SOUTHERN
JUNE 2018

GRDC GROWNOTES™

GRDC
GRAINS RESEARCH & DEVELOPMENT CORPORATION

LENTIL

SECTION 11

PRE-HARVEST TREATMENTS

KEY POINTS | DESICCATION | CROP-TOPPING | WINDROWING

Pre-harvest treatments

Key points

- Crop-topping is a form of desiccation, and is common practice in lentil.
- Timing of crop-topping is based on the weed stages of development to prevent weed seedset.
- Crop desiccation is used to aid in uniform ripening of the crop and to kill green weeds for harvest.
- Desiccation enables an earlier harvest.
- Do not use glyphosate to desiccate lentil crops if the seed is to be retained for sowing.
- Timing of crop-topping or desiccation is more critical than the rate of application of the desiccant.

FEEDBACK

11.1 Desiccation

Desiccation is the application of herbicide to a virtually mature crop prior to harvest with the aim of halting further growth and development of the plant. Desiccation is used to aid in uniform ripening of the crop and also to kill green weeds. It also enables an earlier harvest. Desiccation is becoming a common practice, particularly in all pulse crops.

Desiccation is a valuable management tool especially under conditions where:

- There is a problem with green weeds at harvest;
- Improved harvest efficiency is required:
  - » Desiccation eliminates many of the problems associated with green stems and 'gum' build-up causing uneven flow of material through the harvester and 'jamming' problems; and
  - » Minimising the risk of harvester blockages, which enables drum speeds to be reduced in many cases, with a reduction in cracked or damaged grain;
- Early summer rain causes reshooting and re-flowering of lentils;
- Problems of patchy/delayed crop maturity on heavy clay soils; and
- Where 'early harvest management' is being adopted.

Desiccation of lentil has been found to improve yields (Table 1) and harvestability.

Table 1: Lentil yield (t/ha) with and without desiccation in Western Australia.

Harvest method	Merredin 1994	Cunderdin 1996	Merredin 1998	Average
Desiccated	0.86	1.48	1.43	1.26
Normal	0.72	1.26	1.32	1.10
Windrowing	0.45	-	-	-

Source: G Riethmuller, K Siddique, I Pritchard (2005 revised) Successful Lentil Harvesting. Agriculture Western Australia Farmnote 99/99

Benefits of crop desiccation are similar to those from windrowing and include more uniform maturity, reduced problems associated with late weed growth and advanced harvest date. Compared with windrowing, the crop is not placed on the ground so there is less risk of harvest problems due to wet weather.

Timing is critical and is based on crop stage of growth. Timing is either similar to or later than that for windrowing depending on the product used.

Early desiccation should be avoided as it can result in yield and quality losses. The danger of premature desiccation is in causing staining of the seed coat, having excessive green cotyledons in the sample, and/or producing small or wrinkled seed, all of which can create marketing problems.

Crop damage from ground rigs can also be an issue, particularly in tall crops. Tram-lining may help and should be considered at sowing if crop desiccation is likely to be used.

Diquat (Reglone®) is registered for desiccation of lentil. **DO NOT use glyphosate to desiccate lentil crops if the seed is to be retained for sowing.**

FEEDBACK

Photo 1: *A lentil crop showing different stages of development of pods within the canopy.*

Photo: M. Raynes, formerly Pulse Australia

Photo 2: *A lentil crop that has been desiccated for easier harvest due to the presence of broadleaf weeds.*

Photo: W. Hawthorne, formerly Pulse Australia

11.1.1 Seed and pod development

Pod and seed maturation in lentil is very staggered up each podded branch and between branches. Immature seeds are generally in the top one-third to one-quarter of the canopy. Due to the effects of higher temperatures and varying degrees

FEEDBACK

of moisture stress on the plant at maturity, this period of time is generally more compressed and of shorter duration than flowering.

An issue requiring careful consideration is how to optimise the timing of the desiccation when various stages of seed maturity are present on individual plants, as well as variation across the paddock.

This can be further compounded by soil type variation or irregular land surface with alternating mounds and depressions/hollows (micro-relief), commonly referred to as 'crab hole' country. This can further add to the problem of uneven crop maturity.

