 835 | 368 | 5 | 0.59174 |  |  |
| 15 | SST 843 | 365 | 6 | -0.12285 |  |  |
| 16 | SST 866 | 363 | 9 | 0.76166 |  |  |
| 17 | SST 875 | 371 | 3 | 0.58149 |  |  |
| 18 | SST 877 | 340 | 19 | 1.37578 |  |  |
| 19 | SST 884 | 364 | 8 | 0.18340 |  |  |
| 20 | SST 895 | 364 | 7 | 3.47556 |  |  |
| **Mean** |  | **357** |  |  |  |  |
| **Coefficient of variation (%)** | | **4.60** |  |  |  |  |
| **LSDt(0,05)** |  | **10.20** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Hartwater | 317 | 4 | 0.83968 |  |  |
| 2 | Hopetown | 311 | 5 | -2.85598 |  |  |
| 3 | Modderrivier | 397 | 1 | -2.15230 |  |  |
| 4 | Prieska | 377 | 3 | 6.54153 |  |  |
| 5 | Vaalharts | 382 | 2 | -2.37294 |  |  |
| **Mean** |  | **357** |  |  |  |  |
| **Coefficient of variation (%)** | | **4.60** |  |  |  |  |
| **LSDt(0,05)** |  | **5.10** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Cooler Central Irrigation Area (earlier planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Hartswater 2016-06-20** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 9.10 | e | 16 | 5.13 | 82.95 | 15 | 13.20 | 8 | 317 | 12 |
| **Krokodil** | 9.89 | b | 3 | 5.74 | 83.60 | 13 | 11.62 | 20 | 278 | 20 |
| **PAN 3400** | 10.55 | a | 1 | 5.51 | 84.05 | 7 | 12.82 | 13 | 321 | 7 |
| **PAN 3471** | 9.63 | bcd | 5 | 7.86 | 83.55 | 14 | 12.96 | 10 | 307 | 19 |
| **PAN 3497** | 9.92 | b | 2 | 5.01 | 85.10 | 1 | 12.79 | 14 | 320 | 9 |
| **PAN 3515** | 9.03 | e | 18 | 1.63 | 83.95 | 9 | 12.54 | 17 | 321 | 7 |
| **PAN 3623** | 9.51 | bcde | 7 | 6.41 | 82.25 | 18 | 13.43 | 5 | 308 | 17 |
| **Sabie** | 9.26 | cde | 12 | 1.07 | 84.00 | 8 | 13.29 | 7 | 307 | 18 |
| **SST 806** | 9.72 | bc | 4 | 6.47 | 84.40 | 4 | 12.93 | 11 | 337 | 2 |
| **SST 8125** | 9.41 | bcde | 8 | 2.36 | 84.55 | 2 | 12.89 | 12 | 325 | 4 |
| **SST 8135** | 9.19 | de | 14 | 3.60 | 83.80 | 11 | 13.13 | 9 | 322 | 5 |
| **SST 8154** | 9.35 | cde | 9 | 5.92 | 82.80 | 16 | 13.67 | 3 | 315 | 15 |
| **SST 8155** | 9.29 | cde | 11 | 9.40 | 83.70 | 12 | 12.39 | 18 | 315 | 14 |
| **SST 835** | 9.53 | bcde | 6 | 5.62 | 84.25 | 6 | 12.67 | 15 | 322 | 6 |
| **SST 843** | 7.54 | g | 20 | 7.79 | 82.00 | 19 | 15.16 | 1 | 317 | 11 |
| **SST 866** | 9.17 | de | 15 | 7.45 | 83.90 | 10 | 12.55 | 16 | 317 | 12 |
| **SST 875** | 9.35 | cde | 10 | 5.73 | 84.35 | 5 | 12.36 | 19 | 340 | 1 |
| **SST 877** | 9.06 | e | 17 | 6.73 | 84.45 | 3 | 13.36 | 6 | 318 | 10 |
| **SST 884** | 9.26 | cde | 13 | 5.97 | 81.65 | 20 | 13.56 | 4 | 310 | 16 |
| **SST 895** | 8.49 | f | 19 | 8.74 | 82.75 | 17 | 14.01 | 2 | 325 | 3 |
| **Mean** | **9.31** |  |  |  | **83.60** |  | **13.07** |  | **317** |  |
| **Coefficient of variation (%)** | **3.84** |  |  |  | **0.56** |  | **4.45** |  | **3.79** |  |
| **LSDt(0,05)** | **0.52** |  |  |  | **0.67** |  | **0.84** |  | **17.39** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Cooler Central Irrigation Area (earlier planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Hopetown 2016-06-21** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 10.95 | bcdef | 10 | 5.54 | 84.95 | 17 | 12.37 | 10 | 304 | 15 |
| **Krokodil** | 10.88 | bcdef | 11 | 1.91 | 85.45 | 8 | 11.55 | 20 | 294 | 19 |
| **PAN 3400** | 11.91 | a | 1 | 4.52 | 85.45 | 8 | 12.97 | 5 | 300 | 18 |
| **PAN 3471** | 11.43 | ab | 3 | 3.16 | 85.80 | 4 | 12.31 | 12 | 301 | 17 |
| **PAN 3497** | 11.18 | abcde | 6 | 5.07 | 86.00 | 2 | 12.06 | 16 | 317 | 7 |
| **PAN 3515** | 11.26 | abcd | 5 | 6.36 | 85.65 | 7 | 11.87 | 19 | 308 | 12 |
| **PAN 3623** | 9.54 | h | 19 | 12.15 | 85.20 | 14 | 13.30 | 2 | 325 | 2 |
| **Sabie** | 10.14 | gh | 18 | 3.51 | 84.40 | 19 | 12.51 | 8 | 302 | 16 |
| **SST 806** | 11.00 | bcde | 9 | 7.74 | 86.45 | 1 | 12.46 | 9 | 324 | 3 |
| **SST 8125** | 11.37 | abc | 4 | 2.91 | 85.95 | 3 | 12.13 | 13 | 323 | 5 |
| **SST 8135** | 11.03 | bcde | 8 | 4.73 | 85.75 | 5 | 12.35 | 11 | 319 | 6 |
| **SST 8154** | 10.26 | fgh | 17 | 7.17 | 85.45 | 8 | 12.99 | 3 | 307 | 14 |
| **SST 8155** | 10.46 | efg | 16 | 6.54 | 84.25 | 20 | 12.00 | 17 | 310 | 11 |
| **SST 835** | 10.69 | cdefg | 12 | 5.23 | 85.70 | 6 | 12.11 | 14 | 329 | 1 |
| **SST 843** | 8.42 | i | 20 | 2.98 | 85.10 | 16 | 14.60 | 1 | 315 | 8 |
| **SST 866** | 11.12 | bcde | 7 | 7.52 | 85.40 | 11 | 11.96 | 18 | 311 | 10 |
| **SST 875** | 10.56 | defg | 13 | 10.10 | 85.30 | 12 | 12.07 | 15 | 324 | 3 |
| **SST 877** | 10.48 | efg | 14 | 3.03 | 84.55 | 18 | 12.80 | 7 | 293 | 20 |
| **SST 884** | 10.48 | efg | 14 | 4.02 | 85.25 | 13 | 12.96 | 6 | 312 | 9 |
| **SST 895** | 11.48 | ab | 2 | 6.83 | 85.15 | 15 | 12.98 | 4 | 308 | 12 |
| **Mean** | **10.73** |  |  |  | **85.36** |  | **12.52** |  | **311** |  |
| **Coefficient of variation (%)** | **4.72** |  |  |  | **0.70** |  | **3.10** |  | **2.97** |  |
| **LSDt(0,05)** | **0.73** |  |  |  | **0.87** |  | **0.56** |  | **13.37** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Cooler Central Irrigation Area (earlier planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Modderrivier 2016-06-15** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 7.45 | def | 15 | 9.38 | 77.85 | 7 | 14.84 | 16 | 365 | 19 |
| **Krokodil** | 8.39 | a | 1 | 6.98 | 77.55 | 8 | 14.27 | 20 | 354 | 20 |
| **PAN 3400** | 7.53 | cdef | 14 | 8.77 | 77.00 | 12 | 15.67 | 5 | 409 | 4 |
| **PAN 3471** | 7.89 | abcd | 7 | 11.97 | 78.05 | 5 | 15.44 | 8 | 394 | 16 |
| **PAN 3497** | 7.39 | def | 16 | 6.06 | 76.55 | 17 | 15.82 | 2 | 380 | 17 |
| **PAN 3515** | 8.23 | ab | 5 | 17.96 | 77.40 | 10 | 14.41 | 19 | 404 | 10 |
| **PAN 3623** | 8.24 | ab | 4 | 8.77 | 80.20 | 2 | 15.54 | 6 | 410 | 1 |
| **Sabie** | 7.16 | efg | 18 | 8.58 | 76.60 | 16 | 15.71 | 4 | 403 | 12 |
| **SST 806** | 7.00 | fg | 19 | 8.96 | 76.55 | 17 | 15.80 | 3 | 410 | 1 |
| **SST 8125** | 7.76 | bcde | 12 | 9.03 | 76.70 | 15 | 15.24 | 11 | 406 | 8 |
| **SST 8135** | 7.73 | bcde | 13 | 5.57 | 76.95 | 14 | 15.48 | 7 | 409 | 4 |
| **SST 8154** | 8.08 | abc | 6 | 4.93 | 79.10 | 3 | 15.36 | 10 | 410 | 1 |
| **SST 8155** | 6.69 | g | 20 | 13.54 | 73.85 | 20 | 15.01 | 14 | 402 | 13 |
| **SST 835** | 7.82 | abcd | 10 | 9.21 | 77.00 | 12 | 15.39 | 9 | 399 | 15 |
| **SST 843** | 7.83 | abcd | 9 | 3.70 | 80.95 | 1 | 16.25 | 1 | 404 | 10 |
| **SST 866** | 7.34 | def | 17 | 2.82 | 77.10 | 11 | 14.51 | 18 | 409 | 4 |
| **SST 875** | 7.81 | abcd | 11 | 13.87 | 77.45 | 9 | 15.14 | 12 | 407 | 7 |
| **SST 877** | 7.86 | abcd | 8 | 10.55 | 76.50 | 19 | 14.73 | 17 | 369 | 18 |
| **SST 884** | 8.39 | a | 2 | 5.18 | 77.95 | 6 | 15.11 | 13 | 401 | 14 |
| **SST 895** | 8.34 | ab | 3 | 3.42 | 78.80 | 4 | 15.01 | 14 | 405 | 9 |
| **Mean** | **7.75** |  |  |  | **77.51** |  | **15.24** |  | **397** |  |
| **Coefficient of variation (%)** | **5.41** |  |  |  | **1.66** |  | **2.41** |  | **2.66** |  |
| **LSDt(0,05)** | **0.61** |  |  |  | **1.86** |  | **0.53** |  | **15.31** |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Cooler Central Irrigation Area (earlier planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Prieska 2016-06-07** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 10.69 | bcd | 5 | 19.24 | 82.40 | 17 | 12.64 | 6 | 360 | 17 |
| **Krokodil** | 11.36 | ab | 2 | 8.15 | 82.20 | 19 | 11.79 | 15 | 335 | 20 |
| **PAN 3400** | 10.63 | bcd | 7 | 8.76 | 84.10 | 6 | 12.17 | 9 | 390 | 7 |
| **PAN 3471** | 11.78 | a | 1 | 5.91 | 83.75 | 10 | 11.96 | 13 | 375 | 12 |
| **PAN 3497** | 11.11 | abc | 3 | 5.00 | 84.40 | 3 | 11.53 | 17 | 363 | 16 |
| **PAN 3515** | 8.99 | g | 17 | 9.88 | 84.05 | 7 | 11.32 | 19 | 364 | 14 |
| **PAN 3623** | 7.52 | h | 19 | 8.82 | 82.05 | 20 | 13.65 | 2 | 342 | 19 |
| **Sabie** | 9.81 | defg | 12 | 16.79 | 83.75 | 10 | 12.22 | 8 | 353 | 18 |
| **SST 806** | 10.96 | abc | 4 | 11.37 | 84.45 | 2 | 12.07 | 11 | 401 | 2 |
| **SST 8125** | 10.28 | cdef | 10 | 13.77 | 84.20 | 4 | 11.71 | 16 | 400 | 3 |
| **SST 8135** | 10.56 | bcde | 8 | 8.27 | 84.50 | 1 | 12.13 | 10 | 397 | 4 |
| **SST 8154** | 7.73 | h | 18 | 11.01 | 82.80 | 15 | 13.01 | 3 | 375 | 11 |
| **SST 8155** | 9.52 | efg | 14 | 3.84 | 82.90 | 14 | 11.88 | 14 | 364 | 13 |
| **SST 835** | 10.29 | cdef | 9 | 9.36 | 84.15 | 5 | 11.32 | 19 | 395 | 5 |
| **SST 843** | 7.12 | h | 20 | 8.25 | 82.60 | 16 | 14.67 | 1 | 387 | 10 |
| **SST 866** | 10.67 | bcd | 6 | 7.24 | 83.05 | 13 | 11.37 | 18 | 390 | 7 |
| **SST 875** | 9.79 | defg | 13 | 6.34 | 83.80 | 9 | 11.99 | 12 | 392 | 6 |
| **SST 877** | 9.27 | fg | 16 | 8.89 | 83.50 | 12 | 12.57 | 7 | 364 | 15 |
| **SST 884** | 9.48 | fg | 15 | 10.53 | 82.40 | 17 | 12.77 | 5 | 390 | 9 |
| **SST 895** | 10.09 | cdef | 11 | 13.95 | 83.90 | 8 | 12.82 | 4 | 408 | 1 |
| **Mean** | **9.88** |  |  |  | **83.45** |  | **12.28** |  | **377** |  |
| **Coefficient of variation (%)** | **7.24** |  |  |  | **1.23** |  | **2.65** |  | **4.51** |  |
| **LSDt(0,05)** | **1.03** |  |  |  | **1.48** |  | **0.47** |  | **24.60** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Cooler Central Irrigation Area (earlier planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Vaalharts 2016-06-24** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 8.63 | hi | 18 | 9.33 | 80.35 | 18 | 11.08 | 3 | 372 | 17 |
| **Krokodil** | 9.78 | abc | 5 | 4.66 | 80.25 | 19 | 9.36 | 20 | 332 | 20 |
| **PAN 3400** | 9.98 | ab | 2 | 2.04 | 81.90 | 3 | 10.85 | 6 | 373 | 15 |
| **PAN 3471** | 9.67 | abcd | 7 | 4.52 | 81.50 | 7 | 10.58 | 9 | 373 | 16 |
| **PAN 3497** | 9.81 | abc | 4 | 2.69 | 81.35 | 11 | 10.20 | 14 | 375 | 14 |
| **PAN 3515** | 8.24 | i | 19 | 3.35 | 80.50 | 16 | 9.72 | 17 | 386 | 10 |
| **PAN 3623** | 8.74 | ghi | 17 | 4.22 | 80.80 | 15 | 11.16 | 2 | 389 | 7 |
| **Sabie** | 9.08 | efgh | 13 | 4.33 | 81.50 | 7 | 10.49 | 11 | 378 | 12 |
| **SST 806** | 10.12 | a | 1 | 1.41 | 82.80 | 1 | 10.15 | 15 | 383 | 11 |
| **SST 8125** | 9.01 | efgh | 14 | 5.07 | 82.05 | 2 | 9.64 | 18 | 401 | 3 |
| **SST 8135** | 9.66 | abcd | 8 | 3.54 | 81.70 | 6 | 10.44 | 12 | 402 | 2 |
| **SST 8154** | 9.33 | cdef | 11 | 2.47 | 81.25 | 12 | 10.96 | 4 | 389 | 8 |
| **SST 8155** | 9.68 | abcd | 6 | 5.49 | 81.45 | 10 | 10.02 | 16 | 372 | 17 |
| **SST 835** | 9.49 | bcde | 10 | 5.82 | 81.75 | 4 | 9.59 | 19 | 394 | 5 |
| **SST 843** | 7.18 | j | 20 | 4.97 | 80.45 | 17 | 12.82 | 1 | 401 | 3 |
| **SST 866** | 9.88 | abc | 3 | 4.84 | 81.10 | 13 | 10.37 | 13 | 388 | 9 |
| **SST 875** | 9.22 | defg | 12 | 3.85 | 81.75 | 4 | 10.55 | 10 | 390 | 6 |
| **SST 877** | 8.75 | ghi | 16 | 5.08 | 81.05 | 14 | 10.61 | 8 | 358 | 19 |
| **SST 884** | 9.64 | abcd | 9 | 3.41 | 79.85 | 20 | 10.76 | 7 | 405 | 1 |
| **SST 895** | 8.85 | fgh | 15 | 3.05 | 81.50 | 7 | 10.94 | 5 | 376 | 13 |
| **Mean** | **9.24** |  |  |  | **81.24** |  | **10.51** |  | **382** |  |
| **Coefficient of variation (%)** | **4.10** |  |  |  | **0.71** |  | **3.81** |  | **7.28** |  |
| **LSDt(0,05)** | **0.55** |  |  |  | **0.84** |  | **0.58** |  | **40.17** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cooler Central Irrigation Area (later planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 6.68 | 23 | 6.84 | 19 | 7.39 | 24 |  |  |  |  |  |  |
| **Duzi** | 9.58 | 3 | 7.52 | 20 | 7.25 | 18 | 7.48 | 19 | 7.95 | 13 | 8.11 | 15 | 8.55 | 15 |
| **Koedoes** |  |  | 9.25 | 3 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 9.51 | 4 | 8.74 | 10 | 8.30 | 6 | 8.47 | 5 | 8.76 | 4 | 8.85 | 5 | 9.13 | 7 |
| **PAN 3400** | 9.67 | 2 | 9.04 | 7 | 8.17 | 7 | 8.48 | 4 | 8.84 | 3 | 8.96 | 4 | 9.35 | 2 |
| **PAN 3471** | 9.47 | 5 | 8.80 | 9 | 8.04 | 11 | 8.15 | 11 | 8.62 | 6 | 8.77 | 7 | 9.14 | 6 |
| **PAN 3478** |  |  |  |  |  |  | 7.88 | 16 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 8.07 | 10 | 8.10 | 12 |  |  |  |  |  |  |
| **PAN 3497** | 9.43 | 9 | 8.34 | 16 | 8.12 | 8 | 7.46 | 22 | 8.34 | 10 | 8.63 | 10 | 8.89 | 11 |
| **PAN 3515** | 9.39 | 11 | 8.30 | 17 | 7.57 | 15 |  |  |  |  | 8.42 | 12 | 8.84 | 12 |
| **PAN 3623** | 9.45 | 6 | 9.25 | 4 | 8.50 | 1 |  |  |  |  | 9.07 | 2 | 9.35 | 3 |
| **Renoster** |  |  | 9.45 | 1 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 8.91 | 17 | 7.40 | 21 | 7.55 | 16 | 7.92 | 15 | 7.95 | 14 | 7.95 | 16 | 8.16 | 18 |
| **SST 806** | 9.22 | 14 | 8.57 | 12 | 8.34 | 4 | 8.26 | 8 | 8.60 | 8 | 8.71 | 9 | 8.90 | 9 |
| **SST 8125** | 8.85 | 18 | 8.42 | 15 |  |  |  |  |  |  |  |  | 8.64 | 14 |
| **SST 8134** |  |  | 8.95 | 8 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 9.36 | 12 | 8.43 | 14 |  |  |  |  |  |  |  |  | 8.90 | 7 |
| **SST 8154** | 9.31 | 13 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 8.85 | 19 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 7.47 | 21 |  |  |  |  |  |  |
| **SST 835** | 9.19 | 15 | 8.19 | 18 | 8.09 | 9 | 8.06 | 13 | 8.38 | 9 | 8.49 | 11 | 8.69 | 13 |
| **SST 843** | 8.49 | 20 | 8.43 | 13 | 7.52 | 17 | 7.70 | 18 | 8.03 | 12 | 8.15 | 14 | 8.46 | 16 |
| **SST 866** | 9.45 | 6 | 9.11 | 6 | 7.73 | 13 | 8.15 | 10 | 8.61 | 7 | 8.76 | 8 | 9.28 | 5 |
| **SST 867** |  |  | 6.74 | 22 | 7.65 | 14 | 7.86 | 17 |  |  |  |  |  |  |
| **SST 875** | 9.45 | 8 | 8.65 | 11 | 8.30 | 5 | 8.28 | 7 | 8.67 | 5 | 8.80 | 6 | 9.05 | 8 |
| **SST 876** |  |  |  |  |  |  | 8.24 | 9 |  |  |  |  |  |  |
| **SST 877** | 9.01 | 16 | 7.70 | 19 | 7.86 | 12 | 7.97 | 14 | 8.14 | 11 | 8.19 | 13 | 8.36 | 17 |
| **SST 884** | 9.42 | 10 | 9.15 | 5 | 8.37 | 3 | 8.81 | 1 | 8.94 | 2 | 8.98 | 3 | 9.29 | 4 |
| **SST 895** | 9.69 | 1 | 9.25 | 2 | 8.44 | 2 | 8.65 | 2 | 9.01 | 1 | 9.13 | 1 | 9.47 | 1 |
| **SST 896** |  |  |  |  |  |  | 8.64 | 3 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 8.30 | 6 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 7.46 | 23 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 7.47 | 20 |  |  |  |  |  |  |
| **Mean** | **9.28** |  | **8.45** |  | **7.93** |  | **8.03** |  | **8.49** |  | **8.62** |  | **8.91** |  |
| **LSDt(0,05)** | **0.33** |  | **0.28** |  | **0.17** |  | **0.18** |  | **0.13** |  | **0.16** |  | **0.23** |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Cooler Central Irrigation Area (later planting) AMMI Analysis** | | | | | | |
| **Anova of the yield of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 719 | 1436.2 | 2.00 |  |  |
| **Treatments** | | 179 | 1157.7 | 6.47 | 13.43 | <0,001 |
| **Genotypes** | | 19 | 67.2 | 3.54 | 7.34 | <0,001 |
| **Environments** | | 8 | 932.2 | 116.53 | 100.16 | <0,001 |
| **Block** |  | 27 | 31.4 | 1.16 | 2.41 | <0,001 |
| **Interactions** | | 152 | 158.3 | 1.04 | 2.16 | <0,001 |
| **IPCA** |  | 26 | 54.0 | 2.08 | 4.31 | <0,001 |
| **IPCA** |  | 24 | 30.9 | 1.29 | 2.67 | <0,001 |
| **Residuals** |  | 102 | 73.3 | 0.72 | 1.49 | 0.0029 |
| **Error** |  | 513 | 247.1 | 0.48 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Duzi | 9.58 | 3 | -0.00591 |  |  |
| 2 | Krokodil | 9.51 | 4 | 0.60626 |  |  |
| 3 | PAN 3400 | 9.67 | 2 | 0.12555 |  |  |
| 4 | PAN 3471 | 9.47 | 5 | 0.41146 |  |  |
| 5 | PAN 3497 | 9.43 | 9 | 0.40072 |  |  |
| 6 | PAN 3515 | 9.39 | 11 | 0.10432 |  |  |
| 7 | PAN 3623 | 9.45 | 6 | -0.84480 |  |  |
| 8 | Sabie | 8.91 | 17 | 0.91112 |  |  |
| 9 | SST 806 | 9.22 | 14 | 0.01290 |  |  |
| 10 | SST 8125 | 8.85 | 18 | 0.13248 |  |  |
| 11 | SST 8135 | 9.36 | 12 | -0.18163 |  |  |
| 12 | SST 8154 | 9.31 | 13 | -0.65946 |  |  |
| 13 | SST 8155 | 8.85 | 19 | 0.25653 |  |  |
| 14 | SST 835 | 9.19 | 15 | -0.12472 |  |  |
| 15 | SST 843 | 8.49 | 20 | -0.55948 |  |  |
| 16 | SST 866 | 9.45 | 6 | 0.11417 |  |  |
| 17 | SST 875 | 9.45 | 8 | 0.26685 |  |  |
| 18 | SST 877 | 9.01 | 16 | -0.05024 |  |  |
| 19 | SST 884 | 9.42 | 10 | -0.35910 |  |  |
| 20 | SST 895 | 9.69 | 1 | -0.55702 |  |  |
| **Mean** |  | **9.28** |  |  |  |  |
| **Coefficient of variation (%)** | | **7.70** |  |  |  |  |
| **LSDt(0,05)** |  | **0.33** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Barkley-West | 9.72 | 4 | 0.46852 |  |  |
| 2 | Douglas | 8.06 | 8 | 1.21332 |  |  |
| 3 | Hopetown | 10.11 | 3 | -0.50147 |  |  |
| 4 | Modderrivier | 11.12 | 1 | -0.24271 |  |  |
| 5 | Prieska | 10.55 | 2 | 0.50172 |  |  |
| 6 | Rama 1 | 8.25 | 6 | -0.90435 |  |  |
| 7 | Rama 2 | 9.65 | 5 | -0.68669 |  |  |
| 8 | Upington | 7.90 | 9 | -0.16834 |  |  |
| 9 | Vaalharts | 8.19 | 7 | 0.32000 |  |  |
| **Mean** |  | **9.28** |  |  |  |  |
| **Coefficient of variation (%)** | | **7.70** |  |  |  |  |
| **LSDt(0,05)** |  | **0.22** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cooler Central Irrigation Area (later planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 79.88 | 22 | 79.69 | 16 | 77.54 | 20 |  |  |  |  |  |  |
| **Duzi** | 82.46 | 15 | 80.88 | 20 | 79.66 | 17 | 77.63 | 19 | 80.16 | 13 | 81.00 | 15 | 81.67 | 16 |
| **Koedoes** |  |  | 82.66 | 4 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 82.66 | 11 | 82.71 | 3 | 80.72 | 10 | 78.24 | 10 | 81.08 | 5 | 82.03 | 6 | 82.69 | 4 |
| **PAN 3400** | 82.49 | 13 | 82.17 | 8 | 80.94 | 6 | 78.74 | 6 | 81.09 | 4 | 81.87 | 8 | 82.33 | 9 |
| **PAN 3471** | 83.23 | 5 | 82.65 | 5 | 81.17 | 4 | 78.97 | 2 | 81.51 | 2 | 82.35 | 2 | 82.94 | 3 |
| **PAN 3478** |  |  |  |  |  |  | 78.76 | 5 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 81.63 | 2 | 79.52 | 1 |  |  |  |  |  |  |
| **PAN 3497** | 83.03 | 7 | 81.87 | 10 | 81.78 | 1 | 78.74 | 6 | 81.36 | 3 | 82.23 | 4 | 82.45 | 8 |
| **PAN 3515** | 82.79 | 10 | 81.34 | 16 | 80.52 | 13 |  |  |  |  | 81.55 | 12 | 82.07 | 12 |
| **PAN 3623** | 83.41 | 3 | 83.02 | 2 | 80.59 | 12 |  |  |  |  | 82.34 | 3 | 83.22 | 2 |
| **Renoster** |  |  | 80.96 | 19 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 81.87 | 19 | 81.37 | 15 | 79.91 | 15 | 77.72 | 17 | 80.22 | 11 | 81.05 | 14 | 81.62 | 17 |
| **SST 806** | 83.02 | 8 | 82.21 | 7 | 81.13 | 5 | 77.85 | 16 | 81.05 | 6 | 82.12 | 5 | 82.62 | 6 |
| **SST 8125** | 82.47 | 14 | 81.31 | 17 |  |  |  |  |  |  |  |  | 81.89 | 15 |
| **SST 8134** |  |  | 80.99 | 18 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 82.81 | 9 | 81.52 | 13 |  |  |  |  |  |  |  |  | 82.17 | 10 |
| **SST 8154** | 83.63 | 1 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 81.47 | 20 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 78.17 | 11 |  |  |  |  |  |  |
| **SST 835** | 83.14 | 6 | 81.38 | 14 | 80.77 | 9 | 78.44 | 8 | 80.93 | 8 | 81.76 | 9 | 82.26 | 10 |
| **SST 843** | 83.61 | 2 | 83.87 | 1 | 81.51 | 3 | 78.90 | 4 | 81.97 | 1 | 83.00 | 1 | 83.74 | 1 |
| **SST 866** | 82.63 | 12 | 82.30 | 6 | 80.21 | 14 | 78.08 | 13 | 80.81 | 9 | 81.71 | 10 | 82.47 | 7 |
| **SST 867** |  |  | 80.50 | 21 | 80.87 | 7 | 77.97 | 14 |  |  |  |  |  |  |
| **SST 875** | 82.41 | 16 | 81.67 | 12 | 80.85 | 8 | 77.94 | 15 | 80.72 | 10 | 81.64 | 11 | 82.04 | 14 |
| **SST 876** |  |  |  |  |  |  | 78.92 | 3 |  |  |  |  |  |  |
| **SST 877** | 82.16 | 18 | 79.76 | 23 | 79.09 | 19 | 77.69 | 18 | 79.68 | 14 | 80.34 | 16 | 80.96 | 18 |
| **SST 884** | 82.36 | 17 | 81.73 | 11 | 79.21 | 18 | 77.43 | 22 | 80.18 | 12 | 81.10 | 13 | 82.05 | 13 |
| **SST 895** | 83.25 | 4 | 81.98 | 9 | 80.64 | 11 | 78.12 | 12 | 81.00 | 7 | 81.96 | 7 | 82.62 | 5 |
| **SST 896** |  |  |  |  |  |  | 77.34 | 23 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 78.33 | 9 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 76.84 | 24 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 77.46 | 21 |  |  |  |  |  |  |
| **Mean** | **82.75** |  | **81.68** |  | **80.57** |  | **78.14** |  | **80.84** |  | **81.75** |  | **82.32** |  |
| **LSDt(0,05)** | **0.54** |  | **0.54** |  | **0.44** |  | **0.64** |  | **0.31** |  | **0.30** |  | **0.39** |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Cooler Central Irrigation Area (later planting) AMMI Analysis** | | | | | | |
| **Anova of the hectolitre mass of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 719 | 1827.8 | 2.542 |  |  |
| **Treatments** | | 179 | 1087.7 | 6.077 | 5.06 | <0,001 |
| **Genotypes** | | 19 | 217.0 | 11.421 | 9.51 | <0,001 |
| **Environments** | | 8 | 394.3 | 49.283 | 10.74 | <0,001 |
| **Block** |  | 27 | 123.9 | 4.587 | 3.82 | <0,001 |
| **Interactions** | | 152 | 476.4 | 3.134 | 2.61 | <0,001 |
| **IPCA** |  | 26 | 176.8 | 6.800 | 5.66 | <0,001 |
| **IPCA** |  | 24 | 115.8 | 4.826 | 4.02 | <0,001 |
| **Residuals** |  | 102 | 183.8 | 1.802 | 1.50 | 0.0026 |
| **Error** |  | 513 | 616.3 | 1.201 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Duzi | 82.46 | 15 | 0.74003 |  |  |
| 2 | Krokodil | 82.66 | 11 | -0.09967 |  |  |
| 3 | PAN 3400 | 82.49 | 13 | 0.09709 |  |  |
| 4 | PAN 3471 | 83.23 | 5 | -0.20850 |  |  |
| 5 | PAN 3497 | 83.03 | 7 | 0.16008 |  |  |
| 6 | PAN 3515 | 82.79 | 10 | 0.23268 |  |  |
| 7 | PAN 3623 | 83.41 | 3 | -0.66976 |  |  |
| 8 | Sabie | 81.87 | 19 | 1.75771 |  |  |
| 9 | SST 806 | 83.02 | 8 | 0.26069 |  |  |
| 10 | SST 8125 | 82.47 | 14 | -0.04454 |  |  |
| 11 | SST 8135 | 82.81 | 9 | 0.12487 |  |  |
| 12 | SST 8154 | 83.63 | 1 | -0.49155 |  |  |
| 13 | SST 8155 | 81.47 | 20 | 0.13780 |  |  |
| 14 | SST 835 | 83.14 | 6 | -0.03173 |  |  |
| 15 | SST 843 | 83.61 | 2 | -1.07263 |  |  |
| 16 | SST 866 | 82.63 | 12 | -0.16140 |  |  |
| 17 | SST 875 | 82.41 | 16 | 0.06212 |  |  |
| 18 | SST 877 | 82.16 | 18 | 0.40805 |  |  |
| 19 | SST 884 | 82.36 | 17 | -0.64728 |  |  |
| 20 | SST 895 | 83.25 | 4 | -0.55405 |  |  |
| **Mean** |  | **82.75** |  |  |  |  |
| **Coefficient of variation (%)** | | **1.40** |  |  |  |  |
| **LSDt(0,05)** |  | **0.54** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Barkley-West | 83.10 | 3 | 0.40875 |  |  |
| 2 | Douglas | 82.76 | 5 | 0.41326 |  |  |
| 3 | Hopetown | 82.46 | 7 | 0.33881 |  |  |
| 4 | Modderrivier | 83.12 | 2 | 1.17301 |  |  |
| 5 | Prieska | 84.20 | 1 | 1.16922 |  |  |
| 6 | Rama 1 | 83.00 | 4 | 0.20289 |  |  |
| 7 | Rama 2 | 82.76 | 5 | 1.26753 |  |  |
| 8 | Upington | 81.69 | 8 | 0.61118 |  |  |
| 9 | Vaalharts | 81.62 | 9 | 1.19641 |  |  |
| **Mean** |  | **82.75** |  |  |  |  |
| **Coefficient of variation (%)** | | **1.40** |  |  |  |  |
