

## Sonneblomkultivaraanbevelings vir 2021/2022

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LNR- Grain Crops, Potchefstroom and Biometry

Om finansiële sukses met sonneblomproduksie te verseker, is 'n hoë vlak van doeltreffendheid noodsaaklik. Die seleksie van goed aangepaste kultivars is 'n goedkoop en eenvoudige manier om doeltreffendheid te bevorder en daarvoor is inligting oor die prestasie van kultivars nodig.

Die doel van die nasionale sonneblom kultivar-evaluasieproewe is om inligting te verskaf, sodat sinvolle kultivar keuses gemaak kan word.

Kultivar-aanbevelings in dié dokument spruit voort uit samewerking tussen die LNR-IGG en verskeie saadmaatskappye met finansiële ondersteuning van die Olie- en Proteïensade Ontwikkelings-trust.

21 kultivars, waarvan vier nuwe inskrywings is, is in 19 veldproewe gedurende 2020/2021 geëvalueer. In **Tabel 1** word die groei-seisoenlengtes van dié kultivars, asook die gemiddelde opbrengste wat in 2019/2020 en 2020/2021 behaal is, aangetoon.

**Grafieke 1-3** toon sonneblom saadopbrengs vir een jaar (**1**), twee jaar (**2**) en drie jaar (**3**) aan.

### Opbrengswaarskynlikheid

Die opbrengswaarskynlikheid van 'n kultivar is die kans om 'n bogemiddelde opbrengs by 'n bepaalde opbrengspotensiaal te behaal. Indien die opbrengswaarskynlikheid van 'n kultivar by 'n bepaalde opbrengspotensiaal byvoorbeeld 60% is, dui dit op 'n 60% kans om 'n bogemiddelde opbrengs te behaal en 'n 40% kans om ondergemiddeld te presteer.

**Tabel 2** toon opbrengswaarskynlikheidswaardes, van die kultivars wat in 2020/2021 geëvalueer is aan. Weens die jaarlikse toevoeging en onttrekking van kultivars, is 'n meerjarige oesekerheidsevaluasie op slegs 'n beperkte aantal kultivars moontlik. **Tabel 3** toon opbrengswaarskynlikheidswaardes, van 17 kultivars wat in 40 proewe gedurende 2019/2020 en 2020/2021 geëvalueer is, aan. **Tabel 4** toon opbrengswaarskynlikheid van 16 kultivars wat in 54 proewe gedurende 2018/2019 – 2020/2021 groei seisoen geëvalueer is.

**Tabel 3** kan gebruik word om 'n kernseleksie van

## Sunflower cultivar recommendations for 2021/2022

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ARC-Grain Crops, Potchefstroom and Biometry

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 for which information on the performance of cultivars is needed.

The aim of the sunflower cultivar trials is to generate information from which a sensible selection of cultivars can be made.

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

21 cultivars, of which four were new introductions, were evaluated in nineteen field trials during 2020/2021. **Table 1** shows the growing season lengths of these cultivars as well as their mean seed yields for 2019/2020 and 2020/2021.

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

### 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** shows yield probability values for the cultivars tested in 2020/2021. 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** shows yield probability values for 17 cultivars that were evaluated in 40 trials during 2019/2020 and 2020/2021. **Table 4** shows yield probability values for 16 cultivars that were evaluated in 54 trials during the 2018/2019 to 2020/2021 growing season.

**Table 3** and **Table 4** can be used to select a core

kultivars te maak. Hierdie opsomming kan aangevul word met kultivars uit **Tabelle 1** en **2**. Dit is altyd raadsaam om meer as een kultivar te plant en om nuwe kultivars slegs op 'n beperkte skaal in te sluit.

### Kultivarseleksie uit die opbrengswaarskynlikheidstabel

Bepaal eerstens die opbrengspotensiaal van 'n land en stel dan 'n opbrengsmikpunt. Die langtermyn gemiddelde opbrengs is gewoonlik 'n goeie aanduiding van die opbrengspotensiaal wat dikwels ook as die mikpunt dien. Raadpleeg vervolgens die opbrengswaarskynlikheidstabelle.