Often, inspection of commercial crops nearing potential time for desiccation reveals that while the lower pods have dried to below 15% seed moisture (seeds detached from pod), the upper 25% of pods on each fruiting branch were still at 30 to 40% moisture content, and at varying stages approaching physiological maturity.

11.1.2 Timing of desiccation

The optimal stage to desiccate the crop is when the vast majority of seeds have reached physiological maturity. To assess desiccation timing, walk along a transect through a representative paddock section and randomly sample pods from the top third of the canopy. A minimum of 50 pods should be sampled.

Seed should then be shelled from the pod and the representative seed sample assessed as to the proportion of dark green seed (maximum 50%) and yellow-buff colour seed (minimum 50%). If clear green seed (Photo 3) is present in the sample, then the crop is too immature and should be reassessed at a later date.

Photo 3: *Green kernel (right) due to early desiccation of red lentil. A maximum of 1% is allowable in receival and export standards.*

Photo: W. Hawthorne, formerly Pulse Australia

Timing of desiccation is critical to ensure grain yield and quality are not compromised. Desiccating too early can lead to both significant yield penalties and grain size problems. Results from a trial (Lenaghan & McCann 2003)[1] indicate that desiccation should not occur before 50% of the seeds in the pods present in the top third of the canopy are displaying some colour change (yellow-buff) and the remaining seeds are firm to touch and a deep green colour. (See Table 2 and Photo 1.)

As an indicator this will coincide with 60% of the pods in the top third of the canopy appearing yellow-buff. The rate of desiccant (Reglone® 1.5 L/ha and 1 L/ha) did not

1 L Lenaghan, T McCann (2003) Lentil desiccation – optimum timing and rates. The Lentil Company, http://www.jsaindependent.com.au/publications/lentil_desiccation_report.pdf

FEEDBACK

have a significant effect on yield or grain quality in this trial. Timing is more critical than the rate, so the rate should be adjusted depending on the target.

Timing of desiccation is more critical than the rate of application of the desiccant.

Whilst it did not happen in this trial, grain colour (seed coat discolouration and/or and green kernel) can be compromised if desiccation is done too early. This can be especially so if rain falls during the dry period before harvest.

Table 2: Desiccation* timing with diquat (Reglone®) and its effect on lentil grain yield and quality.

Timing	Visual symptoms in top third of canopy at desiccation			Grain yield (t/ha)	Grain quality	
	Crop	Pod	Seed		Poor colour (%)	Screenings (% <2 mm slotted screen)
Untreated control	100% ripe brown	100% colour change	100% colour change	1.8	<0.1%	2.0
T1	90% green 10% mottled yellow	No colour change	10% immature (not formed properly) 10% clear green & soft 80% green & firm	1.2	<0.1%	4.0
T2	40% green 60% mottled yellow	20% colour change	5% green & soft 85% green & firm 10% colour change	1.4	<0.1%	2.2
T3	5% green 90% mottled yellow 5% ripe brown	60% colour change	55% green & firm 45% colour change	1.7	<0.1%	1.9
T4	<1% green 60% mottled yellow 40% ripe brown	85% colour change	25% green & firm 75% colour change	2.1	<0.1%	2.6
T5	5% mottled yellow 95% ripe brown	100% colour change	100% colour change	2.1	<0.1%	2.9
lsd					ns	0.7

*Average of desiccant treatments 1.0 & 1.5L/ha Reglone® + 0.1% wetter
Source: L Lenaghan, T McCann (2003) Lentil desiccation – optimum timing and rates. The Lentil Company, http://www.jsaindependent.com.au/publications/lentil_desiccation_report.pdf

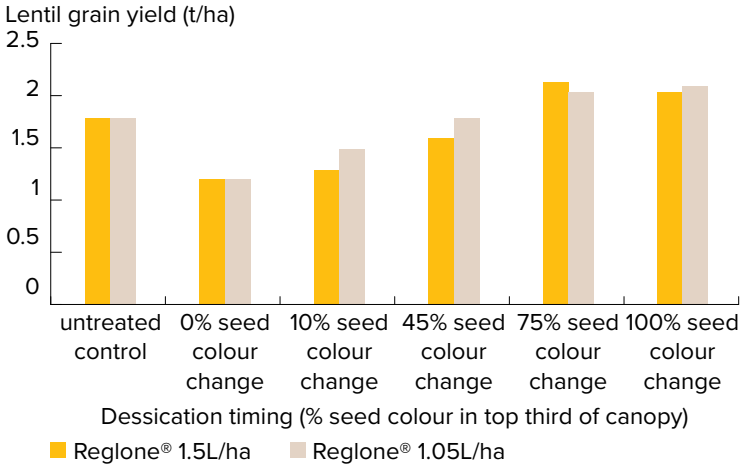

Figure 1: *Desiccation timing and its effect on yield and quality in lentil**.