| **LSDt(0,05)** |  | **0.36** |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cooler Central Irrigation Area (later planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 13.21 | 13 | 13.14 | 6 | 11.96 | 9 |  |  |  |  |  |  |
| **Duzi** | 12.40 | 3 | 13.17 | 15 | 13.10 | 8 | 12.10 | 4 | 12.69 | 3 | 12.89 | 6 | 12.79 | 5 |
| **Koedoes** |  |  | 13.49 | 5 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 11.44 | 20 | 11.75 | 23 | 12.21 | 19 | 11.38 | 24 | 11.70 | 14 | 11.80 | 16 | 11.60 | 18 |
| **PAN 3400** | 12.27 | 7 | 13.27 | 11 | 13.18 | 4 | 11.89 | 11 | 12.65 | 5 | 12.91 | 5 | 12.77 | 6 |
| **PAN 3471** | 11.95 | 15 | 13.06 | 18 | 12.95 | 14 | 11.69 | 20 | 12.41 | 11 | 12.65 | 12 | 12.51 | 14 |
| **PAN 3478** |  |  |  |  |  |  | 12.10 | 4 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 13.04 | 12 | 11.75 | 17 |  |  |  |  |  |  |
| **PAN 3497** | 12.09 | 11 | 13.19 | 14 | 13.06 | 9 | 11.78 | 15 | 12.53 | 7 | 12.78 | 8 | 12.64 | 11 |
| **PAN 3515** | 11.69 | 19 | 12.79 | 21 | 12.71 | 17 |  |  |  |  | 12.40 | 15 | 12.24 | 17 |
| **PAN 3623** | 12.95 | 2 | 13.71 | 2 | 13.29 | 2 |  |  |  |  | 13.32 | 2 | 13.33 | 2 |
| **Renoster** |  |  | 12.80 | 20 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 12.38 | 4 | 13.52 | 4 | 13.06 | 9 | 11.81 | 14 | 12.69 | 3 | 12.99 | 4 | 12.95 | 3 |
| **SST 806** | 12.02 | 14 | 13.34 | 9 | 13.26 | 3 | 11.70 | 19 | 12.58 | 6 | 12.87 | 7 | 12.68 | 9 |
| **SST 8125** | 12.13 | 10 | 13.13 | 16 |  |  |  |  |  |  |  |  | 12.63 | 12 |
| **SST 8134** |  |  | 13.39 | 7 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 12.14 | 9 | 13.35 | 8 |  |  |  |  |  |  |  |  | 12.75 | 6 |
| **SST 8154** | 12.28 | 6 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 11.90 | 16 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 12.25 | 2 |  |  |  |  |  |  |
| **SST 835** | 12.03 | 13 | 13.30 | 10 | 12.99 | 13 | 11.58 | 23 | 12.48 | 10 | 12.77 | 9 | 12.67 | 10 |
| **SST 843** | 13.65 | 1 | 14.40 | 1 | 14.56 | 1 | 13.44 | 1 | 14.01 | 1 | 14.20 | 1 | 14.03 | 1 |
| **SST 866** | 11.70 | 18 | 12.79 | 21 | 12.88 | 15 | 11.69 | 20 | 12.27 | 12 | 12.46 | 13 | 12.25 | 16 |
| **SST 867** |  |  | 13.62 | 3 | 13.06 | 9 | 11.84 | 13 |  |  |  |  |  |  |
| **SST 875** | 11.73 | 17 | 12.93 | 19 | 12.54 | 18 | 11.64 | 22 | 12.21 | 13 | 12.40 | 14 | 12.33 | 15 |
| **SST 876** |  |  |  |  |  |  | 11.97 | 8 |  |  |  |  |  |  |
| **SST 877** | 12.08 | 12 | 13.09 | 17 | 13.13 | 7 | 11.75 | 17 | 12.51 | 8 | 12.77 | 10 | 12.59 | 13 |
| **SST 884** | 12.15 | 8 | 13.25 | 12 | 12.81 | 16 | 11.77 | 16 | 12.50 | 9 | 12.74 | 11 | 12.70 | 8 |
| **SST 895** | 12.37 | 5 | 13.44 | 6 | 13.18 | 4 | 12.07 | 7 | 12.77 | 2 | 13.00 | 3 | 12.91 | 4 |
| **SST 896** |  |  |  |  |  |  | 12.14 | 3 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 11.93 | 10 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 12.09 | 6 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 11.87 | 12 |  |  |  |  |  |  |
| **Mean** | **12.17** |  | **13.22** |  | **13.06** |  | **11.92** |  | **12.57** |  | **12.81** |  | **12.68** |  |
| **LSDt(0,05)** | **0.30** |  | **0.30** |  | **0.27** |  | **0.30** |  | **0.15** |  | **0.17** |  | **0.22** |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Cooler Central Irrigation Area (later planting) AMMI Analysis** | | | | | | |
| **Anova of the protein content of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 719 | 1290.2 | 1.79 |  |  |
| **Treatments** | | 179 | 1062.1 | 5.93 | 18.13 | <0,001 |
| **Genotypes** | | 19 | 155.2 | 8.17 | 24.96 | <0,001 |
| **Environments** | | 8 | 843.9 | 105.49 | 47.34 | <0,001 |
| **Block** |  | 27 | 60.2 | 2.23 | 6.81 | <0,001 |
| **Interactions** | | 152 | 63.0 | 0.41 | 1.27 | 0.0311 |
| **IPCA** |  | 26 | 22.1 | 0.85 | 2.60 | <0,001 |
| **IPCA** |  | 24 | 13.8 | 0.57 | 1.75 | 0.0154 |
| **Residuals** |  | 102 | 27.1 | 0.27 | 0.81 | 0.9024 |
| **Error** |  | 513 | 167.9 | 0.33 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Duzi | 12.40 | 3 | 0.38917 |  |  |
| 2 | Krokodil | 11.44 | 20 | -0.50573 |  |  |
| 3 | PAN 3400 | 12.27 | 7 | 0.09371 |  |  |
| 4 | PAN 3471 | 11.95 | 15 | 0.09564 |  |  |
| 5 | PAN 3497 | 12.09 | 11 | 0.48799 |  |  |
| 6 | PAN 3515 | 11.69 | 19 | 0.39289 |  |  |
| 7 | PAN 3623 | 12.95 | 2 | -0.11607 |  |  |
| 8 | Sabie | 12.38 | 4 | 0.42396 |  |  |
| 9 | SST 806 | 12.02 | 14 | 0.25752 |  |  |
| 10 | SST 8125 | 12.13 | 10 | 0.44497 |  |  |
| 11 | SST 8135 | 12.14 | 9 | 0.01175 |  |  |
| 12 | SST 8154 | 12.28 | 6 | -0.14382 |  |  |
| 13 | SST 8155 | 11.90 | 16 | 0.20093 |  |  |
| 14 | SST 835 | 12.03 | 13 | -0.17940 |  |  |
| 15 | SST 843 | 13.65 | 1 | -0.80419 |  |  |
| 16 | SST 866 | 11.70 | 18 | -0.39774 |  |  |
| 17 | SST 875 | 11.73 | 17 | -0.10460 |  |  |
| 18 | SST 877 | 12.08 | 12 | 0.02831 |  |  |
| 19 | SST 884 | 12.15 | 8 | -0.27205 |  |  |
| 20 | SST 895 | 12.37 | 5 | -0.30325 |  |  |
| **Mean** |  | **12.17** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.30** |  |  |  |  |
| **LSDt(0,05)** |  | **0.30** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Barkley-West | 12.63 | 3 | -0.35301 |  |  |
| 2 | Douglas | 14.14 | 1 | -0.82440 |  |  |
| 3 | Hopetown | 12.25 | 5 | 0.22791 |  |  |
| 4 | Modderrivier | 12.04 | 6 | 0.00461 |  |  |
| 5 | Prieska | 10.59 | 8 | -0.59292 |  |  |
| 6 | Rama 1 | 11.82 | 7 | -0.21248 |  |  |
| 7 | Rama 2 | 12.28 | 4 | 0.73816 |  |  |
| 8 | Upington | 13.23 | 2 | 0.36253 |  |  |
| 9 | Vaalharts | 10.53 | 9 | 0.64960 |  |  |
| **Mean** |  | **12.17** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.30** |  |  |  |  |
| **LSDt(0,05)** |  | **0.20** |  |  |  |  |

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| **Cooler Central Irrigation Area (later planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 342 | 21 | 379 | 12 | 372 | 14 |  |  |  |  |  |  |
| **Duzi** | 354 | 16 | 343 | 18 | 374 | 15 | 368 | 16 | 360 | 12 | 357 | 13 | 349 | 15 |
| **Koedoes** |  |  | 350 | 12 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 329 | 20 | 335 | 23 | 349 | 19 | 333 | 24 | 336 | 14 | 338 | 16 | 332 | 18 |
| **PAN 3400** | 351 | 17 | 347 | 15 | 380 | 10 | 374 | 9 | 363 | 9 | 359 | 11 | 349 | 14 |
| **PAN 3471** | 358 | 13 | 363 | 5 | 380 | 11 | 374 | 10 | 368 | 8 | 367 | 7 | 360 | 8 |
| **PAN 3478** |  |  |  |  |  |  | 381 | 2 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 366 | 17 | 376 | 4 |  |  |  |  |  |  |
| **PAN 3497** | 358 | 13 | 346 | 16 | 375 | 14 | 362 | 20 | 360 | 11 | 359 | 10 | 352 | 13 |
| **PAN 3515** | 348 | 18 | 343 | 19 | 378 | 13 |  |  |  |  | 356 | 14 | 345 | 16 |
| **PAN 3623** | 363 | 7 | 372 | 1 | 356 | 18 |  |  |  |  | 364 | 9 | 368 | 2 |
| **Renoster** |  |  | 348 | 13 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 356 | 15 | 348 | 13 | 372 | 16 | 367 | 18 | 361 | 10 | 359 | 12 | 352 | 12 |
| **SST 806** | 373 | 2 | 352 | 11 | 388 | 3 | 373 | 13 | 371 | 2 | 371 | 3 | 362 | 6 |
| **SST 8125** | 375 | 1 | 364 | 4 |  |  |  |  |  |  |  |  | 370 | 1 |
| **SST 8134** |  |  | 369 | 2 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 362 | 10 | 353 | 10 |  |  |  |  |  |  |  |  | 358 | 8 |
| **SST 8154** | 359 | 12 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 363 | 8 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 347 | 23 |  |  |  |  |  |  |
| **SST 835** | 371 | 3 | 354 | 9 | 384 | 8 | 374 | 8 | 371 | 4 | 370 | 4 | 362 | 5 |
| **SST 843** | 367 | 5 | 365 | 3 | 386 | 5 | 375 | 7 | 373 | 1 | 373 | 1 | 366 | 3 |
| **SST 866** | 361 | 11 | 359 | 7 | 385 | 7 | 373 | 11 | 369 | 6 | 368 | 6 | 360 | 9 |
| **SST 867** |  |  | 339 | 22 | 387 | 4 | 355 | 22 |  |  |  |  |  |  |
| **SST 875** | 369 | 4 | 357 | 8 | 389 | 1 | 370 | 15 | 371 | 3 | 372 | 2 | 363 | 4 |
| **SST 876** |  |  |  |  |  |  | 380 | 3 |  |  |  |  |  |  |
| **SST 877** | 339 | 19 | 344 | 17 | 381 | 9 | 359 | 21 | 355 | 13 | 354 | 15 | 341 | 17 |
| **SST 884** | 363 | 9 | 359 | 6 | 385 | 6 | 376 | 4 | 371 | 5 | 369 | 5 | 361 | 7 |
| **SST 895** | 364 | 6 | 342 | 20 | 389 | 2 | 383 | 1 | 369 | 7 | 365 | 8 | 353 | 11 |
| **SST 896** |  |  |  |  |  |  | 375 | 6 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 367 | 17 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 363 | 19 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 373 | 12 |  |  |  |  |  |  |
| **Mean** | **359** |  | **352** |  | **378** |  | **369** |  | **364** |  | **362** |  | **356** |  |
| **LSDt(0,05)** | **7.30** |  | **13.45** |  | **8.17** |  | **9.18** |  | **4.50** |  | **5.20** |  | **6.80** |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **Cooler Central Irrigation Area (later planting) AMMI Analysis** | | | | | | |
| **Anova of the falling number of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 719 | 1150709 | 1600 |  |  |
| **Treatments** | | 179 | 1014961 | 5670 | 24.08 | <0,001 |
| **Genotypes** | | 19 | 87122 | 4585 | 19.48 | <0,001 |
| **Environments** | | 8 | 853158 | 106645 | 192.28 | <0,001 |
| **Block** |  | 27 | 14975 | 555 | 2.36 | <0,001 |
| **Interactions** | | 152 | 74681 | 491 | 2.09 | <0,001 |
| **IPCA** |  | 26 | 29503 | 1135 | 4.82 | <0,001 |
| **IPCA** |  | 24 | 21076 | 878 | 3.73 | <0,001 |
| **Residuals** |  | 102 | 24102 | 236 | 1.00 | 0.4768 |
| **Error** |  | 513 | 120773 | 235 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Duzi | 354 | 16 | -1.97383 |  |  |
| 2 | Krokodil | 329 | 20 | -4.64242 |  |  |
| 3 | PAN 3400 | 351 | 17 | 0.95348 |  |  |
| 4 | PAN 3471 | 358 | 13 | 1.12567 |  |  |
| 5 | PAN 3497 | 358 | 13 | -0.35621 |  |  |
| 6 | PAN 3515 | 348 | 18 | -2.59627 |  |  |
| 7 | PAN 3623 | 363 | 7 | 2.00012 |  |  |
| 8 | Sabie | 356 | 15 | 0.62177 |  |  |
| 9 | SST 806 | 373 | 2 | 0.40613 |  |  |
| 10 | SST 8125 | 375 | 1 | 0.13071 |  |  |
| 11 | SST 8135 | 362 | 10 | 2.00087 |  |  |
| 12 | SST 8154 | 359 | 12 | 0.29120 |  |  |
| 13 | SST 8155 | 363 | 8 | 0.97274 |  |  |
| 14 | SST 835 | 371 | 3 | -0.00931 |  |  |
| 15 | SST 843 | 367 | 5 | 2.02760 |  |  |
| 16 | SST 866 | 361 | 11 | 2.38405 |  |  |
| 17 | SST 875 | 369 | 4 | 0.10580 |  |  |
| 18 | SST 877 | 339 | 19 | -5.47005 |  |  |
| 19 | SST 884 | 363 | 9 | 1.04946 |  |  |
| 20 | SST 895 | 364 | 6 | 0.97848 |  |  |
| **Mean** |  | **359** |  |  |  |  |
| **Coefficient of variation (%)** | | **4.40** |  |  |  |  |
| **LSDt(0,05)** |  | **7.30** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Barkley-West | 395 | 3 | 5.85271 |  |  |
| 2 | Douglas | 316 | 9 | -4.86496 |  |  |
| 3 | Hopetown | 363 | 5 | 1.31032 |  |  |
| 4 | Modderrivier | 384 | 4 | 3.34598 |  |  |
| 5 | Prieska | 327 | 7 | -0.22723 |  |  |
| 6 | Rama 1 | 320 | 8 | -2.53828 |  |  |
| 7 | Rama 2 | 328 | 6 | -2.88282 |  |  |
| 8 | Upington | 403 | 1 | -0.34572 |  |  |
| 9 | Vaalharts | 397 | 2 | 0.34999 |  |  |
| **Mean** |  | **359** |  |  |  |  |
| **Coefficient of variation (%)** | | **4.40** |  |  |  |  |
| **LSDt(0,05)** |  | **4.90** |  |  |  |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Cooler Central Irrigation Area (later planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Barkly West 2016-07-05** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 10.05 | abcd | 7 | 1.12 | 82.45 | 17 | 12.77 | 6 | 377 | 17 |
| **Krokodil** | 9.36 | bcd | 16 | 9.21 | 83.50 | 4 | 11.98 | 18 | 344 | 20 |
| **PAN 3400** | 10.47 | a | 1 | 4.94 | 82.85 | 14 | 12.78 | 5 | 410 | 1 |
| **PAN 3471** | 10.16 | abc | 5 | 7.06 | 83.50 | 4 | 12.26 | 16 | 405 | 12 |
| **PAN 3497** | 10.05 | abcd | 6 | 13.25 | 83.05 | 12 | 12.43 | 13 | 388 | 16 |
| **PAN 3515** | 9.88 | abcd | 8 | 2.56 | 82.85 | 14 | 11.98 | 18 | 350 | 18 |
| **PAN 3623** | 10.33 | ab | 3 | 2.91 | 83.40 | 8 | 13.57 | 2 | 397 | 13 |
| **Sabie** | 10.43 | a | 2 | 3.44 | 83.45 | 7 | 12.44 | 12 | 393 | 14 |
| **SST 806** | 9.86 | abcd | 9 | 1.95 | 82.60 | 16 | 12.63 | 10 | 410 | 1 |
| **SST 8125** | 9.32 | bcd | 17 | 8.51 | 82.20 | 18 | 12.64 | 9 | 409 | 8 |
| **SST 8135** | 9.58 | abcd | 13 | 9.87 | 83.50 | 4 | 12.31 | 14 | 409 | 10 |
| **SST 8154** | 9.50 | abcd | 14 | 17.56 | 84.20 | 2 | 12.98 | 4 | 393 | 15 |
| **SST 8155** | 9.20 | cd | 18 | 4.93 | 82.00 | 19 | 12.22 | 17 | 410 | 1 |
| **SST 835** | 9.78 | abcd | 11 | 5.26 | 83.65 | 3 | 12.68 | 7 | 409 | 8 |
| **SST 843** | 8.09 | e | 20 | 11.85 | 84.30 | 1 | 14.33 | 1 | 410 | 1 |
| **SST 866** | 9.49 | abcd | 15 | 10.86 | 83.20 | 11 | 12.55 | 11 | 410 | 1 |
| **SST 875** | 10.19 | abc | 4 | 1.76 | 83.30 | 9 | 11.97 | 20 | 410 | 1 |
| **SST 877** | 9.73 | abcd | 12 | 5.50 | 83.25 | 10 | 12.27 | 15 | 345 | 19 |
| **SST 884** | 9.82 | abcd | 10 | 4.78 | 81.65 | 20 | 12.68 | 7 | 410 | 1 |
| **SST 895** | 9.13 | d | 19 | 11.04 | 83.00 | 13 | 13.03 | 3 | 408 | 11 |
| **Mean** | **9.72** |  |  |  | **83.10** |  | **12.63** |  | **395** |  |
| **Coefficient of variation (%)** | **7.33** |  |  |  | **0.83** |  | **2.99** |  | **3.34** |  |
| **LSDt(0,05)** | **1.03** |  |  |  | **1.00** |  | **0.55** |  | **19.07** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Cooler Central Irrigation Area (later planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Douglas 2016-06-30** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 8.39 | bcde | 9 | 19.86 | 82.50 | 13 | 13.96 | 13 | 321 | 8 |
| **Krokodil** | 8.65 | abc | 4 | 8.41 | 82.05 | 18 | 14.32 | 7 | 311 | 12 |
| **PAN 3400** | 8.55 | abcd | 5 | 7.79 | 82.40 | 14 | 14.18 | 8 | 311 | 14 |
| **PAN 3471** | 8.86 | abc | 3 | 7.70 | 82.70 | 12 | 13.78 | 15 | 309 | 17 |
| **PAN 3497** | 9.04 | ab | 2 | 12.11 | 83.50 | 4 | 13.39 | 19 | 313 | 11 |
| **PAN 3515** | 9.11 | a | 1 | 11.61 | 83.40 | 6 | 13.03 | 20 | 303 | 20 |
| **PAN 3623** | 6.57 | h | 20 | 4.39 | 82.35 | 15 | 15.30 | 2 | 306 | 18 |
| **Sabie** | 8.42 | abcde | 7 | 8.28 | 82.10 | 17 | 14.11 | 10 | 311 | 12 |
| **SST 806** | 7.91 | def | 13 | 5.77 | 83.85 | 1 | 13.78 | 15 | 323 | 4 |
| **SST 8125** | 7.92 | def | 12 | 2.90 | 83.40 | 6 | 13.70 | 18 | 329 | 1 |
| **SST 8135** | 7.88 | def | 14 | 6.26 | 83.30 | 8 | 14.34 | 6 | 309 | 16 |
| **SST 8154** | 7.31 | fg | 18 | 7.61 | 81.65 | 19 | 14.41 | 5 | 319 | 9 |
| **SST 8155** | 7.93 | def | 11 | 9.25 | 80.35 | 20 | 13.78 | 15 | 311 | 15 |
| **SST 835** | 7.77 | ef | 15 | 10.43 | 83.60 | 2 | 14.18 | 8 | 325 | 3 |
| **SST 843** | 6.64 | gh | 19 | 3.39 | 82.95 | 10 | 15.58 | 1 | 305 | 19 |
| **SST 866** | 8.53 | abcd | 6 | 9.92 | 83.45 | 5 | 14.00 | 12 | 313 | 10 |
| **SST 875** | 8.40 | abcde | 8 | 14.10 | 83.00 | 9 | 13.80 | 14 | 323 | 4 |
| **SST 877** | 7.43 | f | 17 | 13.61 | 82.30 | 16 | 14.03 | 11 | 328 | 2 |
| **SST 884** | 7.72 | ef | 16 | 6.85 | 82.85 | 11 | 14.49 | 4 | 323 | 6 |
| **SST 895** | 8.18 | cde | 10 | 5.04 | 83.55 | 3 | 14.55 | 3 | 322 | 7 |
| **Mean** | **8.06** |  |  |  | **82.76** |  | **14.14** |  | **316** |  |
| **Coefficient of variation (%)** | **6.11** |  |  |  | **1.25** |  | **4.09** |  | **4.37** |  |
| **LSDt(0,05)** | **0.71** |  |  |  | **1.50** |  | **0.84** |  | **19.94** |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Cooler Central Irrigation Area (later planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Hopetown 2016-07-22** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 10.22 | abcde | 9 | 10.62 | 83.40 | 4 | 12.73 | 3 | 338 | 18 |
| **Krokodil** | 11.07 | ab | 2 | 9.94 | 82.25 | 11 | 11.13 | 20 | 331 | 19 |
| **PAN 3400** | 10.06 | bcde | 11 | 15.78 | 81.20 | 18 | 12.02 | 15 | 319 | 20 |
| **PAN 3471** | 9.15 | e | 20 | 12.44 | 81.30 | 17 | 12.23 | 11 | 345 | 16 |
| **PAN 3497** | 9.65 | cde | 14 | 17.34 | 83.35 | 5 | 12.09 | 13 | 356 | 14 |
| **PAN 3515** | 10.58 | abcd | 5 | 8.22 | 82.30 | 10 | 11.82 | 17 | 354 | 15 |
| **PAN 3623** | 10.24 | abcde | 8 | 7.48 | 82.70 | 9 | 13.00 | 2 | 383 | 4 |
| **Sabie** | 9.36 | de | 19 | 12.82 | 80.80 | 19 | 12.15 | 12 | 367 | 9 |
| **SST 806** | 10.57 | abcd | 6 | 3.58 | 83.35 | 5 | 12.27 | 9 | 389 | 2 |
| **SST 8125** | 9.80 | bcde | 13 | 15.30 | 82.25 | 11 | 12.55 | 4 | 399 | 1 |
| **SST 8135** | 10.06 | bcde | 11 | 11.07 | 82.25 | 11 | 12.39 | 7 | 387 | 3 |
| **SST 8154** | 10.60 | abcd | 4 | 2.50 | 84.20 | 1 | 11.59 | 19 | 373 | 8 |
| **SST 8155** | 9.60 | cde | 17 | 6.56 | 81.35 | 16 | 12.06 | 14 | 359 | 13 |
| **SST 835** | 10.13 | abcde | 10 | 8.60 | 83.15 | 7 | 12.54 | 6 | 375 | 6 |
| **SST 843** | 9.62 | cde | 15 | 3.08 | 83.85 | 2 | 13.58 | 1 | 373 | 7 |
| **SST 866** | 10.33 | abcde | 7 | 4.96 | 82.25 | 11 | 11.71 | 18 | 377 | 5 |
| **SST 875** | 9.61 | cde | 16 | 9.22 | 82.15 | 15 | 12.01 | 16 | 362 | 11 |
| **SST 877** | 9.59 | cde | 18 | 10.29 | 80.40 | 20 | 12.55 | 4 | 339 | 17 |
| **SST 884** | 10.69 | abc | 3 | 3.34 | 82.85 | 8 | 12.26 | 10 | 360 | 12 |
| **SST 895** | 11.36 | a | 1 | 4.98 | 83.75 | 3 | 12.38 | 8 | 367 | 10 |
| **Mean** | **10.11** |  |  |  | **82.46** |  | **12.25** |  | **363** |  |
| **Coefficient of variation (%)** | **8.77** |  |  |  | **1.51** |  | **4.80** |  | **6.13** |  |
| **LSDt(0,05)** | **1.28** |  |  |  | **1.80** |  | **0.85** |  | **32.14** |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Cooler Central Irrigation Area (later planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Modderrivier 2016-06-29** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 10.87 | bcdef | 15 | 5.30 | 80.00 | 19 | 12.27 | 5 | 373 | 17 |
| **Krokodil** | 11.40 | abcd | 7 | 8.30 | 82.00 | 16 | 11.07 | 20 | 336 | 20 |
| **PAN 3400** | 11.43 | abcd | 6 | 10.30 | 83.45 | 13 | 12.17 | 7 | 372 | 18 |
| **PAN 3471** | 11.18 | abcdef | 11 | 3.21 | 83.90 | 5 | 12.12 | 8 | 385 | 13 |
| **PAN 3497** | 11.57 | abc | 3 | 3.29 | 84.10 | 4 | 12.10 | 10 | 387 | 11 |
| **PAN 3515** | 10.60 | def | 18 | 3.89 | 82.50 | 15 | 11.93 | 12 | 375 | 16 |
| **PAN 3623** | 11.59 | ab | 2 | 10.59 | 83.70 | 9 | 12.53 | 3 | 400 | 3 |
| **Sabie** | 10.46 | ef | 19 | 10.09 | 79.85 | 20 | 12.60 | 2 | 376 | 15 |
| **SST 806** | 11.07 | abcdef | 12 | 4.29 | 84.70 | 1 | 11.78 | 14 | 406 | 1 |
| **SST 8125** | 10.70 | cdef | 16 | 5.61 | 83.75 | 8 | 11.52 | 17 | 404 | 2 |
| **SST 8135** | 11.50 | abc | 5 | 4.51 | 83.50 | 12 | 12.11 | 9 | 391 | 10 |
| **SST 8154** | 11.39 | abcd | 8 | 2.54 | 84.65 | 2 | 12.30 | 4 | 383 | 14 |
| **SST 8155** | 10.63 | def | 17 | 7.15 | 81.75 | 18 | 11.64 | 16 | 386 | 12 |
| **SST 835** | 11.82 | a | 1 | 3.19 | 83.80 | 7 | 11.87 | 13 | 395 | 6 |
| **SST 843** | 10.35 | f | 20 | 4.25 | 84.60 | 3 | 13.99 | 1 | 397 | 5 |
| **SST 866** | 11.23 | abcde | 10 | 1.78 | 83.60 | 10 | 11.28 | 19 | 398 | 4 |
| **SST 875** | 10.94 | bcdef | 13 | 7.14 | 83.20 | 14 | 11.36 | 18 | 393 | 7 |
| **SST 877** | 10.93 | bcdef | 14 | 5.99 | 82.00 | 16 | 11.77 | 15 | 341 | 19 |
| **SST 884** | 11.52 | abc | 4 | 3.65 | 83.55 | 11 | 12.02 | 11 | 393 | 8 |
| **SST 895** | 11.28 | abcde | 9 | 9.90 | 83.85 | 6 | 12.27 | 5 | 392 | 9 |
| **Mean** | **11.12** |  |  |  | **83.12** |  | **12.04** |  | **384** |  |
| **Coefficient of variation (%)** | **5.43** |  |  |  | **1.61** |  | **2.67** |  | **3.77** |  |
| **LSDt(0,05)** | **0.87** |  |  |  | **1.94** |  | **0.47** |  | **20.92** |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Cooler Central Irrigation Area (later planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Prieska 2016-07-06** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 10.65 | cdef | 10 | 6.59 | 84.70 | 4 | 10.60 | 6 | 317 | 17 |
| **Krokodil** | 11.38 | ab | 2 | 0.78 | 84.45 | 6 | 9.66 | 20 | 301 | 20 |
| **PAN 3400** | 11.02 | abcd | 4 | 8.84 | 84.25 | 9 | 10.48 | 9 | 318 | 16 |
| **PAN 3471** | 10.09 | fghi | 16 | 6.46 | 84.40 | 8 | 10.30 | 16 | 328 | 11 |
| **PAN 3497** | 10.28 | efgh | 15 | 15.18 | 84.00 | 12 | 10.42 | 11 | 319 | 15 |
| **PAN 3515** | 10.32 | defgh | 14 | 5.07 | 84.65 | 5 | 10.05 | 19 | 316 | 18 |
| **PAN 3623** | 10.68 | bcdef | 8 | 4.71 | 84.00 | 12 | 11.20 | 2 | 328 | 10 |
| **Sabie** | 11.47 | a | 1 | 3.16 | 85.70 | 1 | 10.40 | 13 | 327 | 12 |
| **SST 806** | 10.67 | bcdef | 9 | 6.59 | 84.95 | 3 | 10.36 | 15 | 340 | 2 |
| **SST 8125** | 9.78 | hi | 19 | 12.25 | 83.75 | 16 | 10.46 | 10 | 339 | 3 |
| **SST 8135** | 10.59 | cdefg | 11 | 6.71 | 84.45 | 6 | 10.15 | 18 | 326 | 13 |
| **SST 8154** | 9.93 | ghi | 17 | 5.90 | 85.15 | 2 | 10.87 | 4 | 325 | 14 |
| **SST 8155** | 9.91 | ghi | 18 | 7.44 | 83.40 | 19 | 10.16 | 17 | 332 | 7 |
| **SST 835** | 10.43 | defgh | 13 | 6.10 | 84.15 | 10 | 10.42 | 11 | 342 | 1 |
| **SST 843** | 9.40 | i | 20 | 6.72 | 83.95 | 14 | 13.01 | 1 | 339 | 4 |
| **SST 866** | 10.83 | abcde | 6 | 5.01 | 83.50 | 18 | 10.38 | 14 | 329 | 9 |
| **SST 875** | 11.27 | abc | 3 | 5.27 | 83.85 | 15 | 10.53 | 7 | 338 | 5 |
| **SST 877** | 10.76 | bcdef | 7 | 4.60 | 83.65 | 17 | 10.51 | 8 | 308 | 19 |
| **SST 884** | 10.59 | cdefg | 11 | 7.25 | 83.00 | 20 | 10.68 | 5 | 331 | 8 |
| **SST 895** | 10.93 | abcde | 5 | 3.46 | 84.10 | 11 | 11.18 | 3 | 335 | 6 |
| **Mean** | **10.55** |  |  |  | **84.20** |  | **10.59** |  | **327** |  |
| **Coefficient of variation (%)** | **4.64** |  |  |  | **0.60** |  | **2.81** |  | **2.78** |  |
| **LSDt(0,05)** | **0.71** |  |  |  | **0.73** |  | **0.43** |  | **13.13** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Cooler Central Irrigation Area (later planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Rama 1 2016-07-07** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 8.84 | abcd | 5 | 12.36 | 83.65 | 5 | 12.10 | 5 | 319 | 11 |
| **Krokodil** | 6.70 | j | 20 | 19.18 | 81.40 | 20 | 11.55 | 14 | 303 | 20 |
| **PAN 3400** | 8.70 | abcde | 6 | 5.07 | 82.10 | 17 | 12.24 | 3 | 307 | 19 |
| **PAN 3471** | 8.11 | defgh | 13 | 6.99 | 83.35 | 7 | 11.76 | 8 | 316 | 15 |
| **PAN 3497** | 8.24 | cdefg | 11 | 6.73 | 82.95 | 10 | 11.79 | 7 | 327 | 5 |
| **PAN 3515** | 8.69 | abcde | 7 | 7.40 | 83.75 | 4 | 11.23 | 19 | 319 | 11 |
| **PAN 3623** | 9.01 | ab | 3 | 4.82 | 84.85 | 1 | 12.45 | 2 | 312 | 16 |
| **Sabie** | 7.12 | ij | 19 | 14.28 | 82.80 | 12 | 12.17 | 4 | 312 | 17 |
| **SST 806** | 8.31 | bcdefg | 10 | 10.88 | 81.80 | 19 | 11.24 | 18 | 327 | 6 |
| **SST 8125** | 7.76 | fghi | 16 | 6.46 | 82.55 | 15 | 11.53 | 15 | 337 | 2 |