Kultivars met die hoogste opbrengswaarskynlikhede, wat in die kolom onder 'n bepaalde opbrengspotensiaal getoon word, het die grootste kans om goed in die bepaalde omstandighede te presteer.

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.

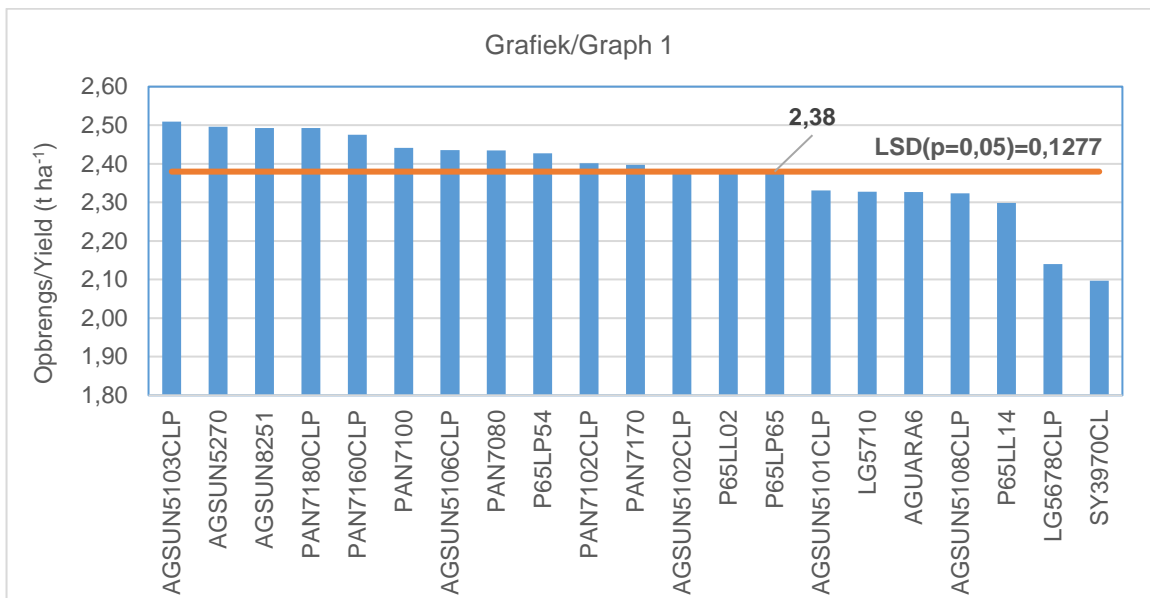
### Cultivar selection from the yield probability table

Determine the yield potential for a particular land 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 yield target. Consult the yield probability tables next.

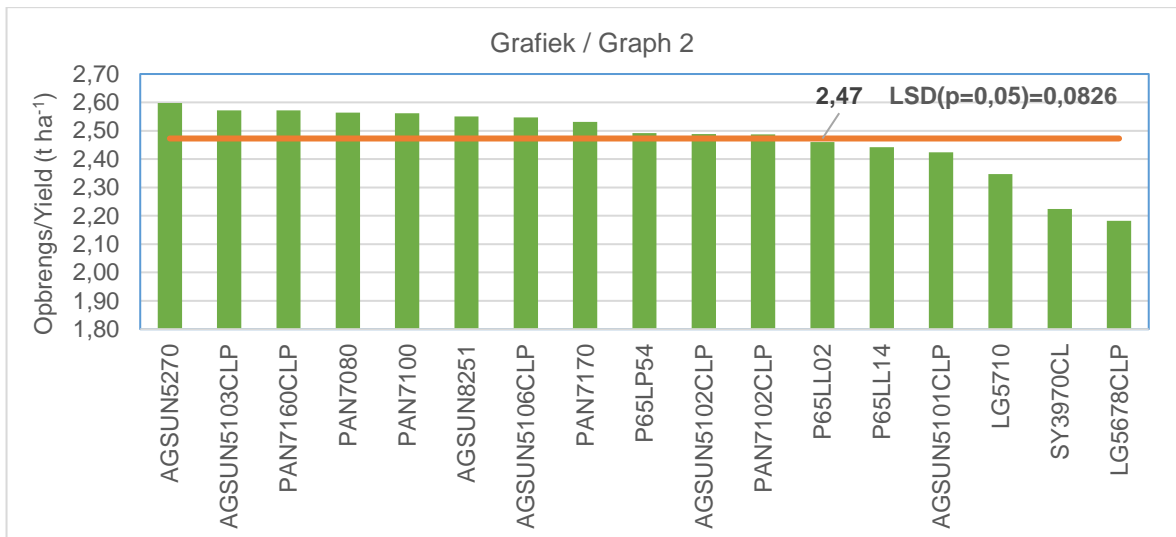
Cultivars with the highest yield probability values, in the column below a particular yield potential, are those with the best chance to perform well under the particular conditions.

