

## Results for the 2016/17 season maize evaluation

Cultivar selection is one of the most important decisions, which a farmer has to make each season because it affects yield and quality of the crop. Maize seed is developed based on altitude, rainfall, soil type temperature and various other climatic conditions. It is therefore of utmost importance that a farmer selects the best cultivar for a particular maize growing region in order to obtain optimum yields. The Agricultural Research Council - Grain Crops (ARC – GC) provides an independent evaluation of maize cultivars from various seed companies in an effort to aid the farmers in selecting the best cultivar for every maize production region in South Africa.

Maize yield adaptability and stability trials were carried out in conjunction with seed companies in six regions comprising of the Water Table (Region 1), Western (Region 2), Temperate eastern (Region 3), Cold eastern (Region 4), KwaZulu-Natal (Region 5) and Short growers (Region 6). The maize crop grown in the Water Table, Western, and Eastern areas was grown under rain fed conditions while the Short Growers region was established under irrigation. Fifty-nine medium and long season maize hybrids were planted in the Western and Eastern maize growing regions of South Africa. Forty-one cultivars comprising of popular and new commercial hybrids were planted in the Western maize growing areas furthermore, 34, 41 and 36 hybrids were planted in the Water Table region, Temperate Eastern and Cold Eastern regions respectively. Twenty-two short and ultra-short season maize hybrids were planted on 28 localities in the Western and Eastern maize growing regions of South Africa.

**Tables 1, 6, 11, 16, 21, 26 & 31** illustrates the results of statistically analysed yield data obtained from varying range of growing conditions giving a good indication of each variety's potential. Data from some of the localities with coefficient of variation (CV) values above 20% was discarded and is not represented in this report. This report includes data on new cultivars that were added in the 2016/17 season and this allows comparison with the other established varieties in the market.

**Tables 2, 7, 12, 17, 22, 27 & 32** shows the diagnostic parameters that were used to determine suitability of trials.

The genetic coefficient of variation (GCV) – Relates to the yield difference between the highest and lowest in comparison with the mean. High GCV values shows likelihood of disease sensitivity, varying maturity stage and temperature sensitivity.

Repeatability of genotype mean yield ( $t_n$ ) – Denotes the relationship of genetic variance of observed means. The value is useful if only the number of replications varies within trials.  
Repeatability of plot yield (t)- or interclass correlation coefficient

Standard Error (SE) t – Shows the standard error of the intra class correlation and also the accuracy of (t) calculation. Less than 3 values show low reliability.

**Tables 3, 8, 13, 18, 23, 28 & 33** shows the results of regression analysis. The slope of the regression line indicates the yields tendency. If the slope is greater than 1.0, it indicates a higher potential cultivar; smaller than 1.0 value indicates a lower potential cultivar while a near or equal to 1.0 indicates a widely adapted cultivar. The yield stability is indicated by the D-values. Cultivars with a D-value near zero are expected to be more stable, the greater the D-values the more the yield would vary between the growing environments.

The yield probability values are shown in tables **4, 9, 14, 19, 24, 29 & 34** Yield probability values are important in selecting cultivars. The yield probability of a cultivar is the chance to get an above average yield at a particular yield potential. If the yield probability of a cultivar is 80%, the chance to get a yield

above the mean of all cultivars is eight out of ten with a two out of ten chance of obtaining a yield below the mean.

**Tables 5, 10, 15, 20, 25, 30 and 35** give an indication of the agronomic characteristics of cultivars over the past season.