

Make a **sensible selection** based on 14 field trials

SAFIAH MA'ALI, WILLIAM MAKGOGA and JAN ERASMUS ARC-Grain Crops, Potchefstroom

Maintaining a high level of efficiency is the basis for the financial success of sunflower production. The selection of well-adapted cultivars is a simple and easy way to foster efficiency. To make the correct selection, information on the performance of cultivars is needed.

The aim of the sunflower cultivar trials is to generate information in order to make a sensible selection of cultivars possible.

The cultivar recommendations in this document stem from such an evaluation, made possible by collaboration between the ARC-Grain Crops and several seed companies, with financial support from the Oil and Protein Seed Development Trust.

24 cultivars, of which six were new introductions, were evaluated in 14 field trials during 2018/2019. **Table 1** shows the growing season lengths of these cultivars as well as their mean seed yields for 2017/2018 and 2018/2019.

The graphs on page 18 show sunflower seed yields for one year (**Graph 1**), two years (**Graph 2**) and three years (**Graph 3**).

1 DAYS TO FLOWERING AND SEED YIELD OF CULTIVARS EVALUATED IN 2017/2018 AND 2018/2019.

CULTIVAR	DAYS TO 50% FLOWERING MEAN	YIELD (T/HA)		
		2017/2018	2018/2019	MEAN
AGSUN 5101 CLP	71	2,23	2,16	2,20
AGSUN 5102 CLP	71	2,21	2,15	2,18
AGSUN 5103 CLP	72	2,44	2,23	2,34
AGSUN 5106 CLP	72	2,43	2,28	2,36
AGSUN 5270	67	2,46	2,38	2,42
AGSUN 5273	69	2,29	2,06	2,18
AGSUN 5278	69	2,26	2,07	2,17
AGSUN 8251	70	2,35	2,31	2,33
LG 5678 CLP	71	-	2,04	2,04
LG 5710	69	-	2,19	2,19
P 64 LL 23	67	-	2,33	2,33
P 65 LC 17	68	-	2,31	2,31
P 65 LL02	70	2,52	2,35	2,44
P 65 LL14	69	2,37	2,27	2,32
P 65 LP 54	69	2,40	2,22	2,31
PAN 7080	67	2,43	2,37	2,40
PAN 7100	68	2,51	2,23	2,37
PAN 7102 CLP	67	2,42	2,39	2,41
PAN 7156 CLP	69	2,45	2,31	2,38
PAN 7158 HO	71	2,33	2,22	2,28
PAN 7160 CLP	69	2,59	2,26	2,43
PHB 65A70	67	2,42	-	2,42
SY 3970 CL	70	2,11	2,02	2,07
SY 3975 CLOH	69	-	1,84	1,84
SY Arizona	67	-	2,24	2,24

Yield probability

A cultivar's yield probability is the chance to realise an above average yield at a particular yield potential. For instance, if the yield probability of a cultivar at a particular yield potential equals 60%, the chance to realise a yield above the mean of all cultivars is 60%, with a 40% chance of obtaining a yield below the mean.

Table 2 (on page 17) shows yield probability values for the cultivars tested in 2018/2019. Since new cultivars are introduced and some removed annually, a multi-season reliability analysis is only possible for a limited number of cultivars. **Table 3** (on page 17) shows yield probability values for 18 cultivars that were evaluated in 23 trials during 2017/2018 and 2018/2019. **Table 4** (on page 18) shows yield probability values for twelve cultivars that were evaluated in 35 trials during the 2016/2017 to 2018/2019 growing season.

Table 3 and Table 4 can be used to select a core of cultivars. This selection can be expanded with cultivars selected from Tables 1 and 2. It is advisable to grow more than one cultivar and to include new cultivars on a limited scale only.

Cultivar selection from the yield probability table

Determine the yield potential for a particular field and set a yield target. The long-term mean yield of a particular field is usually a good indicator of the yield potential and can therefore serve as a yield target. Consult the yield probability tables next.

Cultivars with the highest yield probability values, in the column below a particular yield potential, are those with the best chance to perform well under the particular conditions.