* Note – More detail of crop stage at desiccation is shown in Table 2. Seed colour changes indicated are from the top third of the canopy only, as these are the most immature grains.
Source: L Lenaghan, T McCann (2003) Lentil desiccation – optimum timing and rates. The Lentil Company, http://www.jsaindependent.com.au/publications/lentil_desiccation_report.pdf

FEEDBACK

A lentil desiccation trial at Birchip in 2001 showed no yield or quality penalties with early desiccation with Reglone® at 1.5L/ha plus 0.1% wetter (BCG 20011). Four treatments were applied, and all were harvested on the same day.

Treatments (and grain yields) with an lsd ($p<0.05$) of 0.24t/ha were:

Control – not desiccated. Harvested normally (1.38t/ha);

- desiccated when pods were fully formed but still green (1.26t./ha);
- desiccated when pods were fully formed and seed in the bottom pods could be 'rattled' (1.34t/ha); and
- desiccated when pods were fully formed and seed in the mid pods could be 'rattled' (1.24t/ha).

This description of the lentil growth stage as "pods were fully formed but still green" is now known to be less precise than those used by Lenaghan & McCann (2003).[2]

Photo 4: *Lentil during pod-fill and before dry-down.*

Photo: W. Hawthorne, formerly Pulse Australia

2 L Lenaghan, T McCann (2003) Lentil desiccation – optimum timing and rates. The Lentil Company, http://www.jsaindependent.com.au/publications/lentil_desiccation_report.pdf

FEEDBACK

Photo 5: *Lentil during pod-fill and starting to dry down.*

Photo: W. Hawthorne, formerly Pulse Australia

Photo 6: *Lentil starting to dry down.*

Photo: W. Hawthorne, formerly Pulse Australia

FEEDBACK

Photo 7: *Lentil drying down.*

Photo: W. Hawthorne, formerly Pulse Australia

Photo 8: *Lentil drying down.*

Photo: W. Hawthorne, formerly Pulse Australia

FEEDBACK

Photo 9: *Green plants on wheel-track edges and also greener parts of a paddock. If desiccated too early issues with grain quality can occur.*

Photo: W. Hawthorne, formerly Pulse Australia

Photo 10: *Desiccating lentil. Note the green wheel tracks from previous traffic.*

Photo: M. Raynes, formerly Pulse Australia

11.1.3 Effect of desiccants on green immature seeds

Applying desiccants to seed that is still green and actively filling will result in:

- a reduction in grain size (and yield);
- an increase in a greenish discolouration of the seed coat (if >1%, green kernels (cotyledons) leads to severe marketing problems); and
- a reduction in seed viability (dead or abnormal seed).

FEEDBACK

In lentil and other pulse crops intended for use as seed or for sprouting markets, glyphosate should not be used as it will affect seed germination even when applied after physiological maturity. See a faba bean example in Table 3.

Table 3: Effects of desiccation timing on seed viability in faba bean.

Treatment	Faba bean crop stage	% Normal seed	% Abnormal seed	% Total germinated
Nil pre-harvest treatment		92	2	94
Desiccated – glyphosate	Seed physiological maturity	27	63	90
	Seed physiological maturity plus 6 days	64	29	93
Windrowed	Seed physiological maturity	89	2	91
	Seed physiological maturity plus 6 days	85	7	92

Source: P Matthews, D Holding (2004) Managing faba bean harvest. in Proceedings of Bean Focus 2004 pp100-103, https://grdc.com.au/Resources/GrowNotes.

11.1.4 Products registered for the pre-harvest desiccation of lentil

Table 4: The following table comprises extracts from the Reglone® and Roundup Ultra Max® product labels.