| **SST 8135** | 8.35 | bcdefg | 9 | 6.89 | 82.60 | 14 | 12.05 | 6 | 328 | 4 |
| **SST 8154** | 9.06 | ab | 2 | 7.69 | 84.05 | 3 | 11.66 | 11 | 318 | 13 |
| **SST 8155** | 7.68 | ghi | 17 | 8.66 | 82.70 | 13 | 11.66 | 11 | 322 | 8 |
| **SST 835** | 8.16 | defgh | 12 | 11.30 | 82.50 | 16 | 11.52 | 16 | 338 | 1 |
| **SST 843** | 7.43 | hij | 18 | 9.22 | 83.15 | 8 | 13.87 | 1 | 320 | 9 |
| **SST 866** | 7.97 | efgh | 15 | 12.54 | 83.05 | 9 | 11.31 | 17 | 318 | 13 |
| **SST 875** | 8.96 | abc | 4 | 7.06 | 82.00 | 18 | 11.20 | 20 | 337 | 3 |
| **SST 877** | 8.04 | efgh | 14 | 10.20 | 83.40 | 6 | 11.76 | 8 | 310 | 18 |
| **SST 884** | 8.49 | bcdef | 8 | 7.15 | 82.90 | 11 | 11.59 | 13 | 323 | 7 |
| **SST 895** | 9.39 | a | 1 | 6.03 | 84.45 | 2 | 11.69 | 10 | 319 | 10 |
| **Mean** | **8.25** |  |  |  | **83.00** |  | **11.82** |  | **320** |  |
| **Coefficient of variation (%)** | **6.29** |  |  |  | **1.31** |  | **4.66** |  | **4.50** |  |
| **LSDt(0,05)** | **0.75** |  |  |  | **1.57** |  | **0.80** |  | **20.84** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Cooler Central Irrigation Area (later planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Rama 2 2016-07-19** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 9.76 | abcde | 9 | 6.25 | 81.95 | 16 | 12.83 | 5 | 321 | 13 |
| **Krokodil** | 9.23 | ef | 16 | 3.46 | 83.50 | 6 | 11.51 | 18 | 315 | 17 |
| **PAN 3400** | 10.07 | abcd | 5 | 3.55 | 82.65 | 12 | 12.69 | 7 | 316 | 16 |
| **PAN 3471** | 9.91 | abcde | 7 | 7.49 | 83.70 | 5 | 12.12 | 14 | 323 | 12 |
| **PAN 3497** | 9.63 | bcde | 11 | 4.70 | 81.75 | 18 | 12.87 | 4 | 325 | 8 |
| **PAN 3515** | 9.71 | abcde | 10 | 5.57 | 82.75 | 10 | 11.37 | 20 | 324 | 10 |
| **PAN 3623** | 10.38 | a | 2 | 2.50 | 84.45 | 2 | 13.07 | 1 | 324 | 9 |
| **Sabie** | 8.59 | f | 19 | 6.90 | 79.50 | 20 | 12.90 | 3 | 314 | 19 |
| **SST 806** | 9.20 | ef | 18 | 14.97 | 81.95 | 16 | 12.22 | 11 | 363 | 1 |
| **SST 8125** | 9.22 | ef | 17 | 5.73 | 82.55 | 13 | 12.72 | 6 | 357 | 2 |
| **SST 8135** | 10.13 | abc | 4 | 2.57 | 82.95 | 8 | 12.00 | 15 | 317 | 15 |
| **SST 8154** | 9.89 | abcde | 8 | 6.50 | 84.20 | 3 | 12.27 | 10 | 315 | 17 |
| **SST 8155** | 8.58 | f | 20 | 4.74 | 82.20 | 15 | 12.38 | 8 | 337 | 5 |
| **SST 835** | 9.35 | de | 15 | 5.96 | 83.00 | 7 | 11.68 | 17 | 345 | 3 |
| **SST 843** | 9.50 | cde | 13 | 6.22 | 85.00 | 1 | 12.98 | 2 | 337 | 6 |
| **SST 866** | 10.42 | a | 1 | 4.07 | 82.80 | 9 | 11.45 | 19 | 314 | 20 |
| **SST 875** | 9.47 | cde | 14 | 4.69 | 82.35 | 14 | 11.89 | 16 | 339 | 4 |
| **SST 877** | 9.52 | cde | 12 | 3.41 | 81.45 | 19 | 12.17 | 13 | 318 | 14 |
| **SST 884** | 10.04 | abcd | 6 | 8.57 | 82.70 | 11 | 12.20 | 12 | 324 | 10 |
| **SST 895** | 10.35 | ab | 3 | 6.80 | 83.85 | 4 | 12.34 | 9 | 328 | 7 |
| **Mean** | **9.65** |  |  |  | **82.76** |  | **12.28** |  | **328** |  |
| **Coefficient of variation (%)** | **5.28** |  |  |  | **1.41** |  | **5.31** |  | **4.91** |  |
| **LSDt(0,05)** | **0.74** |  |  |  | **1.69** |  | **0.94** |  | **23.27** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Cooler Central Irrigation Area (later planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Upington 2016-07-05** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 8.83 | a | 1 | 5.35 | 81.70 | 9 | 13.20 | 13 | 409 | 8 |
| **Krokodil** | 8.77 | ab | 2 | 5.96 | 83.20 | 4 | 12.31 | 20 | 367 | 20 |
| **PAN 3400** | 8.23 | abcd | 5 | 9.28 | 81.35 | 13 | 13.25 | 12 | 410 | 1 |
| **PAN 3471** | 8.69 | ab | 3 | 7.62 | 83.70 | 3 | 12.51 | 19 | 410 | 1 |
| **PAN 3497** | 7.83 | defg | 10 | 7.95 | 81.85 | 8 | 13.29 | 10 | 398 | 16 |
| **PAN 3515** | 8.19 | abcde | 6 | 8.27 | 81.50 | 12 | 12.86 | 17 | 398 | 15 |
| **PAN 3623** | 8.59 | abc | 4 | 5.39 | 83.85 | 2 | 14.32 | 1 | 410 | 1 |
| **Sabie** | 7.14 | gh | 19 | 3.30 | 80.35 | 18 | 13.66 | 3 | 402 | 14 |
| **SST 806** | 7.29 | fgh | 18 | 3.70 | 81.05 | 14 | 13.27 | 11 | 409 | 10 |
| **SST 8125** | 6.78 | h | 20 | 7.38 | 80.20 | 19 | 13.30 | 9 | 396 | 17 |
| **SST 8135** | 7.79 | defg | 12 | 6.44 | 80.85 | 15 | 13.34 | 7 | 410 | 1 |
| **SST 8154** | 7.74 | defg | 14 | 19.69 | 82.75 | 5 | 13.63 | 4 | 406 | 12 |
| **SST 8155** | 7.81 | defg | 11 | 0.97 | 78.80 | 20 | 12.87 | 16 | 410 | 1 |
| **SST 835** | 7.78 | defg | 13 | 2.19 | 82.05 | 7 | 12.97 | 15 | 406 | 13 |
| **SST 843** | 7.96 | cdef | 9 | 4.27 | 83.90 | 1 | 13.89 | 2 | 410 | 1 |
| **SST 866** | 7.53 | efg | 16 | 6.39 | 80.75 | 16 | 12.53 | 18 | 409 | 9 |
| **SST 875** | 7.56 | defg | 15 | 5.10 | 80.55 | 17 | 13.07 | 14 | 410 | 1 |
| **SST 877** | 7.49 | efg | 17 | 4.80 | 81.60 | 10 | 13.56 | 5 | 391 | 19 |
| **SST 884** | 7.96 | cdef | 8 | 5.17 | 81.60 | 10 | 13.33 | 8 | 393 | 18 |
| **SST 895** | 8.10 | bcde | 7 | 5.78 | 82.10 | 6 | 13.49 | 6 | 407 | 11 |
| **Mean** | **7.90** |  |  |  | **81.69** |  | **13.23** |  | **403** |  |
| **Coefficient of variation (%)** | **6.15** |  |  |  | **0.95** |  | **3.70** |  | **2.81** |  |
| **LSDt(0,05)** | **0.70** |  |  |  | **1.13** |  | **0.71** |  | **16.40** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Cooler Central Irrigation Area (later planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Vaalharts 2016-07-15** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 8.59 | bc | 5 | 5.55 | 81.80 | 9 | 11.12 | 2 | 410 | 2 |
| **Krokodil** | 9.06 | ab | 2 | 4.78 | 81.60 | 10 | 9.44 | 20 | 351 | 20 |
| **PAN 3400** | 8.47 | cd | 8 | 3.36 | 82.15 | 6 | 10.65 | 9 | 394 | 14 |
| **PAN 3471** | 9.07 | a | 1 | 3.82 | 82.55 | 3 | 10.52 | 11 | 399 | 13 |
| **PAN 3497** | 8.54 | cd | 6 | 3.48 | 82.70 | 2 | 10.44 | 12 | 407 | 6 |
| **PAN 3515** | 7.39 | h | 18 | 4.61 | 81.45 | 12 | 10.92 | 5 | 392 | 15 |
| **PAN 3623** | 7.68 | fgh | 15 | 2.27 | 81.35 | 13 | 11.10 | 3 | 409 | 4 |
| **Sabie** | 7.24 | h | 20 | 4.66 | 82.25 | 5 | 10.97 | 4 | 404 | 8 |
| **SST 806** | 8.10 | def | 13 | 3.25 | 82.95 | 1 | 10.66 | 8 | 390 | 16 |
| **SST 8125** | 8.34 | cde | 11 | 4.30 | 81.55 | 11 | 10.75 | 7 | 408 | 5 |
| **SST 8135** | 8.38 | cde | 10 | 4.29 | 81.90 | 7 | 10.55 | 10 | 386 | 17 |
| **SST 8154** | 8.41 | cd | 9 | 4.44 | 81.85 | 8 | 10.78 | 6 | 400 | 12 |
| **SST 8155** | 8.28 | cde | 12 | 5.62 | 80.70 | 18 | 10.31 | 15 | 402 | 11 |
| **SST 835** | 7.54 | gh | 17 | 3.41 | 82.40 | 4 | 10.43 | 13 | 403 | 9 |
| **SST 843** | 7.38 | h | 19 | 3.04 | 80.75 | 17 | 11.62 | 1 | 410 | 1 |
| **SST 866** | 8.75 | abc | 3 | 1.75 | 81.10 | 16 | 10.05 | 18 | 379 | 18 |
| **SST 875** | 8.64 | abc | 4 | 4.58 | 81.30 | 15 | 9.73 | 19 | 410 | 3 |
| **SST 877** | 7.61 | gh | 16 | 4.83 | 81.35 | 13 | 10.06 | 17 | 368 | 19 |
| **SST 884** | 7.91 | efg | 14 | 7.81 | 80.10 | 20 | 10.07 | 16 | 407 | 6 |
| **SST 895** | 8.49 | cd | 7 | 5.10 | 80.60 | 19 | 10.41 | 14 | 403 | 9 |
| **Mean** | **8.19** |  |  |  | **81.62** |  | **10.53** |  | **397** |  |
| **Coefficient of variation (%)** | **4.02** |  |  |  | **0.84** |  | **5.90** |  | **4.21** |  |
| **LSDt(0,05)** | **0.48** |  |  |  | **0.99** |  | **0.90** |  | **24.15** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Warmer Northern Irrigation Area (earlier planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 7.17 | 21 | 7.84 | 17 | 6.33 | 23 |  |  |  |  |  |  |
| **Duzi** | 7.20 | 11 | 7.54 | 18 | 7.96 | 14 | 7.01 | 12 | 7.43 | 11 | 7.57 | 13 | 7.37 | 15 |
| **Koedoes** |  |  | 8.18 | 11 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 8.14 | 1 | 7.95 | 15 | 7.92 | 15 | 6.88 | 17 | 7.72 | 9 | 8.00 | 8 | 8.04 | 5 |
| **PAN 3400** | 7.29 | 8 | 8.52 | 3 | 8.07 | 13 | 7.87 | 1 | 7.94 | 4 | 7.96 | 9 | 7.90 | 6 |
| **PAN 3471** | 6.50 | 20 | 7.84 | 17 | 8.56 | 6 | 7.09 | 10 | 7.50 | 10 | 7.63 | 12 | 7.17 | 16 |
| **PAN 3478** |  |  |  |  |  |  | 7.36 | 7 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 8.55 | 7 | 7.57 | 4 |  |  |  |  |  |  |
| **PAN 3497** | 6.90 | 15 | 8.26 | 10 | 8.87 | 2 | 7.16 | 8 | 7.80 | 6 | 8.01 | 6 | 7.58 | 11 |
| **PAN 3515** | 6.78 | 18 | 8.14 | 12 | 8.19 | 12 |  |  |  |  | 7.70 | 11 | 7.46 | 14 |
| **PAN 3623** | 7.79 | 3 | 8.32 | 9 | 7.53 | 18 |  |  |  |  | 7.88 | 10 | 8.05 | 3 |
| **Renoster** |  |  | 7.96 | 14 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 6.73 | 19 | 6.93 | 22 | 8.39 | 9 | 6.96 | 14 | 7.25 | 13 | 7.35 | 15 | 6.83 | 18 |
| **SST 806** | 7.21 | 10 | 8.45 | 6 | 9.04 | 1 | 7.55 | 5 | 8.06 | 3 | 8.23 | 3 | 7.83 | 7 |
| **SST 8125** | 7.00 | 14 | 7.98 | 13 |  |  |  |  |  |  |  |  | 7.49 | 13 |
| **SST 8134** |  |  | 8.37 | 7 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 7.27 | 9 | 8.36 | 8 |  |  |  |  |  |  |  |  | 7.81 | 5 |
| **SST 8154** | 7.09 | 12 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 6.90 | 16 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 7.09 | 10 |  |  |  |  |  |  |
| **SST 835** | 7.04 | 13 | 8.47 | 5 | 8.74 | 5 | 7.37 | 6 | 7.91 | 5 | 8.08 | 5 | 7.76 | 10 |
| **SST 843** | 7.60 | 6 | 7.50 | 19 | 6.46 | 19 | 6.12 | 24 | 6.92 | 14 | 7.19 | 16 | 7.55 | 12 |
| **SST 866** | 7.68 | 4 | 7.89 | 16 | 8.86 | 3 | 6.57 | 20 | 7.75 | 7 | 8.14 | 4 | 7.78 | 9 |
| **SST 867** |  |  | 6.85 | 23 | 8.51 | 8 | 6.57 | 20 |  |  |  |  |  |  |
| **SST 875** | 7.62 | 5 | 8.48 | 4 | 7.91 | 16 | 6.95 | 15 | 7.74 | 8 | 8.00 | 7 | 8.05 | 4 |
| **SST 876** |  |  |  |  |  |  | 7.01 | 12 |  |  |  |  |  |  |
| **SST 877** | 6.85 | 17 | 7.45 | 20 | 8.30 | 10 | 6.91 | 16 | 7.38 | 12 | 7.53 | 14 | 7.15 | 17 |
| **SST 884** | 8.01 | 2 | 8.59 | 2 | 8.28 | 11 | 7.74 | 2 | 8.16 | 1 | 8.29 | 2 | 8.30 | 1 |
| **SST 895** | 7.57 | 7 | 8.63 | 1 | 8.74 | 4 | 7.59 | 3 | 8.13 | 2 | 8.31 | 1 | 8.10 | 2 |
| **SST 896** |  |  |  |  |  |  | 6.82 | 18 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 6.71 | 19 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 6.56 | 22 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 7.12 | 9 |  |  |  |  |  |  |
| **Mean** | **7.26** |  | **7.99** |  | **8.25** |  | **7.04** |  | **7.69** |  | **7.87** |  | **7.68** |  |
| **LSDt(0,05)** | **0.33** |  | **0.23** |  | **0.22** |  | **0.67** |  | **0.15** |  | **0.14** |  | **0.19** |  |

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| **Warmer Northern Irrigation Area (earlier planting) AMMI Analysis** | | | | | | |
| **Anova of the yield of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 239 | 204.62 | 0.856 |  |  |
| **Treatments** | | 59 | 175.06 | 2.967 | 18.75 | <0,001 |
| **Genotypes** | | 19 | 45.48 | 2.394 | 15.12 | <0,001 |
| **Environments** | | 2 | 89.76 | 44.879 | 162.05 | <0,001 |
| **Block** |  | 9 | 2.49 | 0.277 | 1.75 | 0.0813 |
| **Interactions** | | 38 | 39.83 | 1.048 | 6.62 | <0,001 |
| **IPCA** |  | 20 | 24.59 | 1.230 | 7.77 | <0,001 |
| **IPCA** |  | 18 | 15.24 | 0.846 | 5.35 | <0,001 |
| **Residuals** |  | 0 | 0.00 |  |  |  |
| **Error** |  | 171 | 27.06 | 0.158 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Duzi | 7.20 | 11 | 0.31221 |  |  |
| 2 | Krokodil | 8.14 | 1 | 0.44333 |  |  |
| 3 | PAN 3400 | 7.29 | 8 | -0.15896 |  |  |
| 4 | PAN 3471 | 6.50 | 20 | 0.30690 |  |  |
| 5 | PAN 3497 | 6.90 | 15 | -0.25682 |  |  |
| 6 | PAN 3515 | 6.78 | 18 | 0.11598 |  |  |
| 7 | PAN 3623 | 7.79 | 3 | -0.08916 |  |  |
| 8 | Sabie | 6.73 | 19 | 0.85052 |  |  |
| 9 | SST 806 | 7.21 | 10 | -0.91483 |  |  |
| 10 | SST 8125 | 7.00 | 14 | 0.13711 |  |  |
| 11 | SST 8135 | 7.27 | 9 | 0.10231 |  |  |
| 12 | SST 8154 | 7.09 | 12 | -0.27903 |  |  |
| 13 | SST 8155 | 6.90 | 16 | -0.05154 |  |  |
| 14 | SST 835 | 7.04 | 13 | -0.33365 |  |  |
| 15 | SST 843 | 7.60 | 6 | 0.17606 |  |  |
| 16 | SST 866 | 7.68 | 4 | -0.29997 |  |  |
| 17 | SST 875 | 7.62 | 5 | 0.17161 |  |  |
| 18 | SST 877 | 6.85 | 17 | -0.10328 |  |  |
| 19 | SST 884 | 8.01 | 2 | 0.05355 |  |  |
| 20 | SST 895 | 7.57 | 7 | -0.18232 |  |  |
| **Mean** |  | **7.26** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.60** |  |  |  |  |
| **LSDt(0,05)** |  | **0.33** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Burgersfort | 7.08 | 2 | 0.52086 |  |  |
| 2 | Groblersdal | 8.08 | 1 | 0.75753 |  |  |
| 3 | Skuinsdrift | 6.62 | 3 | -1.27839 |  |  |
| **Mean** |  | **7.26** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.60** |  |  |  |  |
| **LSDt(0.05)** |  | **0.13** |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Warmer Northern Irrigation Area (earlier planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 79.99 | 21 | 81.32 | 15 | 79.70 | 24 |  |  |  |  |  |  |
| **Duzi** | 79.15 | 13 | 80.67 | 15 | 80.77 | 19 | 80.40 | 15 | 80.25 | 11 | 80.20 | 13 | 79.91 | 13 |
| **Koedoes** |  |  | 81.67 | 4 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 79.67 | 6 | 80.81 | 13 | 81.00 | 17 | 79.80 | 22 | 80.32 | 10 | 80.49 | 12 | 80.24 | 9 |
| **PAN 3400** | 78.88 | 14 | 80.75 | 14 | 82.29 | 5 | 81.00 | 9 | 80.73 | 7 | 80.64 | 10 | 79.82 | 14 |
| **PAN 3471** | 80.27 | 1 | 81.65 | 5 | 82.20 | 7 | 81.70 | 2 | 81.46 | 1 | 81.37 | 1 | 80.96 | 2 |
| **PAN 3478** |  |  |  |  |  |  | 81.70 | 2 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 83.02 | 1 | 82.40 | 1 |  |  |  |  |  |  |
| **PAN 3497** | 79.80 | 3 | 81.24 | 8 | 82.30 | 4 | 81.20 | 6 | 81.14 | 5 | 81.11 | 6 | 80.52 | 6 |
| **PAN 3515** | 79.37 | 11 | 80.85 | 12 | 81.79 | 9 |  |  |  |  | 80.67 | 8 | 80.11 | 10 |
| **PAN 3623** | 80.18 | 2 | 81.57 | 6 | 81.49 | 12 |  |  |  |  | 81.08 | 7 | 80.88 | 3 |
| **Renoster** |  |  | 80.09 | 19 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 78.83 | 15 | 80.16 | 18 | 81.40 | 14 | 80.40 | 15 | 80.20 | 12 | 80.13 | 14 | 79.50 | 17 |
| **SST 806** | 79.55 | 8 | 81.74 | 3 | 82.54 | 2 | 81.40 | 4 | 81.31 | 2 | 81.28 | 3 | 80.65 | 4 |
| **SST 8125** | 78.73 | 17 | 80.46 | 17 |  |  |  |  |  |  |  |  | 79.60 | 16 |
| **SST 8134** |  |  | 78.87 | 23 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 79.30 | 12 | 81.36 | 7 |  |  |  |  |  |  |  |  | 80.33 | 7 |
| **SST 8154** | 79.65 | 7 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 78.47 | 19 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 80.30 | 18 |  |  |  |  |  |  |
| **SST 835** | 79.77 | 4 | 81.21 | 9 | 82.45 | 3 | 81.30 | 5 | 81.18 | 4 | 81.14 | 5 | 80.49 | 7 |
| **SST 843** | 79.68 | 5 | 82.58 | 1 | 81.75 | 10 | 81.10 | 7 | 81.28 | 3 | 81.34 | 2 | 81.13 | 1 |
| **SST 866** | 79.53 | 9 | 80.66 | 16 | 81.80 | 8 | 80.60 | 14 | 80.65 | 8 | 80.66 | 9 | 80.10 | 11 |
| **SST 867** |  |  | 80.06 | 20 | 81.47 | 13 | 80.70 | 12 |  |  |  |  |  |  |
| **SST 875** | 78.80 | 16 | 81.09 | 10 | 81.73 | 11 | 80.70 | 12 | 80.58 | 9 | 80.54 | 11 | 79.95 | 12 |
| **SST 876** |  |  |  |  |  |  | 81.10 | 7 |  |  |  |  |  |  |
| **SST 877** | 78.70 | 18 | 79.00 | 22 | 81.10 | 16 | 80.40 | 15 | 79.80 | 14 | 79.60 | 16 | 78.85 | 18 |
| **SST 884** | 78.32 | 20 | 80.92 | 11 | 80.91 | 18 | 80.10 | 20 | 80.06 | 13 | 80.05 | 15 | 79.62 | 15 |
| **SST 895** | 79.43 | 10 | 81.84 | 2 | 82.23 | 6 | 81.00 | 9 | 81.13 | 6 | 81.17 | 4 | 80.64 | 5 |
| **SST 896** |  |  |  |  |  |  | 80.10 | 20 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 80.90 | 11 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 80.30 | 18 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 79.80 | 22 |  |  |  |  |  |  |
| **Mean** | **79.30** |  | **80.84** |  | **81.77** |  | **80.75** |  | **80.72** |  | **80.72** |  | **80.18** |  |
| **LSDt(0,05)** | **1.03** |  | **0.60** |  | **0.45** |  | **0.57** |  | **0.32** |  | **0.37** |  | **0.53** |  |

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| **Warmer Northern Irrigation Area (earlier planting) AMMI Analysis** | | | | | | |
| **Anova of the hectolitre mass of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 239 | 1860.5 | 7.78 |  |  |
| **Treatments** | | 59 | 1565.5 | 26.53 | 16.43 | <0,001 |
| **Genotypes** | | 19 | 68.8 | 3.62 | 2.24 | 0.0034 |
| **Environments** | | 2 | 1390.3 | 695.16 | 332.71 | <0,001 |
| **Block** |  | 9 | 18.8 | 2.09 | 1.29 | 0.2434 |
| **Interactions** | | 38 | 106.4 | 2.80 | 1.73 | 0.0096 |
| **IPCA** |  | 20 | 67.3 | 3.36 | 2.08 | 0.0063 |
| **IPCA** |  | 18 | 39.1 | 2.17 | 1.35 | 0.1651 |
| **Residuals** |  | 0 | 0.0 |  |  |  |
| **Error** |  | 171 | 276.1 | 1.61 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Duzi | 79.15 | 13 | 0.12030 |  |  |
| 2 | Krokodil | 79.67 | 6 | -0.32216 |  |  |
| 3 | PAN 3400 | 78.88 | 14 | -0.10390 |  |  |
| 4 | PAN 3471 | 80.27 | 1 | -0.53400 |  |  |
| 5 | PAN 3497 | 79.80 | 3 | -0.38721 |  |  |
| 6 | PAN 3515 | 79.37 | 11 | 0.19202 |  |  |
| 7 | PAN 3623 | 80.18 | 2 | -0.70527 |  |  |
| 8 | Sabie | 78.83 | 15 | 0.48039 |  |  |
| 9 | SST 806 | 79.55 | 8 | 0.44974 |  |  |
| 10 | SST 8125 | 78.73 | 17 | 0.87291 |  |  |
| 11 | SST 8135 | 79.30 | 12 | 0.11288 |  |  |
| 12 | SST 8154 | 79.65 | 7 | -0.56677 |  |  |
| 13 | SST 8155 | 78.47 | 19 | 0.22430 |  |  |
| 14 | SST 835 | 79.77 | 4 | 0.29145 |  |  |
| 15 | SST 843 | 79.68 | 5 | -0.87741 |  |  |
| 16 | SST 866 | 79.53 | 9 | 0.05970 |  |  |
| 17 | SST 875 | 78.80 | 16 | -0.18465 |  |  |
| 18 | SST 877 | 78.70 | 18 | 0.71981 |  |  |
| 19 | SST 884 | 78.32 | 20 | 0.05883 |  |  |
| 20 | SST 895 | 79.43 | 10 | 0.09903 |  |  |
| **Mean** |  | **79.30** |  |  |  |  |
| **Coefficient of variation (%)** | | **1.60** |  |  |  |  |
| **LSDt(0,05)** |  | **1.03** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Burgersfort | 82.23 | 1 | 1.62307 |  |  |
| 2 | Groblersdal | 79.35 | 2 | -1.08544 |  |  |
| 3 | Skuinsdrift | 76.33 | 3 | -0.53763 |  |  |
| **Mean** |  | **79.30** |  |  |  |  |
| **Coefficient of variation (%)** | | **1.60** |  |  |  |  |
| **LSDt(0.05)** |  | **0.40** |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Warmer Northern Irrigation Area (earlier planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 12.07 | 3 | 10.36 | 8 | 10.21 | 4 |  |  |  |  |  |  |
| **Duzi** | 12.09 | 19 | 11.82 | 10 | 10.74 | 4 | 10.24 | 3 | 11.22 | 6 | 11.55 | 7 | 11.96 | 13 |
| **Koedoes** |  |  | 11.99 | 6 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 12.19 | 18 | 10.70 | 23 | 9.92 | 19 | 9.68 | 22 | 10.62 | 14 | 10.94 | 16 | 11.45 | 18 |
| **PAN 3400** | 13.16 | 2 | 12.01 | 4 | 10.18 | 12 | 10.19 | 5 | 11.39 | 2 | 11.78 | 4 | 12.59 | 2 |
| **PAN 3471** | 12.69 | 6 | 11.48 | 16 | 10.36 | 8 | 9.76 | 19 | 11.07 | 8 | 11.51 | 9 | 12.09 | 9 |
| **PAN 3478** |  |  |  |  |  |  | 9.61 | 23 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 10.14 | 13 | 9.81 | 14 |  |  |  |  |  |  |
| **PAN 3497** | 12.21 | 17 | 12.01 | 4 | 10.05 | 18 | 9.78 | 18 | 11.01 | 10 | 11.42 | 10 | 12.11 | 8 |
| **PAN 3515** | 12.34 | 16 | 11.40 | 19 | 10.06 | 17 |  |  |  |  | 11.27 | 14 | 11.87 | 16 |
| **PAN 3623** | 12.48 | 12 | 12.21 | 2 | 11.61 | 2 |  |  |  |  | 12.10 | 2 | 12.35 | 4 |
| **Renoster** |  |  | 11.26 | 20 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 13.03 | 3 | 11.96 | 7 | 10.57 | 7 | 9.71 | 20 | 11.32 | 3 | 11.85 | 3 | 12.50 | 3 |
| **SST 806** | 12.59 | 10 | 11.57 | 15 | 10.10 | 16 | 9.79 | 16 | 11.01 | 10 | 11.42 | 11 | 12.08 | 10 |
| **SST 8125** | 12.45 | 13 | 11.45 | 17 |  |  |  |  |  |  |  |  | 11.95 | 14 |
| **SST 8134** |  |  | 11.75 | 11 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 12.72 | 5 | 11.64 | 13 |  |  |  |  |  |  |  |  | 12.18 | 5 |
| **SST 8154** | 12.76 | 4 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 12.40 | 14 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 11.14 | 2 |  |  |  |  |  |  |
| **SST 835** | 12.59 | 10 | 11.44 | 18 | 10.12 | 15 | 9.99 | 11 | 11.04 | 9 | 11.38 | 12 | 12.02 | 11 |
| **SST 843** | 13.90 | 1 | 13.34 | 1 | 12.61 | 1 | 11.80 | 1 | 12.91 | 1 | 13.28 | 1 | 13.62 | 1 |
| **SST 866** | 12.09 | 19 | 11.12 | 22 | 10.28 | 11 | 9.69 | 21 | 10.80 | 13 | 11.16 | 15 | 11.61 | 17 |
| **SST 867** |  |  | 11.94 | 8 | 10.32 | 10 | 10.12 | 6 |  |  |  |  |  |  |
| **SST 875** | 12.65 | 8 | 11.21 | 21 | 10.14 | 13 | 9.94 | 13 | 10.99 | 12 | 11.33 | 13 | 11.93 | 15 |
| **SST 876** |  |  |  |  |  |  | 9.79 | 16 |  |  |  |  |  |  |
| **SST 877** | 12.38 | 15 | 11.58 | 14 | 10.62 | 5 | 10.01 | 10 | 11.15 | 7 | 11.53 | 8 | 11.98 | 12 |
| **SST 884** | 12.64 | 9 | 11.65 | 12 | 10.75 | 3 | 10.08 | 7 | 11.28 | 5 | 11.68 | 6 | 12.15 | 7 |
| **SST 895** | 12.67 | 7 | 11.84 | 9 | 10.59 | 6 | 10.04 | 9 | 11.29 | 4 | 11.70 | 5 | 12.26 | 5 |
| **SST 896** |  |  |  |  |  |  | 9.99 | 11 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 9.81 | 14 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 9.61 | 23 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 10.08 | 7 |  |  |  |  |  |  |
| **Mean** | **12.60** |  | **11.71** |  | **10.50** |  | **10.04** |  | **11.22** |  | **11.62** |  | **12.15** |  |
| **LSDt(0,05)** | **0.72** |  | **0.45** |  | **0.43** |  | **0.53** |  | **0.25** |  | **0.29** |  | **0.39** |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **Warmer Northern Irrigation Area (earlier planting) AMMI Analysis** | | | | | | |
| **Anova of the protein content of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 239 | 358.89 | 1.502 |  |  |
| **Treatments** | | 59 | 216.76 | 3.674 | 4.79 | <0,001 |
| **Genotypes** | | 19 | 39.14 | 2.060 | 2.68 | <0,001 |
| **Environments** | | 2 | 156.97 | 78.483 | 64.64 | <0,001 |
| **Block** |  | 9 | 10.93 | 1.214 | 1.58 | 0.1239 |
| **Interactions** | | 38 | 20.66 | 0.544 | 0.71 | 0.8945 |
| **IPCA** |  | 20 | 15.02 | 0.751 | 0.98 | 0.4899 |
| **IPCA** |  | 18 | 5.63 | 0.313 | 0.41 | 0.9849 |
| **Residuals** |  | 0 | 0.00 |  |  |  |
| **Error** |  | 171 | 131.20 | 0.767 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Duzi | 12.09 | 19 | -0.51418 |  |  |
| 2 | Krokodil | 12.19 | 18 | 0.26848 |  |  |
| 3 | PAN 3400 | 13.16 | 2 | 0.48470 |  |  |
| 4 | PAN 3471 | 12.69 | 6 | 0.03467 |  |  |
| 5 | PAN 3497 | 12.21 | 17 | 0.01304 |  |  |
| 6 | PAN 3515 | 12.34 | 16 | 0.02558 |  |  |
| 7 | PAN 3623 | 12.48 | 12 | 0.25137 |  |  |
| 8 | Sabie | 13.03 | 3 | 0.25646 |  |  |
| 9 | SST 806 | 12.59 | 10 | -0.16901 |  |  |
| 10 | SST 8125 | 12.45 | 13 | -0.28267 |  |  |