Tips to optimise sunflower yields

1. Choosing the correct hybrid is one of the key decisions every grower has to make before the beginning of a season. Growers should consider not only the yield, but also yield stability, yield potential and yield probability according to a realistic yield potential for each field.
2. Planting date: Plantings during November up to mid-December will benefit yield significantly as opposed to late season plantings in January or even February.
3. Planting depth: A general recommendation for planting depth is an extreme challenge. In most cases sandy soils that tend to dry out quicker will necessitate a deeper planting depth. Avoid poorly drained soils as well as highly acidic soils.
4. It is essential to run a millipede rotary harrow (*duisendpoet*) over your newly planted crop three to four days after planting, since a hard crust will cause a poor stand.
5. Plant population should be based on soil type, rainfall and yield potential. Keep to the optimal plant population of 35 000 to 42 000 plants per hectare and maintain a row width of 0,91cm.
6. Crop rotation: Do not plant the same crop in the same field year after year. A two- or three-year rotation cycle is necessary to control diseases.
7. Appropriate fertilisation is important and plays an important role in yields achieved. A fertiliser programme must always be based on scientific soil analysis. If at all possible, do not apply the full nitrogen requirement in one application. Rather apply half during planting and the other half at 30 to 40 days after emergence.
8. Another vital key to achieving a good sunflower yield is good weed control – especially in the first 45 days of a young seedling's life. Clearfield hybrids allow growers to address this issue shortly after emergence with the application of a post-emergence herbicide. Growers should not neglect to apply a pre-emergence grass herbicide during planting. ➔

← MAKE A SENSIBLE SELECTION...

2 THE YIELD PROBABILITY (%) OF CULTIVARS EVALUATED IN 2018/2019 AT DIFFERENT YIELD POTENTIALS.

CULTIVAR	YIELD POTENTIAL (T/HA)					
	1,0	1,5	2,0	2,5	3,0	3,5
AGSUN 5101 CLP	47	46	44	43	42	41
AGSUN 5102 CLP	67	57	43	31	21	15
AGSUN 5103 CLP	37	42	46	52	56	61
AGSUN 5106 CLP	14	25	44	65	81	90
AGSUN 5270	66	72	76	81	82	84
AGSUN 5273	32	29	27	26	26	26
AGSUN 5278	41	36	30	25	22	20
AGSUN 8251	79	79	75	72	67	63
LG 5678 CLP	38	29	21	15	11	90
LG 5710	39	41	43	46	47	50
P 64 LL 23	80	74	66	55	45	36
P 65 LL 02	48	60	72	81	88	91
P 65 LL 14	50	59	67	75	81	84
P 65 LP 54	48	48	46	46	45	45
P 65 LC 17	63	63	61	60	57	55
PAN 7080	60	68	75	80	84	86
PAN 7100	84	71	53	33	18	90
PAN 7102 CLP	81	82	82	80	78	75
PAN 7156 CLP	82	84	84	84	82	80
PAN 7158 HO	36	37	36	38	38	41
PAN 7160 CLP	33	48	63	77	86	92
SY 3970 CL	10	13	16	21	28	36
SY 3975 CLOH	28	17	80	40	20	20
SY Arizona	47	47	47	47	47	47

3 THE YIELD PROBABILITY (%) OF CULTIVARS EVALUATED IN 2017/2018 AND 2018/2019 AT DIFFERENT YIELD POTENTIALS.

CULTIVAR	YIELD POTENTIAL (T/HA)					
	1,0	1,5	2,0	2,5	3,0	3,5
AGSUN 5101 CLP	33	32	32	32	32	33
AGSUN 5102 CLP	53	41	27	18	11	70
AGSUN 5103 CLP	25	34	44	56	66	76
AGSUN 5106 CLP	37	45	52	61	67	74
AGSUN 5270	72	75	75	77	77	78
AGSUN 5273	36	30	23	18	13	11
AGSUN 5278	55	45	33	24	16	11
AGSUN 8251	69	65	61	55	50	45
P 65 LL 02	61	68	72	78	81	84
P 65 LL 14	58	60	61	63	64	65
P 65 LP 54	37	40	42	46	48	52
PAN 7080	44	53	62	71	78	83
PAN 7100	62	60	58	56	54	52
PAN 7102 CLP	77	76	73	70	67	63
PAN 7156 CLP	78	76	73	70	65	61
PAN 7158 HO	45	43	41	39	38	37
PAN 7160 CLP	50	57	65	72	78	82
SY 3970 CL	19	18	16	16	16	17

