



NORTHERN

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GRDC™ **GROWNOTES™**



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GRAINS RESEARCH
& DEVELOPMENT
CORPORATION

SUNFLOWER

SECTION 12

HARVEST

PHYSIOLOGICAL MATURITY | MACHINERY SETUP | RECEIVAL STANDARDS

VIDEOS

Sunflower grower and Chairman of the Australian Sunflower Association Kevin Charlesworth comments on sunflower harvest preparation and pitfalls. GCTV13: [Harvesting sunflowers](#)

Harvest

Sunflower harvesting is best carried out as close to 9% seed moisture content as possible. There is a tendency to overestimate moisture content of a sunflower crop, meaning harvest is often delayed until moisture contents are on average 7%. This results in a loss in yield and more difficulty in obtaining a clean sample. As sunflowers become drier and more brittle, the bracts, and parts of the head break into small pieces which are difficult to separate from the seeds. As a result admixture levels are usually higher when moisture contents are lower at harvest. ¹

12.1 Physiological maturity

Physiological maturity signifies when the maximum seed weight has been reached. The crop can then be harvested at any time, however sufficient drydown needs to occur to reach a moisture content suitable for storage or delivery.

Physiological maturity is identified when the bracts surrounding the sunflower head change to brown, preceding this they will change from green to yellow and eventually to brown. The seed moisture content at physiological maturity is usually between 30–40% and the crop is suitable for desiccation to aid in quicker drydown. ²



Figure 1: Physiological maturity is identified when the bracts surrounding the sunflower head change to brown. The heads turn from green to yellow to brown.

Photo: Drew Penberthy, Penagcon

12.2 Machinery setup

Machinery setup can have a big impact on the quality of the sample harvested and the speed at which a crop may be harvested. Headers with ‘head snatchers’ and sullivan reels are a popular choice. These adaptations allow the sunflower heads and approximately 20 cm of stalk only to be fed through the header. This means a large reduction in the amount of material which needs to be threshed and reduces the likelihood of excessive trash and admixture in the sample. Sunflower trays are also a useful addition for retaining heads and seeds in the header front.

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>
² DPI (2008) Sunflower Production Guidelines for the Northern Grains Region – Northern NSW and Southern QLD. L Serafin, S Belfield. http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0011/249779/Sunflower-production-guidelines-for-the-northern-grains-region.pdf

Harvesting sunflowers when they are too moist leads to problems with threshing the heads which retain a significant amount of moisture, particularly in the pith. Slow drum speeds aid in harvest. Speeds of around 450 rpm for conventional headers and 250–350 rpm for rotary headers are suggested. Fan speeds should be fairly fast, but will often depend on the size of the seed.³

A survey of 48 sunflower crops grown during 2005–06 showed that the average moisture at delivery was 7% which is a loss of 2 tonne in 100 tonnes. The moisture ranged from 4.5–12%.

Conversely harvesting above 9% moisture means storage of sunflowers is potentially dangerous due to the risk of fire in the silo and downgrading due to mould.⁴

Harvesting at low moisture contents (< 6%) may cause an increase in admixture as the plant stalks and heads become dry and brittle, shattering easily into small pieces. This added trash is difficult to separate by grading and penalties apply for excess admixture.⁵

12.2.1 Header set up

Conventional headers need alterations to harvest sunflowers effectively. The most common changes include:

- Sunflower trays – are attached below the cutter bar to catch sunflower seeds falling out of the heads during the harvesting process.
- Sullivan reel and headsnatcher – are designed to minimise the amount of plant material entering the front reducing potential contamination. Both remove the sunflower head just below the peduncle, causing minimal disturbance to the rest of the plant. These modifications allow the ability to harvest at higher moisture contents and whilst some green leaf remains.