| 11 | SST 8135 | 12.72 | 5 | -0.15402 |  |  |
| 12 | SST 8154 | 12.76 | 4 | 0.25038 |  |  |
| 13 | SST 8155 | 12.40 | 14 | -0.15074 |  |  |
| 14 | SST 835 | 12.59 | 10 | -0.02206 |  |  |
| 15 | SST 843 | 13.90 | 1 | 0.41360 |  |  |
| 16 | SST 866 | 12.09 | 19 | -0.02214 |  |  |
| 17 | SST 875 | 12.65 | 8 | 0.36271 |  |  |
| 18 | SST 877 | 12.38 | 15 | -0.11782 |  |  |
| 19 | SST 884 | 12.64 | 9 | -0.09701 |  |  |
| 20 | SST 895 | 12.67 | 7 | -0.83134 |  |  |
| **Mean** |  | **12.60** |  |  |  |  |
| **Coefficient of variation (%)** | | **7.10** |  |  |  |  |
| **LSDt(0,05)** |  | **0.72** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Burgersfort | 11.48 | 3 | 0.96825 |  |  |
| 2 | Groblersdal | 12.95 | 2 | -0.99975 |  |  |
| 3 | Skuinsdrift | 13.37 | 1 | 0.03150 |  |  |
| **Mean** |  | **12.60** |  |  |  |  |
| **Coefficient of variation (%)** | | **7.10** |  |  |  |  |
| **LSDt(0.05)** |  | **0.28** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Warmer Northern Irrigation Area (earlier planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 352 | 14 | 394 | 4 | 309 | 14 |  |  |  |  |  |  |
| **Duzi** | 318 | 6 | 352 | 15 | 393 | 9 | 301 | 18 | 341 | 7 | 354 | 6 | 335 | 8 |
| **Koedoes** |  |  | 365 | 2 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 274 | 20 | 312 | 23 | 362 | 19 | 264 | 24 | 303 | 14 | 316 | 16 | 293 | 18 |
| **PAN 3400** | 300 | 16 | 356 | 10 | 393 | 10 | 310 | 12 | 340 | 9 | 349 | 12 | 328 | 13 |
| **PAN 3471** | 307 | 14 | 355 | 11 | 394 | 5 | 297 | 21 | 338 | 11 | 352 | 9 | 331 | 11 |
| **PAN 3478** |  |  |  |  |  |  | 317 | 7 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 393 | 10 | 296 | 22 |  |  |  |  |  |  |
| **PAN 3497** | 307 | 13 | 360 | 5 | 393 | 8 | 299 | 20 | 340 | 8 | 353 | 8 | 333 | 9 |
| **PAN 3515** | 304 | 15 | 344 | 20 | 389 | 15 |  |  |  |  | 346 | 13 | 324 | 16 |
| **PAN 3623** | 296 | 19 | 354 | 12 | 381 | 18 |  |  |  |  | 344 | 15 | 325 | 15 |
| **Renoster** |  |  | 330 | 22 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 313 | 11 | 349 | 17 | 392 | 12 | 313 | 11 | 342 | 6 | 351 | 10 | 331 | 10 |
| **SST 806** | 332 | 1 | 363 | 4 | 395 | 1 | 353 | 1 | 361 | 1 | 363 | 1 | 347 | 1 |
| **SST 8125** | 315 | 9 | 357 | 8 |  |  |  |  |  |  |  |  | 336 | 7 |
| **SST 8134** |  |  | 357 | 9 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 296 | 18 | 363 | 3 |  |  |  |  |  |  |  |  | 330 | 10 |
| **SST 8154** | 320 | 5 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 320 | 4 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 300 | 19 |  |  |  |  |  |  |
| **SST 835** | 317 | 8 | 359 | 7 | 395 | 3 | 324 | 4 | 348 | 4 | 357 | 5 | 338 | 5 |
| **SST 843** | 324 | 2 | 351 | 16 | 388 | 17 | 277 | 23 | 335 | 12 | 354 | 7 | 338 | 6 |
| **SST 866** | 323 | 3 | 353 | 13 | 395 | 2 | 326 | 3 | 349 | 3 | 357 | 3 | 338 | 4 |
| **SST 867** |  |  | 344 | 20 | 391 | 14 | 310 | 13 |  |  |  |  |  |  |
| **SST 875** | 311 | 12 | 345 | 19 | 394 | 6 | 308 | 15 | 339 | 10 | 350 | 11 | 328 | 14 |
| **SST 876** |  |  |  |  |  |  | 315 | 10 |  |  |  |  |  |  |
| **SST 877** | 299 | 17 | 346 | 18 | 388 | 16 | 305 | 16 | 334 | 13 | 344 | 14 | 323 | 17 |
| **SST 884** | 318 | 7 | 359 | 6 | 394 | 7 | 304 | 17 | 344 | 5 | 357 | 4 | 338 | 3 |
| **SST 895** | 314 | 10 | 368 | 1 | 392 | 13 | 334 | 2 | 352 | 2 | 358 | 2 | 341 | 2 |
| **SST 896** |  |  |  |  |  |  | 318 | 6 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 316 | 9 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 320 | 5 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 316 | 8 |  |  |  |  |  |  |
| **Mean** | **310** |  | **352** |  | **390** |  | **310** |  | **340** |  | **350** |  | **331** |  |
| **LSDt(0,05)** | **21.00** |  | **10.71** |  | **5.31** |  | **12.93** |  | **6.40** |  | **6.90** |  | **10.41** |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Warmer Northern Irrigation Area (earlier planting) AMMI Analysis** | | | | | | |
| **Anova of the falling number of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 239 | 267711 | 1120 |  |  |
| **Treatments** | | 59 | 146213 | 2478 | 3.73 | <0,001 |
| **Genotypes** | | 19 | 39009 | 2053 | 3.09 | <0,001 |
| **Environments** | | 2 | 53475 | 26738 | 30.63 | <0,001 |
| **Block** |  | 9 | 7857 | 873 | 1.31 | 0.2329 |
| **Interactions** | | 38 | 53729 | 1414 | 2.13 | <0,001 |
| **IPCA** |  | 20 | 43690 | 2184 | 3.29 | <0,001 |
| **IPCA** |  | 18 | 10039 | 558 | 0.84 | 0.6522 |
| **Residuals** |  | 0 | 0 |  |  |  |
| **Error** |  | 171 | 113641 | 665 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Duzi | 318 | 6 | 0.71651 |  |  |
| 2 | Krokodil | 274 | 20 | 5.82029 |  |  |
| 3 | PAN 3400 | 300 | 16 | 0.03841 |  |  |
| 4 | PAN 3471 | 307 | 14 | 1.24761 |  |  |
| 5 | PAN 3497 | 307 | 13 | 1.42700 |  |  |
| 6 | PAN 3515 | 304 | 15 | 1.12896 |  |  |
| 7 | PAN 3623 | 296 | 19 | 2.73381 |  |  |
| 8 | Sabie | 313 | 11 | -1.44836 |  |  |
| 9 | SST 806 | 332 | 1 | -2.71019 |  |  |
| 10 | SST 8125 | 315 | 9 | 0.43372 |  |  |
| 11 | SST 8135 | 296 | 18 | 2.22064 |  |  |
| 12 | SST 8154 | 320 | 5 | -1.51525 |  |  |
| 13 | SST 8155 | 320 | 4 | 0.67988 |  |  |
| 14 | SST 835 | 317 | 8 | 0.02093 |  |  |
| 15 | SST 843 | 324 | 2 | -3.17921 |  |  |
| 16 | SST 866 | 323 | 3 | -2.02742 |  |  |
| 17 | SST 875 | 311 | 12 | 2.02499 |  |  |
| 18 | SST 877 | 299 | 17 | -2.51433 |  |  |
| 19 | SST 884 | 318 | 7 | -3.73699 |  |  |
| 20 | SST 895 | 314 | 10 | -1.36099 |  |  |
| **Mean** |  | **310** |  |  |  |  |
| **Coefficient of variation (%)** | | **8.40** |  |  |  |  |
| **LSDt(0,05)** |  | **21.00** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Burgersfort | 316 | 2 | 3.67553 |  |  |
| 2 | Groblersdal | 290 | 3 | -8.32799 |  |  |
| 3 | Skuinsdrift | 325 | 1 | 4.65246 |  |  |
| **Mean** |  | **310** |  |  |  |  |
| **Coefficient of variation (%)** | | **8.40** |  |  |  |  |
| **LSDt(0.05)** |  | **8.13** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Warmer Northern Irrigation Area (earlier planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Burgersfort 2016-05-24** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 7.62 | abc | 3 | 6.27 | 82.15 | 11 | 10.70 | 19 | 327 | 4 |
| **Krokodil** | 8.08 | a | 1 | 5.84 | 82.00 | 12 | 11.33 | 12 | 295 | 19 |
| **PAN 3400** | 6.95 | defg | 12 | 5.74 | 81.50 | 17 | 12.43 | 2 | 321 | 7 |
| **PAN 3471** | 6.44 | gh | 19 | 5.87 | 82.35 | 10 | 11.77 | 5 | 327 | 4 |
| **PAN 3497** | 6.96 | defg | 11 | 7.61 | 81.90 | 14 | 11.03 | 17 | 309 | 17 |
| **PAN 3515** | 6.53 | gh | 16 | 3.42 | 82.60 | 6 | 11.16 | 14 | 312 | 14 |
| **PAN 3623** | 7.26 | cde | 8 | 5.67 | 81.95 | 13 | 11.75 | 6 | 311 | 16 |
| **Sabie** | 7.21 | cdef | 9 | 3.94 | 82.80 | 4 | 12.03 | 3 | 317 | 11 |
| **SST 806** | 6.77 | efgh | 13 | 3.86 | 83.15 | 1 | 11.35 | 11 | 340 | 1 |
| **SST 8125** | 7.40 | bcd | 6 | 3.77 | 82.90 | 3 | 10.95 | 18 | 330 | 2 |
| **SST 8135** | 7.39 | bcd | 7 | 9.44 | 82.40 | 9 | 11.43 | 8 | 313 | 13 |
| **SST 8154** | 6.65 | fgh | 15 | 4.51 | 81.65 | 16 | 11.85 | 4 | 320 | 8 |
| **SST 8155** | 6.49 | gh | 18 | 3.19 | 81.85 | 15 | 11.04 | 16 | 317 | 11 |
| **SST 835** | 6.52 | gh | 17 | 1.61 | 83.10 | 2 | 11.41 | 10 | 319 | 9 |
| **SST 843** | 6.69 | efgh | 14 | 5.39 | 81.25 | 20 | 13.28 | 1 | 297 | 18 |
| **SST 866** | 7.19 | cdef | 10 | 5.85 | 82.60 | 6 | 11.15 | 15 | 318 | 10 |
| **SST 875** | 7.60 | abc | 5 | 4.65 | 81.50 | 17 | 11.75 | 6 | 328 | 3 |
| **SST 877** | 6.32 | h | 20 | 5.88 | 82.80 | 4 | 11.25 | 13 | 292 | 20 |
| **SST 884** | 7.61 | abc | 4 | 5.56 | 81.50 | 17 | 11.42 | 9 | 312 | 15 |
| **SST 895** | 7.85 | ab | 2 | 2.69 | 82.60 | 6 | 10.59 | 20 | 321 | 6 |
| **Mean** | **7.08** |  |  |  | **82.23** |  | **11.48** |  | **316** |  |
| **Coefficient of variation (%)** | **5.72** |  |  |  | **0.75** |  | **7.24** |  | **5.78** |  |
| **LSDt(0,05)** | **0.59** |  |  |  | **0.89** |  | **1.20** |  | **26.44** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Warmer Northern Irrigation Area (earlier planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Groblersdal 2016-05-25** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 7.87 | efg | 10 | 9.59 | 78.60 | 17 | 13.16 | 4 | 292 | 11 |
| **Krokodil** | 9.39 | a | 1 | 6.33 | 79.80 | 5 | 12.27 | 20 | 205 | 20 |
| **PAN 3400** | 8.05 | def | 7 | 3.33 | 78.50 | 18 | 12.95 | 10 | 278 | 13 |
| **PAN 3471** | 7.60 | fgh | 17 | 3.68 | 81.00 | 1 | 13.16 | 4 | 275 | 15 |
| **PAN 3497** | 7.20 | h | 19 | 8.27 | 79.50 | 8 | 12.48 | 19 | 275 | 14 |
| **PAN 3515** | 7.81 | fg | 13 | 4.93 | 79.20 | 12 | 12.59 | 17 | 274 | 16 |
| **PAN 3623** | 8.82 | bc | 4 | 5.30 | 80.95 | 2 | 12.71 | 15 | 253 | 19 |
| **Sabie** | 8.01 | defg | 8 | 1.78 | 79.40 | 9 | 13.01 | 8 | 304 | 7 |
| **SST 806** | 7.14 | h | 20 | 6.82 | 78.90 | 15 | 13.15 | 6 | 333 | 1 |
| **SST 8125** | 7.48 | gh | 18 | 7.47 | 77.15 | 20 | 12.99 | 9 | 290 | 12 |
| **SST 8135** | 7.94 | efg | 9 | 5.09 | 79.20 | 12 | 13.20 | 3 | 257 | 18 |
| **SST 8154** | 7.80 | fg | 14 | 2.26 | 80.30 | 4 | 12.83 | 13 | 312 | 5 |
| **SST 8155** | 7.86 | fg | 11 | 4.48 | 78.65 | 16 | 12.82 | 14 | 295 | 10 |
| **SST 835** | 7.75 | fg | 16 | 7.70 | 79.25 | 11 | 12.93 | 12 | 297 | 9 |
| **SST 843** | 9.29 | ab | 2 | 2.94 | 80.95 | 2 | 13.93 | 1 | 332 | 2 |
| **SST 866** | 8.40 | cde | 6 | 5.62 | 79.70 | 6 | 12.64 | 16 | 320 | 4 |
| **SST 875** | 8.52 | cd | 5 | 4.63 | 79.35 | 10 | 12.52 | 18 | 273 | 17 |
| **SST 877** | 7.86 | fg | 12 | 5.49 | 78.00 | 19 | 12.94 | 11 | 300 | 8 |
| **SST 884** | 9.09 | ab | 3 | 4.56 | 78.95 | 14 | 13.09 | 7 | 328 | 3 |
| **SST 895** | 7.76 | fg | 15 | 3.77 | 79.70 | 6 | 13.71 | 2 | 305 | 6 |
| **Mean** | **8.08** |  |  |  | **79.35** |  | **12.95** |  | **290** |  |
| **Coefficient of variation (%)** | **4.66** |  |  |  | **1.51** |  | **3.88** |  | **9.73** |  |
| **LSDt(0,05)** | **0.54** |  |  |  | **0.17** |  | **0.73** |  | **40.80** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Warmer Northern Irrigation Area (earlier planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Skuinsdrift 2016-05-27** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 6.11 | ij | 17 | 1.59 | 76.70 | 8 | 12.43 | 20 | 337 | 3 |
| **Krokodil** | 6.94 | cdef | 6 | 5.42 | 77.20 | 4 | 12.98 | 17 | 321 | 13 |
| **PAN 3400** | 6.86 | cdefg | 7 | 4.45 | 76.65 | 9 | 14.09 | 2 | 301 | 20 |
| **PAN 3471** | 5.47 | k | 19 | 6.55 | 77.45 | 3 | 13.13 | 14 | 318 | 15 |
| **PAN 3497** | 6.54 | fghi | 12 | 8.87 | 78.00 | 1 | 13.12 | 15 | 337 | 3 |
| **PAN 3515** | 6.01 | j | 18 | 6.97 | 76.30 | 11 | 13.26 | 13 | 326 | 9 |
| **PAN 3623** | 7.30 | abcd | 4 | 3.63 | 77.65 | 2 | 12.99 | 16 | 325 | 10 |
| **Sabie** | 4.98 | l | 20 | 4.99 | 74.30 | 20 | 14.05 | 3 | 318 | 16 |
| **SST 806** | 7.71 | a | 1 | 6.89 | 76.60 | 10 | 13.27 | 12 | 323 | 12 |
| **SST 8125** | 6.12 | ij | 16 | 8.22 | 76.15 | 14 | 13.42 | 9 | 325 | 10 |
| **SST 8135** | 6.47 | fghij | 13 | 5.21 | 76.30 | 11 | 13.54 | 7 | 319 | 14 |
| **SST 8154** | 6.82 | defgh | 10 | 8.13 | 77.00 | 5 | 13.58 | 6 | 328 | 8 |
| **SST 8155** | 6.34 | hij | 15 | 3.38 | 74.90 | 18 | 13.32 | 11 | 349 | 1 |
| **SST 835** | 6.84 | cdefg | 8 | 5.63 | 76.95 | 6 | 13.43 | 8 | 336 | 5 |
| **SST 843** | 6.83 | defg | 9 | 3.81 | 76.85 | 7 | 14.48 | 1 | 344 | 2 |
| **SST 866** | 7.43 | ab | 2 | 6.32 | 76.30 | 11 | 12.48 | 19 | 331 | 6 |
| **SST 875** | 6.76 | efgh | 11 | 6.50 | 75.55 | 16 | 13.68 | 5 | 331 | 7 |
| **SST 877** | 6.38 | ghij | 14 | 5.11 | 75.30 | 17 | 12.97 | 18 | 306 | 19 |
| **SST 884** | 7.33 | abc | 3 | 4.19 | 74.50 | 19 | 13.42 | 9 | 313 | 18 |
| **SST 895** | 7.10 | bcde | 5 | 5.74 | 76.00 | 15 | 13.71 | 4 | 317 | 17 |
| **Mean** | **6.62** |  |  |  | **76.33** |  | **13.37** |  | **325** |  |
| **Coefficient of variation (%)** | **5.08** |  |  |  | **1.07** |  | **3.11** |  | **6.67** |  |
| **LSDt(0,05)** | **0.49** |  |  |  | **1.19** |  | **0.60** |  | **31.34** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Warmer Northern Irrigation Area (later planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 7.11 | 20 | 7.20 | 17 | 6.59 | 24 |  |  |  |  |  |  |
| **Duzi** | 7.86 | 4 | 7.75 | 13 | 7.46 | 11 | 7.02 | 16 | 7.52 | 8 | 7.69 | 7 | 7.80 | 6 |
| **Koedoes** |  |  | 7.95 | 6 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 7.45 | 12 | 8.36 | 2 | 7.21 | 16 | 7.28 | 8 | 7.57 | 5 | 7.67 | 8 | 7.90 | 3 |
| **PAN 3400** | 8.22 | 1 | 8.41 | 1 | 8.19 | 1 | 7.06 | 15 | 7.97 | 1 | 8.27 | 1 | 8.31 | 1 |
| **PAN 3471** | 7.67 | 8 | 7.86 | 9 | 7.44 | 12 | 7.22 | 9 | 7.55 | 6 | 7.66 | 9 | 7.77 | 7 |
| **PAN 3478** |  |  |  |  |  |  | 7.48 | 5 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 7.27 | 14 | 7.47 | 6 |  |  |  |  |  |  |
| **PAN 3497** | 7.38 | 16 | 7.84 | 10 | 7.65 | 8 | 6.80 | 21 | 7.41 | 9 | 7.62 | 10 | 7.61 | 11 |
| **PAN 3515** | 7.31 | 17 | 7.52 | 17 | 7.68 | 7 |  |  |  |  | 7.51 | 12 | 7.42 | 14 |
| **PAN 3623** | 8.00 | 3 | 7.76 | 12 | 7.76 | 6 |  |  |  |  | 7.84 | 3 | 7.88 | 5 |
| **Renoster** |  |  | 8.03 | 5 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 7.12 | 19 | 6.92 | 22 | 6.98 | 18 | 6.95 | 18 | 6.99 | 14 | 7.01 | 15 | 7.02 | 18 |
| **SST 806** | 7.39 | 15 | 7.28 | 18 | 7.62 | 9 | 6.98 | 17 | 7.32 | 11 | 7.43 | 13 | 7.34 | 15 |
| **SST 8125** | 7.75 | 6 | 7.65 | 15 |  |  |  |  |  |  |  |  | 7.70 | 9 |
| **SST 8134** |  |  | 7.92 | 7 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 7.72 | 7 | 8.05 | 3 |  |  |  |  |  |  |  |  | 7.89 | 3 |
| **SST 8154** | 7.75 | 5 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 7.55 | 11 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 6.70 | 23 |  |  |  |  |  |  |
| **SST 835** | 7.57 | 10 | 7.55 | 16 | 7.96 | 4 | 7.49 | 4 | 7.64 | 4 | 7.70 | 6 | 7.56 | 13 |
| **SST 843** | 6.94 | 20 | 7.15 | 19 | 6.90 | 19 | 7.10 | 13 | 7.02 | 13 | 7.00 | 16 | 7.05 | 17 |
| **SST 866** | 7.42 | 14 | 7.71 | 14 | 8.06 | 3 | 7.53 | 3 | 7.68 | 3 | 7.73 | 5 | 7.56 | 12 |
| **SST 867** |  |  | 6.77 | 23 | 7.26 | 15 | 7.16 | 11 |  |  |  |  |  |  |
| **SST 875** | 7.45 | 12 | 7.88 | 8 | 7.40 | 13 | 6.90 | 19 | 7.41 | 10 | 7.57 | 11 | 7.66 | 10 |
| **SST 876** |  |  |  |  |  |  | 7.56 | 2 |  |  |  |  |  |  |
| **SST 877** | 7.23 | 18 | 6.99 | 21 | 7.59 | 10 | 7.17 | 10 | 7.25 | 12 | 7.27 | 14 | 7.11 | 16 |
| **SST 884** | 7.63 | 9 | 7.79 | 11 | 7.85 | 5 | 6.83 | 20 | 7.52 | 7 | 7.76 | 4 | 7.71 | 8 |
| **SST 895** | 8.03 | 2 | 8.04 | 4 | 8.11 | 2 | 7.07 | 14 | 7.81 | 2 | 8.06 | 2 | 8.03 | 2 |
| **SST 896** |  |  |  |  |  |  | 6.73 | 22 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 7.67 | 1 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 7.11 | 12 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 7.30 | 7 |  |  |  |  |  |  |
| **Mean** | **7.57** |  | **7.66** |  | **7.56** |  | **7.13** |  | **7.48** |  | **7.61** |  | **7.63** |  |
| **LSDt(0,05)** | **0.35** |  | **0.23** |  | **0.20** |  | **0.52** |  | **0.15** |  | **0.15** |  | **0.20** |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **Warmer Northern Irrigation Area (later planting) AMMI Analysis** | | | | | | |
| **Anova of the yield of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 319 | 350.2 | 1.098 |  |  |
| **Treatments** | | 79 | 288.6 | 3.653 | 16.05 | <0,001 |
| **Genotypes** | | 19 | 30.4 | 1.601 | 7.03 | <0,001 |
| **Environments** | | 3 | 169.1 | 56.361 | 69.51 | <0,001 |
| **Block** |  | 12 | 9.7 | 0.811 | 3.56 | <0,001 |
| **Interactions** | | 57 | 89.1 | 1.563 | 6.87 | <0,001 |
| **IPCA** |  | 21 | 59.3 | 2.822 | 12.40 | <0,001 |
| **IPCA** |  | 19 | 19.0 | 1.002 | 4.40 | <0,001 |
| **Residuals** |  | 17 | 10.8 | 0.634 | 2.79 | <0,001 |
| **Error** |  | 228 | 51.9 | 0.228 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Duzi | 7.86 | 4 | 0.14078 |  |  |
| 2 | Krokodil | 7.45 | 12 | 0.24577 |  |  |
| 3 | PAN 3400 | 8.22 | 1 | -0.27726 |  |  |
| 4 | PAN 3471 | 7.67 | 8 | 0.66876 |  |  |
| 5 | PAN 3497 | 7.38 | 16 | 0.49315 |  |  |
| 6 | PAN 3515 | 7.31 | 17 | 0.14757 |  |  |
| 7 | PAN 3623 | 8.00 | 3 | -0.58868 |  |  |
| 8 | Sabie | 7.12 | 19 | 0.76910 |  |  |
| 9 | SST 806 | 7.39 | 15 | 0.55370 |  |  |
| 10 | SST 8125 | 7.75 | 6 | 0.26231 |  |  |
| 11 | SST 8135 | 7.72 | 7 | -0.28419 |  |  |
| 12 | SST 8154 | 7.75 | 5 | -0.43764 |  |  |
| 13 | SST 8155 | 7.55 | 11 | -0.04236 |  |  |
| 14 | SST 835 | 7.57 | 10 | 0.02216 |  |  |
| 15 | SST 843 | 6.94 | 20 | -0.91918 |  |  |
| 16 | SST 866 | 7.42 | 14 | -0.39369 |  |  |
| 17 | SST 875 | 7.45 | 12 | 0.39887 |  |  |
| 18 | SST 877 | 7.23 | 18 | -0.24723 |  |  |
| 19 | SST 884 | 7.63 | 9 | -0.39810 |  |  |
| 20 | SST 895 | 8.03 | 2 | -0.11383 |  |  |
| **Mean** |  | **7.57** |  |  |  |  |
| **Coefficient of variation (%)** | | **6.60** |  |  |  |  |
| **LSDt(0,05)** |  | **0.35** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Brits JvR | 6.81 | 4 | 0.96767 |  |  |
| 2 | Koedoeskop | 8.74 | 1 | -1.58219 |  |  |
| 3 | Makoppa | 7.17 | 3 | 0.63918 |  |  |
| 4 | Ohrigstad | 7.56 | 2 | -0.02467 |  |  |
| **Mean** |  | **7.57** |  |  |  |  |
| **Coefficient of variation (%)** | | **6.60** |  |  |  |  |
| **LSDt(0.05)** |  | **0.16** |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Warmer Northern Irrigation Area (later planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 81.87 | 18 | 78.59 | 17 | 82.50 | 19 |  |  |  |  |  |  |
| **Duzi** | 81.66 | 15 | 82.17 | 16 | 78.88 | 12 | 82.20 | 21 | 81.23 | 11 | 80.90 | 12 | 81.92 | 14 |
| **Koedoes** |  |  | 82.26 | 14 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 81.60 | 17 | 82.65 | 9 | 79.72 | 4 | 82.70 | 14 | 81.67 | 6 | 81.32 | 7 | 82.13 | 12 |
| **PAN 3400** | 81.94 | 11 | 83.05 | 5 | 79.29 | 7 | 83.10 | 7 | 81.85 | 4 | 81.43 | 6 | 82.50 | 6 |
| **PAN 3471** | 82.75 | 1 | 83.32 | 2 | 79.45 | 6 | 83.90 | 1 | 82.36 | 2 | 81.84 | 3 | 83.04 | 1 |
| **PAN 3478** |  |  |  |  |  |  | 83.90 | 1 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 80.46 | 1 | 83.40 | 4 |  |  |  |  |  |  |
| **PAN 3497** | 82.20 | 7 | 83.47 | 1 | 80.05 | 2 | 83.70 | 3 | 82.36 | 1 | 81.91 | 1 | 82.84 | 3 |
| **PAN 3515** | 80.96 | 20 | 82.18 | 15 | 78.81 | 14 |  |  |  |  | 80.65 | 13 | 81.57 | 16 |
| **PAN 3623** | 81.94 | 11 | 83.25 | 3 | 79.59 | 5 |  |  |  |  | 81.59 | 4 | 82.60 | 5 |
| **Renoster** |  |  | 81.12 | 21 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 81.61 | 16 | 81.54 | 19 | 78.70 | 16 | 82.20 | 21 | 81.01 | 12 | 80.62 | 14 | 81.58 | 15 |
| **SST 806** | 82.30 | 6 | 83.14 | 4 | 78.99 | 9 | 82.90 | 10 | 81.83 | 5 | 81.48 | 5 | 82.72 | 4 |
| **SST 8125** | 82.20 | 7 | 82.33 | 12 |  |  |  |  |  |  |  |  | 82.27 | 11 |
| **SST 8134** |  |  | 80.77 | 23 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 82.01 | 10 | 82.83 | 8 |  |  |  |  |  |  |  |  | 82.42 | 7 |
| **SST 8154** | 82.46 | 5 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 81.34 | 19 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 82.30 | 20 |  |  |  |  |  |  |
| **SST 835** | 82.51 | 3 | 82.31 | 13 | 78.89 | 11 | 82.80 | 13 | 81.63 | 7 | 81.24 | 8 | 82.41 | 9 |
| **SST 843** | 82.75 | 1 | 83.04 | 6 | 79.76 | 3 | 83.00 | 8 | 82.14 | 3 | 81.85 | 2 | 82.90 | 2 |
| **SST 866** | 82.50 | 4 | 82.34 | 11 | 78.84 | 13 | 82.60 | 17 | 81.57 | 8 | 81.23 | 9 | 82.42 | 7 |
| **SST 867** |  |  | 82.95 | 7 | 78.80 | 15 | 83.30 | 5 |  |  |  |  |  |  |
| **SST 875** | 81.94 | 11 | 81.96 | 17 | 79.24 | 8 | 82.90 | 10 | 81.51 | 10 | 81.05 | 11 | 81.95 | 13 |
| **SST 876** |  |  |  |  |  |  | 83.30 | 5 |  |  |  |  |  |  |
| **SST 877** | 81.51 | 18 | 81.41 | 20 | 77.73 | 19 | 82.90 | 10 | 80.89 | 13 | 80.22 | 16 | 81.46 | 18 |
| **SST 884** | 81.85 | 14 | 81.11 | 22 | 78.58 | 18 | 81.80 | 23 | 80.84 | 14 | 80.51 | 15 | 81.48 | 17 |
| **SST 895** | 82.20 | 7 | 82.38 | 10 | 78.91 | 10 | 82.60 | 17 | 81.52 | 9 | 81.16 | 10 | 82.29 | 10 |
| **SST 896** |  |  |  |  |  |  | 81.80 | 23 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 83.00 | 8 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 82.70 | 14 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 82.70 | 14 |  |  |  |  |  |  |
| **Mean** | **82.01** |  | **82.32** |  | **79.12** |  | **82.84** |  | **81.60** |  | **81.19** |  | **82.25** |  |
| **LSDt(0,05)** | **0.75** |  | **0.68** |  | **0.56** |  | **0.77** |  | **0.35** |  | **0.39** |  | **0.50** |  |

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| **Warmer Northern Irrigation Area (later planting) AMMI Analysis** | | | | | | |
| **Anova of the hectolitre mass of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 319 | 538.6 | 1.689 |  |  |
| **Treatments** | | 79 | 264.2 | 3.344 | 3.21 | <0,001 |
| **Genotypes** | | 19 | 68.3 | 3.596 | 3.45 | <0,001 |
| **Environments** | | 3 | 63.6 | 21.201 | 6.86 | <0,001 |
| **Block** |  | 12 | 37.1 | 3.092 | 2.97 | <0,001 |
| **Interactions** | | 57 | 132.2 | 2.320 | 2.23 | <0,001 |
| **IPCA** |  | 21 | 59.7 | 2.842 | 2.73 | <0,001 |
| **IPCA** |  | 19 | 43.4 | 2.284 | 2.19 | 0.0036 |
| **Residuals** |  | 17 | 29.1 | 1.714 | 1.65 | 0.0544 |
| **Error** |  | 228 | 237.4 | 1.041 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Duzi | 81.66 | 15 | -0.56141 |  |  |
| 2 | Krokodil | 81.60 | 17 | -0.38178 |  |  |
| 3 | PAN 3400 | 81.94 | 11 | 0.02822 |  |  |
| 4 | PAN 3471 | 82.75 | 1 | 0.11618 |  |  |
| 5 | PAN 3497 | 82.20 | 7 | 0.57209 |  |  |
| 6 | PAN 3515 | 80.96 | 20 | 0.34494 |  |  |
| 7 | PAN 3623 | 81.94 | 11 | -0.84039 |  |  |
| 8 | Sabie | 81.61 | 16 | -0.26211 |  |  |
| 9 | SST 806 | 82.30 | 6 | 0.54504 |  |  |
| 10 | SST 8125 | 82.20 | 7 | 0.40465 |  |  |
| 11 | SST 8135 | 82.01 | 10 | -0.17139 |  |  |
| 12 | SST 8154 | 82.46 | 5 | -0.70920 |  |  |
| 13 | SST 8155 | 81.34 | 19 | -0.02132 |  |  |
| 14 | SST 835 | 82.51 | 3 | 0.52873 |  |  |
| 15 | SST 843 | 82.75 | 1 | -0.58439 |  |  |
| 16 | SST 866 | 82.50 | 4 | 0.31922 |  |  |
| 17 | SST 875 | 81.94 | 11 | 0.38474 |  |  |
| 18 | SST 877 | 81.51 | 18 | 0.50522 |  |  |
| 19 | SST 884 | 81.85 | 14 | -0.21620 |  |  |