Active ingredient	Example trade name	Rate	Critical comments
Diquat	Reglone® (200 g/L)	2–3 L/ha	Spray as soon as the crop has reached full maturity. Helps overcome slow and uneven ripening and weed problems at harvest. Add Agral® 200 mL/100 L or BS1000® 160 mL/100 L prepared spray. **DO NOT harvest for 2 days after application.**
Glyphosate*	Roundup Ultra Max® (570 g/L)	0.645–1.7 L/ha	**Apply when physiologically mature and less than 15% green pods.** Use higher rates where crops or weeds are dense and where faster desiccation is required. **DO NOT harvest within 7 days of application.**

Note: Always read the label supplied with the product before each use.

WARNING: DO NOT use glyphosate to desiccate lentil, field pea, faba bean or chickpea that are to be used for seed or sprouting as germination is affected.

11.1.5 Practicalities of desiccation

Desiccants work more efficiently when sprayed slightly later than optimal time for windrowing; when the crop is reasonably ripe across the entire paddock. It is important to ensure that good coverage of the desiccant is achieved to ensure that the stems dry down. Desiccants applied by aircraft, due to wet paddock conditions, do not dry down the plant matter as effectively as ground application.

Pulse Australia released an 'Alert' on desiccation and crop-topping in October 2016. (Please note: This alert was from an international marketing perspective.)

Click on the link for the most current information including herbicides and desiccants approved for use in lentil.
http://pulseaus.com.au/blog/post/broadleaf-crop-desiccation

MORE INFORMATION

For more information on desiccation go to:
Desiccation and Crop-topping: Risks in Pulse and Canola Crops:
http://pulseaus.com.au/storage/app/media/crops/pulses/20161005_PA-AOF-desiccant.pdf

FEEDBACK

11.2 Crop-topping

Crop-topping is a form of desiccation; however, its timing is based on weed stages of development rather than that of lentil. It is timed to prevent weed seedset, meaning the lentil crop can be compromised if crop-topping is implemented too early. Products used and rates applied differ from that of desiccation.

Table 5: Summary of lentil varietal response to grain yield effects of crop-topping with paraquat at the mid timing (optimum) stage for ryegrass crop-topping in South Australia.

Variety	Maturity of the variety	Yield loss* (No of years) at mid-crop-top timing**	Yield loss range (%) at mid-crop-top timing**
Boomer	Mid/late	2/3	0-24%
Nugget	Mid/late	2/3*	0-22%
Nipper$^{\Phi}$	Mid	1/3	0-20%
PBA Flash$^{\Phi}$	Early/mid	1/3	0-14%
PBA Blitz$^{\Phi}$	Early	1/3	0-10%
PBA Jumbo$^{\Phi}$	Mid	0/3	0

* Number of years' significant yield loss occurred out of the total years tested (x/3)
** The percentage yield loss range compared with Nil treatments.

Source: Grain yield implications of crop-topping pulses for late weed control in south-eastern Australia. "Capturing Opportunities and Overcoming Obstacles in Australian Agronomy", (2012), Proceedings of 16th Australian Agronomy Conference 2012, http://www.regional.org.au/au/asa/2012/weeds/8099_linesml.htm

Timing of crop-topping is critical from both a weed and crop perspective.

Timing of crop-topping in lentil works very well in early maturing varieties like PBA Blitz$^{\Phi}$, PBA Bolt$^{\Phi}$ and PBA Flash$^{\Phi}$. However, timing can be marginal in some years in other lentil varieties that are later maturing (Nugget). Crop-topping is generally not always possible in later varieties due to maturity being so late relative to ryegrass maturity in a lengthy growing season.

11.2.1 Implications of crop topping too early

Growers must be aware of grain quality defects that may occur if crop-topping occurs earlier than the optimal time. These grain quality defects can result in either rejection at delivery or severe downgrading.

Crop topping of lentil too early can cause discoloured seed coat or cotyledons (kernel). Also some of the smaller pods near the top of the plant are more exposed to direct contact by the desiccant spray. Seeds in these less mature pods are not physiologically mature (green kernel) when they dry down. Grain quality issues due to early crop-topping are exacerbated if crop-topping occurs just prior to a significant rainfall event.

Rate of desiccant product or product used can also influence speed of dry-down, hence the potential for more grains that are immature.

