

Assuring the quality of South African wheat

South Africa operates in a free market economic system and participation by wheat-breeding and seed companies in the process for the release of bread wheat varieties is highly recommended. A new or introduction cultivar is only released for planting if it possesses improved agronomical as well as improved flour quality characteristics compared to the cultivars planted commercially in a specific area.

The classification of wheat cultivars is an attempt to provide the wheat industry with new cultivars that perform well agronomically and possess suitable milling, rheological and baking characteristics. Analytical procedures and classification norms are compiled in conjunction with wheat breeders, millers, bakers and storage companies to ensure market-directed and quality-driven wheat production in the interest of wheat producers and processors. The availability of new and improved wheat varieties is important as a constant demand exists for higher yields, better quality, better processing properties and increased disease resistance.

Classification norms use cultivars as biological quality standards as a frame of reference against which new breeding lines are evaluated. Only cultivars that are successfully grown commercially and possess acceptable agronomical and quality characteristics may be considered as biological quality standards.

As the breeding and development of new wheat varieties with suitable quality characteristics is an expensive, long-term project, classification norms and quality standards are provided to breeders as guidelines that should stand the test of time. Changing the classification norms and establishing new quality standards are for this reason thoroughly investigated and carefully considered to ensure that the long-term goals of breeding programs are achieved. Recent amendments include introducing a new biological quality standard (SST 0117) for the dry land Southern (Winter rainfall) areas, an update to the determination of the 100 g bread evaluation scores and the inclusion of the Konica Minolta CM-5 colour results as part of the quality evaluation norms.

The effect of climate, rainfall, environmental interaction, cultivation practices and other factors that influence wheat quality, makes the use of fixed criteria or norms for classification purposes impractical. For this reason, cultivars are used as biological quality standards, and acceptable deviations from the standard are established as classification norms. Producers continuously strive to improve the wheat yield and quality by selecting the best cultivars for commercial production in a specific area. High grading standards are set to ensure adequate quality control.

The evaluation of wheat breeder lines and the approval of a new cultivar for release are, since April 2018, performed by the Wheat Forum Cultivar and Technical Committee. A line approved for release, is registered as a cultivar in accordance with the Plant Breeders' Act, Act 15 of 1976, by the applicable breeder company (plant breeder's rights are a form of Intellectual Property rights).

The Wheat Forum requested that two documents, namely 'Analysis Procedure and Evaluation Norms for the Release of Bread Wheat Breeder Varieties for the RSA', as well as the Cultivar List be hosted on the website of the SAGL. SAGL was also appointed as responsible party for the maintenance of the aforementioned documents.

The cultivar list hosted on the SAGL website is named the Wheat Forum Cultivar List, to distinguish this list from any other lists in existence. The criteria for listing a cultivar on the Wheat Forum Cultivar List is the minuted approval of the cultivar by the Cultivar and Technical Committee of the Wheat Forum. Approval indicates that the cultivar has passed the evaluation process as described in the 'Analysis Procedure and Evaluation Norms for the Release of Bread Wheat Breeder Varieties for the RSA' document.

Any addition or elimination of a cultivar to/from the Wheat Forum Cultivar List, shall be based on a resolution documented in Minutes of meetings of the Wheat Forum Cultivar and Technical Committee. The Wheat Forum Cultivar List shall be updated annually upon receipt of the Minutes of the Wheat Forum Cultivar and Technical Committee meeting. The latest revision of both these documents are available on the SAGL website.

Since wheat is a self-pollinating crop, meaning that grain produced has the same genetic composition as the parent, grain can be harvested and replanted as seed, which results in less seed being sold. In South Africa, approximately 70% of wheat is planted with farm saved seed. As a result, the investment in the development of new cultivars is only covered by a small portion of the market. A lack of return on investment therefore prevents new seed companies and new cultivars from entering the market. This situation is however not unique to South Africa. In order to address this issue, various End Point Royalty systems were investigated and the outcome was a proposal to establish a statutory levy for breeding and technology, in addition to the industry levy that has been implemented for many years.

After meetings and consultations with stakeholders and various experts, the South African Cultivar & Technology Agency NPC (SACTA) was established in June 2016. SACTA has been mandated by role-players in the different industries to administer the breeding and technology levy and makes payments to the seed companies from funds collected by means of the levies. The payments are made annually and are based on the calculated market share of each seed company. It is envisaged that this system will eventually be implemented for all self-pollinating crops.

Wheat grades

The latest bread wheat grading regulations were published in the Government Gazette No. 42862, dated 29 November 2019. The regulations are detailed in Government Notice NO. R. 1547 of 29 November 2019. According to these regulations the classes of wheat are Bread Wheat and Other Wheat. The grades for Bread Wheat are Super Grade, Grade 1, Grade 2 and Grade 3. No grades are determined for Class Other Wheat.

The 335 representative crop samples of the 2023/24 season received were graded as follows: 19% was graded Super Grade, 25% was graded Grade 1, 21% was graded Grade 2, 10% was graded Grade 3 and 25% Class Other Wheat (COW). Please refer to Graphs 17 to 20 for the percentage of wheat crop quality survey samples graded per Class and grade over the last four seasons.

Of the 85 samples received that were downgraded to COW, 8 samples (9%) had protein content values below 9.5% (14% mb), 4 samples (5%) had hectolitre mass values below 74 kg/hl, 1 sample had a falling number value below 220 seconds and 28 samples (33%) had screening levels higher than 3%.

The deviations that caused the highest percentages of samples to be downgraded to COW was other grain and unthreshed ears with 52% (44 samples) and combined deviations with 28% (24 samples).

49% of the downgraded samples originated from the Western Cape, 17% from the Free State and 34% from the irrigation areas.

22% of wheat crop quality survey samples originating in the Free State were graded Super Grade. 41% of the wheat crop samples from the irrigation areas and 4% of wheat crop samples from the Western Cape Province graded Super Grade.

