



2021 National Cultivar Evaluation results in the Free State

Good yields in a challenging, excessively wet season

In the recent past, drought has been the major challenge for dryland wheat farmers in the Free State Province. However, 2021 was an exception as producers faced a new challenge of excessive rain at harvest.

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ARC-SMALL GRAIN, BETHLEHEM

Most dryland wheat producers traditionally plant on high water table soils to ensure adequate moisture supply during the dry periods. However, such lands are also highly susceptible to flooding damage in wet seasons.

Excellent spring rain was recorded in the Eastern and North Western Free State in 2021, and this translated into higher average yields of up to 5,5 t/ha for some of the high-yield potential cultivars. Extremely high rainfall figures were also recorded during wheat ripening and this unfortunately resulted in a delayed harvesting process. Subsequently, many cultivars evaluated in 2021 had serious problems with sprouting in the ear and reduced falling numbers.

Conditions experienced this season emphasise the need for dryland producers to consider not only their yield, but also sprouting tolerance and lodging resistance when making cultivar choices.

For 2021, four dryland trials were planted under ARC-Small

Grain's (ARC-SGs) national cultivar evaluation programme in the North Western and Eastern Free State. The trials were all successful, despite the heavy rainfall conditions during the harvest time.

A total of 17 cultivars were provided by three institutions, namely ARC-SG, Sensako and Pannar, for the 2021 programme, and there were no new entries. Data from these trials was included in the project report and submitted to the National Cultivar Evaluation Workgroup.

In **Tables 1 to 4**, the yield results for the 2021 season, as well as two-, three- and four-year results for each region and planting date, are presented.

More detailed information on the performance of irrigation wheat cultivars is available in the production guidelines published by ARC-Small Grain on an annual basis. These include information on the one-year performance, as well as long-term data for all the production regions and different planting times. The guidelines are available to producers on the Agricultural Research Council (ARC) website (www.arc.agric.za).

For any additional information, producers are welcome to contact Lientjie Visser on 058 307 3400 or visserl@arc.agric.za.

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Table 1: North Western Free State (earlier planting).
Average yield (t/ha) of entries during the period from 2018 – 2021.

Cultivar	2021	R	2020	R	2019	R	2018	R	Four-year average 2018-2021	R	Three-year average 2019-2021	R	Two-year average 2020-2021	R
Elands	3,80	15	2,42	6	2,26	8	2,26	18	2,69	10	2,83	8	3,11	9
Gariep	3,85	14	2,26	12	2,20	9	3,14	9	2,87	8	2,77	9	3,06	11
Koonap	3,73	16	2,14	15	1,61	18	2,56	13	2,51	13	2,49	13	2,94	14
Kougas	4,02	12	2,14	14	1,89	14	3,01	10	2,76	9	2,68	11	3,08	10
Kubetu	5,35	3	2,40	7	2,37	4	3,42	6	3,38	4	3,37	3	3,88	4
Matlabas	5,07	4	2,93	1	2,50	1	3,42	5	3,48	2	3,50	1	4,00	2
Mokolo	4,45	10	2,26	13									3,36	8
PAN 3111	5,79	1	2,31	10	2,26	7	3,67	3	3,51	1	3,45	2	4,05	1
PAN 3161	4,76	8	2,53	3	2,45	3	3,84	1	3,40	3	3,25	5	3,65	7
PAN 3195							3,67	2						
PAN 3198														
PAN 3368	3,72	17	2,27	11	1,86	15	2,27	17	2,53	12	2,62	12	3,00	13
Senqu	3,97	13	2,09	16	2,08	10	2,32	16	2,61	11	2,71	10	3,03	12
SST 3149			2,38	9	1,84	16	2,79	12						
SST 3186	4,36	11												
SST 3197	4,60	9												
SST 316					1,90	12	2,49	15						
SST 317					2,27	6	2,97	11						
SST 347	4,77	7	2,38	8	2,28	5	3,21	8	3,20	6	3,20	6	3,66	6
SST 356	4,93	5	2,46	5	1,95	11	2,51	14	3,08	7	3,27	4	3,93	3
SST 387	5,41	2	2,62	2	1,90	12	3,57	4	3,24	5	3,13	7	3,74	5
SST 398					1,76	17	2,26	19						
Wedzi	4,86	6	2,53	3	2,49	2	3,29	7	2,18	14	1,81	14	1,47	15
Mean	4,56		2,38		2,10		2,98		2,96		2,93		3,33	
LSD _t (0,05)	0,40		0,14		0,14		0,16		0,10		0,12		0,18	

