



# National Groundnut Cultivar Evaluation 2017

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## **SUMMARY**

Since the 2006/07 season the National Groundnut Cultivar trials were conducted within the groundnut production areas of South Africa. The last evaluation was conducted during the 2011/12 season after which these trials were replaced by the Evaluation trials of registered cultivars and international cultivars being tested for adaptation to South African conditions. An initiative from the groundnut industry initiated the 2016/2017 National groundnut cultivar evaluation where current locally registered cultivars from different companies as well as some breeding lines from the ARC was tested within the groundnut production areas of South Africa. The most outstanding cultivar which performed well under both dryland and irrigation conditions, across the groundnut production area of South Africa is ARC-SelliePlus. The information contained within this report is of great importance for the Groundnut Industry as this information is necessary by producer to do cultivar selection as well as for the seed producers to establish areas in which cultivars performs.

## **INTRODUCTION**

The importance of adaptation, yield and quality are highlighted in conducting the groundnut evaluation trials. The data obtained is of great value as this has been proven by the previous groundnut trials as well as with evaluation trials conducted on other crops.

Promising developmental lines as well as registered cultivars are evaluated by accumulated trial data to ensure the availability of the latest relevant data for the producer and industry. It is critical to evaluate the different lines across the major groundnut production areas as it will give better insight into the adaptation over different seasons. This data is used to compile a National Groundnut Cultivar Evaluation report.

Since the cultivar evaluations was put on hold in 2012, the groundnut Industry has come together to restart the evaluation trials in order to obtain critical information that is needed by the Industry and producers in order to make informative decisions. During the October 2016 Groundnut forum meeting a work group was establish to co-ordinate the 2016\17 trial planting and within 9(nine) days after initiation the 8(eight) available trials were sent out. Mr Lourens de Kock graciously committed himself to be the coordinator for this project.

## **MATERIAL AND METHODS**

Twelve (12) registered cultivars for three companies (ARC, Contrywide Nuts and Golden Peanut) and eight potential cultivar breeding lines from the ARC were tested at eight different localities. Each of these localities has a unique climate and soil-type, which is representative of the groundnut-production areas of South Africa. The trials were divided into two groups: Irrigated (three) and dryland trials (five). A complete randomized block design was used for the trial layout. Three replicates per trail was used. Each trial delivered crucial data according to the area in which it was cultivated and the treatments applied. Standard agricultural practices were employed. Planting dates were between 15 – 30 November with Prieska planted on 10 December and Delareyville and Schweizer Reneke being plated late in December. It is critical to adhere to prescribed planting dates as deviation from those dates may result in major yield

losses. All trials were harvested at 150 days after planting to ensure uniformity over all the trials.

## RESULTS

Only registered cultivars' results will be discussed. Table 1-14 also contains results from the 8 ARC-Breeding lines that were included in the trails. From the results obtained PC480-K14 and PC435-K4 has shown potential.

### Irrigation trials

#### Pod yield (Table 1)

The overall performers across all three localities were ARC-SelliePlus (3,5 t ha<sup>-1</sup>), GP023 (3,4 t ha<sup>-1</sup>) and Anel (3,2 t ha<sup>-1</sup>) respectively.

Per locality the following results was obtained:

At Hartswater GP023 ( 5,1 t ha<sup>-1</sup>), Tufa (4,8 t ha<sup>-1</sup>) and ARC-SelliePlus (4,7 t ha<sup>-1</sup>) were the top performers respectively .

At Prieska ARC-Sellieplus (3,9 t ha<sup>-1</sup>), GP023 (3,6 t ha<sup>-1</sup>) and Anel (3,4 t ha<sup>-1</sup>) were the top performers respectively.

At Delareyville Anel (1,9 t ha<sup>-1</sup>), ARC-SelliePlus (1,8 t ha<sup>-1</sup>) and ARC-Oleic2 (1,7 t ha<sup>-1</sup>) were the top performers respectively. It must be noted that the trial at Delareyville were planted late in December which is outside the prescribed planting dates for groundnut production.

#### Kernel yield (Table 2)

The overall best performers across all three localities were GP023 (2,6 t ha<sup>-1</sup>), ARC-SelliePlus (2,6 t ha<sup>-1</sup>) and Anel (2,4 t ha<sup>-1</sup>) respectively.

