



SOUTHERN JUNE 2018

FIELD PEA SECTION 10 PRE-HARVEST TREATMENTS

KEY POINTS | PURPOSE | DESICCATION | CROP-TOPPING | WINDROWING | CHEMICAL PRODUCTS REGISTERED FOR USE IN FIELD PEA



Pre-harvest treatments

Key points

- Desiccation is a practice applied to field pea crops that assists with the production of high-quality seed and planning around harvest.
- Desiccation is used to aid in uniform ripening of the crop and to kill green weeds.
- Desiccation enables a more timed harvest; generally an earlier harvest.
- Do not use glyphosate to desiccate field pea crops if the seed is to be retained for seeding production or for sprouting.
- Timing of desiccation is more critical than the rate of application of the desiccant.
- Crop-topping is a form of desiccation based on the weed stages of development to prevent weed seedset.
- Windrowing of field pea is possible, with some success using wider swathes into bulkier windrows.





FEEDBACK

(i) MORE INFORMATION

GRDC Fact Sheet: Pre-harvest herbicide use www.grdc.com.au/GRDC-FS-PreHarvestHerbicide

Pulse Australia: Desiccation and croptopping in pulses <u>http://pulseaus.com.au/growing-</u> <u>pulses/publications/desiccation-and-</u> <u>croptopping</u>

NSW DPI Desiccation and Harvest of field pea http://www.dpi.nsw.gov.au/__data/ assets/pdf_file/0004/157099/pulsepoint-05.pdf



Purpose

Pre-harvest treatments to assist with harvest and weed management include:

- Desiccation herbicide is applied to a mature crop to remove moisture from the crop and any green weeds to enable an earlier harvest. Field pea is well suited to desiccation and it is a common practice.
- Crop-topping herbicide is applied specifically to reduce weed seedset with minimal damage to the crop. Early-maturing varieties aid to this success.
- Windrowing cutting the crop to assist with direct heading, uneven crop maturity or weed seed management.
- Weed wiping herbicide is applied to weeds that project above the crop canopy.¹ It is successfully used in field pea to prevent seedset of ryegrass and other tall weeds that stand above the crop. Consider height of pea when choosing the variety.²

Desiccation and windrowing are primarily used to enable earlier harvest and to dry out green weeds. Timing is based on the maturity of the crop.

Crop-topping is primarily used to minimise weed seedset and is based on the maturity of the target weed. It is essential to ensure that the crop is mature enough so that the seed is not damaged.

Desiccation and crop-topping can reduce seed viability, depending on the timing and product used. They are not recommended for crops intended to be saved for seed.³

10.1 Desiccation

Desiccation is the chemical termination of plant growth at the stage when all growth functions have been completed. At this stage, seed size and yield have been set. In field pea, research has shown this occurs when seed moisture content drops to around 30% (Figure 1).

Seed moisture (%)



Figure 1: Dry-down pattern of field pea seeds with and without desiccation.

Source: E Armstrong, D Carpenter (1999) Desiccation & harvest of field peas. Pulse Point 5, Second Edition, NSW Agriculture, <u>http://www.dpi.</u> nsw.gov.au/_____data/assets/pdf_file/0004/157099/pulse-point-05.pdf

Desiccation of field pea crops prior to harvest can improve timeliness of harvest, maintain grain quality, and reduce soil and trash contamination of the sample. In addition, crop maturity can be advanced by 7–14 days. Harvest problems caused by late weed growth or irregular ripening and yield losses from potential shattering, wet



¹ Pulse Australia (2016) Southern/western field pea best management practices training course, module 8-2016, Draft. Pulse Australia Limited

² GRDC (2009) Field Peas: The Ute Guide, Southern region. GRDC, <u>https://grdc.com.au/resources-and-publications/all-publications/2009/04/field-peas-the-ute-guide</u>

³ Pulse Australia (2016) Pulses: Desiccation and croptopping. Pulse Australia website, <u>http://pulseaus.com.au/growing-pulses/publications/desiccation-and-croptopping</u>





weather delays or hail damage can be minimised with desiccation. High seed quality is also maintained, with less damage from late insect attack or disease blemishes.