| 20 | SST 895 | 82.20 | 7 | -0.00082 |  |  |
| **Mean** |  | **82.01** |  |  |  |  |
| **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 | Brits JvR | 82.75 | 1 | 0.77189 |  |  |
| 2 | Koedoeskop | 81.99 | 2 | -1.68759 |  |  |
| 3 | Makoppa | 81.67 | 3 | 0.45483 |  |  |
| 4 | Ohrigstad | 81.64 | 4 | 0.46087 |  |  |
| **Mean** |  | **82.01** |  |  |  |  |
| **Coefficient of variation (%)** | | **1.30** |  |  |  |  |
| **LSDt(0.05)** |  | **0.33** |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Warmer Northern Irrigation Area (later planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 13.11 | 3 | 12.38 | 8 | 11.31 | 5 |  |  |  |  |  |  |
| **Duzi** | 11.93 | 14 | 12.78 | 10 | 12.41 | 7 | 11.24 | 9 | 12.09 | 6 | 12.37 | 9 | 12.36 | 11 |
| **Koedoes** |  |  | 12.85 | 6 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 11.48 | 20 | 11.75 | 23 | 11.42 | 19 | 10.60 | 24 | 11.31 | 14 | 11.55 | 16 | 11.62 | 18 |
| **PAN 3400** | 12.25 | 5 | 12.84 | 7 | 12.30 | 9 | 11.27 | 6 | 12.17 | 3 | 12.46 | 5 | 12.55 | 5 |
| **PAN 3471** | 12.03 | 12 | 12.47 | 19 | 11.90 | 16 | 11.34 | 4 | 11.94 | 10 | 12.13 | 12 | 12.25 | 13 |
| **PAN 3478** |  |  |  |  |  |  | 11.25 | 8 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 12.03 | 13 | 10.63 | 23 |  |  |  |  |  |  |
| **PAN 3497** | 12.10 | 10 | 12.76 | 12 | 12.62 | 2 | 10.65 | 22 | 12.03 | 7 | 12.49 | 4 | 12.43 | 9 |
| **PAN 3515** | 11.71 | 16 | 12.11 | 22 | 11.89 | 17 |  |  |  |  | 11.90 | 15 | 11.91 | 17 |
| **PAN 3623** | 12.45 | 2 | 12.89 | 5 | 12.61 | 3 |  |  |  |  | 12.65 | 2 | 12.67 | 2 |
| **Renoster** |  |  | 12.46 | 20 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 12.39 | 4 | 12.83 | 9 | 12.52 | 5 | 11.26 | 7 | 12.25 | 2 | 12.58 | 3 | 12.61 | 3 |
| **SST 806** | 12.22 | 6 | 12.68 | 14 | 12.23 | 11 | 10.83 | 18 | 11.99 | 8 | 12.38 | 8 | 12.45 | 8 |
| **SST 8125** | 11.72 | 15 | 12.59 | 17 |  |  |  |  |  |  |  |  | 12.16 | 14 |
| **SST 8134** |  |  | 12.84 | 7 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 12.09 | 11 | 12.63 | 16 |  |  |  |  |  |  |  |  | 12.36 | 8 |
| **SST 8154** | 12.43 | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 11.54 | 19 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 11.73 | 2 |  |  |  |  |  |  |
| **SST 835** | 12.21 | 7 | 12.74 | 13 | 12.13 | 12 | 10.82 | 20 | 11.98 | 9 | 12.36 | 10 | 12.48 | 7 |
| **SST 843** | 13.06 | 1 | 13.92 | 1 | 13.20 | 1 | 12.08 | 1 | 13.07 | 1 | 13.39 | 1 | 13.49 | 1 |
| **SST 866** | 11.70 | 17 | 12.51 | 18 | 11.82 | 18 | 11.02 | 17 | 11.76 | 12 | 12.01 | 13 | 12.11 | 15 |
| **SST 867** |  |  | 13.19 | 2 | 12.60 | 4 | 10.83 | 18 |  |  |  |  |  |  |
| **SST 875** | 11.64 | 18 | 12.24 | 21 | 11.91 | 15 | 10.82 | 20 | 11.65 | 13 | 11.93 | 14 | 11.94 | 16 |
| **SST 876** |  |  |  |  |  |  | 11.15 | 12 |  |  |  |  |  |  |
| **SST 877** | 12.18 | 8 | 12.78 | 10 | 12.42 | 6 | 11.24 | 9 | 12.16 | 4 | 12.46 | 6 | 12.48 | 6 |
| **SST 884** | 11.94 | 13 | 12.68 | 14 | 11.97 | 14 | 11.09 | 15 | 11.92 | 11 | 12.20 | 11 | 12.31 | 12 |
| **SST 895** | 12.18 | 8 | 12.92 | 4 | 12.26 | 10 | 11.07 | 16 | 12.11 | 5 | 12.45 | 7 | 12.55 | 4 |
| **SST 896** |  |  |  |  |  |  | 11.42 | 3 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 11.10 | 14 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 11.14 | 13 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 11.19 | 11 |  |  |  |  |  |  |
| **Mean** | **12.06** |  | **12.72** |  | **12.24** |  | **11.13** |  | **12.03** |  | **12.33** |  | **12.37** |  |
| **LSDt(0,05)** | **0.43** |  | **0.36** |  | **0.32** |  | **0.56** |  | **0.20** |  | **0.22** |  | **0.28** |  |

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| **Warmer Northern Irrigation Area (later planting) AMMI Analysis** | | | | | | |
| **Anova of the protein content of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 319 | 843.4 | 2.64 |  |  |
| **Treatments** | | 79 | 750.5 | 9.50 | 25.20 | <0,001 |
| **Genotypes** | | 19 | 43.2 | 2.27 | 6.03 | <0,001 |
| **Environments** | | 3 | 679.5 | 226.49 | 392.51 | <0,001 |
| **Block** |  | 12 | 6.9 | 0.58 | 1.53 | 0.1142 |
| **Interactions** | | 57 | 27.8 | 0.49 | 1.29 | 0.0972 |
| **IPCA** |  | 21 | 14.0 | 0.67 | 1.76 | 0.0234 |
| **IPCA** |  | 19 | 9.1 | 0.48 | 1.27 | 0.2066 |
| **Residuals** |  | 17 | 4.7 | 0.28 | 0.74 | 0.7603 |
| **Error** |  | 228 | 86.0 | 0.38 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Duzi | 11.93 | 14 | -0.39645 |  |  |
| 2 | Krokodil | 11.48 | 20 | -0.21549 |  |  |
| 3 | PAN 3400 | 12.25 | 5 | -0.10328 |  |  |
| 4 | PAN 3471 | 12.03 | 12 | 0.05728 |  |  |
| 5 | PAN 3497 | 12.10 | 10 | 0.02844 |  |  |
| 6 | PAN 3515 | 11.71 | 16 | 0.12112 |  |  |
| 7 | PAN 3623 | 12.45 | 2 | 0.35338 |  |  |
| 8 | Sabie | 12.39 | 4 | 0.23742 |  |  |
| 9 | SST 806 | 12.22 | 6 | 0.56231 |  |  |
| 10 | SST 8125 | 11.72 | 15 | 0.11051 |  |  |
| 11 | SST 8135 | 12.09 | 11 | 0.27251 |  |  |
| 12 | SST 8154 | 12.43 | 3 | 0.01134 |  |  |
| 13 | SST 8155 | 11.54 | 19 | -0.66326 |  |  |
| 14 | SST 835 | 12.21 | 7 | 0.25019 |  |  |
| 15 | SST 843 | 13.06 | 1 | -0.47758 |  |  |
| 16 | SST 866 | 11.70 | 17 | 0.18104 |  |  |
| 17 | SST 875 | 11.64 | 18 | -0.03845 |  |  |
| 18 | SST 877 | 12.18 | 8 | -0.07946 |  |  |
| 19 | SST 884 | 11.94 | 13 | -0.46503 |  |  |
| 20 | SST 895 | 12.18 | 8 | 0.25346 |  |  |
| **Mean** |  | **12.06** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.20** |  |  |  |  |
| **LSDt(0,05)** |  | **0.43** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Brits JvR | 13.05 | 2 | -0.10604 |  |  |
| 2 | Koedoeskop | 11.99 | 3 | 0.12616 |  |  |
| 3 | Makoppa | 9.72 | 4 | -0.96958 |  |  |
| 4 | Ohrigstad | 13.49 | 1 | 0.94946 |  |  |
| **Mean** |  | **12.06** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.20** |  |  |  |  |
| **LSDt(0.05)** |  | **0.19** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Warmer Northern Irrigation Area (later planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 367 | 15 | 356 | 8 | 344 | 14 |  |  |  |  |  |  |
| **Duzi** | 360 | 9 | 371 | 11 | 350 | 15 | 344 | 16 | 356 | 9 | 360 | 9 | 365 | 7 |
| **Koedoes** |  |  | 371 | 8 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 323 | 20 | 346 | 23 | 314 | 19 | 314 | 24 | 324 | 14 | 327 | 16 | 334 | 18 |
| **PAN 3400** | 348 | 17 | 367 | 16 | 353 | 11 | 344 | 14 | 353 | 12 | 356 | 13 | 357 | 15 |
| **PAN 3471** | 351 | 16 | 380 | 1 | 345 | 17 | 352 | 11 | 357 | 8 | 358 | 12 | 365 | 8 |
| **PAN 3478** |  |  |  |  |  |  | 345 | 13 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 342 | 18 | 358 | 5 |  |  |  |  |  |  |
| **PAN 3497** | 366 | 3 | 361 | 18 | 350 | 14 | 339 | 19 | 354 | 11 | 359 | 10 | 363 | 11 |
| **PAN 3515** | 351 | 15 | 355 | 21 | 355 | 10 |  |  |  |  | 354 | 14 | 353 | 16 |
| **PAN 3623** | 361 | 6 | 379 | 2 | 353 | 12 |  |  |  |  | 364 | 3 | 370 | 3 |
| **Renoster** |  |  | 364 | 17 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 357 | 12 | 360 | 19 | 359 | 3 | 347 | 12 | 356 | 10 | 359 | 11 | 359 | 14 |
| **SST 806** | 373 | 1 | 369 | 14 | 364 | 1 | 362 | 2 | 367 | 1 | 369 | 1 | 371 | 2 |
| **SST 8125** | 369 | 2 | 377 | 3 |  |  |  |  |  |  |  |  | 373 | 1 |
| **SST 8134** |  |  | 374 | 4 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 355 | 13 | 371 | 10 |  |  |  |  |  |  |  |  | 363 | 10 |
| **SST 8154** | 345 | 18 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 362 | 5 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 323 | 23 |  |  |  |  |  |  |
| **SST 835** | 360 | 8 | 371 | 9 | 358 | 4 | 362 | 3 | 363 | 4 | 363 | 5 | 365 | 6 |
| **SST 843** | 361 | 6 | 373 | 5 | 350 | 15 | 352 | 10 | 359 | 7 | 361 | 7 | 367 | 5 |
| **SST 866** | 354 | 14 | 373 | 5 | 357 | 5 | 367 | 1 | 363 | 3 | 361 | 8 | 363 | 12 |
| **SST 867** |  |  | 352 | 22 | 357 | 6 | 344 | 17 |  |  |  |  |  |  |
| **SST 875** | 366 | 4 | 372 | 7 | 355 | 9 | 360 | 4 | 363 | 2 | 364 | 2 | 369 | 4 |
| **SST 876** |  |  |  |  |  |  | 356 | 6 |  |  |  |  |  |  |
| **SST 877** | 333 | 19 | 357 | 20 | 352 | 13 | 329 | 22 | 343 | 13 | 347 | 15 | 345 | 17 |
| **SST 884** | 359 | 10 | 370 | 12 | 356 | 7 | 353 | 8 | 360 | 6 | 362 | 6 | 365 | 9 |
| **SST 895** | 358 | 11 | 370 | 13 | 362 | 2 | 356 | 7 | 361 | 5 | 363 | 4 | 364 | 10 |
| **SST 896** |  |  |  |  |  |  | 352 | 9 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 335 | 20 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 335 | 21 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 342 | 18 |  |  |  |  |  |  |
| **Mean** | **356** |  | **367** |  | **352** |  | **346** |  | **356** |  | **358** |  | **362** |  |
| **LSDt(0,05)** | **12.73** |  | **10.12** |  | **12.27** |  | **14.46** |  | **6.30** |  | **6.91** |  | **8.05** |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **Warmer Northern Irrigation Area (later planting) AMMI Analysis** | | | | | | |
| **Anova of the falling number of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 319 | 473309 | 1484 |  |  |
| **Treatments** | | 79 | 393815 | 4985 | 15.03 | <0,001 |
| **Genotypes** | | 19 | 43256 | 2277 | 6.86 | <0,001 |
| **Environments** | | 3 | 308891 | 102964 | 320.04 | <0,001 |
| **Block** |  | 12 | 3861 | 322 | 0.97 | 0.4785 |
| **Interactions** | | 57 | 41667 | 731 | 2.20 | <0,001 |
| **IPCA** |  | 21 | 33612 | 1601 | 4.83 | <0,001 |
| **IPCA** |  | 19 | 5412 | 285 | 0.86 | 0.6347 |
| **Residuals** |  | 17 | 2643 | 155 | 0.47 | 0.9647 |
| **Error** |  | 228 | 75633 | 332 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Duzi | 360 | 9 | -1.49616 |  |  |
| 2 | Krokodil | 323 | 20 | -4.07045 |  |  |
| 3 | PAN 3400 | 348 | 17 | 0.01363 |  |  |
| 4 | PAN 3471 | 351 | 16 | -0.09714 |  |  |
| 5 | PAN 3497 | 366 | 3 | 0.09608 |  |  |
| 6 | PAN 3515 | 351 | 15 | -2.10428 |  |  |
| 7 | PAN 3623 | 361 | 6 | 2.05549 |  |  |
| 8 | Sabie | 357 | 12 | 2.77844 |  |  |
| 9 | SST 806 | 373 | 1 | -2.85459 |  |  |
| 10 | SST 8125 | 369 | 2 | -0.49946 |  |  |
| 11 | SST 8135 | 355 | 13 | 2.15276 |  |  |
| 12 | SST 8154 | 345 | 18 | 1.71311 |  |  |
| 13 | SST 8155 | 362 | 5 | -0.93783 |  |  |
| 14 | SST 835 | 360 | 8 | 0.17716 |  |  |
| 15 | SST 843 | 361 | 6 | 3.10344 |  |  |
| 16 | SST 866 | 354 | 14 | 1.03644 |  |  |
| 17 | SST 875 | 366 | 4 | 0.06842 |  |  |
| 18 | SST 877 | 333 | 19 | -4.72505 |  |  |
| 19 | SST 884 | 359 | 10 | 2.03059 |  |  |
| 20 | SST 895 | 358 | 11 | 1.55939 |  |  |
| **Mean** |  | **356** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.10** |  |  |  |  |
| **LSDt(0,05)** |  | **12.73** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Brits JvR | 326 | 3 | -3.45276 |  |  |
| 2 | Koedoeskop | 376 | 2 | 6.37078 |  |  |
| 3 | Makoppa | 396 | 1 | 2.71846 |  |  |
| 4 | Ohrigstad | 324 | 4 | -5.63647 |  |  |
| **Mean** |  | **356** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.10** |  |  |  |  |
| **LSDt(0.05)** |  | **5.69** |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Warmer Northern Irrigation Area (later planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Brits (JvR) 2016-06-09** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 6.55 | fgh | 15 | 2.39 | 82.40 | 12 | 13.19 | 8 | 331 | 7 |
| **Krokodil** | 7.11 | abcde | 8 | 3.03 | 82.25 | 14 | 12.33 | 19 | 317 | 17 |
| **PAN 3400** | 7.58 | a | 1 | 4.00 | 82.25 | 14 | 13.60 | 6 | 317 | 17 |
| **PAN 3471** | 7.22 | abcd | 5 | 5.81 | 84.05 | 2 | 12.87 | 11 | 330 | 9 |
| **PAN 3497** | 7.15 | abcde | 6 | 3.57 | 83.65 | 3 | 13.00 | 9 | 332 | 5 |
| **PAN 3515** | 6.39 | gh | 17 | 6.83 | 81.25 | 20 | 12.60 | 16 | 332 | 5 |
| **PAN 3623** | 6.15 | h | 19 | 3.19 | 82.15 | 16 | 13.76 | 3 | 319 | 15 |
| **Sabie** | 7.23 | abcd | 4 | 2.62 | 81.95 | 18 | 13.69 | 4 | 321 | 12 |
| **SST 806** | 7.13 | abcde | 7 | 3.12 | 84.10 | 1 | 12.81 | 13 | 342 | 1 |
| **SST 8125** | 6.99 | cdef | 11 | 4.20 | 82.95 | 9 | 12.23 | 20 | 340 | 2 |
| **SST 8135** | 7.44 | abc | 3 | 9.34 | 82.10 | 17 | 12.84 | 12 | 316 | 19 |
| **SST 8154** | 6.70 | efg | 13 | 2.75 | 83.10 | 7 | 13.80 | 2 | 313 | 20 |
| **SST 8155** | 6.76 | defg | 12 | 5.31 | 82.75 | 11 | 12.45 | 18 | 335 | 4 |
| **SST 835** | 7.02 | cdef | 10 | 8.24 | 83.35 | 5 | 13.29 | 7 | 331 | 8 |
| **SST 843** | 5.03 | i | 20 | 12.80 | 82.95 | 9 | 14.13 | 1 | 326 | 11 |
| **SST 866** | 6.57 | fgh | 14 | 3.91 | 83.55 | 4 | 12.71 | 14 | 318 | 16 |
| **SST 875** | 7.51 | ab | 2 | 2.68 | 83.20 | 6 | 12.63 | 15 | 338 | 3 |
| **SST 877** | 6.18 | h | 18 | 4.45 | 83.10 | 7 | 13.64 | 5 | 321 | 13 |
| **SST 884** | 6.42 | gh | 16 | 3.65 | 81.45 | 19 | 12.59 | 17 | 319 | 14 |
| **SST 895** | 7.02 | bcdef | 9 | 4.86 | 82.40 | 12 | 12.90 | 10 | 330 | 10 |
| **Mean** | **6.81** |  |  |  | **82.75** |  | **13.05** |  | **326** |  |
| **Coefficient of variation (%)** | **4.96** |  |  |  | **1.00** |  | **6.52** |  | **2.99** |  |
| **LSDt(0,05)** | **0.49** |  |  |  | **1.20** |  | **1.23** |  | **14.11** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Warmer Northern Irrigation Area (later planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Koedoeskop 2016-06-07** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 8.60 | gh | 12 | 5.02 | 82.65 | 4 | 11.64 | 15 | 364 | 17 |
| **Krokodil** | 8.34 | hi | 13 | 3.19 | 82.25 | 6 | 11.60 | 16 | 322 | 20 |
| **PAN 3400** | 10.04 | a | 1 | 9.14 | 81.80 | 12 | 12.37 | 4 | 367 | 16 |
| **PAN 3471** | 7.58 | kl | 19 | 5.84 | 82.60 | 5 | 12.02 | 10 | 368 | 15 |
| **PAN 3497** | 7.85 | jk | 17 | 2.99 | 81.25 | 18 | 12.15 | 6 | 389 | 7 |
| **PAN 3515** | 8.19 | hij | 15 | 4.36 | 80.25 | 20 | 11.48 | 18 | 354 | 18 |
| **PAN 3623** | 9.92 | ab | 2 | 5.12 | 83.35 | 3 | 12.06 | 9 | 399 | 3 |
| **Sabie** | 7.15 | l | 20 | 3.45 | 82.00 | 10 | 12.50 | 2 | 399 | 2 |
| **SST 806** | 7.68 | k | 18 | 4.32 | 81.45 | 14 | 12.31 | 5 | 375 | 13 |
| **SST 8125** | 8.31 | hi | 14 | 3.55 | 81.45 | 14 | 12.01 | 12 | 385 | 9 |
| **SST 8135** | 9.53 | bcd | 4 | 1.58 | 82.20 | 7 | 12.07 | 8 | 383 | 10 |
| **SST 8154** | 9.82 | abc | 3 | 7.33 | 83.70 | 1 | 12.42 | 3 | 387 | 8 |
| **SST 8155** | 8.83 | fg | 11 | 4.64 | 81.45 | 14 | 11.55 | 17 | 378 | 12 |
| **SST 835** | 8.84 | fg | 10 | 4.04 | 81.55 | 13 | 12.09 | 7 | 378 | 11 |
| **SST 843** | 9.29 | def | 6 | 5.15 | 83.70 | 1 | 12.96 | 1 | 401 | 1 |
| **SST 866** | 9.28 | def | 7 | 4.73 | 81.95 | 11 | 11.39 | 19 | 375 | 14 |
| **SST 875** | 7.97 | ijk | 16 | 4.10 | 81.30 | 17 | 11.83 | 14 | 390 | 6 |
| **SST 877** | 8.95 | efg | 9 | 4.58 | 80.70 | 19 | 11.96 | 13 | 328 | 19 |
| **SST 884** | 9.40 | cde | 5 | 2.69 | 82.05 | 9 | 11.30 | 20 | 393 | 5 |
| **SST 895** | 9.27 | def | 8 | 5.14 | 82.10 | 8 | 12.02 | 10 | 394 | 4 |
| **Mean** | **8.74** |  |  |  | **81.99** |  | **11.99** |  | **376** |  |
| **Coefficient of variation (%)** | **3.65** |  |  |  | **1.03** |  | **3.83** |  | **6.57** |  |
| **LSDt(0,05)** | **0.46** |  |  |  | **1.23** |  | **0.66** |  | **35.74** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Warmer Northern Irrigation Area (later planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Ohrigstad 2016-06-02** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 8.22 | abc | 4 | 5.30 | 81.05 | 15 | 12.98 | 17 | 337 | 5 |
| **Krokodil** | 7.15 | ef | 16 | 8.93 | 80.75 | 16 | 12.65 | 19 | 310 | 17 |
| **PAN 3400** | 7.72 | abcde | 7 | 4.66 | 81.70 | 11 | 13.30 | 15 | 318 | 12 |
| **PAN 3471** | 8.15 | abcd | 5 | 3.77 | 82.50 | 3 | 13.55 | 9 | 312 | 15 |
| **PAN 3497** | 7.12 | ef | 18 | 10.11 | 81.90 | 9 | 13.52 | 10 | 338 | 3 |
| **PAN 3515** | 7.36 | cdef | 13 | 10.38 | 80.65 | 17 | 13.39 | 13 | 327 | 8 |
| **PAN 3623** | 8.34 | a | 1 | 5.59 | 81.20 | 13 | 14.26 | 2 | 325 | 10 |
| **Sabie** | 6.93 | ef | 19 | 13.06 | 80.60 | 18 | 13.81 | 7 | 310 | 16 |
| **SST 806** | 7.37 | cdef | 12 | 10.53 | 81.80 | 10 | 14.28 | 1 | 366 | 1 |
| **SST 8125** | 8.25 | ab | 3 | 8.13 | 82.50 | 3 | 13.27 | 16 | 342 | 2 |
| **SST 8135** | 7.44 | bcdef | 10 | 8.68 | 81.20 | 13 | 13.86 | 5 | 310 | 18 |
| **SST 8154** | 7.14 | ef | 17 | 2.26 | 81.25 | 12 | 13.66 | 8 | 307 | 20 |
| **SST 8155** | 7.39 | bcdef | 11 | 10.56 | 80.35 | 19 | 12.30 | 20 | 338 | 4 |
| **SST 835** | 7.22 | ef | 15 | 4.31 | 82.20 | 8 | 13.86 | 5 | 326 | 9 |
| **SST 843** | 7.74 | abcde | 6 | 17.22 | 82.35 | 7 | 14.00 | 4 | 309 | 19 |
| **SST 866** | 7.33 | def | 14 | 13.83 | 83.35 | 1 | 13.42 | 11 | 316 | 14 |
| **SST 875** | 7.70 | abcde | 8 | 11.05 | 82.50 | 3 | 12.88 | 18 | 335 | 6 |
| **SST 877** | 6.68 | f | 20 | 5.19 | 80.00 | 20 | 13.40 | 12 | 330 | 7 |
| **SST 884** | 7.69 | abcde | 9 | 6.12 | 82.40 | 6 | 13.39 | 13 | 320 | 11 |
| **SST 895** | 8.33 | a | 2 | 12.95 | 82.60 | 2 | 14.02 | 3 | 316 | 13 |
| **Mean** | **7.56** |  |  |  | **81.64** |  | **13.49** |  | **324** |  |
| **Coefficient of variation (%)** | **7.94** |  |  |  | **1.07** |  | **4.82** |  | **6.36** |  |
| **LSDt(0,05)** | **0.87** |  |  |  | **1.27** |  | **0.94** |  | **29.85** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Warmer Northern Irrigation Area (later planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Makoppa 2016-06-10** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 8.07 | a | 1 | 15.64 | 80.55 | 20 | 9.93 | 3 | 407 | 5 |
| **Krokodil** | 7.18 | bcd | 14 | 3.29 | 81.15 | 15 | 9.34 | 18 | 343 | 20 |
| **PAN 3400** | 7.54 | abcd | 4 | 3.20 | 82.00 | 4 | 9.73 | 8 | 392 | 16 |
| **PAN 3471** | 7.73 | ab | 2 | 6.88 | 81.85 | 9 | 9.70 | 11 | 392 | 15 |
| **PAN 3497** | 7.39 | bcd | 7 | 4.37 | 82.00 | 4 | 9.72 | 10 | 406 | 6 |
| **PAN 3515** | 7.31 | bcd | 10 | 2.59 | 81.70 | 12 | 9.37 | 17 | 391 | 17 |
| **PAN 3623** | 7.58 | abc | 3 | 6.84 | 81.05 | 17 | 9.73 | 7 | 404 | 10 |
| **Sabie** | 7.19 | bcd | 13 | 3.44 | 81.90 | 7 | 9.57 | 14 | 400 | 12 |
| **SST 806** | 7.38 | bcd | 8 | 6.77 | 81.85 | 9 | 9.48 | 15 | 410 | 1 |
| **SST 8125** | 7.44 | bcd | 6 | 1.55 | 81.90 | 7 | 9.38 | 16 | 410 | 1 |
| **SST 8135** | 6.45 | f | 19 | 4.12 | 82.55 | 2 | 9.60 | 12 | 410 | 1 |
| **SST 8154** | 7.36 | bcd | 9 | 5.09 | 81.80 | 11 | 9.84 | 5 | 375 | 18 |
| **SST 8155** | 7.21 | bcd | 12 | 2.64 | 80.80 | 18 | 9.85 | 4 | 398 | 13 |
| **SST 835** | 7.21 | bcd | 11 | 2.43 | 82.95 | 1 | 9.59 | 13 | 405 | 9 |
| **SST 843** | 5.70 | g | 20 | 7.02 | 82.00 | 4 | 11.15 | 1 | 410 | 1 |
| **SST 866** | 6.50 | f | 18 | 6.35 | 81.15 | 15 | 9.27 | 19 | 406 | 7 |
| **SST 875** | 6.61 | ef | 17 | 5.34 | 80.75 | 19 | 9.23 | 20 | 402 | 11 |
| **SST 877** | 7.12 | cde | 15 | 4.73 | 82.25 | 3 | 9.72 | 9 | 353 | 19 |
| **SST 884** | 7.01 | def | 16 | 7.93 | 81.50 | 14 | 10.49 | 2 | 406 | 7 |
| **SST 895** | 7.50 | bcd | 5 | 4.19 | 81.70 | 12 | 9.77 | 6 | 394 | 14 |
| **Mean** | **7.17** |  |  |  | **81.67** |  | **9.72** |  | **396** |  |
| **Coefficient of variation (%)** | **5.43** |  |  |  | **0.83** |  | **3.59** |  | **4.30** |  |
| **LSDt(0,05)** | **0.56** |  |  |  | **0.98** |  | **0.50** |  | **24.61** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Highveld Irrigation Area (earlier planting)** | | | | | | | | | | |
| **Average yield (ton/ha) of entries during the full or partial period from 2014- 2016** | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2014-**  **2016** | **2015**  **-2016** |
| **Buffels** |  |  | 6.95 | 23 | 7.51 | 19 |  |  |  |  |
| **Duzi** | 6.67 | 17 | 8.17 | 19 | 8.25 | 10 | 7.70 | 15 | 7.42 | 17 |
| **Koedoes** |  |  | 8.25 | 18 |  |  |  |  |  |  |
| **Krokodil** | 6.85 | 15 | 8.66 | 10 | 8.43 | 5 | 7.98 | 8 | 7.75 | 13 |
| **PAN 3400** | 7.33 | 4 | 8.36 | 16 | 8.19 | 13 | 7.96 | 9 | 7.84 | 10 |
| **PAN 3471** | 7.34 | 3 | 8.48 | 15 | 8.32 | 8 | 8.05 | 5 | 7.91 | 5 |
| **PAN 3489** |  |  |  |  | 8.47 | 3 |  |  |  |  |
| **PAN 3497** | 8.38 | 1 | 9.51 | 1 | 8.25 | 9 | 8.71 | 1 | 8.94 | 1 |
| **PAN 3515** | 7.24 | 6 | 8.50 | 14 | 7.83 | 16 | 7.86 | 11 | 7.87 | 7 |
| **PAN 3623** | 6.94 | 12 | 9.02 | 4 | 8.13 | 14 | 8.03 | 6 | 7.98 | 4 |
| **Renoster** |  |  | 8.76 | 8 |  |  |  |  |  |  |
| **Sabie** | 6.89 | 13 | 8.10 | 21 | 8.10 | 15 | 7.70 | 14 | 7.50 | 15 |
| **SST 806** | 7.17 | 7 | 8.54 | 13 | 8.32 | 7 | 8.01 | 7 | 7.86 | 8 |
| **SST 8125** | 7.31 | 5 | 8.31 | 17 |  |  |  |  | 7.81 | 11 |
| **SST 8134** |  |  | 9.26 | 2 |  |  |  |  |  |  |
| **SST 8135** | 7.10 | 9 | 8.98 | 5 |  |  |  |  | 8.04 | 3 |
| **SST 8154** | 6.83 | 16 |  |  |  |  |  |  |  |  |
| **SST 8155** | 7.15 | 8 |  |  |  |  |  |  |  |  |
| **SST 835** | 7.40 | 2 | 8.82 | 7 | 8.47 | 3 | 8.23 | 2 | 8.11 | 2 |
| **SST 843** | 6.64 | 19 | 8.12 | 20 | 7.73 | 17 | 7.50 | 16 | 7.38 | 18 |
| **SST 866** | 6.43 | 20 | 8.64 | 11 | 8.24 | 12 | 7.77 | 13 | 7.53 | 14 |
| **SST 867** |  |  | 8.88 | 6 | 7.65 | 18 |  |  |  |  |
| **SST 875** | 7.05 | 10 | 8.72 | 9 | 8.76 | 2 | 8.18 | 4 | 7.89 | 6 |
| **SST 877** | 6.99 | 11 | 8.62 | 12 | 8.25 | 10 | 7.95 | 10 | 7.80 | 12 |
| **SST 884** | 6.66 | 18 | 9.03 | 3 | 8.86 | 1 | 8.18 | 3 | 7.85 | 9 |
| **SST 895** | 6.89 | 14 | 8.05 | 22 | 8.38 | 6 | 7.78 | 12 | 7.47 | 16 |
| **Mean** | **7.06** |  | **8.55** |  | **8.22** |  | **7.97** |  | **7.83** |  |
| **LSDt(0,05)** | **0.36** |  | **0.26** |  | **0.24** |  | **0.16** |  | **0.22** |  |
| ***Due to unforeseen circumstances no trials were processed for the Highveld earlier planting dates in 2013*** | | | | | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Highveld Irrigation Area (earlier planting) AMMI Analysis** | | | | | | |
| **Anova of the yield of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 239 | 407.0 | 1.70 |  |  |
| **Treatments** | | 59 | 371.1 | 6.29 | 36.00 | <0,001 |
| **Genotypes** | | 19 | 38.5 | 2.02 | 11.59 | <0,001 |
| **Environments** | | 2 | 292.1 | 146.06 | 216.89 | <0,001 |
| **Block** |  | 9 | 6.1 | 0.67 | 3.85 | <0,001 |
| **Interactions** | | 38 | 40.5 | 1.07 | 6.10 | <0,001 |
| **IPCA** |  | 20 | 28.5 | 1.43 | 8.16 | <0,001 |
| **IPCA** |  | 18 | 12.0 | 0.67 | 3.81 | <0,001 |
| **Residuals** | | 0 | 0.0 |  |  |  |
| **Error** |  | 171 | 29.9 | 0.17 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Duzi | 6.67 | 17 | 0.06312 |  |  |