FEEDBACK

Photo 11: *Lentil crop with ryegrass at its optimum stage for crop-topping (2011).*

Photo: Grain yield implications of crop-topping pulses for late weed control in south-eastern Australia. "Capturing Opportunities and Overcoming Obstacles in Australian Agronomy", (2012), Proceedings of 16th Australian Agronomy Conference 2012, http://www.regional.org.au/au/asa/2012/weeds/8099_linesml.htm

Photo 12: *Lentil crop with ryegrass at its optimum stage for crop-topping (2010).*

Photo: Grain yield implications of crop-topping pulses for late weed control in south-eastern Australia. "Capturing Opportunities and Overcoming Obstacles in Australian Agronomy", (2012), Proceedings of 16th Australian Agronomy Conference 2012, http://www.regional.org.au/au/asa/2012/weeds/8099_linesml.htm

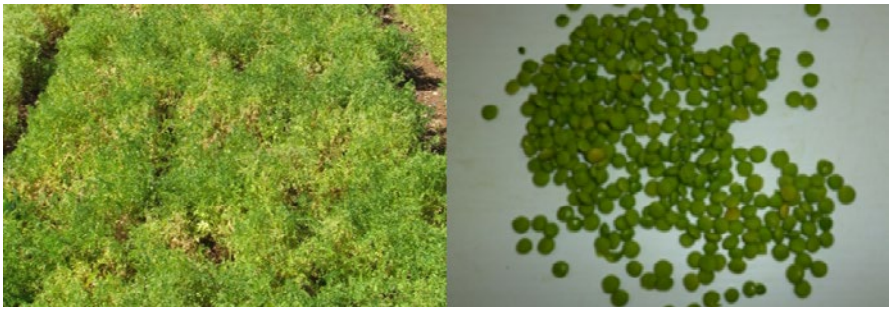

Photo 13: *Lentil crop with ryegrass at its optimum stage for crop-topping (2011).*

Photo: Grain yield implications of crop-topping pulses for late weed control in south-eastern Australia. "Capturing Opportunities and Overcoming Obstacles in Australian Agronomy", (2012), Proceedings of 16th Australian Agronomy Conference 2012, http://www.regional.org.au/au/asa/2012/weeds/8099_linesml.htm

Photo 14: *Lentil crop with ryegrass at its optimum stage for crop-topping (2010).*

Photo: Grain yield implications of crop-topping pulses for late weed control in south-eastern Australia. "Capturing Opportunities and Overcoming Obstacles in Australian Agronomy", (2012), Proceedings of 16th Australian Agronomy Conference 2012, http://www.regional.org.au/au/asa/2012/weeds/8099_linesml.htm

FEEDBACK

MORE INFORMATION

For further information on this trial go to:
http://www.regional.org.au/au/asa/2012/weeds/8099_linesml.htm

MORE INFORMATION

For more information on 'Desiccation and crop-topping of pulses' see Pulse Australia bulletin at http://pulseaus.com.au/growing-pulses/publications/desiccation-and-croptopping

MORE INFORMATION

For more information on crop-topping go to:
Desiccation and Crop-topping: Risks in Pulse and Canola Crops: http://pulseaus.com.au/storage/app/media/crops/pulses/20161005_PA-AOF-desiccant.pdf

MORE INFORMATION

Pulse Australia released an 'Alert' on desiccation and crop-topping in October 2016.

Click on the link for the most current information including herbicides and desiccants approved for use in lentil.
http://pulseaus.com.au/blog/post/broadleaf-crop-desiccation

Trials on crop-topping

A crop-topping trial was conducted at Arthurton/Melton, South Australia in 2011.[3] Key findings were:

- Reductions in grain yield can occur with early crop-topping (two weeks prior to recommended timing);
- Grain yield is unaffected by late crop-topping (two weeks after recommended timing);
- Grain weight is affected by crop-topping similarly to grain yield; and
- Crop-topping does not have an effect on the occurrence of mould in lentil grain.