Per locality the following results was obtained:

At Harts water GP023 (3,9 t ha<sup>-1</sup>), ARC-SelliePlus (3,6 t ha<sup>-1</sup>) and Tufa (3,6 t ha<sup>-1</sup>) were the top performers respectively.

At Prieska GP023 (2,6 t ha<sup>-1</sup>), ARC-SelliePlus (2,6 t ha<sup>-1</sup>) and Anel (2,4 t ha<sup>-1</sup>) were the top performers respectively.

At Delareyville ARC-SelliePlus (1,4 t ha<sup>-1</sup>), Anel (1,3 t ha<sup>-1</sup>) and Akwa (1,3 t ha<sup>-1</sup>) were the top performers respectively. The difference between the pod- and kernel yield is attributed by the shelling percentage (%) which is influenced by weather conditions, production practices as well as the maturity level of the cultivar.

#### Shelling percentage (Table 3)

The overall best performers across all three localities were Tufa, GP023 and GP033 with an average shelling percentage of 76%. At Hartswater the best performers were ARC-AkwaPlus, ARC-Opal and GP023 with a shelling percentage of 77%. The trial average was 75%. At Prieska the best performer was Tufa with a shelling percentage of 79%. The trials average was 74%. At Delareyville the best performer was Akwa with a shelling percentage of 76%. The trials average was 72%.

#### Percentage choice grade (Table 4)

The overall best performers over all three localities were ARC-SelliePlus (85%), ARC-Opal (82%) and Akwa (82%) respectively.

At Hartwater the best performers were ARC-SelliePlus (87%), ARC-Opal (87%) and GP033 (86%) with a trial average of 75%.

At Prieska the best performers were Tufa (84%), ARC-SelliePlus (82%) and GP023 (81%) with a trial average of 79%.

At Delareyville the best performers were Akwa (87%), ARC-SelliePlus (85%) and Anel (84%) with a trial average of 76%.

### **Standard-, diverse- and crushing grade (Table 5-7)**

None of the registered cultivars produced Standard grade gradings as all the cultivars produced Choice grade gradings. The only breeding line that produced Standard grade gradings at one locality (Hartswater) was PC 435-K6 (76%)

The highest trial mean for Diverse grade (Table 6) under the irrigation conditions was obtained at Prieska with a mean of 18%. The cultivar producing the highest percentage diverse grade at Hartswater was Tufa with 29%, at Prieska was GP035 with 25% and at Delareyville it was ARC-Oleic with 20%.

The highest trial mean for Crushing grade (Table 7) was obtained at Delareyville with a mean of 7%. The cultivar producing the highest percentage crushing grade at Hartswater was Tufa with 11%, at Prieska Tufa and Namib both producing 5% and at Delareyville GP023 with 32%.

### **Dryland trials**

#### **Pod yield (Table 8)**

The overall performers across all five localities were ARC-SelliePlus (4,9 t ha<sup>-1</sup>), Anel (4,2 t ha<sup>-1</sup>) and GP035 (4,3 t ha<sup>-1</sup>) respectively.

Per locality the following results was obtained:

At Bultfontein Anel (6,2 t ha<sup>-1</sup>), GP023 (6,0 t ha<sup>-1</sup>) and ARC-SelliePlus (5,9 t ha<sup>-1</sup>) were the top performers respectively .

At Setlagole Anel (3,7 t ha<sup>-1</sup>), ARC-SelliePlus (3,6 t ha<sup>-1</sup>) and Tufa (3,3 t ha<sup>-1</sup>) were the top performers respectively.

At Hoopstad ARC-SelliePlus (5,5 t ha<sup>-1</sup>), Anel (4,7 t ha<sup>-1</sup>) and ARC-Oleic2 (4,5 t ha<sup>-1</sup>) were the top performers respectively.

At Bothaville ARC-SelliePlus (6,6 t ha<sup>-1</sup>), Akwa (6,2 t ha<sup>-1</sup>) and GP035 (6,1 t ha<sup>-1</sup>) were the top performers respectively.

At Schweizer Reneke ARC-SelliePlus (3,0 t ha<sup>-1</sup>), Anel (2,9 t ha<sup>-1</sup>) and GP023 (2,6 t ha<sup>-1</sup>) were the top performers respectively. It must be noted that the trial at Schweizer Reneke were planted late in December which is outside the prescribed planting dates for groundnut production.