| 2 | Krokodil | 6.85 | 15 | 0.27560 |  |  |
| 3 | PAN 3400 | 7.33 | 4 | -0.22745 |  |  |
| 4 | PAN 3471 | 7.34 | 3 | 0.20397 |  |  |
| 5 | PAN 3497 | 8.38 | 1 | -0.63728 |  |  |
| 6 | PAN 3515 | 7.24 | 6 | -0.33544 |  |  |
| 7 | PAN 3623 | 6.94 | 12 | 0.47514 |  |  |
| 8 | Sabie | 6.89 | 13 | -0.87475 |  |  |
| 9 | SST 806 | 7.17 | 7 | 0.13357 |  |  |
| 10 | SST 8125 | 7.31 | 5 | 0.50240 |  |  |
| 11 | SST 8135 | 7.10 | 9 | 0.28940 |  |  |
| 12 | SST 8154 | 6.83 | 16 | -0.10695 |  |  |
| 13 | SST 8155 | 7.15 | 8 | -0.15458 |  |  |
| 14 | SST 835 | 7.40 | 2 | -0.00366 |  |  |
| 15 | SST 843 | 6.64 | 19 | -0.48967 |  |  |
| 16 | SST 866 | 6.43 | 20 | 0.20568 |  |  |
| 17 | SST 875 | 7.05 | 10 | 0.34502 |  |  |
| 18 | SST 877 | 6.99 | 11 | -0.11896 |  |  |
| 19 | SST 884 | 6.66 | 18 | 0.42605 |  |  |
| 20 | SST 895 | 6.89 | 14 | 0.02879 |  |  |
| **Mean** |  | **7.06** |  |  |  |  |
| **Coefficient of variation (%)** | | **6.20** |  |  |  |  |
| **LSDt(0,05)** | | **0.36** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Clarens | 6.59 | 2 | -1.17704 |  |  |
| 2 | Villiers | 8.59 | 1 | 1.13244 |  |  |
| 3 | Welkom | 6.01 | 3 | 0.04461 |  |  |
| **Mean** |  | **7.06** |  |  |  |  |
| **Coefficient of variation (%)** | | **6.20** |  |  |  |  |
| **LSDt(0.05)** |  | **0.14** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Highveld Irrigation Area (earlier planting)** | | | | | | | | | | |
| **Average hectolitre mass (kg/hl) of entries during the full or partial period from 2014- 2016** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2014- 2016** | **2015-2016** |
| **Buffels** |  |  | 81.64 | 20 | 80.61 | 19 |  |  |  |  |
| **Duzi** | 81.28 | 12 | 80.88 | 23 | 81.15 | 16 | 81.10 | 16 | 81.08 | 18 |
| **Koedoes** |  |  | 83.47 | 14 |  |  |  |  |  |  |
| **Krokodil** | 80.69 | 16 | 83.19 | 16 | 81.01 | 18 | 81.63 | 12 | 81.94 | 13 |
| **PAN 3400** | 81.44 | 10 | 82.91 | 18 | 81.40 | 13 | 81.92 | 10 | 82.18 | 12 |
| **PAN 3471** | 82.31 | 2 | 84.40 | 5 | 82.54 | 2 | 83.08 | 3 | 83.36 | 4 |
| **PAN 3489** |  |  |  |  | 82.99 | 1 |  |  |  |  |
| **PAN 3497** | 83.33 | 1 | 83.72 | 11 | 82.22 | 6 | 83.09 | 2 | 83.53 | 2 |
| **PAN 3515** | 81.17 | 14 | 83.68 | 12 | 81.67 | 10 | 82.17 | 8 | 82.43 | 10 |
| **PAN 3623** | 80.11 | 18 | 84.50 | 4 | 81.90 | 9 | 82.17 | 9 | 82.31 | 11 |
| **Renoster** |  |  | 81.59 | 21 |  |  |  |  |  |  |
| **Sabie** | 81.78 | 6 | 81.47 | 22 | 81.23 | 15 | 81.49 | 15 | 81.63 | 16 |
| **SST 806** | 82.28 | 3 | 84.79 | 2 | 82.39 | 4 | 83.15 | 1 | 83.54 | 1 |
| **SST 8125** | 81.25 | 13 | 83.92 | 8 |  |  |  |  | 82.59 | 9 |
| **SST 8134** |  |  | 83.05 | 17 |  |  |  |  |  |  |
| **SST 8135** | 82.17 | 4 | 84.51 | 3 |  |  |  |  | 83.34 | 5 |
| **SST 8154** | 81.81 | 5 |  |  |  |  |  |  |  |  |
| **SST 8155** | 80.66 | 17 |  |  |  |  |  |  |  |  |
| **SST 835** | 81.56 | 9 | 84.36 | 6 | 82.06 | 7 | 82.66 | 5 | 82.96 | 6 |
| **SST 843** | 81.75 | 7 | 85.01 | 1 | 82.43 | 3 | 83.06 | 4 | 83.38 | 3 |
| **SST 866** | 81.09 | 15 | 82.41 | 19 | 81.54 | 11 | 81.68 | 11 | 81.75 | 14 |
| **SST 867** |  |  | 83.66 | 13 | 81.13 | 17 |  |  |  |  |
| **SST 875** | 81.62 | 8 | 83.85 | 9 | 82.05 | 8 | 82.51 | 7 | 82.74 | 7 |
| **SST 877** | 79.91 | 19 | 83.28 | 15 | 81.32 | 14 | 81.50 | 14 | 81.60 | 17 |
| **SST 884** | 79.60 | 20 | 83.77 | 10 | 81.48 | 12 | 81.62 | 13 | 81.69 | 15 |
| **SST 895** | 81.40 | 11 | 83.99 | 7 | 82.30 | 5 | 82.56 | 6 | 82.70 | 8 |
| **Mean** | **81.36** |  | **83.39** |  | **81.76** |  | **82.21** |  | **82.48** |  |
| **LSDt(0,05)** | **0.82** |  | **1.39** |  | **0.68** |  | **0.55** |  | **0.84** |  |
| ***Due to unforeseen circumstances no trials were processed for the Highveld earlier planting dates in 2013*** | | | | | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Highveld Irrigation Area (earlier planting) AMMI Analysis** | | | | | | |
| **Anova of the hectolitre mass of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 239 | 535.7 | 2.241 |  |  |
| **Treatments** | | 59 | 352.2 | 5.970 | 6.10 | <0,001 |
| **Genotypes** | | 19 | 176.8 | 9.307 | 9.52 | <0,001 |
| **Environments** | | 2 | 67.7 | 33.827 | 18.75 | <0,001 |
| **Block** |  | 9 | 16.2 | 1.805 | 1.85 | 0.0634 |
| **Interactions** | | 38 | 107.7 | 2.835 | 2.90 | <0,001 |
| **IPCA** |  | 20 | 77.5 | 3.875 | 3.96 | <0,001 |
| **IPCA** |  | 18 | 30.3 | 1.681 | 1.72 | 0.0401 |
| **Residuals** | | 0 | 0.0 |  |  |  |
| **Error** |  | 171 | 167.2 | 0.978 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Duzi | 81.28 | 12 | -0.32932 |  |  |
| 2 | Krokodil | 80.69 | 16 | 0.14596 |  |  |
| 3 | PAN 3400 | 81.44 | 10 | -0.46338 |  |  |
| 4 | PAN 3471 | 82.31 | 2 | -0.20085 |  |  |
| 5 | PAN 3497 | 83.33 | 1 | -0.88530 |  |  |
| 6 | PAN 3515 | 81.17 | 14 | -0.16878 |  |  |
| 7 | PAN 3623 | 80.11 | 18 | 1.00897 |  |  |
| 8 | Sabie | 81.78 | 6 | -0.79144 |  |  |
| 9 | SST 806 | 82.28 | 3 | 0.01955 |  |  |
| 10 | SST 8125 | 81.25 | 13 | 0.07922 |  |  |
| 11 | SST 8135 | 82.17 | 4 | 0.08343 |  |  |
| 12 | SST 8154 | 81.81 | 5 | 0.34044 |  |  |
| 13 | SST 8155 | 80.66 | 17 | -0.11510 |  |  |
| 14 | SST 835 | 81.56 | 9 | 0.22786 |  |  |
| 15 | SST 843 | 81.75 | 7 | 0.40097 |  |  |
| 16 | SST 866 | 81.09 | 15 | 0.02988 |  |  |
| 17 | SST 875 | 81.62 | 8 | -0.32356 |  |  |
| 18 | SST 877 | 79.91 | 19 | -0.25717 |  |  |
| 19 | SST 884 | 79.60 | 20 | 0.99581 |  |  |
| 20 | SST 895 | 81.40 | 11 | 0.20280 |  |  |
| **Mean** |  | **81.36** |  |  |  |  |
| **Coefficient of variation (%)** | | **1.20** |  |  |  |  |
| **LSDt(0,05)** | | **0.82** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Clarens | 80.65 | 3 | -1.60263 |  |  |
| 2 | Villiers | 81.49 | 2 | 1.32514 |  |  |
| 3 | Welkom | 81.93 | 1 | 0.27749 |  |  |
| **Mean** |  | **81.36** |  |  |  |  |
| **Coefficient of variation (%)** | | **1.20** |  |  |  |  |
| **LSDt(0.05)** |  | **0.32** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Highveld Irrigation Area (earlier planting)** | | | | | | | | | | |
| **Average protein content (%) of entries during the full or partial period from 2014- 2016** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2014- 2016** | **2015-2016** |
| **Buffels** |  |  | 11.64 | 7 | 12.44 | 5 |  |  |  |  |
| **Duzi** | 13.49 | 10 | 11.38 | 16 | 12.22 | 9 | 12.36 | 10 | 12.44 | 10 |
| **Koedoes** |  |  | 11.61 | 9 |  |  |  |  |  |  |
| **Krokodil** | 12.56 | 20 | 10.73 | 23 | 11.65 | 19 | 11.65 | 16 | 11.65 | 18 |
| **PAN 3400** | 13.25 | 14 | 11.60 | 10 | 12.27 | 7 | 12.37 | 8 | 12.43 | 11 |
| **PAN 3471** | 13.23 | 15 | 11.25 | 19 | 12.18 | 13 | 12.22 | 11 | 12.24 | 16 |
| **PAN 3489** |  |  |  |  | 11.91 | 18 |  |  |  |  |
| **PAN 3497** | 12.79 | 18 | 11.73 | 6 | 12.10 | 15 | 12.21 | 12 | 12.26 | 14 |
| **PAN 3515** | 13.05 | 17 | 11.30 | 18 | 12.25 | 8 | 12.20 | 13 | 12.18 | 17 |
| **PAN 3623** | 13.95 | 2 | 12.08 | 3 | 12.50 | 2 | 12.84 | 2 | 13.02 | 2 |
| **Renoster** |  |  | 11.56 | 12 |  |  |  |  |  |  |
| **Sabie** | 13.53 | 9 | 11.87 | 4 | 12.18 | 13 | 12.53 | 4 | 12.70 | 4 |
| **SST 806** | 13.56 | 8 | 11.62 | 8 | 12.20 | 11 | 12.46 | 6 | 12.59 | 5 |
| **SST 8125** | 13.42 | 11 | 11.14 | 22 |  |  |  |  | 12.28 | 12 |
| **SST 8134** |  |  | 11.86 | 5 |  |  |  |  |  |  |
| **SST 8135** | 13.36 | 12 | 11.58 | 11 |  |  |  |  | 12.47 | 8 |
| **SST 8154** | 13.92 | 3 |  |  |  |  |  |  |  |  |
| **SST 8155** | 12.72 | 19 |  |  |  |  |  |  |  |  |
| **SST 835** | 13.36 | 12 | 11.18 | 20 | 11.95 | 16 | 12.16 | 14 | 12.27 | 13 |
| **SST 843** | 15.07 | 1 | 13.45 | 1 | 13.27 | 1 | 13.93 | 1 | 14.26 | 1 |
| **SST 866** | 13.72 | 5 | 11.18 | 20 | 12.22 | 9 | 12.37 | 9 | 12.45 | 9 |
| **SST 867** |  |  | 11.45 | 14 | 12.45 | 3 |  |  |  |  |
| **SST 875** | 13.11 | 16 | 11.41 | 15 | 11.92 | 17 | 12.15 | 15 | 12.26 | 14 |
| **SST 877** | 13.79 | 4 | 11.35 | 17 | 12.20 | 11 | 12.45 | 7 | 12.57 | 6 |
| **SST 884** | 13.62 | 6 | 11.52 | 13 | 12.32 | 6 | 12.49 | 5 | 12.57 | 6 |
| **SST 895** | 13.61 | 7 | 12.20 | 2 | 12.45 | 3 | 12.75 | 3 | 12.91 | 3 |
| **Mean** | **13.46** |  | **11.60** |  | **12.25** |  | **12.45** |  | **12.53** |  |
| **LSDt(0,05)** | **0.43** |  | **0.60** |  | **0.43** |  | **0.29** |  | **0.37** |  |
| ***Due to unforeseen circumstances no trials were processed for the Highveld earlier planting dates in 2013*** | | | | | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Highveld Irrigation Area (earlier planting) AMMI Analysis** | | | | | | |
| **Anova of the protein content of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 239 | 244.84 | 1.024 |  |  |
| **Treatments** | | 59 | 193.33 | 3.277 | 12.44 | <0,001 |
| **Genotypes** | | 19 | 66.11 | 3.479 | 13.21 | <0,001 |
| **Environments** | | 2 | 107.14 | 53.568 | 74.55 | <0,001 |
| **Block** |  | 9 | 6.47 | 0.719 | 2.73 | 0.0054 |
| **Interactions** | | 38 | 20.08 | 0.528 | 2.01 | 0.0014 |
| **IPCA** |  | 20 | 15.75 | 0.787 | 2.99 | <0,001 |
| **IPCA** |  | 18 | 4.34 | 0.241 | 0.91 | 0.5619 |
| **Residuals** | | 0 | 0.00 |  |  |  |
| **Error** |  | 171 | 45.05 | 0.263 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Duzi | 13.49 | 10 | -0.13759 |  |  |
| 2 | Krokodil | 12.56 | 20 | 0.09060 |  |  |
| 3 | PAN 3400 | 13.25 | 14 | 0.52636 |  |  |
| 4 | PAN 3471 | 13.23 | 15 | 0.04285 |  |  |
| 5 | PAN 3497 | 12.79 | 18 | 0.72147 |  |  |
| 6 | PAN 3515 | 13.05 | 17 | 0.11170 |  |  |
| 7 | PAN 3623 | 13.95 | 2 | -0.21729 |  |  |
| 8 | Sabie | 13.53 | 9 | 0.44999 |  |  |
| 9 | SST 806 | 13.56 | 8 | -0.14320 |  |  |
| 10 | SST 8125 | 13.42 | 11 | -0.00011 |  |  |
| 11 | SST 8135 | 13.36 | 12 | 0.01725 |  |  |
| 12 | SST 8154 | 13.92 | 3 | -0.08303 |  |  |
| 13 | SST 8155 | 12.72 | 19 | 0.09929 |  |  |
| 14 | SST 835 | 13.36 | 12 | 0.11588 |  |  |
| 15 | SST 843 | 15.07 | 1 | -0.15050 |  |  |
| 16 | SST 866 | 13.72 | 5 | -0.63135 |  |  |
| 17 | SST 875 | 13.11 | 16 | 0.12046 |  |  |
| 18 | SST 877 | 13.79 | 4 | -0.07498 |  |  |
| 19 | SST 884 | 13.62 | 6 | -0.56127 |  |  |
| 20 | SST 895 | 13.61 | 7 | -0.29653 |  |  |
| **Mean** |  | **13.46** |  |  |  |  |
| **Coefficient of variation (%)** | | **4.00** |  |  |  |  |
| **LSDt(0,05)** | | **0.43** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Clarens | 13.60 | 2 | -1.07566 |  |  |
| 2 | Villiers | 12.58 | 3 | 0.89032 |  |  |
| 3 | Welkom | 14.19 | 1 | 0.18534 |  |  |
| **Mean** |  | **13.46** |  |  |  |  |
| **Coefficient of variation (%)** | | **4.00** |  |  |  |  |
| **LSDt(0.05)** |  | **0.17** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Highveld Irrigation Area (earlier planting)** | | | | | | | | | | |
| **Average falling number (s) of entries during the full or partial period from 2014- 2016** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **2016** | **R** | **2015** | **R** | **2014** | **R** | **3 year average** | **R** | **2 year average** | **R** |
| **2014- 2016** | **2015-2016** |
| **Buffels** |  |  | 325 | 12 | 352 | 10 |  |  |  |  |
| **Duzi** | 281 | 18 | 311 | 20 | 334 | 18 | 309 | 14 | 296 | 16 |
| **Koedoes** |  |  | 331 | 6 |  |  |  |  |  |  |
| **Krokodil** | 239 | 19 | 305 | 22 | 329 | 19 | 291 | 16 | 272 | 18 |
| **PAN 3400** | 320 | 7 | 303 | 23 | 354 | 9 | 326 | 9 | 311 | 11 |
| **PAN 3471** | 304 | 12 | 310 | 21 | 356 | 5 | 323 | 12 | 307 | 14 |
| **PAN 3489** |  |  |  |  | 344 | 15 |  |  |  |  |
| **PAN 3497** | 317 | 8 | 325 | 12 | 346 | 12 | 330 | 7 | 321 | 7 |
| **PAN 3515** | 284 | 17 | 316 | 17 | 336 | 17 | 312 | 13 | 300 | 15 |
| **PAN 3623** | 238 | 20 | 325 | 11 | 344 | 14 | 303 | 15 | 282 | 17 |
| **Renoster** |  |  | 313 | 19 |  |  |  |  |  |  |
| **Sabie** | 303 | 14 | 329 | 7 | 343 | 16 | 325 | 10 | 316 | 10 |
| **SST 806** | 340 | 1 | 338 | 2 | 349 | 11 | 343 | 2 | 339 | 1 |
| **SST 8125** | 315 | 10 | 324 | 14 |  |  |  |  | 320 | 8 |
| **SST 8134** |  |  | 316 | 18 |  |  |  |  |  |  |
| **SST 8135** | 299 | 15 | 319 | 15 |  |  |  |  | 309 | 12 |
| **SST 8154** | 311 | 11 |  |  |  |  |  |  |  |  |
| **SST 8155** | 303 | 13 |  |  |  |  |  |  |  |  |
| **SST 835** | 321 | 5 | 337 | 4 | 359 | 3 | 339 | 4 | 329 | 4 |
| **SST 843** | 321 | 6 | 331 | 5 | 355 | 7 | 336 | 6 | 326 | 6 |
| **SST 866** | 328 | 3 | 326 | 10 | 362 | 1 | 339 | 5 | 327 | 5 |
| **SST 867** |  |  | 328 | 8 | 356 | 4 |  |  |  |  |
| **SST 875** | 326 | 4 | 337 | 3 | 355 | 6 | 339 | 3 | 331 | 3 |
| **SST 877** | 317 | 9 | 319 | 16 | 345 | 13 | 327 | 8 | 318 | 9 |
| **SST 884** | 288 | 16 | 327 | 9 | 354 | 8 | 323 | 11 | 308 | 13 |
| **SST 895** | 333 | 2 | 342 | 1 | 360 | 2 | 345 | 1 | 337 | 2 |
| **Mean** | **304** |  | **323** |  | **349** |  | **325** |  | **314** |  |
| **LSDt(0,05)** | **26.73** |  | **16.47** |  | **16.27** |  | **11.41** |  | **15.69** |  |
| ***Due to unforeseen circumstances no trials were processed for the Highveld earlier planting dates in 2013*** | | | | | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Highveld Irrigation Area (earlier planting) AMMI Analysis** | | | | | | |
| **Anova of the falling number of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 239 | 515049 | 2155 |  |  |
| **Treatments** | | 59 | 315960 | 5355 | 5.78 | <0,001 |
| **Genotypes** | | 19 | 171660 | 9035 | 9.75 | <0,001 |
| **Environments** | | 2 | 70428 | 35214 | 7.81 | <0,001 |
| **Block** |  | 9 | 40605 | 4512 | 4.87 | <0,001 |
| **Interactions** | | 38 | 73871 | 1944 | 2.10 | <0,001 |
| **IPCA** |  | 20 | 63561 | 3178 | 3.43 | <0,001 |
| **IPCA** |  | 18 | 10310 | 573 | 0.62 | 0.8824 |
| **Residuals** | | 0 | 0 |  |  |  |
| **Error** |  | 171 | 158484 | 927 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Duzi | 281 | 18 | 1.02033 |  |  |
| 2 | Krokodil | 239 | 19 | 1.48059 |  |  |
| 3 | PAN 3400 | 320 | 7 | -1.96922 |  |  |
| 4 | PAN 3471 | 304 | 12 | 0.53016 |  |  |
| 5 | PAN 3497 | 317 | 8 | -3.36236 |  |  |
| 6 | PAN 3515 | 284 | 17 | -0.81632 |  |  |
| 7 | PAN 3623 | 238 | 20 | 4.19090 |  |  |
| 8 | Sabie | 303 | 14 | -3.21544 |  |  |
| 9 | SST 806 | 340 | 1 | -1.88627 |  |  |
| 10 | SST 8125 | 315 | 10 | -1.97719 |  |  |
| 11 | SST 8135 | 299 | 15 | 0.90015 |  |  |
| 12 | SST 8154 | 311 | 11 | 2.15556 |  |  |
| 13 | SST 8155 | 303 | 13 | 0.29097 |  |  |
| 14 | SST 835 | 321 | 5 | -3.71499 |  |  |
| 15 | SST 843 | 321 | 6 | 2.85045 |  |  |
| 16 | SST 866 | 328 | 3 | 0.56804 |  |  |
| 17 | SST 875 | 326 | 4 | -2.08894 |  |  |
| 18 | SST 877 | 317 | 9 | -0.90031 |  |  |
| 19 | SST 884 | 288 | 16 | 6.18856 |  |  |
| 20 | SST 895 | 333 | 2 | -0.24466 |  |  |
| **Mean** |  | **304** |  |  |  |  |
| **Coefficient of variation (%)** | | **10.90** |  |  |  |  |
| **LSDt(0,05)** | | **26.73** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Clarens | 328 | 1 | -9.08274 |  |  |
| 2 | Villiers | 295 | 2 | 5.61663 |  |  |
| 3 | Welkom | 289 | 3 | 3.46611 |  |  |
| **Mean** |  | **304** |  |  |  |  |
| **Coefficient of variation (%)** | | **10.90** |  |  |  |  |
| **LSDt(0.05)** |  | **10.35** |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Highveld Irrigation Area (earlier planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Clarens\_2016-06-10** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 5.88 | ijk | 18 | 4.87 | 81.05 | 8 | 13.68 | 9 | 294 | 17 |
| **Krokodil** | 5.99 | hij | 17 | 9.47 | 79.55 | 17 | 12.60 | 19 | 249 | 19 |
| **PAN 3400** | 7.11 | bc | 3 | 9.43 | 81.22 | 7 | 12.87 | 17 | 363 | 5 |
| **PAN 3471** | 6.63 | defg | 9 | 5.21 | 82.02 | 3 | 13.36 | 13 | 322 | 12 |
| **PAN 3497** | 8.77 | a | 1 | 4.21 | 84.17 | 1 | 12.13 | 20 | 372 | 3 |
| **PAN 3515** | 7.10 | bcd | 4 | 6.77 | 80.52 | 13 | 13.22 | 14 | 314 | 15 |
| **PAN 3623** | 6.01 | hij | 16 | 9.38 | 77.55 | 19 | 14.24 | 4 | 222 | 20 |
| **Sabie** | 7.16 | b | 2 | 7.69 | 82.20 | 2 | 13.15 | 16 | 357 | 7 |
| **SST 806** | 6.59 | efg | 10 | 8.71 | 81.55 | 4 | 13.90 | 8 | 382 | 1 |
| **SST 8125** | 6.40 | fgh | 13 | 10.43 | 80.65 | 9 | 13.63 | 10 | 356 | 8 |
| **SST 8135** | 6.19 | ghi | 14 | 7.34 | 81.45 | 6 | 13.41 | 11 | 314 | 16 |
| **SST 8154** | 6.53 | efg | 11 | 6.45 | 80.42 | 14 | 14.09 | 5 | 316 | 14 |
| **SST 8155** | 7.08 | bcd | 5 | 6.55 | 80.42 | 14 | 12.73 | 18 | 325 | 11 |
| **SST 835** | 7.07 | bcd | 6 | 7.37 | 80.55 | 11 | 13.37 | 12 | 377 | 2 |
| **SST 843** | 7.00 | bcde | 7 | 3.99 | 80.55 | 11 | 15.22 | 1 | 321 | 13 |
| **SST 866** | 5.44 | k | 20 | 6.44 | 80.37 | 16 | 14.59 | 2 | 347 | 10 |
| **SST 875** | 6.17 | ghi | 15 | 8.94 | 81.55 | 4 | 13.18 | 15 | 371 | 4 |
| **SST 877** | 6.66 | cdef | 8 | 7.10 | 79.32 | 18 | 14.04 | 7 | 351 | 9 |
| **SST 884** | 5.54 | jk | 19 | 7.42 | 77.30 | 20 | 14.41 | 3 | 258 | 18 |
| **SST 895** | 6.44 | fgh | 12 | 9.52 | 80.65 | 9 | 14.08 | 6 | 359 | 6 |
| **Mean** | **6.59** |  |  |  | **80.65** |  | **13.60** |  | **328** |  |
| **Coefficient of variation (%)** | **4.96** |  |  |  | **1.24** |  | **5.30** |  | **12.27** |  |
| **LSDt(0,05)** | **0.47** |  |  |  | **1.45** |  | **1.04** |  | **58.26** |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Highveld Irrigation Area (earlier planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Villiers\_2016-06-20** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 7.99 | fg | 17 | 8.88 | 80.87 | 15 | 12.32 | 18 | 269 | 17 |
| **Krokodil** | 8.62 | bcdefg | 10 | 4.26 | 80.65 | 17 | 11.77 | 20 | 233 | 20 |
| **PAN 3400** | 8.58 | bcdefg | 11 | 5.04 | 80.50 | 19 | 12.92 | 3 | 305 | 9 |
| **PAN 3471** | 9.10 | abc | 4 | 9.08 | 82.35 | 5 | 12.46 | 13 | 294 | 11 |
| **PAN 3497** | 9.31 | ab | 2 | 5.14 | 82.52 | 3 | 12.51 | 11 | 288 | 12 |
| **PAN 3515** | 8.32 | defg | 15 | 3.15 | 80.70 | 16 | 12.54 | 10 | 265 | 18 |
| **PAN 3623** | 9.12 | abc | 3 | 2.61 | 81.15 | 12 | 12.74 | 6 | 239 | 19 |
| **Sabie** | 7.11 | h | 20 | 12.92 | 80.60 | 18 | 12.99 | 2 | 281 | 16 |
| **SST 806** | 8.91 | abcde | 7 | 6.05 | 82.45 | 4 | 12.63 | 8 | 328 | 2 |
| **SST 8125** | 9.59 | a | 1 | 1.89 | 81.90 | 9 | 12.66 | 7 | 286 | 14 |
| **SST 8135** | 8.84 | abcde | 8 | 3.77 | 82.62 | 2 | 12.36 | 15 | 288 | 13 |
| **SST 8154** | 8.30 | efg | 16 | 3.64 | 82.15 | 7 | 12.87 | 5 | 318 | 6 |
| **SST 8155** | 8.75 | bcdef | 9 | 2.71 | 81.15 | 12 | 11.89 | 19 | 299 | 10 |
| **SST 835** | 9.08 | abcd | 5 | 3.02 | 82.10 | 8 | 12.58 | 9 | 283 | 15 |
| **SST 843** | 7.90 | g | 18 | 9.54 | 82.67 | 1 | 13.78 | 1 | 338 | 1 |
| **SST 866** | 7.88 | gh | 19 | 8.65 | 81.32 | 11 | 12.36 | 15 | 325 | 3 |
| **SST 875** | 8.97 | abcde | 6 | 3.84 | 81.52 | 10 | 12.44 | 14 | 315 | 7 |
| **SST 877** | 8.39 | cdefg | 14 | 6.54 | 79.17 | 20 | 12.90 | 4 | 313 | 8 |
| **SST 884** | 8.50 | cdefg | 13 | 3.02 | 81.05 | 14 | 12.33 | 17 | 324 | 4 |
| **SST 895** | 8.52 | cdefg | 12 | 2.13 | 82.30 | 6 | 12.48 | 12 | 322 | 5 |
| **Mean** | **8.59** |  |  |  | **81.49** |  | **12.58** |  | **295** |  |
| **Coefficient of variation (%)** | **6.25** |  |  |  | **0.81** |  | **2.51** |  | **8.61** |  |
| **LSDt(0,05)** | **0.78** |  |  |  | **0.96** |  | **0.46** |  | **36.78** |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Highveld Irrigation Area (earlier planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Welkom AJ\_2016-06-30** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 6.13 | bcde | 7 | 6.45 | 81.92 | 11 | 14.45 | 4 | 279 | 16 |
| **Krokodil** | 5.92 | efgh | 14 | 2.43 | 81.87 | 12 | 13.30 | 20 | 236 | 20 |
| **PAN 3400** | 6.28 | bcd | 5 | 5.16 | 82.60 | 4 | 13.96 | 14 | 293 | 10 |
| **PAN 3471** | 6.30 | bc | 4 | 5.22 | 82.55 | 5 | 13.87 | 15 | 296 | 9 |
| **PAN 3497** | 7.08 | a | 1 | 2.71 | 83.27 | 1 | 13.72 | 16 | 292 | 12 |
| **PAN 3515** | 6.31 | bc | 3 | 4.66 | 82.27 | 8 | 13.39 | 19 | 272 | 17 |
| **PAN 3623** | 5.69 | fgh | 17 | 2.49 | 81.62 | 14 | 14.85 | 2 | 254 | 19 |
| **Sabie** | 6.41 | b | 2 | 5.30 | 82.55 | 5 | 14.45 | 4 | 271 | 18 |
| **SST 806** | 6.01 | cdef | 10 | 6.62 | 82.82 | 3 | 14.15 | 10 | 310 | 3 |
| **SST 8125** | 5.94 | efgh | 12 | 4.98 | 81.20 | 18 | 13.98 | 13 | 305 | 4 |
| **SST 8135** | 6.28 | bcd | 5 | 4.02 | 82.42 | 7 | 14.33 | 7 | 296 | 8 |
| **SST 8154** | 5.65 | gh | 18 | 4.86 | 82.85 | 2 | 14.78 | 3 | 300 | 7 |
| **SST 8155** | 5.63 | h | 19 | 9.59 | 80.40 | 20 | 13.55 | 18 | 286 | 14 |
| **SST 835** | 6.07 | cde | 8 | 7.46 | 82.02 | 9 | 14.14 | 11 | 303 | 6 |
| **SST 843** | 5.02 | i | 20 | 5.53 | 82.02 | 9 | 16.21 | 1 | 304 | 5 |
| **SST 866** | 5.96 | defg | 11 | 6.02 | 81.57 | 15 | 14.22 | 9 | 312 | 2 |
| **SST 875** | 6.02 | cdef | 9 | 4.17 | 81.80 | 13 | 13.71 | 17 | 293 | 11 |
| **SST 877** | 5.92 | efgh | 15 | 7.57 | 81.22 | 17 | 14.44 | 6 | 286 | 13 |
| **SST 884** | 5.93 | efgh | 13 | 4.00 | 80.45 | 19 | 14.10 | 12 | 284 | 15 |
| **SST 895** | 5.72 | fgh | 16 | 6.27 | 81.25 | 16 | 14.28 | 8 | 319 | 1 |
| **Mean** | **6.01** |  |  |  | **81.93** |  | **14.19** |  | **289** |  |
| **Coefficient of variation (%)** | **3.82** |  |  |  | **0.80** |  | **2.13** |  | **5.47** |  |
| **LSDt(0,05)** | **0.33** |  |  |  | **0.94** |  | **0.44** |  | **22.87** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Highveld Irrigation Area (later planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 5.62 | 22 | 8.16 | 8 | 7.29 | 10 |  |  |  |  |  |  |
| **Duzi** | 7.41 | 16 | 5.41 | 23 | 8.00 | 12 | 7.03 | 14 | 6.96 | 12 | 6.94 | 15 | 6.41 | 18 |
| **Koedoes** |  |  | 6.53 | 8 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 8.57 | 2 | 6.61 | 5 | 8.52 | 3 | 6.71 | 17 | 7.60 | 3 | 7.90 | 2 | 7.59 | 3 |
| **PAN 3400** | 7.79 | 14 | 6.58 | 6 | 8.17 | 7 | 7.37 | 8 | 7.48 | 5 | 7.51 | 5 | 7.19 | 7 |
| **PAN 3471** | 8.04 | 7 | 6.05 | 16 | 7.89 | 15 | 7.82 | 2 | 7.45 | 6 | 7.33 | 9 | 7.04 | 9 |
| **PAN 3478** |  |  |  |  |  |  | 7.83 | 1 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 8.20 | 6 | 7.78 | 3 |  |  |  |  |  |  |
| **PAN 3497** | 7.54 | 15 | 6.04 | 17 | 8.75 | 2 | 7.68 | 6 | 7.50 | 4 | 7.45 | 7 | 6.79 | 14 |
| **PAN 3515** | 7.81 | 12 | 6.06 | 14 | 7.46 | 18 |  |  |  |  | 7.11 | 12 | 6.93 | 12 |