Photo 15: *Varying stages of maturity of seeds in pods of PBA Blitz$^{\phi}$ at the stage of crop-topping.*

Photo: M. Raynes, formerly Pulse Australia

Photo 16: *Varying stages of maturity of pods of PBA Hurricane XT$^{\phi}$ at the stage of crop-topping.*

Photo: M. Raynes, formerly Pulse Australia

3 M Lines, L McMurray, J Brand (2012) Grain yield implications of crop-topping pulses for late weed control in south-eastern Australia. In "Capturing Opportunities and Overcoming Obstacles in Australian Agronomy". Edited by I. Yunusa. Proceedings of 16th Australian Agronomy Conference 2012, 14-18 October 2012, Armidale, NSW, http://www.regional.org.au/au/asa/2012/weeds/8099_linesml.htm

FEEDBACK

11.3 Windrowing

Windrowing (or swathing) is when a standing crop is cut then left on the ground for the grain to be harvested at a later date. It is primarily used to bring the harvest date forward, uniformly ripen the crop, protect the crop from shattering where harvest is to be delayed, or be a part of general management to reduce seedset of weeds present.

Windrowing has become common in pulses like faba beans in some areas as growers try to reduce problems associated with direct harvesting, uneven crop maturity, or weed seed management. Windrowing lentil crops is not a common practice in Australia. However, it is possible if done correctly.

11.3.1 Benefits

Windrowing a pulse crop, including lentil can provide a number of benefits:

- Uniform maturity of the crop in paddocks;
- Problems caused by late maturing weeds are avoided. These include delayed harvest which increases the risk of staining caused by the weather and disease, and storage problems from green weed contamination;
- Can advance the harvest date when done as soon as the crop is mature, avoiding clashes with other crops, such as cereals;
- Weed seed is moved into a windrow that can be burnt after harvest;
- Lower pods are harvested rather than being left behind, due to the lower cutting height possible with a windrower;
- Excessively tall crops can be better handled at harvest. When direct harvesting tall crops the reel can be in the way: pushing plants forward and causing problems with feeding material into the harvester and losses on the cutter bar. Direct harvesting very tall and lodged crops is also very slow. Windrowing can dramatically increase harvester efficiency;
- Windrowing reduces damage to harvesters. Harvesters working in 'rougher' country can damage knife fingers and sections, retractable fingers and other components on sticks and stones. Pick-up fronts leave most of these 'undesirables' on the ground; and
- Harvest speed may be increased, particularly if a light crop is made into paired windrows; therefore, increasing the width covered by the harvester pass.[4]

In Canada, windrowing of lentil is prevalent. A key reason is that growers believe the lentil maintains its grain colour with this practice. Improved colour is a key parameter that assists growers in achieving a higher quality grade.

11.3.2 Risks

There are several risks to windrowing crops:

- Windrowing too early (prior to crop maturity) can cause significant yield and quality losses. Small and shrivelled seed will result from drying down of immature seed;
- Windrowing too late can cause shatter losses as the cutter bar hits the crop;
- The seed coat can discolour if left too long in the windrow, especially in wet conditions when mould growth and seed staining can occur;
- Light windrows can be blown; and
- Topsoil can blow if there is very little root system and plant biomass left.

While windowing lentil maintains better colour, it has not necessarily been found to be enough of an advantage for some growers compared to the overall time savings in the harvest program with crop-topping, desiccation and direct harvesting.

4 Pulse Australia (2016) Southern Lentil: Best Management Practices Training Course. Pulse Australia.

FEEDBACK

Windrowing of lentil crops for uniform ripening and earlier harvest was once considered impractical because lentil windrows often lack bulk, are difficult to pick up from the bare ground, and tend to be blown around in strong winds when left to dry down. However, there has been some success in placing wide windrows doubled into a bulkier windrow and using a 'cotton wheel roller' to compact the windrow. Risk is reduced and harvesting efficiency improved because of the larger, compact windrow and wide windrows covered in the harvesting pass.

A windrowing trial was attempted in 1994 at Merredin in WA; however, issues with picking up the lentil windrow with crop lifters led to a yield reduction of 37%.[5] Even so, windrowing may be an option in medium rainfall areas where growth and biomass production are generally large and good harvest weather is difficult to achieve. A self-propelled windrower is required to cut across the lay of the crop and a pick-up front is ideal.

11.3.3 Timing

The most critical step in windrowing is timing. Windrowing at the correct maturity time reduces the time the lentil plant spends in the windrow. Assessment for timing of windrowing should be based on seed maturity. Lentil seed is considered physiologically mature when the seed is filled to its maximum size, and has changed colour.

