



NORTHERN

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GRDC™ **GROWNOTES™**



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GRAINS RESEARCH
& DEVELOPMENT
CORPORATION

SUNFLOWER

SECTION 2

PRE-PLANTING

VARIETAL PERFORMANCE | PLANTING SEED QUALITY

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Pre-planting

2.1 Varietal performance

Five sunflower hybrids will be marketed in NSW for sowing in 2014–15. It is advisable to grow more than one hybrid to spread risk, as no hybrid excels in all characteristics.

Select hybrids based on end-use requirement, yielding ability (seed and oil), disease tolerance, head inclination, height and good agronomic type. Hybrids and their characteristics are described in Table 1.

Table 1: Characteristics of sunflower hybrids available in 2016–2017.

Company	Hybrid	Maturity	End use	Height	Head inclination
Nuseed	Ausigold 4	Medium–slow (early plant) Medium (late plant)	Polyunsaturated Suitable for dehulling	Medium–tall	Pendulous
	Ausistripe 14	Medium	Confectionery/ Birdseed	Medium-tall	Semi-erect
	Ausigold 62	Medium	Monounsaturated	Medium	Semi-erect
Pacific Seeds	Hyoleic 41	Medium–slow	Monounsaturated	Medium–tall	Semi-pendulous
	Sunbird 7	Medium	Confectionery/ Birdseed	Medium–tall	Semi-pendulous

2.1.1 Yielding ability

Select hybrids firstly on yield potential but also on oil content. Use hybrid trial results as a guide (see Table 2) but always try the hybrids on your farm and grow those that produce the best average results for you.

Generally, the medium–slow-maturing hybrids have the highest yield potential. Monounsaturated hybrids yield equal to, or slightly less than, the best polyunsaturated hybrids. However, monounsaturated hybrids usually have a higher oil percentage and attract a price premium.¹

¹ L Serafin, D McCaffery, S Thompson (2014) Sunflower. Summer crop production guide 2014, pp. 80–92. NSW DPI Management Guide. NSW Department of Primary Industries, <http://www.dpi.nsw.gov.au/agriculture/broadacre-crops/guides/summer-crop-production-guide>

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Table 2: Dryland sunflower hybrid performance across seasons and sites 2004–09.

Hybrid	Yield (t/ha)	Oil content (%)	No. of trials
Hysun 39	1.91	40.96	14
Hyoleic 41	1.87	40.88	16
Hysun 47	1.84	41.61	2
Hysun 38	1.80	39.70	16
Ausigold 7	1.80	41.30	13
SV60066	1.79	–	1
Ausigold 51	1.75	38.76	6
Ausigold 63	1.73	42.46	2
Ausigold 4	1.73	41.08	16
Ausigold 8	1.72	39.37	9
Ausigold 61	1.72	40.88	12
Ausigold 62	1.69	41.30	16
Award	1.67	–	1
Sunbird 7	1.67	37.10	9
Ausigold 5	1.62	39.73	6
Ausigold 50	1.60	36.67	8
SV60050	1.60	–	1
HP002GN	1.58	36.62	5
Ausigold 10	1.53	–	1
Sunoleic 06	1.53	41.30	16
Advantage	1.50	41.11	16
HP004GN	1.50	39.88	5
Jade Emperor	1.48	20.47	3
Ausigold 64	1.47	40.83	2
Ausigold 52	1.32	34.36	4
LSD	0.26 t/ha	2.35%	

2.1.2 Oil, protein or other quality traits

High oil percentages give growers a premium of 1.5% of price for each 1% of oil >40% (use Table 2 as a guide to oil contents). Birdseed and confectionary hybrids such as Sunbird 7 have low relative oil percentages, as oil content is not a requirement for these end uses.²

Monounsaturated sunflowers are preferably sown in spring, because higher average night temperatures during seed development will enhance oleic acid content.³

Polyunsaturated sunflowers are sown in summer, as they require cool mean daily temperatures to produce high linoleic acid levels. Sowing in the late planting window ensures that seed filling occurs in autumn. Sowing earlier than this, i.e. in spring, usually results in linoleic acid levels in the oil below the required 62%.⁴

² L Serafin, D McCaffery, S Thompson (2014) Sunflower. Summer crop production guide 2014, pp. 80–92. NSW DPI Management Guide. NSW Department of Primary Industries, <http://www.dpi.nsw.gov.au/agriculture/broadacre-crops/guides/summer-crop-production-guide>

³ L Serafin, S Belfield (2008) Sunflower production guidelines for the northern grains region—northern NSW and southern Qld. NSW Department of Primary Industries, http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0011/249779/Sunflower-production-guidelines-for-the-northern-grains-region.pdf

⁴ L Serafin, S Belfield (2008) Sunflower production guidelines for the northern grains region—northern NSW and southern Qld. NSW Department of Primary Industries, http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0011/249779/Sunflower-production-guidelines-for-the-northern-grains-region.pdf

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2.1.3 Maturity

The growth rate of all hybrids is largely determined by temperature, photoperiod and moisture. In northern NSW, a medium–slow hybrid sown at Moree in early September and at Spring Ridge in mid-October takes about 80–85 days to flower. The same hybrids sown in mid-December to mid-January take about 60 and 65 days, respectively. Medium maturity hybrids are up to 5 days quicker to flower. Quick and medium-quick hybrids are best suited to late sowing times and north-western areas, west of the Newell Highway.⁵

2.1.4 Head inclination and stem curvature

Hybrids with pendulous heads tend to suffer less sunscald at flowering than erect hybrids. However, pendulous hybrids with highly curved stems are more prone to lodging, making harvesting difficult, and water may pool in the back of the heads, increasing susceptibility to disease.⁶

2.2 Planting seed quality

The seed companies provide information on each bag of seed designed to meet government regulations and assist the farmer at planting time.