| **PAN 3623** | 9.38 | 1 | 6.93 | 2 | 7.89 | 15 |  |  |  |  | 8.07 | 1 | 8.15 | 1 |
| **Renoster** |  |  | 6.49 | 10 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 7.85 | 11 | 6.01 | 19 | 8.39 | 5 | 7.53 | 7 | 7.45 | 7 | 7.35 | 8 | 6.93 | 13 |
| **SST 806** | 8.08 | 5 | 6.70 | 3 | 8.04 | 10 | 6.84 | 15 | 7.41 | 8 | 7.25 | 10 | 7.39 | 4 |
| **SST 8125** | 8.04 | 6 | 6.02 | 18 |  |  |  |  |  |  |  |  | 7.03 | 10 |
| **SST 8134** |  |  | 6.54 | 7 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 7.90 | 10 | 6.61 | 3 |  |  |  |  |  |  |  |  | 7.25 | 5 |
| **SST 8154** | 7.79 | 13 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 6.73 | 20 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 4.43 | 24 |  |  |  |  |  |  |
| **SST 835** | 8.22 | 4 | 6.51 | 9 | 8.94 | 1 | 7.71 | 5 | 7.85 | 1 | 7.89 | 3 | 7.37 | 5 |
| **SST 843** | 7.06 | 19 | 6.39 | 12 | 7.23 | 19 | 4.52 | 23 | 6.30 | 14 | 6.89 | 16 | 6.72 | 15 |
| **SST 866** | 7.33 | 17 | 6.06 | 15 | 7.92 | 13 | 6.55 | 21 | 6.96 | 11 | 7.10 | 13 | 6.69 | 16 |
| **SST 867** |  |  | 6.33 | 13 | 8.46 | 4 | 7.23 | 12 |  |  |  |  |  |  |
| **SST 875** | 7.93 | 9 | 6.01 | 20 | 7.55 | 17 | 7.08 | 13 | 7.14 | 10 | 7.16 | 11 | 6.97 | 11 |
| **SST 876** |  |  |  |  |  |  | 6.63 | 18 |  |  |  |  |  |  |
| **SST 877** | 7.21 | 18 | 5.81 | 21 | 8.13 | 9 | 6.56 | 20 | 6.93 | 13 | 7.05 | 14 | 6.51 | 17 |
| **SST 884** | 7.94 | 8 | 6.39 | 11 | 8.02 | 11 | 6.40 | 22 | 7.19 | 9 | 7.45 | 6 | 7.16 | 8 |
| **SST 895** | 8.32 | 3 | 6.95 | 1 | 7.91 | 14 | 7.35 | 9 | 7.63 | 2 | 7.72 | 4 | 7.63 | 2 |
| **SST 896** |  |  |  |  |  |  | 6.63 | 19 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 7.77 | 4 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 6.80 | 16 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 7.27 | 11 |  |  |  |  |  |  |
| **Mean** | **7.85** |  | **6.29** |  | **8.09** |  | **6.95** |  | **7.27** |  | **7.38** |  | **7.10** |  |
| **LSDt(0,05)** | **0.45** |  | **0.21** |  | **0.29** |  | **0.96** |  | **0.21** |  | **0.18** |  | **0.22** |  |
| ***\*Only Daniëlsrus data*** | | | |  |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Highveld Irrigation Area (later planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 80.28 | 22 | 79.15 | 16 | 79.40 | 12 |  |  |  |  |  |  |
| **Duzi** | 78.48 | 12 | 80.47 | 19 | 78.91 | 17 | 78.23 | 20 | 79.02 | 11 | 79.29 | 13 | 79.47 | 15 |
| **Koedoes** |  |  | 81.93 | 8 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 78.16 | 14 | 81.63 | 12 | 78.59 | 18 | 79.00 | 17 | 79.35 | 10 | 79.46 | 12 | 79.90 | 12 |
| **PAN 3400** | 77.53 | 17 | 82.03 | 7 | 79.36 | 14 | 79.38 | 13 | 79.57 | 9 | 79.64 | 10 | 79.78 | 13 |
| **PAN 3471** | 80.15 | 2 | 82.49 | 4 | 80.55 | 4 | 80.08 | 6 | 80.82 | 1 | 81.06 | 2 | 81.32 | 2 |
| **PAN 3478** |  |  |  |  |  |  | 80.73 | 2 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 81.28 | 1 | 81.90 | 1 |  |  |  |  |  |  |
| **PAN 3497** | 79.51 | 6 | 81.39 | 14 | 81.00 | 2 | 80.48 | 3 | 80.59 | 3 | 80.63 | 5 | 80.45 | 7 |
| **PAN 3515** | 78.34 | 13 | 80.83 | 16 | 79.61 | 10 |  |  |  |  | 79.59 | 11 | 79.58 | 14 |
| **PAN 3623** | 79.64 | 4 | 82.86 | 2 | 79.23 | 15 |  |  |  |  | 80.58 | 6 | 81.25 | 4 |
| **Renoster** |  |  | 80.37 | 21 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 77.20 | 19 | 78.28 | 23 | 79.60 | 11 | 78.80 | 18 | 78.47 | 13 | 78.79 | 16 | 77.74 | 18 |
| **SST 806** | 79.81 | 3 | 82.77 | 3 | 80.29 | 6 | 79.85 | 9 | 80.68 | 2 | 80.90 | 3 | 81.29 | 3 |
| **SST 8125** | 78.83 | 9 | 81.34 | 15 |  |  |  |  |  |  |  |  | 80.08 | 10 |
| **SST 8134** |  |  | 80.56 | 18 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 78.55 | 11 | 81.79 | 6 |  |  |  |  |  |  |  |  | 80.17 | 7 |
| **SST 8154** | 78.81 | 10 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 77.30 | 18 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 76.50 | 24 |  |  |  |  |  |  |
| **SST 835** | 79.54 | 5 | 82.14 | 6 | 80.51 | 5 | 79.93 | 8 | 80.53 | 4 | 80.73 | 4 | 80.84 | 6 |
| **SST 843** | 80.30 | 1 | 83.06 | 1 | 80.69 | 3 | 78.05 | 21 | 80.53 | 5 | 81.35 | 1 | 81.68 | 1 |
| **SST 866** | 77.94 | 15 | 81.89 | 9 | 79.90 | 7 | 79.63 | 10 | 79.84 | 8 | 79.91 | 9 | 79.91 | 11 |
| **SST 867** |  |  | 81.63 | 12 | 79.81 | 8 | 80.30 | 5 |  |  |  |  |  |  |
| **SST 875** | 79.06 | 8 | 81.71 | 11 | 79.60 | 11 | 79.05 | 16 | 79.86 | 7 | 80.12 | 8 | 80.39 | 8 |
| **SST 876** |  |  |  |  |  |  | 79.60 | 11 |  |  |  |  |  |  |
| **SST 877** | 76.44 | 20 | 80.42 | 20 | 79.65 | 9 | 79.10 | 15 | 78.90 | 12 | 78.84 | 15 | 78.43 | 17 |
| **SST 884** | 77.70 | 16 | 80.83 | 16 | 78.26 | 19 | 77.00 | 23 | 78.45 | 14 | 78.93 | 14 | 79.27 | 16 |
| **SST 895** | 79.35 | 7 | 82.37 | 5 | 79.48 | 13 | 79.18 | 14 | 80.09 | 6 | 80.40 | 7 | 80.86 | 5 |
| **SST 896** |  |  |  |  |  |  | 77.65 | 22 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 80.43 | 4 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 79.98 | 7 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 78.80 | 18 |  |  |  |  |  |  |
| **Mean** | **78.63** |  | **81.44** |  | **79.76** |  | **79.29** |  | **79.76** |  | **80.01** |  | **80.13** |  |
| **LSDt(0,05)** | **0.86** |  | **1.22** |  | **0.66** |  | **1.05** |  | **0.57** |  | **0.62** |  | **0.82** |  |
| ***\*Only Daniëlsrus data*** | | | |  |  |  |  |  |  |  |  |  |  |  |

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| **Highveld Irrigation Area (later planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 13.68 | 10 | 10.48 | 6 | 12.98 | 10 |  |  |  |  |  |  |
| **Duzi** | 12.62 | 5 | 13.87 | 6 | 10.31 | 8 | 13.38 | 5 | 12.55 | 3 | 12.27 | 7 | 13.24 | 6 |
| **Koedoes** |  |  | 13.97 | 4 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 11.39 | 20 | 12.79 | 22 | 9.66 | 19 | 11.29 | 24 | 11.28 | 14 | 11.28 | 16 | 12.09 | 18 |
| **PAN 3400** | 12.59 | 7 | 13.37 | 16 | 10.49 | 5 | 12.72 | 17 | 12.29 | 7 | 12.15 | 9 | 12.98 | 9 |
| **PAN 3471** | 12.35 | 11 | 13.35 | 17 | 10.31 | 8 | 12.54 | 21 | 12.14 | 11 | 12.00 | 10 | 12.85 | 12 |
| **PAN 3478** |  |  |  |  |  |  | 12.60 | 18 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 9.98 | 14 | 12.58 | 20 |  |  |  |  |  |  |
| **PAN 3497** | 12.59 | 6 | 13.46 | 14 | 9.80 | 18 | 12.86 | 12 | 12.18 | 9 | 11.95 | 12 | 13.03 | 8 |
| **PAN 3515** | 11.88 | 18 | 12.67 | 23 | 9.86 | 17 |  |  |  |  | 11.47 | 15 | 12.28 | 17 |
| **PAN 3623** | 13.06 | 2 | 13.77 | 9 | 10.56 | 4 |  |  |  |  | 12.46 | 3 | 13.42 | 2 |
| **Renoster** |  |  | 13.48 | 13 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 12.58 | 8 | 14.21 | 2 | 10.31 | 8 | 12.60 | 18 | 12.43 | 6 | 12.39 | 5 | 13.40 | 3 |
| **SST 806** | 12.42 | 10 | 13.32 | 18 | 10.77 | 2 | 13.80 | 4 | 12.58 | 2 | 12.62 | 2 | 12.87 | 11 |
| **SST 8125** | 12.07 | 17 | 13.23 | 20 |  |  |  |  |  |  |  |  | 12.65 | 15 |
| **SST 8134** |  |  | 13.65 | 11 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 12.16 | 16 | 13.39 | 9 |  |  |  |  |  |  |  |  | 12.78 | 10 |
| **SST 8154** | 12.17 | 15 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 12.69 | 4 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 14.63 | 2 |  |  |  |  |  |  |
| **SST 835** | 12.27 | 14 | 13.27 | 19 | 10.17 | 12 | 12.25 | 23 | 11.99 | 12 | 11.90 | 13 | 12.77 | 14 |
| **SST 843** | 13.45 | 1 | 14.97 | 1 | 11.78 | 1 | 16.19 | 1 | 14.10 | 1 | 13.40 | 1 | 14.21 | 1 |
| **SST 866** | 12.34 | 12 | 13.54 | 12 | 9.98 | 14 | 12.82 | 14 | 12.17 | 10 | 11.95 | 11 | 12.94 | 10 |
| **SST 867** |  |  | 13.91 | 5 | 10.02 | 13 | 12.84 | 13 |  |  |  |  |  |  |
| **SST 875** | 11.70 | 19 | 13.19 | 21 | 9.91 | 16 | 12.99 | 9 | 11.95 | 13 | 11.60 | 14 | 12.45 | 16 |
| **SST 876** |  |  |  |  |  |  | 13.94 | 3 |  |  |  |  |  |  |
| **SST 877** | 12.75 | 3 | 13.79 | 8 | 10.67 | 3 | 12.73 | 15 | 12.49 | 4 | 12.40 | 4 | 13.27 | 5 |
| **SST 884** | 12.28 | 13 | 13.83 | 7 | 10.45 | 7 | 12.50 | 22 | 12.26 | 8 | 12.19 | 8 | 13.05 | 7 |
| **SST 895** | 12.55 | 9 | 14.00 | 3 | 10.26 | 11 | 13.13 | 8 | 12.48 | 5 | 12.27 | 6 | 13.28 | 4 |
| **SST 896** |  |  |  |  |  |  | 13.19 | 6 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 12.73 | 16 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 13.15 | 7 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 12.93 | 11 |  |  |  |  |  |  |
| **Mean** | **12.40** |  | **13.60** |  | **10.30** |  | **13.06** |  | **12.35** |  | **12.14** |  | **12.97** |  |
| **LSDt(0,05)** | **0.40** |  | **0.49** |  | **0.56** |  | **1.29** |  | **0.28** |  | **0.29** |  | **0.33** |  |
| ***\*Only Daniëlsrus data*** | | | |  |  |  |  |  |  |  |  |  |  |  |

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| **Highveld Irrigation Area (later planting)** | | | | | | | | | | | | | | |
| **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** |
| **Buffels** |  |  | 299 | 20 | 302 | 16 | 259 | 20 |  |  |  |  |  |  |
| **Duzi** | 319 | 9 | 303 | 17 | 308 | 13 | 303 | 8 | 308 | 9 | 310 | 11 | 311 | 12 |
| **Koedoes** |  |  | 309 | 11 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 284 | 19 | 291 | 23 | 281 | 19 | 210 | 24 | 266 | 14 | 285 | 16 | 287 | 18 |
| **PAN 3400** | 324 | 8 | 314 | 4 | 323 | 7 | 302 | 9 | 316 | 4 | 320 | 6 | 319 | 6 |
| **PAN 3471** | 319 | 10 | 313 | 9 | 299 | 17 | 269 | 17 | 300 | 12 | 310 | 10 | 316 | 8 |
| **PAN 3478** |  |  |  |  |  |  | 274 | 15 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 296 | 18 | 232 | 23 |  |  |  |  |  |  |
| **PAN 3497** | 317 | 12 | 305 | 16 | 326 | 5 | 284 | 13 | 308 | 10 | 316 | 8 | 311 | 11 |
| **PAN 3515** | 296 | 18 | 297 | 21 | 319 | 11 |  |  |  |  | 304 | 15 | 297 | 16 |
| **PAN 3623** | 303 | 17 | 313 | 6 | 302 | 15 |  |  |  |  | 306 | 13 | 308 | 14 |
| **Renoster** |  |  | 299 | 19 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 317 | 12 | 301 | 18 | 305 | 14 | 330 | 2 | 313 | 6 | 312 | 9 | 309 | 13 |
| **SST 806** | 332 | 4 | 323 | 1 | 324 | 6 | 260 | 19 | 310 | 7 | 304 | 14 | 327 | 1 |
| **SST 8125** | 325 | 6 | 317 | 2 |  |  |  |  |  |  |  |  | 321 | 5 |
| **SST 8134** |  |  | 310 | 10 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 282 | 20 | 305 | 8 |  |  |  |  |  |  |  |  | 293 | 13 |
| **SST 8154** | 315 | 14 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 305 | 16 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 237 | 22 |  |  |  |  |  |  |
| **SST 835** | 334 | 2 | 314 | 3 | 322 | 9 | 319 | 3 | 322 | 1 | 323 | 3 | 324 | 3 |
| **SST 843** | 318 | 11 | 313 | 7 | 323 | 8 | 279 | 14 | 308 | 8 | 318 | 7 | 316 | 8 |
| **SST 866** | 326 | 5 | 309 | 12 | 341 | 1 | 310 | 6 | 321 | 3 | 325 | 2 | 317 | 7 |
| **SST 867** |  |  | 305 | 13 | 332 | 4 | 316 | 5 |  |  |  |  |  |  |
| **SST 875** | 332 | 3 | 314 | 5 | 336 | 3 | 304 | 7 | 321 | 2 | 327 | 1 | 323 | 4 |
| **SST 876** |  |  |  |  |  |  | 273 | 16 |  |  |  |  |  |  |
| **SST 877** | 312 | 15 | 296 | 22 | 316 | 12 | 261 | 18 | 296 | 13 | 308 | 12 | 304 | 15 |
| **SST 884** | 324 | 7 | 305 | 14 | 339 | 2 | 242 | 21 | 303 | 11 | 323 | 5 | 314 | 10 |
| **SST 895** | 336 | 1 | 313 | 8 | 320 | 10 | 288 | 12 | 314 | 5 | 323 | 4 | 324 | 2 |
| **SST 896** |  |  |  |  |  |  | 288 | 11 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 296 | 10 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 346 | 1 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 317 | 4 |  |  |  |  |  |  |
| **Mean** | **316** |  | **307** |  | **317** |  | **283** |  | **308** |  | **313** |  | **312** |  |
| **LSDt(0,05)** | **30.54** |  | **8.32** |  | **26.10** |  | **71.11** |  | **14.26** |  | **11.84** |  | **12.99** |  |
| ***\*Only Daniëlsrus data*** | | | |  |  |  |  |  |  |  |  |  |  |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Highveld Irrigation Area (later planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Harrismith TF\_2016-07-12** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 7.09 | fgh | 13 | 6.12 | 77.45 | 11 | 12.22 | 11 | 323 | 19 |
| **Krokodil** | 6.87 | ghi | 14 | 5.81 | 76.53 | 16 | 11.28 | 20 | 302 | 20 |
| **PAN 3400** | 6.35 | k | 18 | 3.12 | 75.15 | 19 | 12.51 | 5 | 368 | 10 |
| **PAN 3471** | 6.72 | ij | 16 | 2.71 | 79.10 | 3 | 12.28 | 10 | 356 | 13 |
| **PAN 3497** | 5.39 | m | 20 | 4.87 | 77.53 | 9 | 11.92 | 17 | 373 | 8 |
| **PAN 3515** | 7.20 | efg | 10 | 1.22 | 77.23 | 12 | 11.73 | 19 | 342 | 16 |
| **PAN 3623** | 7.79 | bc | 4 | 0.79 | 78.83 | 5 | 12.77 | 2 | 343 | 14 |
| **Sabie** | 5.80 | l | 19 | 8.83 | 75.90 | 18 | 12.75 | 3 | 357 | 12 |
| **SST 806** | 7.60 | bcd | 5 | 2.00 | 79.28 | 2 | 12.45 | 8 | 391 | 1 |
| **SST 8125** | 7.95 | b | 2 | 1.23 | 78.05 | 8 | 12.13 | 12 | 385 | 3 |
| **SST 8135** | 7.12 | fgh | 11 | 2.79 | 77.05 | 13 | 12.47 | 7 | 329 | 18 |
| **SST 8154** | 7.23 | efg | 9 | 4.79 | 77.48 | 10 | 12.11 | 13 | 366 | 11 |
| **SST 8155** | 6.38 | jk | 17 | 2.48 | 76.40 | 17 | 12.36 | 9 | 342 | 15 |
| **SST 835** | 7.31 | def | 7 | 5.77 | 78.83 | 5 | 12.48 | 6 | 373 | 7 |
| **SST 843** | 7.26 | def | 8 | 1.31 | 80.45 | 1 | 13.71 | 1 | 384 | 4 |
| **SST 866** | 7.11 | fgh | 12 | 3.11 | 76.63 | 15 | 12.11 | 13 | 389 | 2 |
| **SST 875** | 7.55 | cde | 6 | 5.03 | 78.73 | 7 | 11.88 | 18 | 370 | 9 |
| **SST 877** | 6.79 | hi | 15 | 5.01 | 74.27 | 20 | 12.74 | 4 | 338 | 17 |
| **SST 884** | 7.91 | bc | 3 | 3.18 | 76.75 | 14 | 12.01 | 16 | 376 | 6 |
| **SST 895** | 8.52 | a | 1 | 5.07 | 79.05 | 4 | 12.08 | 15 | 383 | 5 |
| **Mean** | **7.10** |  |  |  | **77.53** |  | **12.30** |  | **360** |  |
| **Coefficient of variation (%)** | **3.58** |  |  |  | **0.80** |  | **1.90** |  | **5.43** |  |
| **LSDt(0,05)** | **0.37** |  |  |  | **0.90** |  | **0.34** |  | **28.22** |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **Highveld Irrigation Area (later planting)** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Potchefstroom\_2016-07-13** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 7.72 | ij | 16 | 5.85 | 79.50 | 13 | 13.02 | 4 | 314 | 1 |
| **Krokodil** | 10.27 | b | 2 | 4.78 | 79.80 | 10 | 11.51 | 20 | 265 | 12 |
| **PAN 3400** | 9.23 | de | 6 | 11.86 | 79.90 | 9 | 12.67 | 8 | 280 | 7 |
| **PAN 3471** | 9.35 | cd | 5 | 4.46 | 81.20 | 2 | 12.41 | 12 | 281 | 6 |
| **PAN 3497** | 9.70 | bcd | 4 | 6.75 | 81.50 | 1 | 13.27 | 2 | 262 | 17 |
| **PAN 3515** | 8.42 | gh | 10 | 6.22 | 79.45 | 14 | 12.04 | 16 | 250 | 19 |
| **PAN 3623** | 10.97 | a | 1 | 1.42 | 80.45 | 3 | 13.35 | 1 | 263 | 15 |
| **Sabie** | 9.89 | bc | 3 | 6.82 | 78.50 | 19 | 12.42 | 11 | 278 | 8 |
| **SST 806** | 8.56 | fgh | 9 | 7.74 | 80.35 | 4 | 12.39 | 13 | 272 | 9 |
| **SST 8125** | 8.14 | ghij | 13 | 6.08 | 79.60 | 12 | 12.02 | 17 | 264 | 14 |
| **SST 8135** | 8.67 | efg | 8 | 3.20 | 80.05 | 8 | 11.85 | 18 | 236 | 20 |
| **SST 8154** | 8.36 | gh | 11 | 8.93 | 80.15 | 6 | 12.23 | 14 | 264 | 13 |
| **SST 8155** | 7.09 | kl | 19 | 7.13 | 78.20 | 20 | 13.02 | 4 | 269 | 11 |
| **SST 835** | 9.13 | def | 7 | 4.63 | 80.25 | 5 | 12.07 | 15 | 294 | 3 |
| **SST 843** | 6.86 | l | 20 | 5.15 | 80.15 | 6 | 13.18 | 3 | 252 | 18 |
| **SST 866** | 7.54 | jk | 18 | 7.51 | 79.25 | 16 | 12.56 | 9 | 263 | 16 |
| **SST 875** | 8.31 | ghi | 12 | 6.17 | 79.40 | 15 | 11.53 | 19 | 294 | 2 |
| **SST 877** | 7.64 | jk | 17 | 8.21 | 78.60 | 18 | 12.76 | 7 | 286 | 5 |
| **SST 884** | 7.96 | hij | 15 | 7.21 | 78.65 | 17 | 12.54 | 10 | 272 | 10 |
| **SST 895** | 8.12 | ghij | 14 | 8.09 | 79.65 | 11 | 13.02 | 4 | 288 | 4 |
| **Mean** | **8.59** |  |  |  | **79.73** |  | **12.49** |  | **272** |  |
| **Coefficient of variation (%)** | **4.85** |  |  |  | **0.87** |  | **4.20** |  | **13.33** |  |
| **LSDt(0,05)** | **0.60** |  |  |  | **1.00** |  | **0.73** |  | **53.33** |  |

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| **KwaZulu-Natal Irrigation 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** |
| **Buffels** |  |  | 4.35 | 23 | 5.80 | 19 | 6.89 | 20 |  |  |  |  |  |  |
| **Duzi** | 6.82 | 8 | 5.24 | 17 | 6.67 | 15 | 7.28 | 15 | 6.50 | 10 | 6.24 | 11 | 6.03 | 9 |
| **Koedoes** |  |  | 5.52 | 12 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 6.68 | 12 | 5.77 | 5 | 7.08 | 9 | 7.75 | 5 | 6.82 | 3 | 6.51 | 6 | 6.23 | 5 |
| **PAN 3400** | 7.07 | 4 | 5.33 | 14 | 7.21 | 6 | 7.31 | 13 | 6.73 | 6 | 6.53 | 5 | 6.20 | 7 |
| **PAN 3471** | 6.65 | 13 | 5.33 | 15 | 7.53 | 4 | 7.64 | 8 | 6.79 | 4 | 6.50 | 8 | 5.99 | 11 |
| **PAN 3478** |  |  |  |  |  |  | 7.11 | 17 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 7.53 | 3 | 8.24 | 1 |  |  |  |  |  |  |
| **PAN 3497** | 5.95 | 17 | 5.13 | 18 | 7.01 | 11 | 7.46 | 10 | 6.39 | 11 | 6.03 | 14 | 5.54 | 17 |
| **PAN 3515** | 7.23 | 2 | 5.73 | 7 | 6.97 | 12 |  |  |  |  | 6.64 | 3 | 6.48 | 2 |
| **PAN 3623** | 6.81 | 9 | 5.69 | 8 | 6.87 | 13 |  |  |  |  | 6.46 | 9 | 6.25 | 4 |
| **Renoster** |  |  | 6.18 | 1 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 5.52 | 20 | 4.85 | 21 | 6.77 | 14 | 7.93 | 3 | 6.27 | 13 | 5.71 | 16 | 5.19 | 18 |
| **SST 806** | 6.81 | 10 | 5.57 | 9 | 7.79 | 2 | 7.70 | 6 | 6.97 | 1 | 6.72 | 1 | 6.19 | 8 |
| **SST 8125** | 6.76 | 11 | 4.88 | 20 |  |  |  |  |  |  |  |  | 5.82 | 14 |
| **SST 8134** |  |  | 6.00 | 4 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 7.21 | 3 | 6.13 | 2 |  |  |  |  |  |  |  |  | 6.67 | 1 |
| **SST 8154** | 7.35 | 1 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 5.83 | 19 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 6.59 | 23 |  |  |  |  |  |  |
| **SST 835** | 6.56 | 14 | 5.25 | 16 | 7.86 | 1 | 8.02 | 2 | 6.92 | 2 | 6.56 | 4 | 5.91 | 13 |
| **SST 843** | 6.20 | 16 | 5.37 | 13 | 6.54 | 16 | 6.34 | 24 | 6.11 | 14 | 6.04 | 13 | 5.79 | 15 |
| **SST 866** | 5.89 | 18 | 5.54 | 11 | 7.05 | 10 | 7.66 | 7 | 6.53 | 9 | 6.16 | 12 | 5.71 | 16 |
| **SST 867** |  |  | 4.36 | 22 | 6.44 | 17 | 7.07 | 18 |  |  |  |  |  |  |
| **SST 875** | 6.26 | 15 | 5.75 | 6 | 7.25 | 5 | 7.87 | 4 | 6.78 | 5 | 6.42 | 10 | 6.01 | 10 |
| **SST 876** |  |  |  |  |  |  | 6.93 | 19 |  |  |  |  |  |  |
| **SST 877** | 6.85 | 7 | 5.06 | 19 | 6.19 | 18 | 7.37 | 11 | 6.36 | 12 | 6.03 | 15 | 5.95 | 12 |
| **SST 884** | 6.90 | 5 | 6.01 | 3 | 7.15 | 7 | 6.80 | 21 | 6.71 | 7 | 6.69 | 2 | 6.46 | 3 |
| **SST 895** | 6.86 | 6 | 5.54 | 10 | 7.13 | 8 | 7.23 | 16 | 6.69 | 8 | 6.51 | 7 | 6.20 | 6 |
| **SST 896** |  |  |  |  |  |  | 7.36 | 12 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 7.30 | 14 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 6.66 | 22 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 7.52 | 9 |  |  |  |  |  |  |
| **Mean** | **6.61** |  | **5.42** |  | **6.99** |  | **7.33** |  | **6.61** |  | **6.36** |  | **6.03** |  |
| **LSDt(0,05)** | **0.35** |  | **0.19** |  | **0.35** |  | **0.62** |  | **0.18** |  | **0.18** |  | **0.20** |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **\* Only Bergville data** | | | |  |  |  |  |  |  |  |  |  |  |  |

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| **KwaZulu Natal Irrigation Area AMMI Analysis** | | | | | | |
| **Anova of the yield of entries for for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 239 | 250.18 | 1.047 |  |  |
| **Treatments** | | 59 | 214.89 | 3.642 | 20.22 | <0,001 |
| **Genotypes** | | 19 | 58.54 | 3.081 | 17.11 | <0,001 |
| **Environments** | | 2 | 103.38 | 51.689 | 103.56 | <0,001 |
| **Block** |  | 9 | 4.49 | 0.499 | 2.77 | 0.0047 |
| **Interactions** | | 38 | 52.97 | 1.394 | 7.74 | <0,001 |
| **IPCA** |  | 20 | 28.38 | 1.419 | 7.88 | <0,001 |
| **IPCA** |  | 18 | 24.59 | 1.366 | 7.59 | <0,001 |
| **Residuals** |  | 0 | 0.00 |  |  |  |
| **Error** |  | 171 | 30.80 | 0.180 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Duzi | 6.82 | 8 | 0.52049 |  |  |
| 2 | Krokodil | 6.68 | 12 | -0.32422 |  |  |
| 3 | PAN 3400 | 7.07 | 4 | -0.14113 |  |  |
| 4 | PAN 3471 | 6.65 | 13 | 0.27530 |  |  |
| 5 | PAN 3497 | 5.95 | 17 | -0.44781 |  |  |
| 6 | PAN 3515 | 7.23 | 2 | -0.23446 |  |  |
| 7 | PAN 3623 | 6.81 | 9 | 0.06978 |  |  |
| 8 | Sabie | 5.52 | 20 | 0.24896 |  |  |
| 9 | SST 806 | 6.81 | 10 | 0.44179 |  |  |
| 10 | SST 8125 | 6.76 | 11 | 0.02993 |  |  |
| 11 | SST 8135 | 7.21 | 3 | 0.02043 |  |  |
| 12 | SST 8154 | 7.35 | 1 | -0.74938 |  |  |
| 13 | SST 8155 | 5.83 | 19 | 0.23873 |  |  |
| 14 | SST 835 | 6.56 | 14 | 0.50934 |  |  |
| 15 | SST 843 | 6.20 | 16 | -0.41485 |  |  |
| 16 | SST 866 | 5.89 | 18 | 0.10885 |  |  |
| 17 | SST 875 | 6.26 | 15 | -0.33263 |  |  |
| 18 | SST 877 | 6.85 | 7 | 0.23169 |  |  |
| 19 | SST 884 | 6.90 | 5 | 0.44654 |  |  |
| 20 | SST 895 | 6.86 | 6 | -0.49735 |  |  |
| **Mean** |  | **6.61** |  |  |  |  |
| **Coefficient of variation (%)** | | **6.50** |  |  |  |  |
| **LSDt(0,05)** |  | **0.35** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for yield (ton/ha)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Yield** | **Rank** | **Score** |  |  |
| 1 | Bergville (Britz) | 7.53 | 1 | 1.07809 |  |  |
| 2 | Bergville (Potgieter) | 6.07 | 3 | -1.21734 |  |  |
| 3 | Colenso | 6.22 | 2 | 0.13925 |  |  |
| **Mean** |  | **6.61** |  |  |  |  |
| **Coefficient of variation (%)** | | **6.50** |  |  |  |  |
| **LSDt(0.05)** |  | **0.13** |  |  |  |  |

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| **KwaZulu-Natal Irrigation 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** |
| **Buffels** |  |  | 80.61 | 19 | 80.38 | 19 | 78.69 | 1 |  |  |  |  |  |  |
| **Duzi** | 79.35 | 13 | 81.23 | 17 | 81.26 | 16 | 78.53 | 2 | 80.09 | 7 | 80.61 | 14 | 80.29 | 14 |
| **Koedoes** |  |  | 82.02 | 11 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 79.66 | 9 | 81.83 | 12 | 81.96 | 12 | 75.52 | 12 | 79.74 | 10 | 81.15 | 9 | 80.75 | 10 |
| **PAN 3400** | 78.34 | 17 | 81.38 | 16 | 82.83 | 9 | 74.44 | 18 | 79.25 | 11 | 80.85 | 12 | 79.86 | 15 |
| **PAN 3471** | 80.74 | 3 | 82.44 | 4 | 83.15 | 4 | 76.74 | 7 | 80.77 | 2 | 82.11 | 3 | 81.59 | 4 |
| **PAN 3478** |  |  |  |  |  |  | 76.26 | 8 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 83.96 | 1 | 75.27 | 14 |  |  |  |  |  |  |
| **PAN 3497** | 81.25 | 1 | 82.07 | 8 | 83.59 | 2 | 78.00 | 5 | 81.23 | 1 | 82.30 | 1 | 81.66 | 1 |