**TABEL 1/ TABLE 1: DAE TOT BLOM EN SAADOPBRENGSTE VAN GE-EVALUEERDE KULTIVARS IN 2019/2020 EN 2020/21 / DAYS TO FLOWERING AND SEED YIELD OF CULTIVARS EVALUATED IN 2019/2020 AND 2020/2021**

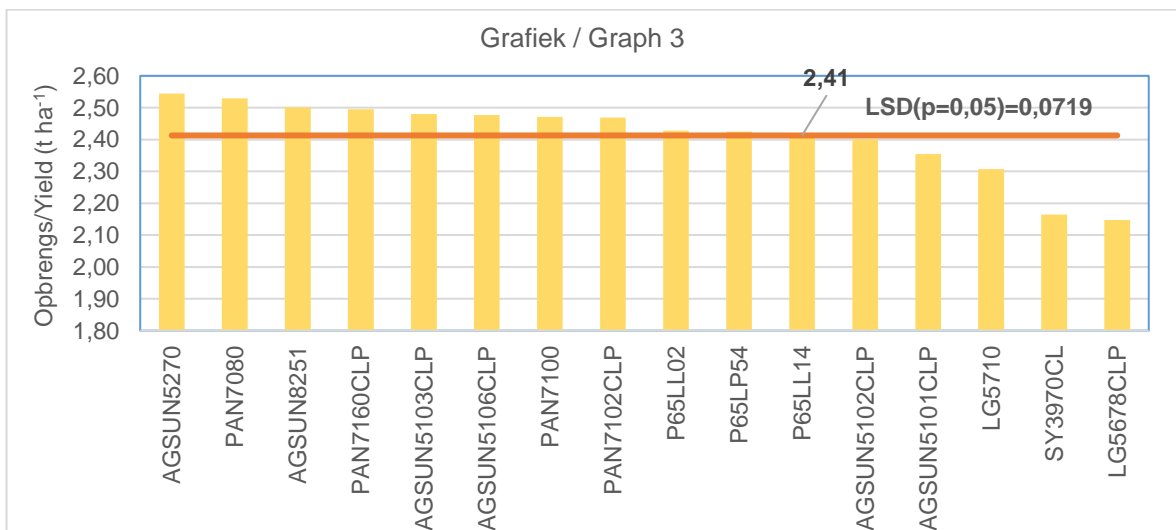
Kultivar/ Cultivar	Dae tot 50% blomstadium / Days to 50% flowering	Opbrengs / seed yield (t ha <sup>-1</sup> )			
		Gemiddeld/Mean	2019/2020	2020/2021	Gem/Mean
AGSUN 5101 CLP	69		2,51	2,33	2,42
AGSUN 5102 CLP	70		2,58	2,38	2,48
AGSUN 5103 CLP	71		2,63	2,51	2,57
AGSUN 5106 CLP	71		2,62	2,44	2,53
AGSUN5108CLP	67		-	2,32	2,32
AGSUN 5270	68		2,66	2,50	2,58
AGSUN 5273	70		2,39	-	2,66
AGSUN 5278	69		2,61	-	2,61
AGSUN 8251	69		2,60	2,49	2,55
Aguara6	69		-	2,33	2,33
LG 5626 HO	67		2,14	-	2,14
LG 5678 CLP	69		2,22	2,14	2,18
LG 5710	68		2,37	2,33	2,35
P 64 LL 23	67		2,69	-	2,69
P 65 LL02	70		2,54	2,37	2,46
P 65 LL14	69		2,57	2,30	2,43
P 65 LP 54	68		2,55	2,43	2,49
P65LP65	70		-	2,37	1,19
PAN 7080	70		2,68	2,43	2,56
PAN 7100	69		2,65	2,44	2,55
PAN 7102 CLP	68		2,56	2,40	2,48
PAN 7156 CLP	70		2,78	-	2,78
PAN 7160 CLP	70		2,66	2,48	2,57
PAN7170	69		2,63	2,40	2,51
PAN7180CLP	70		-	2,49	2,49
RN 28485	66		2,26	-	2,26
RN 28584	67		2,29	-	2,29
SY 3970 CL	70		2,34	2,10	2,22
SY 3975 CLOH	71		2,19	-	2,19
SY Arizona	67		2,25	-	2,25