#### **Kernel yield (Table 9)**

The overall best performers across all three localities were GP023 (2,6 t ha<sup>-1</sup>), ARC-SelliePlus (2,6 t ha<sup>-1</sup>) and Anel (2,4 t ha<sup>-1</sup>) respectively.

Per locality the following results was obtained.:

At Bultfontein Anel (4,8 t ha<sup>-1</sup>), ARC-SelliePlus (4,4 t ha<sup>-1</sup>) and Tufa (4,3 t ha<sup>-1</sup>) were the top performers respectively .

At Setlagole Anel (2,9 t ha<sup>-1</sup>), ARC-Opal (2,6 t ha<sup>-1</sup>) and Tufa (2,6 t ha<sup>-1</sup>) were the top performers respectively.

At Hoopstad ARC-SelliePlus (4,4 t ha<sup>-1</sup>), Anel (3,6 t ha<sup>-1</sup>) and Tufa (3,5 t ha<sup>-1</sup>) were the top performers respectively.

At Bothaville ARC-SelliePlus (4,9 t ha<sup>-1</sup>), Akwa (4,9 t ha<sup>-1</sup>) and Anel (4,7 t ha<sup>-1</sup>) were the top performers respectively.

At Schweizer Reneke ARC-SelliePlus (2,2 t ha<sup>-1</sup>), Anel (2,2 t ha<sup>-1</sup>) and Tufa (2.0 t ha<sup>-1</sup>) were the top performers respectively.

The difference between the pod- and kernel yield is attributed by the shelling percentage (%) which is influenced by weather conditions, production practices as well as the maturity level of the cultivar.

### **Shelling percentage (Table 10)**

The overall best performers across all three localities were Tufa, GP033 and Anel with an average shelling percentage of 78%.

At Bultfontein the best performers were Tufa, ARC-Opal, GP023 and Anel with a shelling percentage of 78%. The trial average was 75%.

At Setlagole the best performer was Kwarts with a shelling percentage of 79%. The trials average was 76%.

At Hoopstad the best performer was ARC-SelliePlus with a shelling percentage of 80%. The trials average was 75%.

At Bothaville the best performers were ARC-AkwaPlus, GP033 and Anel with a shelling percentage of 80%. The trials average was 77%.

At Schweizer Reneke the best performer was Tufa with a shelling percentage of 77%. The trials average was 73%.

### **Percentage choice grade (Table 11)**

The overall best performer over all five localities was ARC-SelliePlus (86%). At Bultfontein the best performer was ARC-SelliePlus (91%) with a trial average of 76%. At Setlagole the best performer was Kwarts (93%) with a trial average of 84%. At Hoopstad the best performer was ARC-Opal (88%) with a trial average of 69%. At Bothaville the best performer was Akwa (91%) with a trial average of 76%. At Schweizer Reneke the best performer was ARC-SelliePlus (80%) with a trial average of 70%.

### **Standard-, diverse- and crushing grade (Table 12-14)**

Two of the registered cultivars produced Standard grade gradings while the rest of the cultivars produced Choice grade gradings. Tufa produced as standard grade grading at Hoopstad of 84%. ARC-Oleic produced standard grade gradings at Bultfontein of 69%, at Hoopstad of 73% and at Bothaville of 76%.

The highest trial mean for Diverse grade (Table 13) was obtained at Schweizer Reneke with a mean of 20%. The cultivar producing the highest percentage diverse grade at Bultfontein was Akwa with 38%, at Setlagole was Namib with 23%, at Hoopstad was GP033 with 16%, at Bothaville was GP035 with 16% and at Schweizer Reneke it was Namib with 32%.

The highest trial mean for Crushing grade (Table14) was obtained at Schweizer Renele with a mean of 10%. The cultivar producing the highest percentage crushing grade at Bultfontein was ARC-Oleic with 15%, at Setlagole ARC-Oleic with 5%, at Hoopstad ARC-Oleic with 14%, At Bothaville ARC-Oleic with 11% and at Schweizer Reneke Namib with 20%.

## **CONCLUSION**

Climatic conditions this past season had a profound impact on yield that was obtained under dryland conditions as the natural timing of rain was in sync with the needs of the groundnut crop, thus producing good quality yields. Overall the season produced little diverse and crushing grading within all samples graded, other than the highlighted cultivars within this report. Disease pressure was highlighted during the prolonged period of rain during the January-February period which was favourable for the outbreak of Webblotch, Botrytis blight, Schlerotinia stem rot as well as the presence of Groundnut Rust once the rains eased. During good rainfall seasons it is evident that the genetic possibility for high yield is present in South African groundnut cultivars.