Prior to commencing harvest, fan and concave settings should be adjusted to ensure sunflower heads are properly threshed, retaining the maximum amount of seed and the least amount of trash.⁶

12.2.2 Harvesting hints

The Australian Sunflower Association provides the following harvesting hints from experienced sunflower growers.⁷

- Header attachments that are strongly recommended:
 - » **Sunflower trays** – to retain heads and seeds in the header front these are essential.
 - » **Sullivan reel** – works at the machine's ground speed to help prevent blockages and reduce seed shattering.
 - » **Head snatcher** (push bar under the cutter bar) – to speed harvesting and reduce trash levels in the sample. Not as important when using a rotary header.
- The use of a neighbour or contractor is preferable to harvesting without these attachments, particularly sunflower trays.
- Care at planting—a uniform crop is easier to harvest so a uniform, even plant stand is the best start.

3 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>

4 DPI (2008) Sunflower Production Guidelines for the Northern Grains Region – Northern NSW and Souther QLD. L Serafin, S Belfield. http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0011/249779/Sunflower-production-guidelines-for-the-northern-grains-region.pdf

5 DPI (2008) Sunflower Production Guidelines for the Northern Grains Region – Northern NSW and Souther QLD. L Serafin, S Belfield. http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0011/249779/Sunflower-production-guidelines-for-the-northern-grains-region.pdf

6 DPI (2008) Sunflower Production Guidelines for the Northern Grains Region – Northern NSW and Souther QLD. L Serafin, S Belfield. http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0011/249779/Sunflower-production-guidelines-for-the-northern-grains-region.pdf

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

- Don't wait until all heads are black. Commence harvest when some 10% of heads are still soft (cream colour on the back). This will reduce trash levels and enable a faster harvest speed. Moisture at this stage should be 9% or less.
- For an over-ripe crop—harvest at night, early morning
- Use a slow drum speed, +450 rpm for conventional headers and +350 rpm for rotaries.
- Each crop and variety is different and fine tuning is normally necessary with every change.
- Do not try to retain small seeds in the sample as trash is a companion of these small seeds. Aim to have the head largely intact out the back of the header with any small centre seeds still present.
- Fan speed as fast as practical without lifting seed over the sieve. A common fault in sunflower harvesting is to use insufficient air for fear of losing the small seeds which are of little value.
- If the header width is the same as the planter, make the guess rows about 20% wider to allow for any header movement without crop damage. Most growers have guidance on headers.
- Dragging chains behind the header may help prevent static and the fine dust that accumulates on the header when stripping sunflowers which are highly flammable. Make sure a firefighter is ready and close.
- Desiccation will speed dry-down and time to harvest in times of poor weather conditions, bird or mice damage. Desiccation should be carried out at physiological maturity if it is to be most beneficial. At physiological maturity the backs of the heads are yellow, bracts are brown and seed moisture content is about 40%. Harvest can commence in 7 to 14 days.
- Do not delay harvest to 9% moisture if weather conditions or pests numbers are likely to reduce yield and quality. Harvesting can commence anytime after physiological maturity.
- Sunflower harvested above 10% moisture content will require drying.
- Admixture above 4% can be refused acceptance or attract a penalty.

i MORE INFORMATION

[NSW DPI Management guide.](#)
[Summer crop production guide.](#)
[Receival standards \(p. 92\)](#)

http://www.graintrade.org.au/commodity_standards

12.3 Receival standards

There are certain rules and regulations that producers need to meet when delivering sunflower seeds. These standards have been developed by the Australian Oilseed Federation Standards Committee. For new growers or growers returning to sunflower, these standards are reviewed annually, so it is important to revisit the guide for current information on oil bonus or discounts and potential deductions for admixture. The standards for monounsaturated, polyunsaturated and bird seed sunflower can be found in more detail at http://www.graintrade.org.au/commodity_standards.⁸

Sunflowers should be delivered at a moisture content of 9% or below. The normal premium/discount system of 1.5% of price for each 1% of oil above/below 40% oil content applies. Growers should be aware that admixture discounts also apply. Test weights are normally around 40 kg/hL, but the receival standard is 32 kg/hL.⁹

8 The Better Sunflower e-Newsletter, May 2012. Australian Oilseeds Federation (AOF), Australian Sunflower Association (ASA) & the Grains Research and Development Corporation (GRDC). http://www.australianoilseeds.com/data/assets/pdf_file/0010/8875/Better_Sunflowers_-_Issue_1_May_2012.pdf

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>