Sonneblom gemiddeldes one jaar (Grafiek 1)/ Sunflower seed yield average one year (Graph 1)



Sonneblom opbrengs gemiddeldes vir two jare (Grafiek 2)/ Sunflower seed yield average for two years (Graph 2)



Sonneblom gemiddeldes vir drie jare (Grafiek 3)/Sunflower seed yield average for three years (Graph 3)

**TABEL 2 / TABLE 2: OPBRENGSWAARSKYNNLIKHEID(%) VIR KULTIVARS GEDURENDE 2020/2021 BY VERSKILLENDE OPBRENGSPOTENSIALE. / THE YIELD PROBABILITY (%) OF CULTIVARS EVALUATED IN 2020/2021 AT DIFFERENT YIELD POTENTIALS**

Kultivar / Cultivar	Opbrengs potensiaal / Yield potential (t ha <sup>-1</sup> )						Regressie lyn / Regression line	
	1	1,5	2	2,5	3	3,5	F prob	R <sup>2</sup>
AGSUN5101CLP	21	27	35	44	54	63	<0.001	0,93
AGSUN5102CLP	48	48	48	48	48	48	<0.001	0,93
AGSUN5103CLP	35	45	58	70	79	85	<0.001	0,85
AGSUN5106CLP	33	43	54	66	75	82	<0.001	0,91
AGSUN5108CLP	37	36	35	35	35	36	<0.001	0,95
AGSUN5270	53	60	66	72	76	79	<0.001	0,89
AGSUN8251	72	71	68	65	61	57	<0.001	0,84
AGUARA6	53	50	46	43	39	37	<0.001	0,83
LG5678CLP	39	24	13	6	3	1	<0.001	0,93
LG5710	36	38	40	43	46	49	<0.001	0,86
P65LL02	46	47	48	49	50	51	<0.001	0,79
P65LL14	52	46	38	32	25	22	<0.001	0,92
P65LP54	62	60	58	55	53	50	<0.001	0,81
P65LP65	49	49	48	48	48	49	<0.001	0,86
PAN7080	26	37	48	62	73	82	<0.001	0,91
PAN7100	65	63	61	58	55	51	<0.001	0,85
PAN7102CLP	72	67	60	52	44	37	<0.001	0,85
PAN7160CLP	59	62	64	66	67	67	<0.001	0,90
PAN7170	70	65	58	50	42	36	<0.001	0,83
PAN7180CLP	56	60	63	67	69	71	<0.001	0,84
SY3970CL	51	43	33	25	19	15	<0.001	0,55

R2 is a statistic that explains the variation around the mean of the appropriate model. An R2 of >0,5 is recommended. The closer the R2 value is to 1, the better the regression fit is. The better the cultivar meets the requirements and stays above the regression line, the more stable the cultivar is. F prob = F probability (the probability that the slope and section on the y-axis contribute significantly to the model). An F prob value of <0,1 is recommended.