The most outstanding cultivar during this current trail period is ARC-SelliePlus. This new cultivar has shown a stability over both irrigated and dryland condition. It is recommended that adhering to planting periods as well as correct production practises is used to ensure a good quality high yielding crop.



Table 1 The pod yield (kg/ha) of each cultivar and line at the different localities under irrigation conditions, 2016/17

Cultivar	Harts water	Dela rey ville	Pries ka	Mean
Akwa	4205	1707	3254	3055
GP035	2978	1586	3421	2662
Tufa	4823	1382	2952	3052
PC 435-K2	4226	1565	3184	2992
ARC-Oleic2	2718	1753	3494	2655
PC 471-K19	3693	1560	3281	2845
ARC-AkwaPlus	3658	1149	3109	2639
PC 435-K4	5009	1603	3693	3435
PC 474-K9	4582	1742	3082	3135
ARC-SelliePlus	4779	1851	3892	3508
PC 472-K3	2815	1481	2995	2430
PC 435-K6	4436	1219	3125	2927
ARC Opal	3189	1509	3396	2698
PC 480-K14	3573	1435	2922	2643
PC 481-K3	3479	1529	3463	2824
GP033	4109	1483	3289	2960
Namib	3179	1375	3270	2608
GP023	5121	1664	3698	3495
Anel	4444	1912	3456	3271
Kwarts	2983	845	2577	2135
Mean	3900	1518	3278	2898
LSD (5%)	2006	772	958	
CV	31	31	18	

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Table 2 The Kernel yield (kg/ha) of each cultivar and line at the different localities under irrigation conditions, 2016/17

Cultivar	Harts water	Delarey Ville	Prie ska	Mean
Akwa	3143	1290	2470	2301
GP035	2245	1136	2325	1902
Tufa	3624	1009	2333	2322
PC 435-K2	3004	1136	2067	2069
ARC-Oleic2	2027	1282	2692	2001
PC 471-K19	2639	1062	2275	1992
ARC-AkwaPlus	2806	780	2421	2003
PC 435-K4	3726	1163	2566	2485
PC 474-K9	3568	1244	2253	2355
ARC-SelliePlus	3627	1380	2799	2602
PC 472-K3	2085	1078	2213	1792
PC 435-K6	3183	841	2294	2106
ARC Opal	2464	1044	2584	2031
PC 480-K14	2767	983	2059	1936
PC 481-K3	2637	1074	2536	2082
GP033	3131	1113	2526	2256
Namib	2383	1007	2340	1910
GP023	3968	1224	2810	2667
Anel	3354	1375	2678	2469
Kwarts	2273	619	1985	1625
Mean	2933	1092	2411	2145
LSD (5%)	1514	558	699	
CV	31	31	18	

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Table 3 Shelling percentage (%) of each cultivar and Line at the different localities under irrigation conditions, 2016/17

Cultivar	Harts water	Dela rey ville	Prie ska	Mean
Akwa	75	76	76	75
GP035	75	72	68	72
Tufa	75	73	79	76
PC 435-K2	71	73	65	70
ARC-Oleic2	75	73	77	75
PC 471-K19	71	68	69	70
ARC-AkwaPlus	77	68	78	74
PC 435-K4	74	73	70	72
PC 474-K9	78	71	73	74
ARC-SelliePlus	76	75	72	74
PC 472-K3	74	73	74	74
PC 435-K6	72	69	73	71
ARC Opal	77	69	76	74
PC 480-K14	77	69	70	72
PC 481-K3	76	70	73	73
GP033	76	75	77	76
Namib	75	73	72	73
GP023	77	74	76	76
Anel	75	72	78	75
Kwarts	76	73	77	75
Mean	75	72	74	74

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Table 4 Percentage (%) choice grade obtained of each cultivar and line at the different localities under irrigation conditions, 2016/17