The ideal time to windrow is when the seeds in the top third of the lentil plant are at full physiological maturity.

Visual measurements such as leaf colour and drop, or pod colour should not be considered for timing of windrowing as these parameters can be misleading; leaves can be prematurely lost and pods blemished by disease.

If the lentil crop is not at the required level of maturity, then windrowing becomes problematic. Alternatively, windrowing on the later side of required maturity increases grain losses due to shattering. Determining the most appropriate time can be difficult taking into account variation across the paddock.

Snails

Windrowing of some pulses has also been successful when it is done only hours in front of the harvester, and done during the early morning whilst the crop is wet with dew to avoid grain loss. This timing is principally to help reduce snail contamination in the grain sample harvested later that day. Such a late timing does not assist in obtaining uniform and early crop ripening.

11.3.4 How to windrow

The cutting height for windrowing should be just below the bottom pods with the reel following the top of the crop. The reel speed should be quite slow. The delivery opening in the windrower should be large enough to prevent blockages or there will be lumps in the windrow. Windrows should be dense and tightly knit for best results.

Pick-up fronts are the most common type used for harvesting windrows. However, crop lifters used close together on open fronts have been used with some success.

Curing should take about 10–12 hot days. However, heavy infestations of radish, weeds and other green matter could delay drying.

5 G Riethmuller, K Siddique, I Pritchard (2005 revised) Successful Lentil Harvesting. Agriculture Western Australia Farmnote 99/99, http://www.agric.wa.gov.au/objtwr/imported_assets/content/fcp/lp/lent/cp/f09999.pdf

FEEDBACK

11.3.5 Should lentils be windrowed or direct headed?

In Canada, the practices of windrowing (swathing) lentil and direct harvesting (straight cut) lentil are both commonplace. There is no clear indication as to which method is best.[6]

The key element in choosing between windrowing and direct harvesting lentil is the level of urgency in harvesting the crop and transferring the grain into storage. Lentil must be prioritised at harvest in preference over other grain crops. This has been highlighted in both Canada and Australia where wet, uncooperative weather or extreme heat and winds have made the management of lentil harvest much more difficult than usual.

Timing and logistics are a consideration as the area that can be direct harvested in one day is less than what can be achieved with harvesting windrows. Windrowing green (not fully mature) lentil results in a larger window of time with which to harvest all crops.

Another consideration for choosing windrowing over direct harvesting is the cost of operation. The cost of operating a harvester versus a windrower is significantly higher. Additionally, windrowing and subsequent harvesting can be done at a speed of around 9–10 km/h, whereas direct harvesting is usually slower, around 6.5km/h, a key advantage when timeliness of harvest is critical.

There may sometimes be a time-sensitivity issue around the windrowing of both lentil and canola. In these circumstances the decision needs to be made whether to use desiccation and straight harvesting rather than windrowing.

11.3.6 Direct harvesting

Most Australian and some Canadian lentil growers tend to prefer direct harvesting (straight cutting) of lentil after desiccation (or crop-topping). Growers attribute much of their success in harvesting lentil to having the correct harvesting equipment. Using a flex harvester front with air reels can result in limited shatter on the knife front, provided the speed of the harvester is maintained. If the crop is shorter or thinner, it can be difficult to keep the crop feeding well and the harvester moving at the desired speed. More losses occur in a thin, poor standing crop compared to a thick and bulky crop. Harvest efficiency is improved if lentil has been rolled and/or sown inter-row into standing stubble, especially in a thinner or shorter crop.

A key benefit of direct harvesting lentil for many growers is time management of the entire harvest program (taking into account all crop types). For some, the time taken for lentil windrowing can be too long and can overlap with when canola and faba bean crops needs windrowing. Desiccating lentil can be completed in significantly less time than windrowing, thus allowing time needed for windrowing canola. Some growers employ additional contract harvesters to take off their lentils rapidly, given the dire yield and market consequences of delayed harvest.

6 B Bratrud (2011) To Swath or Not — Harvest Management of Lentils. Grainews 6 June 2011, http://www.agcanada.com/grainews/2011/06/06/to-swath-or-not-harvest-management-of-lentils/