

## REGIONAL QUALITY SUMMARY

### WINTER RAINFALL AREA

#### (Western Cape)

The Western Cape Province has a Mediterranean climate, characterized by cool, wet winters and hot dry summers. More than 80% of the rainfall is received in winter between April and September, making the Western Cape a predominantly winter rainfall area. Mean annual rainfall varies from 200 to 450 mm. The Swartland (on the west coast) and the Rûens (Southern Cape) are the main distinguishable geographic regions of the winter rainfall area.

These two separate wheat farming regions are divided into individual areas according to amongst other their climate, soils and geographic position. The Swartland region is divided into the following areas: Sandveld, Koringberg, Middle Swartland and High Rainfall Area. The Rûens region is divided into the Western Rûens, Southern Rûens and Eastern Rûens.

The Rûens generally receives higher rainfall than the Swartland, but some areas of the Swartland have better, deeper soils. Wheat is generally planted from the second half of April until the middle of June and harvested during October to December.

The climatic conditions in the Swartland region, leading up to the planting season, showed some bleak prospects for the year ahead. Low rainfall together with high temperatures resulted in the depletion of the already low soil moisture. Most parts of the Swartland received about 50 mm of rain in the first five months, compared to the 90 mm in the previous year and the long-term average of about 130 mm for the first five months. Planting conditions were therefore far from ideal.

Climatic conditions in the Rûens varied a lot during the past seasons. Rainfall varied from 50% less than the long-term average in certain regions to 20% more than the long-term average. The planting season initially started off with sufficient soil moisture, but this diminished as weeks progressed. The Eastern Rûens region was the hardest hit by dry conditions post planting and although good rains were recorded from June/July, damaged was already done in some areas.

The hectolitre mass averaged 79.1 kg/hl compared to the previous season's 81.3 kg/hl. The thousand kernel mass averaged 36.2 g, 3.4 g lower than the previous season and 1.5 g lower than the national average. The average falling number was 370 seconds. The average whole wheat protein content was 13.2% (12% mb), 11.4% in 2016/2017.

The percentage screenings of 1.79% was lower than the previous season's 2.16%, but still the highest of the three areas and 0.28% higher than the national average for 2017/2018. The mixogram peak time (Quadromat Junior mill) averaged 2.6 minutes, the shortest of the three major production areas, although only slightly so. The Bühler extraction averaged 71.5% (average of wheat grades B1 to B4, UT as well as Class Other), slightly lower than 2016/2017. The average wet colour of the flour was -3.9 KJ units and the dry colour L\* value (indicating lightness) 93.77. These colour values indicate a white/light flour that is preferred by millers and bakers and compare well to previous seasons. The average ash content was equal to the 0.58% (db) of the previous year.

The flour protein content averaged 12.0%. The average wet and dry gluten values namely 32.5% and 11.1% (14% mb) were respectively 4.4% and 1.5% higher than the previous season. This can be expected given the almost 2% increase in protein content on average. The gluten index was 93. The average farinogram absorption was 60.9% and the development time 5.7 minutes, the stability averaged 9.4 minutes. The average alveogram strength was 41.4 cm<sup>2</sup>, 10.0 cm<sup>2</sup> higher than last season. The alveogram P/L value was 0.70 compared to the 0.61 of 2016/2017. The average strength on the extensogram was 112 cm<sup>2</sup>. The

overall increase in rheological strength values, compared to the previous season, can be attributed to the higher protein content. The mixogram peak time on the Bühler milled flour averaged 2.4 minutes, similar to last season. The 100-gram baking test showed on average an excellent relationship between protein content and bread volume.

## SUMMER RAINFALL AND IRRIGATION AREA (Free State)

The summer rainfall area (predominantly the Free State Province) is a major dryland wheat production region of South Africa. Considerable variation in precipitation, soil types and average temperature occurs from east to west. The Free State is therefore commonly divided into four distinct dryland wheat production regions, namely: South Western Free State, North Western Free State, Central Free State and Eastern Free State.

Rainfall, particularly the distribution thereof through the growing season, is important for successful wheat production in the summer rainfall areas. Planting dates vary from early to late according to region and commences in May and continues until July. Harvesting takes place from December to January.

