Assuring the quality of South African wheat

South Africa has three major wheat-breeding programs. New or introduction cultivars can only be released for planting if it has better agronomical as well as better flour quality characteristics than 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 and bakers to ensure market-directed and quality-driven wheat production in the interest of wheat producers and processors.

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 the suitable quality characteristics is an expensive, long-term project, classification norms and quality standards are provided to breeders in an attempt to provide them with 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.

The effect of the 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. Grading standards are also set high to ensure adequate quality control.

Various meetings to revive the South African wheat industry has been held since November 2014 and the answer seems to be amongst others a more effective cultivar development and seed breeding system. 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.

Until now, quality was the main focus of breeding programs. Yield was not included as a norm in the cultivar release criteria. Amendments to the release criteria already proposed are: Only two (instead of three) years of data required for final classification of irrigation wheat; yield to be incorporated as criteria norm; relaxed quality criteria with regards to certain quality parameters for high yielding lines.

Breeder lines approved for final classification by the Research Technical Committee for Wheat of the Winter Cereal Trust are registered as a cultivar in accordance with the Plant Breeders' Act, 1976 (Act 15 of 1976) by the applicable breeder company (plant breeder's rights are a form of Intellectual Property rights). Up until the 2016/2017 season, the cultivar in addition, had to be classified in terms of the Regulations relating to the Grading, Packing and marking of Bread Wheat intended for Sale in the Republic of South Africa under the Agricultural Product Standards (APS) Act, 1990 (Act No. 119 of 1990). The cultivar was then listed on the Cultivar list as determined by the Executive Officer: Agricultural Product Standards. All cultivars listed are subject to compulsory certification by SANSOR (South African National Seed Organization) on behalf of the Minister of Agriculture, to ensure cultivar purity and good seed quality. Cultivars cannot be listed on the Cultivar list if Breeders' Rights have not been obtained.

Industry was however informed by the Registrar of the APS Act that the Cultivar list would no longer form part of the Agricultural Product Standards Act. It was suggested by Industry that the Cultivar list be moved to the Plant Improvement Act, which unfortunately did not happen. A satisfactory solution for all stakeholders to this matter is yet to be identified.

Since wheat is a self-pollinating crop, meaning that grain produced has the same genetic composition as the parent, seed can be harvested and replanted, which results in less seed being sold. In South Africa, approximately 70% of wheat is planted with farm saved seed. The investment in the development of new cultivars is as a result only covered by a small portion of the market. A lack of return on investment therefore prevent 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 statutory levy that has been implemented for many years.

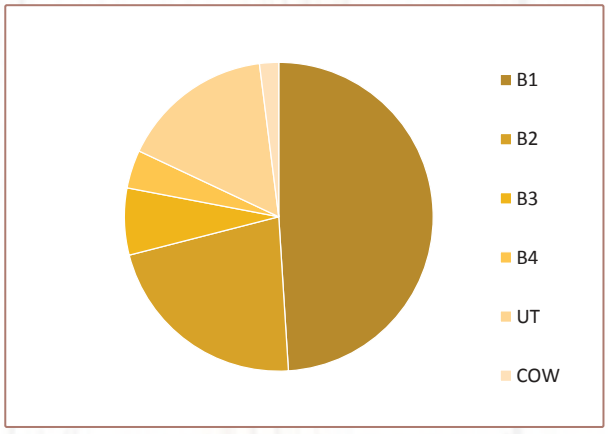
After meetings and consultations with stakeholders and various experts, the South African Cultivar & Technology Agency NPC (SACTA) was established in June 2016. SACTA has been recommended by role-players in the different industries as the body to administer the breeding and technology levy and will make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

Wheat grades

The 337 representative crop samples were graded as follows: 39% was graded B1, 27% was graded B2, 10% was graded B3, 8% was graded B4, 14% UT (Utility Grade) and 2% COW (Class Other Wheat). The majority of the samples (77%) downgraded to Utility Grade was as a result of the percentage of either screenings or other grain and unthreshed ears in combination with the combined deviations exceeding the maximum allowable level for grades B1 to B4. Most of these downgraded samples originated from the Western Cape.

Grade B1 wheat in the Free State province amounted to 71% (52% in the previous season). In the Irrigation areas 52% (60% in the previous season) of the wheat was graded as B1 and in the Western Cape Province 22% was graded as B1 (37% in the previous season).

Graph 17: Percentage of samples per class and grade in the 2015/2016 season



Graph 18: Percentage of samples per class and grade in the 2016/2017 season