**TABEL 3 / TABLE 3: OPBRENGSWAARSKYNNLIKHEID(%) VIR KULTIVARS GEDURENDE 2019/2020 EN 2020/2021 BY VERSKILLENDE OPBRENGSPOTENSIALE. / THE YIELD PROBABILITY (%) OF CULTIVARS EVALUATED IN 2019/2020 AND 2020/2021 AT DIFFERENT YIELD POTENTIALS**

Kultivar / Cultivar	Opbrengs potensiaal / Yield potential (t ha <sup>-1</sup> )						Regressie lyn / Regression line	
	1	1,5	2	2,5	3	3,5	F prob	R <sup>2</sup>
AGSUN5101CLP	41	42	44	46	47	49	<0.001	0,90
AGSUN5102CLP	47	49	50	52	53	54	<0.001	0,90
AGSUN5103CLP	44	49	53	58	62	67	<0.001	0,91
AGSUN5106CLP	39	45	51	57	63	69	<0.001	0,94
AGSUN5270	66	64	61	59	56	53	<0.001	0,80
AGSUN8251	51	52	54	56	57	59	<0.001	0,83
LG5678CLP	40	35	31	27	23	20	<0.001	0,86
LG5710	48	46	44	41	39	38	<0.001	0,84
P65LL02	44	46	47	49	51	53	<0.001	0,88
P65LL14	48	48	48	48	48	48	<0.001	0,80
P65LP54	59	57	54	51	48	45	<0.001	0,81
PAN7080	38	45	51	58	64	70	<0.001	0,82
PAN7100	60	60	60	60	59	59	<0.001	0,90
PAN7102CLP	64	61	56	52	47	43	<0.001	0,86
PAN7160CLP	51	55	57	61	64	67	<0.001	0,93
PAN7170	61	58	56	54	52	49	<0.001	0,91
SY3970CL	48	44	38	34	29	26	<0.001	0,88

R<sup>2</sup> is a statistic that explains the variation around the mean of the appropriate model. An R<sup>2</sup> of >0,5 is recommended. The closer the R<sup>2</sup> value is to 1, the better the regression fit is. The better the cultivar meets the requirements and stays above the regression line, the more stable the cultivar is. F prob = F probability (the probability that the slope and section on the y-axis contribute significantly to the model). An F prob value of <0,1 is recommended.

**TABEL 4 / TABLE 4: OPBRENGSWAARSKYNLIKHEID (%) VIR KULTIVARS GEDURENDE 2018/2019 TOT 2020/2021 BY VERSKILLENDE OPBRENGSPOTENSIALE. / THE YIELD PROBABILITY (%) OF CULTIVARS EVALUATED IN 2018/2019 TO 2020/2021 AT DIFFERENT YIELD POTENTIALS**

Kultivar / Cultivar	Opbrengspotensiaal / Yield potential (t ha <sup>-1</sup> )						Regressie lyn / Regression line	
	1	1,5	2	2,5	3	3,5	F prob	R <sup>2</sup>
AGSUN5101CLP	43	44	45	46	47	47	<0.001	0,91
AGSUN5102CLP	50	50	49	49	48	48	<0.001	0,92
AGSUN5103CLP	42	47	51	55	59	64	<0.001	0,89
AGSUN5106CLP	37	43	50	57	63	70	<0.001	0,93
AGSUN5270	65	64	62	60	58	57	<0.001	0,83
AGSUN8251	56	57	57	58	58	58	<0.001	0,90
LG5678CLP	41	36	31	27	23	19	<0.001	0,89
LG5710	49	47	45	43	41	40	<0.001	0,82
P65LL02	47	48	49	51	52	53	<0.001	0,83
P65LL14	50	50	50	50	50	50	<0.001	0,89
P65LP54	57	55	52	50	47	45	<0.001	0,84
PAN7080	46	51	56	61	66	70	<0.001	0,92
PAN7100	60	59	56	54	52	50	<0.001	0,90
PAN7102CLP	67	63	58	54	49	45	<0.001	0,87
PAN7160CLP	48	52	55	59	63	66	<0.001	0,93
SY3970CL	42	39	36	34	31	28	<0.001	0,76

R<sup>2</sup> is a statistic that explains the variation around the mean of the appropriate model. An R<sup>2</sup> of >0,5 is recommended. The closer the R<sup>2</sup> value is to 1, the better the regression fit is. The better the cultivar meets the requirements and stays above the regression line, the more stable the cultivar is. F prob = F probability (the probability that the slope and section on the y-axis contribute significantly to the model). An F prob value of <0,1 is recommended.