R = Ranking LSD = Least significant difference

Table 2: North Western Free State (later planting).
Average yield (t/ha) of entries during the period from 2018 – 2021.

Cultivar	2021	R	2020	R	2019	R	2018	R	Four-year average 2018-2021	R	Three-year average 2019-2021	R	Two-year average 2020-2021	R
Elands	4,42	12	3,52	8	1,27	12	2,82	12	3,01	11	3,07	11	3,97	11
Gariep	4,74	6	3,62	7	1,57	4	2,93	8	3,22	5	3,31	6	4,18	7
Koonap	4,01	16	3,06	14	1,45	5	2,93	7	2,86	14	2,84	14	3,54	14
Kougas	4,46	11	3,36	12	1,35	9	2,92	9	3,02	10	3,06	12	3,91	13
Kubetu	4,77	5	4,04	1	1,79	2	2,88	10	3,37	4	3,53	2	4,41	3
PAN 3111	5,21	2	3,41	11	1,67	3	4,03	1	3,58	2	3,43	4	4,31	5
PAN 3161	4,97	3	3,91	3	2,02	1	3,64	2	3,64	1	3,63	1	4,44	2
PAN 3195							3,48	3						
PAN 3368	4,39	13	3,64	6	1,40	6	2,57	18	3,00	12	3,14	9	4,02	10
Senqu	4,72	8	3,13	13	1,28	11	2,79	14	2,98	13	3,04	13	3,93	12
SST3186	4,24	14												
SST3197	4,04	15												
SST 316					1,38	7	2,71	16						
SST 317					1,26	13	3,06	6						
SST 347	4,47	10	3,81	4	1,23	16	2,80	13	3,08	9	3,17	8	4,14	8
SST 356	4,73	7	3,66	5	1,23	15	2,75	15	3,09	8	3,21	7	4,20	6
SST 374	4,81	4	3,92	2	1,23	14	2,83	11	3,20	6	3,32	5	4,37	4
SST 387	5,45	1	3,51	9	1,35	8	3,25	4	3,39	3	3,44	3	4,48	1
SST 398					1,17	17	2,64	17						
Wedzi	4,58	9	3,49	10	1,31	10	3,22	5	3,15	7	3,13	10	4,04	9
Mean	4,63		3,58		1,41		3,01		3,18		3,24		4,14	
LSD _t (0,05)	0,45		0,22		0,08		0,19		0,13		0,12		0,27	

R = Ranking LSD = Least significant difference

Table 3: Eastern Free State (earlier planting).

Average yield (t/ha) of entries during the period from 2018 – 2021.