Cultivar	Harts water	Dela rey ville	Prie ska	Mean
Akwa	85	87	76	82
GP035	82	78	70	77
Tufa	61	81	84	75
PC 435-K2	81	76	84	80
ARC-Oleic2	67	81	84	77
PC 471-K19	74	72	71	72
ARC-AkwaPlus	78	80	73	77
PC 435-K4	79	79	89	82
PC 474-K9	83	79	86	83
ARC-SelliePlus	87	85	82	85
PC 472-K3	87	66	82	78
PC 435-K6	0	76	80	52
ARC Opal	87	79	80	82
PC 480-K14	79	77	85	80
PC 481-K3	71	69	72	71
GP033	86	80	76	81
Namib	73	74	78	75
GP023	82	49	81	71
Anel	83	84	74	80
Kwarts	84	75	75	78
Mean	75	76	79	77

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Table 5 Percentage (%) Standard grade obtained by each cultivar and line at the different localities under irrigation conditions, 2016/17

Cultivar	Harts water	Dela rey ville	Prie ska	Mean
Akwa	0	0	0	0
GP035	0	0	0	0
Tufa	0	0	0	0
PC 435-K2	0	0	0	0
ARC-Oleic2	0	0	0	0
PC 471-K19	0	0	0	0
ARC-AkwaPlus	0	0	0	0
PC 435-K4	0	0	0	0
PC 474-K9	0	0	0	0
ARC-SelliePlus	0	0	0	0
PC 472-K3	0	0	0	0
PC 435-K6	76	0	0	25
ARC Opal	0	0	0	0
PC 480-K14	0	0	0	0
PC 481-K3	0	0	0	0
GP033	0	0	0	0
Namib	0	0	0	0
GP023	0	0	0	0
Anel	0	0	0	0
Kwarts	0	0	0	0
Mean	4	0	0	1

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Table 6 Percentage (%) Diverse grade obtained by each cultivar and line at the different localities under irrigation conditions, 2016/17

Cultivar	Harts water	Dela rey ville	Prie ska	Mean
Akwa	12	9	22	14
GP035	15	16	25	18
Tufa	29	14	11	18
PC 435-K2	14	16	14	15
ARC-Oleic2	26	12	13	17
PC 471-K19	19	20	26	22
ARC-AkwaPlus	19	15	24	20
PC 435-K4	14	15	10	13
PC 474-K9	14	15	11	13
ARC-SelliePlus	9	11	16	12
PC 472-K3	8	26	16	17
PC 435-K6	16	19	20	18
ARC Opal	11	16	18	15
PC 480-K14	18	15	13	15
PC 481-K3	22	22	27	23
GP033	11	15	22	16
Namib	20	18	17	18
GP023	13	19	16	16
Anel	12	13	23	16
Kwarts	12	19	22	18
Mean	16	16	18	17

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Table 7 Percentage (%) Crushing grade obtained by each cultivar and line at the different localities under irrigation conditions, 2016/17

Cultivar	Harts water	Dela rey ville	Prie ska	Mean
Akwa	4	4	3	3
GP035	3	6	5	5
Tufa	11	5	5	7
PC 435-K2	5	8	2	5
ARC-Oleic2	8	7	4	6
PC 471-K19	7	8	3	6
ARC-AkwaPlus	3	5	3	3
PC 435-K4	7	7	2	5
PC 474-K9	4	6	3	4
ARC-SelliePlus	4	4	3	4
PC 472-K3	5	9	2	5
PC 435-K6	8	5	1	5
ARC Opal	3	5	2	3
PC 480-K14	4	8	2	4
PC 481-K3	8	9	2	6
GP033	3	5	2	3
Namib	8	8	5	7
GP023	5	32	3	13
Anel	5	3	4	4
Kwarts	5	6	3	5
Mean	5	7	3	5

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Table 8 The pod yield (kg/ha) of each cultivar and line at the different localities under dryland conditions, 2016/17