Wenke vir optimum opbrengste in sonneblom	Tips to optimise sunflowers yields
<ol style="list-style-type: none"> <li>1. Produsent moet nie net na die opbrengs van 'n kultivar kyk nie. Bepaal eers 'n realistiese opbrengs mikpunt van elke land, en kies dan 'n kultivar met 'n goeie opbrengs potensiaal-, stabiliteit en ook 'n goeie opbrengswaarskynlikheid. Die stabiliteit van 'n kultivar word bepaal deur hoe nader die R<sup>2</sup> waarde aan 1 is en hoe kleiner die Fprob is (verkieslik &lt;0.1)</li> <li>2. Plant datum: aanplantings gedurende November tot middel Desember sal 'n aansienlike beter opbrengs lewer teenoor laat seisoen aanplantings gedurende Januarie en selfs Februarie.</li> <li>3. Plant diepte: dit is baie moeilik om 'n aanbeveling ten opsigte van plant diepte te maak. In die meeste gevalle word bietjie dieper geplant in sanderige grond wat vinniger uitdroog. Vermy swak gedreineerde gronde sowel as gronde met 'n hoë suur inhoud vir sonneblom produksie.</li> <li>4. Dit word aanbeveel om drie tot vier dae na aanplanting met 'n duisendpoot oor die land te</li> </ol>	<ol style="list-style-type: none"> <li>1. Choosing the correct hybrid is one of the key decisions every grower has to take before the beginning of a season. Growers should consider not just the yield, but also yield stability, yield potential and yield probability according to a realistic yield potential for each field. The stability of a cultivar is determined by the closer the R<sup>2</sup> value is to 1 and the smaller the F probability is (preferably &lt; 0,1)</li> <li>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.</li> <li>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 deeper planting depth. Avoid poorly drained soils, as well as highly acidic soils.</li> <li>4. It is essential to run a millipede rotary harrow (<i>duisendpoot</i>) over your newly planted crop three to four days after planting, because a hard crust also causes</li> </ol>

gaan om die vorming van 'n kors te voorkom, aangesien dit ook tot swak stand kan lei.

5. Plant populasie: dit word gebaseer op grond tipe, reënval en opbrengspotensiaal. 'n
6. Optimale plantestand van 35 000 tot 42 000 per hektaar met 'n rywydte van 0.91cm word aanbeveel.
7. Wisselbou: moet nie dieselfde gewas op dieselfde land plant jaar na jaar nie. 'n Twee tot drie jaar wisselbou stelsel is noodsaaklik om siektes onder beheer te hou.
8. Korrekte kunsmis toediening is noodsaaklik vir 'n optimum opbrengs. Die toediening moet altyd gebaseer word op grondontledings. Indien moontlik moet die helfte van die stikstof aanbeveling tydens plant tyd toegedien word en die ander helfte 30 tot 40 dae na opkoms.
9. Nog 'n baie belangrike punt om in ag te neem vir 'n goeie sonneblom opbrengs is goeie onkruid beheer, veral gedurende die eerste 45 dae. Die gebruik van "Clearfield kultivars" laat toe dat produsente kort na opkoms onkruiddoder kan gebruik. Produsent moet nie nalaat om "voor-opkoms" grasdoder toe te dien met plant nie.

a poor stand.

5. Plant population: Should be based on soil type, rainfall and yield potential. Keep to the
6. optimal plant population of 35 000 to 42 000 plants per hectare and maintain a row width of 0,91cm.
7. 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.
8. Appropriate fertilisation is important and plays an important role in yields achieved. Your fertiliser programme must always be based on scientific soil analysis. If it is 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.
9. Another vital key to achieving a good sunflower yield is good weed control, especially in the first 45 days in the life of a young seedling. Clearfield hybrids allow growers to address the issue shortly after emergence with the application of post-emergence herbicide. Growers should not neglect to apply a "pre-emergence" grass herbicide during planting.