Cultivar	2021	R	2020	R	2019	R	2018	R	Four-year average 2018-2021	R	Three-year average 2019-2021	R	Two-year average 2020-2021	R
Elands	3,16	16	2,35	13	0,71	12	1,90	14	2,03	12	2,07	12	2,75	13
Gariep	3,58	11	2,65	6	0,56	17	1,84	17	2,16	10	2,26	10	3,11	9
Koonap	3,14	17	2,54	11	0,76	10	1,98	9	2,11	11	2,15	11	2,84	12
Kougas	3,33	14	1,85	16	0,77	8	1,86	16	1,95	14	1,98	14	2,59	15
Kubetu	3,63	9	2,84	4	1,05	4	2,17	4	2,42	4	2,51	4	3,24	6
Matlabas	3,77	5	3,09	1	1,06	3	2,39	2	2,58	1	2,64	3	3,43	2
Mokolo	3,65	8	2,58	9									3,12	8
PAN 3111	4,17	2	2,62	8	1,16	2	2,24	3	2,55	2	2,65	2	3,39	4
PAN 3161	3,60	10	2,29	14	1,24	1	2,57	1	2,42	5	2,38	7	2,94	10
PAN 3195							2,07	6						
PAN 3368	3,23	15	2,25	15	0,54	18	1,92	12	1,98	13	2,01	13	2,74	14
Senqu	3,35	13	2,48	12	0,98	5	2,03	7	2,21	9	2,27	9	2,92	11
SST 3149			2,70	5	0,68	14	1,79	19						
SST 3186	3,52	12												
SST 3197	3,76	6												
SST 316					0,69	13	1,95	10						
SST 317					0,74	11	1,87	15						
SST 347	4,38	1	2,86	2	0,82	6	1,95	11	2,50	3	2,69	1	3,62	1
SST 356	3,96	3	2,85	3	0,63	15	1,83	18	2,32	7	2,48	5	3,41	3
SST 387	3,69	7	2,58	10	0,57	16	2,01	8	2,21	8	2,28	8	3,13	7
SST 398					0,77	9	1,908	13						
Wedzi	3,88	4	2,65	7	0,80	7	2,15	5	2,37	6	2,44	6	3,26	5
Mean	3,64		2,57		0,81		2,02		2,27		2,34		3,10	
LSD _t (0,05)	0,29		0,2		0,1		0,1		0,1		0,2		0,2	

R = Ranking LSD = Least significant difference

Table 4: Eastern Free State (later planting).

Average yield (t/ha) of entries during the period from 2018 – 2021.

Cultivar	2021	R	**2020	R	*2019	R	2018	R	Four-year average 2018-2021	R	Three-year average 2019-2021	R	Two-year average 2020-2021	R
Elands	3,48	8	2,78	7	0,82	4	2,20	5	2,32	7	2,36	7	3,13	7
Gariep	3,47	9	2,55	11	0,71	7	2,27	2	2,25	8	2,25	8	3,01	9
Koonap	2,90	15	2,34	14	0,98	2	2,47	1	2,17	11	2,07	14	2,62	14
Kougas	3,12	12	2,72	9	0,56	13	1,87	16	2,07	14	2,13	12	2,92	13
Kubetu	3,58	6	2,75	8	0,79	5	2,19	6	2,33	6	2,37	6	3,17	6
PAN 3111	4,09	1	2,46	13	0,65	9	2,18	7	2,35	5	2,40	5	3,28	5
PAN 3161	3,94	4	2,89	4	1,08	1	2,05	12	2,49	2	2,64	2	3,41	3
PAN 3195							1,96	14						
PAN 3368	3,93	5	2,81	6	0,65	8	2,21	4	2,40	4	2,46	4	3,37	4
Senqu	3,29	10	2,59	10	0,79	6	2,08	10	2,19	10	2,22	10	2,94	12
SST3186	2,99	14												
SST3197	2,80	16												
SST 316					0,49	16	2,07	11						
SST 317					0,62	12	1,81	17						
SST 347	3,18	11	2,99	3	0,55	14	1,93	15	2,16	12	2,24	9	3,09	8
SST 356	3,99	2	3,09	1	0,84	3	2,12	9	2,51	1	2,64	1	3,54	1
SST 374	3,08	13	2,82	5	0,62	11	2,27	3	2,20	9	2,17	11	2,95	11
SST 387	3,53	7	2,47	12	0,38	17	2,03	13	2,10	13	2,13	13	3,00	10
SST 398					0,54	15	1,79	18						
Wedzi	3,95	3	3,00	2	0,62	10	2,18	7	2,44	3	2,52	3	3,48	2
Mean	3,46		2,73		0,69		2,09		2,28		2,33		3,14	
LSD _t (0,05)	0,22		0,24		0,12		0,12		0,09		0,13		0,17	

R = Ranking LSD = Least significant difference