Cultivar	Bult fon tein	Set la gole	Hoop stad	Botha ville	Schwei zer Reneke	Mean
Akwa	5352	3257	4190	6275	2107	4236
GP035	5513	3213	4401	6191	2394	4343
Tufa	5590	3373	4524	4800	2551	4168
PC 435-K2	5093	3266	5190	6210	2424	4437
ARC-Oleic2	4075	3413	4591	2695	2387	3432
PC 471-K19	5949	2739	4153	4720	1782	3869
ARC-AkwaPlus	5494	3124	4129	5282	2471	4100
PC 435-K4	5505	3435	5371	5474	2277	4412
PC 474-K9	5862	2922	4938	5633	2614	4394
ARC-SelliePlus	5870	3592	5552	6681	2994	4938
PC 472-K3	5188	2899	3884	5754	2832	4111
PC 435-K6	5722	3255	5241	6132	2838	4638
ARC Opal	4891	3362	4320	5836	2285	4139
PC 480-K14	6093	3712	5689	5572	2408	4695
PC 481-K3	4274	3329	4699	4261	2261	3765
GP033	5152	3210	4058	5395	2304	4024
Namib	4996	3164	3792	5319	2439	3942
GP023	6046	3064	3890	5361	2600	4192
Anel	6212	3711	4726	5958	2964	4714
Kwarts	4677	3165	3333	4828	2022	3605
Mean	5378	3260	4534	5419	2448	4208
LSD (5%)	740	545	1012	1297	863	
CV	8	10	14	15	21	

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Table 9 The kernel yield (kg/ha) of each cultivar and line at the different localities under dryland conditions, 2016/17

Cultivar	Bult fon tein	Set la gole	Hoop stad	Botha ville	Schwei zer Reneke	Mean
Akwa	4062	2534	3186	4936	1569	3258
GP035	4121	2440	3288	4643	1666	3231
Tufa	4351	2627	3527	3772	1956	3247
PC 435-K2	3640	2420	3759	4320	1788	3185
ARC-Oleic2	2994	2651	3361	2076	1711	2558
PC 471-K19	4198	1957	2727	3324	1168	2675
ARC-AkwaPlus	4202	2390	3067	4215	1842	3143
PC 435-K4	4052	2546	3972	4048	1616	3247
PC 474-K9	4404	2226	3618	4224	1838	3262
ARC-SelliePlus	4386	2712	4443	4993	2191	3745
PC 472-K3	3859	2170	2935	4406	2069	3088
PC 435-K6	4175	2411	3782	4653	2075	3419
ARC Opal	3792	2615	3386	4585	1717	3219
PC 480-K14	4465	2798	3861	4163	1759	3409
PC 481-K3	3188	2627	3536	3356	1667	2875
GP033	3994	2509	3204	4340	1743	3158
Namib	3845	2444	2839	4181	1829	3028
GP023	4295	2366	2954	4261	1939	3163
Anel	4823	2900	3689	4782	2258	3690
Kwarts	3333	2503	2618	3829	1514	2759
Mean	4009	2492	3388	4155	1796	3168
LSD (5%)	549	415	762	982	632	
CV	8	10	14	14	21	

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Table 10 Shelling percentage (%) of each cultivar and line at the different localities under dryland conditions, 2016/17

Cultivar	Bult fon tein	Set la gole	Hoop stad	Botha ville	Schwei zer Reneke	Mean
Akwa	76	78	76	79	75	77
GP035	75	76	75	75	70	74
Tufa	78	78	78	79	77	78
PC 435-K2	71	74	72	70	74	72
ARC-Oleic2	73	78	73	77	72	75
PC 471-K19	71	71	66	70	66	69
ARC-AkwaPlus	76	77	74	80	75	76
PC 435-K4	74	74	74	74	71	73
PC 474-K9	75	76	73	75	70	74
ARC-SelliePlus	75	76	80	75	73	76
PC 472-K3	74	75	76	77	73	75
PC 435-K6	73	74	72	76	73	74
ARC Opal	78	78	78	79	75	77
PC 480-K14	73	75	68	75	73	73
PC 481-K3	75	79	75	79	74	76
GP033	78	78	79	80	76	78
Namib	77	77	75	79	75	77
GP023	71	77	76	79	75	76
Anel	78	78	78	80	76	78
Kwarts	71	79	79	79	75	77
Mean	75	76	75	77	73	75

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Table 11 Percentage (%) Choice grade obtained by each cultivar and line at the different localities under dryland conditions, 16/17