Good rains occurred in the fallow period during January and February in all regions. During January the rainfall was close to the long-term average, in February the precipitation was however almost three times more than the average figures. In the months leading up to planting time, only 50% of the long-term average was recorded in all regions. This led to sub-optimum conditions during planting time and the early stages of development, unless soil moisture conservation practices were at an optimum level. From the last week of September into the first ten days of October a fair amount of rainfall was recorded in the Eastern and the North Western Free State. In the Central Free State, however, the first significant rain only occurred in November.

The average hectolitre mass was 79.9 kg/hl, 0.5 kg/hl higher than in 2016/2017. The thousand kernel mass (37.9 g) was 2.5 g higher than the previous season. The average percentage screenings was 1.48%, similar to the national average. The average whole wheat protein content decreased from 14.3% the previous season to 12.6% (12% mb) this season. The falling number of 338 seconds, although the lowest average of the three areas, is already within the higher range of acceptable falling number values.

The mixogram (Quadromat Junior) peak time was 2.9 minutes compared to the mostly above 3.0 minute averages of the previous seasons. The average Bühler extraction percentage in the Free State was equal to the previous season's 73.6%. The Kent Jones flour colour was -4.1 KJ units and the L\* value 93.69, indicating a slightly whiter and brighter flour than last season. The average ash content was 0.61% and the average flour protein content 10.9%. The wet gluten content (14% mb) was 29.9% and the dry gluten 10.0%, a decrease of 8.2% and 3.2% respectively compared to the previous season, which is understandable given the 2.8% decrease in flour protein content. The gluten index averaged 94.

The average farinogram water absorption of 59.8% was lower than the previous season's 62.7% and also the lowest of the three areas. The development time averaged 5.0 and the stability 7.2 minutes, both shorter than in 2016/2017. The average alveogram strength of 35.6 cm<sup>2</sup> and extensogram strength of 96 cm<sup>2</sup> were both also noticeably lower than in the previous season. These observations can be expected taking the lower protein content, compared to last season, into account. The Bühler milled flour had an average mixograph peak time of 2.8 minutes. The 100-gram baking test showed that the relationship between protein content and bread volume was excellent between the different grades. Based on the average number values, the Free State wheat had the weakest rheological (dough) quality.

## IRRIGATION AREAS

### (Northern Cape, North West, Mpumalanga, Gauteng, Limpopo and KwaZulu-Natal)

Generally, the irrigation wheat production areas 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 the North West, Limpopo and Gauteng provinces, the Highveld region in Mpumalanga and the Free State, and lastly, the KwaZulu-Natal region.

Planting commences as early as the end of May and continues until the end of July. Harvesting takes place from October to December.

Temperature conditions during this season showed slight deviations to the long-term average in all the production regions. Minimum temperatures in the KwaZulu-Natal and Cooler Irrigation regions were below normal during July and August, which could explain the higher yields obtained in these regions. In the Highveld region minimum temperatures were very close to the long-term average. In the Warmer Irrigation region, the minimum temperatures were slightly higher than the long-term average.

The irrigation wheat had the highest weighted average hectolitre mass of 83.2 kg/hl, as in the previous season. The thousand kernel mass increased by 1.4 g to 39.6 g. The average falling number was 385 seconds (the highest of the three areas). The screenings averaged 1.05%, the lowest of the three areas.

The whole wheat protein content was on average 11.9%, the lowest average content of the three areas. The flour's protein content of 11.0%, was equal to the previous season. The mixogram (Quadromat Junior) peak time averaged 2.8 minutes. The average Bühler extraction was 74.0%, slightly higher than last season and again also the highest of the three production areas.

The dry colour L\* value was 93.83 and the Kent Jones wet colour value -4.3 KJ units. The ash content averaged 0.61%. The wet and dry gluten contents were 29.8% and 10.0% respectively and the gluten index 93. The average farinogram water absorption was 60.1% (58.9% during the previous season), the development time 5.6 minutes and the stability 7.5 minutes.

Alveogram strength averaged 38.9 cm<sup>2</sup> and the P/L 0.80 (37.1 cm<sup>2</sup> and 0.49 respectively the previous season). Higher P/L values are indicative of dough being less extensible (having shorter L values) than dough with higher P/L values and therefore also more elastic. A P/L value of 0.80 is very well situated within the general acceptable range of P/L values for bread baking purposes. The average extensogram strength was 106 cm<sup>2</sup>. The mixogram peak time averaged 2.8 minutes. The relationship between protein content and 100 g bread volume was also shown to be excellent.

***Production area and climatic condition information were kindly provided by ARC-Small Grain.***

Please see the results provided per individual production region on pages 34 to 61.