Information on the bag:

- Variety: name.
- Seed size: 7/8, small; 8/10, medium; 10/14, large.
- Seed count: number of seeds/kg; allow for a 5% tolerance.
- Line or batch no.: the reference number for that seed lot. (Always keep a record for future reference.)

Information on the tag (a tag is attached to most bags; usually, the 'on the bag' information is repeated):⁷

- Purity: minimum purity, other seeds, declared seeds as required by legislation.
- Minimum germination: as required by legislation. The figure quoted is on the safe side (often 85%) and lower than the actual.
- Actual germination: not to be confused with minimum germination. This information is voluntary and can include the following: the actual germination, date of test (if no date, assume seed tested pre-season), number of days to reach the actual germination (usually 7 days). The quicker the seed reaches a value close to the actual the better the quality (e.g. 90% germination in 5 days indicates greater vigour than 90% germination in 10 days).

2.2.1 Seed size

Small (7/8) and medium seed (8/10) is preferred for the spring plant, as smaller seed generally establishes better in cooler conditions. Medium and large seed (10/14) should be used in warmer conditions or when planting deeper into moisture. Larger seed is more suited to precision planters, as smaller, lighter seed may result in doubles in one hole of the planter plate.⁸

⁵ L Serafin, D McCaffery, S Thompson (2014) Sunflower. Summer crop production guide 2014. pp. 80–92. NSW DPI Management Guide. NSW Department of Primary Industries, <http://www.dpi.nsw.gov.au/agriculture/broadacre-crops/guides/summer-crop-production-guide>

⁶ L Serafin, D McCaffery, S Thompson (2014) Sunflower. Summer crop production guide 2014. pp. 80–92. NSW DPI Management Guide. NSW Department of Primary Industries, <http://www.dpi.nsw.gov.au/agriculture/broadacre-crops/guides/summer-crop-production-guide>

⁷ Australian Sunflower Association (2004) The New Big Black Sunflower Pack. Australian Oilseeds Federation

⁸ L Serafin, D McCaffery, S Thompson (2014) Sunflower. Summer crop production guide 2014. pp. 80–92. NSW DPI Management Guide. NSW Department of Primary Industries, <http://www.dpi.nsw.gov.au/agriculture/broadacre-crops/guides/summer-crop-production-guide>

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MORE INFORMATION

<http://www.grdc.com.au/Resources/Factsheets/2012/03/Grain-Storage-Fact-Sheet-Storing-Oilseeds>

http://www.australianoilseeds.com/data/assets/pdf_file/0006/4110/Oilseeds_Flyer.pdf

<http://www.pacificseeds.com.au/info-and-tools/seed-information/86-seed-storage-information.html>

2.2.2 Seed germination and vigour

The minimum germination percentage is usually >90% but check the percentage on the bag or consult seed merchants.⁹ Sunflower seed has the germination percentage and the number of seeds per kg marked on each bag. Check the testing date for currency. It is also advisable to plant treated seed to protect against seedling pests and diseases.¹⁰

2.2.3 Safe rates of fertiliser sown with the seed

The safe rate is affected by the row spacing. Suggested rates of fertiliser which can be safely sown with sunflower seed are shown in Table 3. As row spacing increases the amount of nitrogen and phosphorus which can safely be sown with sunflower seed decreases.

Research conducted by Dowling (1998) showed variations in the response to critical rates of DAP, MAP and triple superphosphate by sunflowers when applied in the seed furrow. Refer to this work before applying fertiliser with the seed. Reductions in establishment may result due to application of certain fertilisers when applied in the seed furrow. Planting equipment and field conditions affect the likelihood of damage.^{11 12}

Table 3: Safe rates of fertiliser sown with sunflower seed.

Row spacing cm	N kg/ha	P kg/ha	Fertiliser product kg/ha		
			Urea	DAP	MAP
45	8	22	22	52	80
60	6	17	16	39	60
75	5	13	13	30	50
100	4	10	10	23	45

Source: The New Big Black Sunflower Pack, Australian Sunflower Association, 2004.

⁹ L Serafin, D McCaffery, S Thompson (2014) Sunflower. Summer crop production guide 2014. pp. 80–92. NSW DPI Management Guide. NSW Department of Primary Industries, <http://www.dpi.nsw.gov.au/agriculture/broadacre-crops/guides/summer-crop-production-guide>

¹⁰ L Serafin, S Belfield (2008) Sunflower production guidelines for the northern grains region—northern NSW and southern Qld. NSW Department of Primary Industries, http://www.dpi.nsw.gov.au/data/assets/pdf_file/0011/249779/Sunflower-production-guidelines-for-the-northern-grains-region.pdf

¹¹ Australian Oilseeds Federation (2012), Better Sunflowers Agronomy Training Package (Big Yellow Sunflower Pack), Agronomy including Irrigation Management <https://bettersunflowers.com.au/bysp/surveyinfo.aspx?sid=5>

¹² Australian Sunflower Association (2004) Boron deficiency. The New Big Black Sunflower Pack. p. 29. Australian Oilseeds Federation