| **PAN 3515** | 79.99 | 6 | 82.07 | 8 | 82.81 | 10 |  |  |  |  | 81.62 | 7 | 81.03 | 6 |
| **PAN 3623** | 80.03 | 5 | 81.78 | 13 | 81.44 | 15 |  |  |  |  | 81.08 | 10 | 80.91 | 8 |
| **Renoster** |  |  | 80.36 | 21 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 78.45 | 16 | 80.30 | 22 | 80.89 | 17 | 75.50 | 13 | 78.79 | 13 | 79.88 | 15 | 79.38 | 17 |
| **SST 806** | 80.10 | 4 | 83.19 | 1 | 83.30 | 3 | 75.14 | 15 | 80.43 | 3 | 82.20 | 2 | 81.65 | 3 |
| **SST 8125** | 79.62 | 11 | 82.15 | 6 |  |  |  |  |  |  |  |  | 80.89 | 9 |
| **SST 8134** |  |  | 80.65 | 18 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 76.84 | 20 | 82.56 | 3 |  |  |  |  |  |  |  |  | 79.70 | 13 |
| **SST 8154** | 79.85 | 8 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 78.34 | 17 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 74.26 | 20 |  |  |  |  |  |  |
| **SST 835** | 79.59 | 12 | 82.61 | 2 | 83.07 | 5 | 74.20 | 21 | 79.87 | 9 | 81.76 | 5 | 81.10 | 5 |
| **SST 843** | 80.91 | 2 | 82.40 | 5 | 82.93 | 8 | 74.07 | 22 | 80.08 | 8 | 82.08 | 4 | 81.66 | 2 |
| **SST 866** | 79.22 | 14 | 81.55 | 15 | 82.40 | 11 | 78.41 | 3 | 80.40 | 4 | 81.06 | 11 | 80.39 | 13 |
| **SST 867** |  |  | 80.38 | 20 | 81.66 | 13 | 75.76 | 11 |  |  |  |  |  |  |
| **SST 875** | 79.65 | 10 | 81.62 | 14 | 82.95 | 7 | 76.16 | 10 | 80.10 | 6 | 81.41 | 8 | 80.64 | 11 |
| **SST 876** |  |  |  |  |  |  | 74.79 | 17 |  |  |  |  |  |  |
| **SST 877** | 78.23 | 19 | 79.52 | 23 | 80.45 | 18 | 74.89 | 16 | 78.27 | 14 | 79.40 | 16 | 78.88 | 18 |
| **SST 884** | 78.82 | 15 | 82.12 | 7 | 81.58 | 14 | 73.89 | 23 | 79.10 | 12 | 80.84 | 13 | 80.47 | 12 |
| **SST 895** | 79.96 | 7 | 82.03 | 10 | 82.96 | 6 | 76.23 | 9 | 80.30 | 5 | 81.65 | 6 | 81.00 | 7 |
| **SST 896** |  |  |  |  |  |  | 74.41 | 19 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 77.17 | 6 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 73.73 | 24 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 78.22 | 4 |  |  |  |  |  |  |
| **Mean** | **79.45** |  | **81.60** |  | **82.29** |  | **75.85** |  | **79.89** |  | **81.25** |  | **80.66** |  |
| **LSDt(0,05)** | **2.23** |  | **0.65** |  | **0.53** |  | **3.57** |  | **0.62** |  | **0.41** |  | **1.23** |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **\* Only Bergville data** | | |  |  |  |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- |
| **KwaZulu Natal Irrigation Area AMMI Analysis** | | | | | | |
| **Anova of the hectolitre mass of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 239 | 2519.8 | 10.54 |  |  |
| **Treatments** | | 59 | 1097.9 | 18.61 | 2.43 | <0,001 |
| **Genotypes** | | 19 | 250.2 | 13.17 | 1.72 | 0.0372 |
| **Environments** | | 2 | 484.8 | 242.38 | 19.54 | <0,001 |
| **Block** |  | 9 | 111.6 | 12.41 | 1.62 | 0.1132 |
| **Interactions** | | 38 | 362.9 | 9.55 | 1.25 | 0.1737 |
| **IPCA** |  | 20 | 335.9 | 16.80 | 2.19 | 0.0037 |
| **IPCA** |  | 18 | 27.0 | 1.50 | 0.20 | 0.9999 |
| **Residuals** |  | 0 | 0.0 |  |  |  |
| **Error** |  | 171 | 1310.3 | 7.66 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Duzi | 79.35 | 13 | -0.11361 |  |  |
| 2 | Krokodil | 79.66 | 9 | 0.27436 |  |  |
| 3 | PAN 3400 | 78.34 | 17 | 0.29970 |  |  |
| 4 | PAN 3471 | 80.74 | 3 | -0.09180 |  |  |
| 5 | PAN 3497 | 81.25 | 1 | 0.14014 |  |  |
| 6 | PAN 3515 | 79.99 | 6 | 0.38111 |  |  |
| 7 | PAN 3623 | 80.03 | 5 | 0.13222 |  |  |
| 8 | Sabie | 78.45 | 16 | -0.10752 |  |  |
| 9 | SST 806 | 80.10 | 4 | 0.58318 |  |  |
| 10 | SST 8125 | 79.62 | 11 | 0.32715 |  |  |
| 11 | SST 8135 | 76.84 | 20 | -2.61702 |  |  |
| 12 | SST 8154 | 79.85 | 8 | -0.30766 |  |  |
| 13 | SST 8155 | 78.34 | 17 | 0.30851 |  |  |
| 14 | SST 835 | 79.59 | 12 | 0.38790 |  |  |
| 15 | SST 843 | 80.91 | 2 | -0.64838 |  |  |
| 16 | SST 866 | 79.22 | 14 | 0.16566 |  |  |
| 17 | SST 875 | 79.65 | 10 | 0.49499 |  |  |
| 18 | SST 877 | 78.23 | 19 | 0.63697 |  |  |
| 19 | SST 884 | 78.82 | 15 | -0.02702 |  |  |
| 20 | SST 895 | 79.96 | 7 | -0.21889 |  |  |
| **Mean** |  | **79.45** |  |  |  |  |
| **Coefficient of variation (%)** | | **3.50** |  |  |  |  |
| **LSDt(0,05)** |  | **2.23** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for hectolitre mass (kg/hl)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Hectolitre mass** | **Rank** | **Score** |  |  |
| 1 | Bergville (Britz) | 81.19 | 1 | 2.44545 |  |  |
| 2 | Bergville (Potgieter) | 79.45 | 2 | -0.91170 |  |  |
| **3** | Colenso | 77.71 | 3 | -1.53375 |  |  |
| **Mean** |  | **79.45** |  |  |  |  |
| **Coefficient of variation (%)** | | **3.50** |  |  |  |  |
| **LSDt(0.05)** |  | **0.86** |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **KwaZulu-Natal Irrigation 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** |
| **Buffels** |  |  | 15.34 | 2 | 12.83 | 2 | 14.10 | 7 |  |  |  |  |  |  |
| **Duzi** | 12.46 | 10 | 14.49 | 12 | 12.56 | 5 | 13.63 | 18 | 13.28 | 6 | 13.17 | 6 | 13.48 | 8 |
| **Koedoes** |  |  | 14.57 | 10 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 11.67 | 20 | 13.81 | 23 | 11.44 | 19 | 12.96 | 24 | 12.47 | 14 | 12.31 | 16 | 12.74 | 18 |
| **PAN 3400** | 12.80 | 5 | 14.34 | 15 | 12.07 | 15 | 13.78 | 14 | 13.25 | 8 | 13.07 | 9 | 13.57 | 6 |
| **PAN 3471** | 12.45 | 12 | 14.26 | 16 | 12.23 | 12 | 13.58 | 20 | 13.13 | 11 | 12.98 | 11 | 13.36 | 13 |
| **PAN 3478** |  |  |  |  |  |  | 13.76 | 15 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 12.42 | 7 | 13.64 | 17 |  |  |  |  |  |  |
| **PAN 3497** | 12.26 | 17 | 14.24 | 17 | 11.90 | 17 | 14.18 | 6 | 13.15 | 10 | 12.80 | 12 | 13.25 | 15 |
| **PAN 3515** | 11.95 | 19 | 13.91 | 21 | 11.97 | 16 |  |  |  |  | 12.61 | 15 | 12.93 | 17 |
| **PAN 3623** | 13.15 | 3 | 14.69 | 7 | 12.78 | 3 |  |  |  |  | 13.54 | 3 | 13.92 | 4 |
| **Renoster** |  |  | 14.20 | 19 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 12.86 | 4 | 15.18 | 4 | 12.41 | 8 | 13.48 | 21 | 13.48 | 3 | 13.48 | 4 | 14.02 | 3 |
| **SST 806** | 12.30 | 16 | 14.59 | 9 | 12.38 | 9 | 14.05 | 8 | 13.33 | 5 | 13.09 | 8 | 13.45 | 11 |
| **SST 8125** | 12.39 | 14 | 14.54 | 11 |  |  |  |  |  |  |  |  | 13.47 | 9 |
| **SST 8134** |  |  | 14.69 | 7 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 12.56 | 7 | 14.49 | 12 |  |  |  |  |  |  |  |  | 13.53 | 5 |
| **SST 8154** | 12.66 | 6 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 12.07 | 18 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 14.96 | 2 |  |  |  |  |  |  |
| **SST 835** | 12.55 | 8 | 14.22 | 18 | 12.24 | 11 | 13.59 | 19 | 13.15 | 9 | 13.00 | 10 | 13.39 | 12 |
| **SST 843** | 14.29 | 1 | 16.01 | 1 | 14.37 | 1 | 16.06 | 1 | 15.18 | 1 | 14.89 | 1 | 15.15 | 1 |
| **SST 866** | 12.41 | 13 | 13.86 | 22 | 12.12 | 13 | 13.85 | 11 | 13.06 | 12 | 12.80 | 13 | 13.14 | 16 |
| **SST 867** |  |  | 15.20 | 3 | 12.09 | 14 | 14.55 | 3 |  |  |  |  |  |  |
| **SST 875** | 12.33 | 15 | 14.19 | 20 | 11.86 | 18 | 13.32 | 23 | 12.92 | 13 | 12.79 | 14 | 13.26 | 14 |
| **SST 876** |  |  |  |  |  |  | 13.82 | 13 |  |  |  |  |  |  |
| **SST 877** | 12.52 | 9 | 14.87 | 6 | 12.27 | 10 | 14.01 | 9 | 13.42 | 4 | 13.22 | 5 | 13.70 | 5 |
| **SST 884** | 12.46 | 10 | 14.44 | 14 | 12.48 | 6 | 13.67 | 16 | 13.26 | 7 | 13.13 | 7 | 13.45 | 10 |
| **SST 895** | 13.39 | 2 | 14.94 | 5 | 12.76 | 4 | 14.42 | 4 | 13.88 | 2 | 13.70 | 2 | 14.17 | 2 |
| **SST 896** |  |  |  |  |  |  | 13.84 | 12 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 13.94 | 10 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 14.28 | 5 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 13.38 | 22 |  |  |  |  |  |  |
| **Mean** | **12.58** |  | **14.57** |  | **12.38** |  | **13.95** |  | **13.35** |  | **13.16** |  | **13.55** |  |
| **LSDt(0,05)** | **0.60** |  | **0.44** |  | **0.43** |  | **0.58** |  | **0.26** |  | **0.29** |  | **0.38** |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **\* Only Bergville data** | | |  |  |  |  |  |  |  |  |  |  |  |  |

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| **KwaZulu Natal Irrigation Area AMMI Analysis** | | | | | | |
| **Anova of the protein content of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 239 | 289.66 | 1.212 |  |  |
| **Treatments** | | 59 | 186.14 | 3.155 | 6.30 | <0,001 |
| **Genotypes** | | 19 | 70.43 | 3.707 | 7.40 | <0,001 |
| **Environments** | | 2 | 91.74 | 45.869 | 23.10 | <0,001 |
| **Block** |  | 9 | 17.87 | 1.985 | 3.96 | <0,001 |
| **Interactions** | | 38 | 23.97 | 0.631 | 1.26 | 0.1628 |
| **IPCA** |  | 20 | 15.68 | 0.784 | 1.56 | 0.0664 |
| **IPCA** |  | 18 | 8.30 | 0.461 | 0.92 | 0.5549 |
| **Residuals** |  | 0 | 0.00 |  |  |  |
| **Error** |  | 171 | 85.65 | 0.501 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Duzi | 12.46 | 10 | -0.11043 |  |  |
| 2 | Krokodil | 11.67 | 20 | 0.04721 |  |  |
| 3 | PAN 3400 | 12.80 | 5 | 0.29018 |  |  |
| 4 | PAN 3471 | 12.45 | 12 | -0.35479 |  |  |
| 5 | PAN 3497 | 12.26 | 17 | 0.11119 |  |  |
| 6 | PAN 3515 | 11.95 | 19 | 0.11212 |  |  |
| 7 | PAN 3623 | 13.15 | 3 | 0.35989 |  |  |
| 8 | Sabie | 12.86 | 4 | -0.35161 |  |  |
| 9 | SST 806 | 12.30 | 16 | 0.50082 |  |  |
| 10 | SST 8125 | 12.39 | 14 | 0.09444 |  |  |
| 11 | SST 8135 | 12.56 | 7 | 0.23864 |  |  |
| 12 | SST 8154 | 12.66 | 6 | 0.26381 |  |  |
| 13 | SST 8155 | 12.07 | 18 | 0.43316 |  |  |
| 14 | SST 835 | 12.55 | 8 | -0.00990 |  |  |
| 15 | SST 843 | 14.29 | 1 | -0.57386 |  |  |
| 16 | SST 866 | 12.41 | 13 | -0.17062 |  |  |
| 17 | SST 875 | 12.33 | 15 | -0.07062 |  |  |
| 18 | SST 877 | 12.52 | 9 | 0.15885 |  |  |
| 19 | SST 884 | 12.46 | 10 | -0.33346 |  |  |
| 20 | SST 895 | 13.39 | 2 | -0.63502 |  |  |
| **Mean** |  | **12.58** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.90** |  |  |  |  |
| **LSDt(0,05)** |  | **0.60** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for protein content (%)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Protein content** | **Rank** | **Score** |  |  |
| 1 | Bergville (Britz) | 13.39 | 1 | -1.06010 |  |  |
| 2 | Bergville (Potgieter) | 11.89 | 3 | 0.14667 |  |  |
| 3 | Colenso | 12.45 | 2 | 0.91343 |  |  |
| **Mean** |  | **12.58** |  |  |  |  |
| **Coefficient of variation (%)** | | **5.90** |  |  |  |  |
| **LSDt(0.05)** |  | **0.23** |  |  |  |  |

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| **KwaZulu-Natal Irrigation 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** |
| **Buffels** |  |  | 304 | 16 | 297 | 8 | 330 | 4 |  |  |  |  |  |  |
| **Duzi** | 331 | 14 | 303 | 17 | 246 | 17 | 318 | 8 | 299 | 12 | 293 | 14 | 317 | 13 |
| **Koedoes** |  |  | 318 | 1 |  |  |  |  |  |  |  |  |  |  |
| **Krokodil** | 290 | 20 | 297 | 21 | 190 | 19 | 284 | 18 | 265 | 14 | 259 | 16 | 293 | 18 |
| **PAN 3400** | 349 | 2 | 309 | 9 | 282 | 14 | 320 | 7 | 315 | 3 | 313 | 8 | 329 | 2 |
| **PAN 3471** | 335 | 11 | 318 | 2 | 289 | 12 | 280 | 19 | 305 | 7 | 314 | 7 | 327 | 6 |
| **PAN 3478** |  |  |  |  |  |  | 332 | 3 |  |  |  |  |  |  |
| **PAN 3489** |  |  |  |  | 307 | 5 | 302 | 11 |  |  |  |  |  |  |
| **PAN 3497** | 330 | 15 | 308 | 12 | 286 | 13 | 287 | 15 | 303 | 8 | 308 | 11 | 319 | 11 |
| **PAN 3515** | 332 | 13 | 301 | 20 | 276 | 15 |  |  |  |  | 303 | 13 | 316 | 16 |
| **PAN 3623** | 320 | 19 | 313 | 7 | 217 | 18 |  |  |  |  | 283 | 15 | 316 | 15 |
| **Renoster** |  |  | 295 | 22 |  |  |  |  |  |  |  |  |  |  |
| **Sabie** | 333 | 12 | 317 | 4 | 275 | 16 | 350 | 1 | 319 | 2 | 308 | 10 | 325 | 8 |
| **SST 806** | 336 | 9 | 309 | 10 | 316 | 1 | 243 | 23 | 301 | 10 | 320 | 3 | 322 | 9 |
| **SST 8125** | 344 | 4 | 316 | 5 |  |  |  |  |  |  |  |  | 330 | 1 |
| **SST 8134** |  |  | 306 | 15 |  |  |  |  |  |  |  |  |  |  |
| **SST 8135** | 324 | 18 | 309 | 10 |  |  |  |  |  |  |  |  | 317 | 11 |
| **SST 8154** | 338 | 7 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 8155** | 329 | 16 |  |  |  |  |  |  |  |  |  |  |  |  |
| **SST 822** |  |  |  |  |  |  | 266 | 20 |  |  |  |  |  |  |
| **SST 835** | 340 | 6 | 315 | 6 | 303 | 6 | 252 | 21 | 303 | 9 | 319 | 4 | 328 | 4 |
| **SST 843** | 349 | 1 | 308 | 12 | 314 | 3 | 195 | 24 | 291 | 13 | 324 | 1 | 329 | 3 |
| **SST 866** | 345 | 3 | 307 | 14 | 315 | 2 | 291 | 14 | 314 | 4 | 322 | 2 | 326 | 7 |
| **SST 867** |  |  | 301 | 19 | 300 | 7 | 295 | 13 |  |  |  |  |  |  |
| **SST 875** | 327 | 17 | 310 | 8 | 291 | 11 | 298 | 12 | 306 | 6 | 309 | 9 | 318 | 12 |
| **SST 876** |  |  |  |  |  |  | 286 | 17 |  |  |  |  |  |  |
| **SST 877** | 335 | 10 | 293 | 23 | 293 | 10 | 309 | 9 | 307 | 5 | 307 | 12 | 314 | 17 |
| **SST 884** | 336 | 8 | 318 | 3 | 297 | 9 | 248 | 22 | 300 | 11 | 317 | 6 | 327 | 5 |
| **SST 895** | 340 | 5 | 303 | 18 | 313 | 4 | 338 | 2 | 323 | 1 | 319 | 5 | 321 | 10 |
| **SST 896** |  |  |  |  |  |  | 286 | 16 |  |  |  |  |  |  |
| **Tamboti** |  |  |  |  |  |  | 325 | 5 |  |  |  |  |  |  |
| **Timbavati** |  |  |  |  |  |  | 304 | 10 |  |  |  |  |  |  |
| **Umlazi** |  |  |  |  |  |  | 325 | 5 |  |  |  |  |  |  |
| **Mean** | **333** |  | **308** |  | **285** |  | **294** |  | **304** |  | **307** |  | **321** |  |
| **LSDt(0,05)** | **12.90** |  | **14.54** |  | **16.54** |  | **11.70** |  | **9.30** |  | **8.60** |  | **9.60** |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **\* Only Bergville data** | | |  |  |  |  |  |  |  |  |  |  |  |  |

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| **KwaZulu Natal Irrigation Area AMMI Analysis** | | | | | | |
| **Anova of the falling number of entries for 2016** | | | | | | |
|  |  |  |  |  |  |  |
| **Source** |  | **Df** | **SS** | **MS** | **F-Value** | **Pr> F** |
| **Total** |  | 239 | 713080 | 2984 |  |  |
| **Treatments** | | 59 | 667350 | 11311 | 46.57 | <0,001 |
| **Genotypes** | | 19 | 37255 | 1961 | 8.07 | <0,001 |
| **Environments** | | 2 | 613467 | 306734 | 657.10 | <0,001 |
| **Block** |  | 9 | 4201 | 467 | 1.92 | 0.0518 |
| **Interactions** | | 38 | 16628 | 438 | 1.80 | 0.0060 |
| **IPCA** |  | 20 | 12239 | 612 | 2.52 | <0,001 |
| **IPCA** |  | 18 | 4389 | 244 | 1.00 | 0.4578 |
| **Residuals** |  | 0 | 0 |  |  |  |
| **Error** |  | 171 | 41530 | 243 |  |  |
|  |  |  |  |  |  |  |
| **Genotype means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Genotype** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Duzi | 331 | 14 | 0.06307 |  |  |
| 2 | Krokodil | 290 | 20 | -3.16737 |  |  |
| 3 | PAN 3400 | 349 | 2 | -1.83502 |  |  |
| 4 | PAN 3471 | 335 | 11 | 1.66894 |  |  |
| 5 | PAN 3497 | 330 | 15 | 1.08168 |  |  |
| 6 | PAN 3515 | 332 | 13 | 0.81889 |  |  |
| 7 | PAN 3623 | 320 | 19 | 4.10290 |  |  |
| 8 | Sabie | 333 | 12 | 1.71190 |  |  |
| 9 | SST 806 | 336 | 9 | 0.18204 |  |  |
| 10 | SST 8125 | 344 | 4 | 0.15252 |  |  |
| 11 | SST 8135 | 324 | 18 | -1.13314 |  |  |
| 12 | SST 8154 | 338 | 7 | 0.39471 |  |  |
| 13 | SST 8155 | 329 | 16 | -0.25557 |  |  |
| 14 | SST 835 | 340 | 6 | -0.62544 |  |  |
| 15 | SST 843 | 349 | 1 | -2.24011 |  |  |
| 16 | SST 866 | 345 | 3 | -0.96397 |  |  |
| 17 | SST 875 | 327 | 17 | -0.82331 |  |  |
| 18 | SST 877 | 335 | 10 | -1.84991 |  |  |
| 19 | SST 884 | 336 | 8 | 0.40216 |  |  |
| 20 | SST 895 | 340 | 5 | 2.31504 |  |  |
| **Mean** |  | **333** |  |  |  |  |
| **Coefficient of variation (%)** | | **4.80** |  |  |  |  |
| **LSDt(0,05)** |  | **12.90** |  |  |  |  |
|  |  |  |  |  |  |  |
| **Environment means and scores for falling number (s)** | | | | |  |  |
|  |  |  |  |  |  |  |
| **Entry** | **Environment** | **Falling number** | **Rank** | **Score** |  |  |
| 1 | Bergville (Britz) | 315 | 2 | 2.00922 |  |  |
| 2 | Bergville (Potgieter) | 402 | 1 | 3.95823 |  |  |
| 3 | Colenso | 282 | 3 | -5.96746 |  |  |
| **Mean** |  | **333** |  |  |  |  |
| **Coefficient of variation (%)** | | **4.80** |  |  |  |  |
| **LSDt(0.05)** |  | **5.00** |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **KwaZulu Natal Irrigation Area** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Bergville (Britz) 2016-05-24** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 8.59 | a | 1 | 0.88 | 80.78 | 16 | 13.38 | 10 | 317 | 10 |
| **Krokodil** | 7.45 | defg | 13 | 8.67 | 82.03 | 9 | 12.34 | 19 | 275 | 20 |
| **PAN 3400** | 8.15 | abcd | 4 | 7.67 | 80.73 | 17 | 13.52 | 7 | 328 | 3 |
| **PAN 3471** | 7.52 | cdefg | 12 | 0.71 | 82.33 | 5 | 13.73 | 4 | 321 | 7 |
| **PAN 3497** | 5.55 | i | 20 | 6.68 | 83.28 | 1 | 12.89 | 16 | 310 | 15 |
| **PAN 3515** | 8.09 | abcd | 5 | 10.88 | 82.63 | 3 | 12.65 | 17 | 308 | 17 |
| **PAN 3623** | 7.71 | bcdef | 10 | 3.90 | 82.10 | 8 | 13.72 | 5 | 311 | 14 |
| **Sabie** | 6.51 | h | 19 | 14.61 | 79.98 | 19 | 14.07 | 3 | 316 | 12 |
| **SST 806** | 8.24 | abc | 3 | 5.28 | 83.20 | 2 | 12.61 | 18 | 312 | 13 |
| **SST 8125** | 7.97 | abcde | 8 | 6.68 | 82.20 | 7 | 13.10 | 14 | 330 | 2 |
| **SST 8135** | 8.07 | abcd | 6 | 8.36 | 72.13 | 20 | 13.21 | 11 | 292 | 19 |
| **SST 8154** | 7.70 | bcdef | 11 | 4.79 | 80.88 | 14 | 13.05 | 15 | 324 | 6 |
| **SST 8155** | 6.99 | fgh | 16 | 5.87 | 80.80 | 15 | 12.18 | 20 | 308 | 16 |
| **SST 835** | 7.97 | abcde | 9 | 6.87 | 82.23 | 6 | 13.39 | 9 | 316 | 11 |
| **SST 843** | 6.52 | h | 18 | 11.94 | 81.15 | 12 | 15.56 | 1 | 326 | 4 |
| **SST 866** | 6.81 | gh | 17 | 6.37 | 81.48 | 11 | 13.52 | 7 | 325 | 5 |
| **SST 875** | 7.14 | fgh | 15 | 2.96 | 82.50 | 4 | 13.19 | 12 | 303 | 18 |
| **SST 877** | 8.07 | abcd | 7 | 5.09 | 81.65 | 10 | 13.15 | 13 | 319 | 9 |
| **SST 884** | 8.36 | ab | 2 | 10.01 | 80.60 | 18 | 13.64 | 6 | 320 | 8 |
| **SST 895** | 7.28 | efg | 14 | 6.13 | 81.15 | 12 | 14.88 | 2 | 340 | 1 |
| **Mean** | **7.53** |  |  |  | **81.19** |  | **13.39** |  | **315** |  |
| **Coefficient of variation (%)** | **6.86** |  |  |  | **5.56** |  | **5.64** |  | **4.69** |  |
| **LSDt(0,05)** | **0.75** |  |  |  | **6.53** |  | **1.09** |  | **21.38** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **KwaZulu Natal Irrigation Area** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Bergville (Potgieter) 2016-05-24** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 5.85 | fghi | 13 | 4.586 | 79.70 | 10 | 11.78 | 9 | 397 | 17 |
| **Krokodil** | 6.67 | bcd | 5 | 3.187 | 79.70 | 10 | 11.21 | 20 | 338 | 20 |
| **PAN 3400** | 6.91 | bc | 4 | 8.450 | 78.65 | 15 | 11.62 | 16 | 410 | 1 |
| **PAN 3471** | 5.53 | hij | 15 | 3.550 | 80.40 | 3 | 11.47 | 17 | 410 | 9 |
| **PAN 3497** | 5.37 | ij | 16 | 15.96 | 81.50 | 1 | 11.73 | 11 | 407 | 11 |
| **PAN 3515** | 7.11 | b | 2 | 6.884 | 79.90 | 6 | 11.28 | 19 | 410 | 1 |
| **PAN 3623** | 6.12 | defg | 9 | 10.28 | 79.90 | 6 | 12.17 | 4 | 406 | 14 |
| **Sabie** | 4.54 | k | 20 | 4.170 | 78.25 | 18 | 12.06 | 6 | 410 | 1 |
| **SST 806** | 5.76 | ghi | 14 | 6.710 | 80.00 | 5 | 11.64 | 15 | 410 | 1 |
| **SST 8125** | 6.36 | cdef | 7 | 0.789 | 79.05 | 14 | 11.74 | 10 | 410 | 1 |
| **SST 8135** | 6.59 | bcde | 6 | 6.080 | 79.60 | 12 | 11.67 | 13 | 398 | 16 |
| **SST 8154** | 7.89 | a | 1 | 6.575 | 79.90 | 6 | 12.38 | 3 | 406 | 12 |
| **SST 8155** | 4.99 | jk | 19 | 11.00 | 78.30 | 17 | 12.07 | 5 | 399 | 15 |
| **SST 835** | 5.36 | ij | 17 | 4.070 | 79.60 | 12 | 11.83 | 8 | 410 | 1 |
| **SST 843** | 6.06 | efgh | 11 | 10.79 | 80.95 | 2 | 13.89 | 1 | 410 | 1 |
| **SST 866** | 5.13 | j | 18 | 5.985 | 78.35 | 16 | 11.42 | 18 | 410 | 1 |
| **SST 875** | 6.35 | def | 8 | 4.453 | 79.85 | 9 | 11.68 | 12 | 397 | 17 |
| **SST 877** | 6.06 | efgh | 10 | 4.893 | 76.90 | 20 | 11.89 | 7 | 393 | 19 |
| **SST 884** | 5.86 | fghi | 12 | 3.513 | 78.15 | 19 | 11.67 | 13 | 406 | 12 |
| **SST 895** | 6.95 | b | 3 | 3.752 | 80.25 | 4 | 12.59 | 2 | 407 | 10 |
| **Mean** | **6.07** |  |  |  | **79.45** |  | **11.89** |  | **402** |  |
| **Coefficient of variation (%)** | **6.40** |  |  |  | **0.77** |  | **4.06** |  | **2.70** |  |
| **LSDt(0,05)** | **0.56** |  |  |  | **0.88** |  | **0.70** |  | **15.68** |  |

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| **2016 Wheat cultivar adaptation trial** | | | | | | | | | | |
| **KwaZulu Natal Irrigation Area** | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **Cultivar** | **Colenso 2016-06-14** | | | | | | | | | |
| **Yield** | | **Rank** | **C.V.** | **Hectolitre mass** | **Rank** | **Protein content** | **Rank** | **Falling number** | **Rank** |
| **Duzi** | 6.03 | ef | 14 | 5.94 | 77.57 | 11 | 12.22 | 13 | 279 | 13 |
| **Krokodil** | 5.94 | ef | 16 | 3.49 | 77.25 | 13 | 11.45 | 20 | 256 | 19 |
| **PAN 3400** | 6.14 | de | 12 | 4.48 | 75.65 | 20 | 13.27 | 3 | 309 | 2 |
| **PAN 3471** | 6.89 | ab | 3 | 1.75 | 79.50 | 2 | 12.15 | 14 | 274 | 15 |
| **PAN 3497** | 6.94 | a | 2 | 4.50 | 78.97 | 3 | 12.14 | 15 | 274 | 16 |
| **PAN 3515** | 6.48 | c | 5 | 7.47 | 77.45 | 12 | 11.93 | 19 | 278 | 14 |
| **PAN 3623** | 6.61 | bc | 4 | 5.34 | 78.10 | 7 | 13.57 | 1 | 245 | 20 |
| **Sabie** | 5.51 | gh | 19 | 6.64 | 77.12 | 14 | 12.46 | 9 | 272 | 18 |
| **SST 806** | 6.44 | cd | 8 | 5.07 | 77.10 | 15 | 12.67 | 6 | 285 | 7 |
| **SST 8125** | 5.94 | ef | 15 | 5.00 | 77.60 | 10 | 12.34 | 11 | 291 | 6 |
| **SST 8135** | 6.96 | a | 1 | 6.16 | 78.80 | 4 | 12.80 | 4 | 282 | 10 |
| **SST 8154** | 6.46 | c | 7 | 6.21 | 78.77 | 5 | 12.55 | 7 | 285 | 8 |
| **SST 8155** | 5.51 | gh | 18 | 2.55 | 75.92 | 19 | 11.96 | 18 | 280 | 12 |
| **SST 835** | 6.35 | cd | 11 | 4.75 | 76.95 | 16 | 12.44 | 10 | 294 | 5 |
| **SST 843** | 6.03 | ef | 13 | 2.63 | 80.62 | 1 | 13.41 | 2 | 312 | 1 |
| **SST 866** | 5.73 | fg | 17 | 5.33 | 77.82 | 8 | 12.31 | 12 | 300 | 3 |
| **SST 875** | 5.31 | h | 20 | 3.10 | 76.60 | 17 | 12.11 | 16 | 282 | 11 |
| **SST 877** | 6.41 | cd | 9 | 4.51 | 76.15 | 18 | 12.52 | 8 | 294 | 4 |
| **SST 884** | 6.48 | c | 6 | 2.17 | 77.70 | 9 | 12.06 | 17 | 283 | 9 |
| **SST 895** | 6.35 | cd | 10 | 7.37 | 78.47 | 6 | 12.69 | 5 | 273 | 17 |
| **Mean** | **6.22** |  |  |  | **77.71** |  | **12.45** |  | **282** |  |
| **Coefficient of variation (%)** | **3.44** |  |  |  | **1.02** |  | **6.68** |  | **6.92** |  |
| **LSDt(0,05)** | **0.31** |  |  |  | **1.15** |  | **1.20** |  | **28.24** |  |