Cultivar	Bult fon tein	Set la gole	Hoop stad	Botha ville	Schwei zer Reneke	Mean
Akwa	60	87	80	91	76	79
GP035	80	78	77	79	65	76
Tufa	75	83	0	83	60	60
PC 435-K2	84	85	85	86	73	82
ARC-Oleic2	0	89	0	0	68	31
PC 471-K19	83	79	76	82	60	76
ARC-AkwaPlus	89	87	81	83	77	83
PC 435-K4	86	83	80	82	68	80
PC 474-K9	88	87	81	80	63	80
ARC-SelliePlus	91	86	83	89	80	86
PC 472-K3	91	84	84	88	77	85
PC 435-K6	0	78	85	85	80	66
ARC Opal	89	87	88	86	70	84
PC 480-K14	87	84	0	86	65	65
PC 481-K3	84	81	77	0	76	64
GP033	89	90	80	84	79	84
Namib	77	73	81	80	49	72
GP023	86	87	83	87	76	84
Anel	89	88	83	86	76	84
Kwarts	86	93	87	87	69	84
Mean	76	84	69	76	70	75

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Table 12 Percentage (%) Standard grade obtained by each cultivar and line at the different localities under dryland conditions, 16/17

Cultivar	Bult fon tein	Set la gole	Hoop stad	Botha ville	Schwei zer Reneke	Mean
Akwa	0	0	0	0	0	0
GP035	0	0	0	0	0	0
Tufa	0	0	84	0	0	17
PC 435-K2	0	0	0	0	0	0
ARC-Oleic2	69	0	73	76	0	43
PC 471-K19	0	0	0	0	0	0
PC 478-K5	0	0	0	0	0	0
PC 435-K4	0	0	0	0	0	0
PC 474-K9	0	0	0	0	0	0
PC 435-K5	0	0	0	0	0	0
PC 472-K3	0	0	0	0	0	0
PC 435-K6	64	0	0	0	0	13
ARC Opal	0	0	0	0	0	0
PC 480-K14	0	0	0	0	0	0
PC 481-K3	0	0	0	73	0	15
GP033	0	0	0	0	0	0
Namib	0	0	0	0	0	0
GP023	0	0	0	0	0	0
Anel	0	0	0	0	0	0
Kwarts	0	0	0	0	0	0
Mean	7	0	8	7	0	4

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Table 13 Percentage (%) Diverse grade obtained by each cultivar and line at the different localities under dryland conditions, 16/17

Cultivar	Bult fon tein	Set la gole	Hoop stad	Botha ville	Schwei zer Reneke	Mean
Akwa	38	11	13	7	17	17
GP035	16	19	15	16	24	18
Tufa	19	14	7	12	28	16
PC 435-K2	10	11	11	10	16	12
ARC-Oleic2	17	7	13	14	20	14
PC 471-K19	13	17	15	13	24	16
ARC-AkwaPlus	8	11	12	11	18	12
PC 435-K4	10	15	12	14	22	14
PC 474-K9	9	10	13	15	23	14
ARC-SelliePlus	7	11	12	8	15	11
PC 472-K3	6	14	11	9	15	11
PC 435-K6	16	19	10	13	13	14
ARC Opal	7	11	9	9	20	11
PC 480-K14	10	12	81	9	23	27
PC 481-K3	11	16	16	19	17	16
GP033	9	8	16	12	14	12
Namib	17	23	10	14	32	19
GP023	8	12	10	10	18	11
Anel	7	10	12	11	18	11
Kwarts	11	6	8	9	21	11
Mean	12	13	15	12	20	14

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Table 14 Percentage (%) Crushing grade obtained by each cultivar and line at the different localities under dryland conditions, 2016/17

Cultivar	Bult fon tein	Set la gole	Hoop stad	Botha ville	Schwei zer Reneke	Mean
Akwa	3	3	8	3	7	5
GP035	4	4	9	5	11	7
Tufa	6	3	10	5	12	7
PC 435-K2	7	4	4	4	11	6
ARC-Oleic2	15	5	14	11	13	12
PC 471-K19	5	4	10	5	16	8
ARC-AkwaPlus	4	3	7	6	5	5
PC 435-K4	5	2	8	5	10	6
PC 474-K9	4	4	7	6	14	7
ARC-SelliePlus	2	3	5	4	6	4
PC 472-K3	3	2	5	4	8	4
PC 435-K6	20	3	5	3	7	8
ARC Opal	5	2	4	5	10	5
PC 480-K14	3	5	20	5	12	9
PC 481-K3	5	4	8	8	7	6
GP033	2	2	4	4	7	4
Namib	6	4	9	6	20	9
GP023	6	1	7	3	6	5
Anel	4	2	6	3	6	4
Kwarts	4	2	6	4	10	5
Mean	6	3	8	5	10	6

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