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In seasons with hot dry finishes, the crop naturally matures quickly and evenly, and the benefits of desiccation can be greatly reduced. Producers need to assess their own circumstances to determine if desiccation will provide financial and managerial benefits.⁴

Desiccation also acts as the first of the summer fallow sprays and can help ease the workload in an already busy harvest period. This spray can also be used as a tool in herbicide-resistance management. Ryegrass plants are often not mature when field pea is ready to desiccate, and as such the application can act as a 'spray-topping' tool to reduce seedset of potentially resistant ryegrass.

10.1.1 Seed and pod development

Pod and seed maturation is very staggered up each podded branch and between branches. Immature seeds are in the top one-third to one-quarter of the canopy. Maturity time is generally more compressed and of shorter duration than flowering due to the effects of higher temperatures and varying degrees of moisture stress on the plant.

One of the challengers to growers is how to optimise the timing of the desiccant spray when there are various stages of seed maturity 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. These soil mounds or depressions ('crab holes') can further add to the problem of uneven crop maturity.

Often, inspection of crops nearing 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 are still at 30-40% moisture content and at varying stages of approaching physiological maturity.⁵

Estimating average seed moisture content (ASMC)

ASMC can be ascertained in a number of ways:

- Pick 10–20 stems at random and sub-sample sufficient seed to fill a moisture meter, which works well for harvest samples but is not very accurate with high moisture samples.
- Pick 10–20 stems at random and sample all the seed, weigh the wet sample and then desiccate/dry until constant weight.
 ASMC (%) = 100 x (wet weight dry weight) / wet weight.

Alternatively, the appearance (colour, opacity) or texture of the pods, the seed or whole plants (e.g. percent maturity) may be used to estimate the correct timing of these operations (Figure 2 and Figure 3).⁶



⁴ S Moore, G Cummings, L Jenkins, J Gentry (2010) Northern Region Field Pea Management Guide. Pulse Australia Ltd, <u>http://porkcrc.com.au/Field_Pea_Production_Guide_pdf</u>

Pulse Australia (2016) Southern/western field pea best management practices training course, module 8-2016. Pulse Australia Limited
 M Seymour (2016) A visual guide to key stages in the growth and maturity of field pea. <u>https://www.agric.wa.gov.au/field-peas/visual-guide-key-stages-growth-and-maturity-field-pea</u>







Figure 2: Seed colour can be used to estimate the seed moisture content (SMC) of field pea. Texture can also be used: >80% SMC, the seed is small, watery and easily squashed; at 40–80% SMC, the seed is easily split with fingernail pressure; at 25–40% SMC, the seed rapidly dries down and is firm but the seed dents with fingernail pressure and will split with increasing force.

 ${\tt Source: DPIRD, } \underline{\tt https://www.agric.wa.gov.au/field-peas/visual-guide-key-stages-growth-and-maturity-field-peas/visual-guide-key-stages-growth-and-guide-key-stages-growth-and-guide-key-stages-growth-and-guide-key-stages-growth-and-guide-key-stages-growth-and-guide-key-stages-growth-and-guide-key-stages-growth-and-guide-key-stages-growth-and-guide-key-stages-growth-and-guide-key-stages-growth-and-guide-key-stages-growth-and-guide-key-stages-growth-and-guide-key-stages-growth-and-guide-key-stages-growth-and-guide-key-stages-growth-and-guide-key-stages-growth-and-guide-key-stages-growth-and-guide-key-sta$



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29th November	2nd December	7th December	12th December	15th December	20th December
10% Maturity 0% Brown pods	25% Maturity 20% Brown pods	75% Maturity 50% Brown pods	90% Maturity 75% Brown pods	95% Maturity 100% Brown Pods	100% Maturity 100% Brown pods
	57% 51% 19%	56% 49%	54% 44% 22%	30%	
60% ASMC	50% ASMC	35% ASMC	27% ASMC	18% ASMC	7% ASMC

Figure 3: Appearance of crop, pods and seed at a range of seed moisture contents, Boyup Brook, WA 2005.

Source: DPIRD, https://agric.wa.gov.au/n/369

10.1.2 Timing of desiccation

The optimal stage to desiccate the crop is when the vast majority of seeds have reached full physiological maturity.

A good starting point to estimate the correct timing of desiccation is to record the end of flowering. Wait a further 20 days, then start closely monitoring the crop as maturity approaches.

- Visibly assess pod colour and development changes. Desiccate when the lower three-quarters of pods along the stem are brown, the seeds are firm, rubbery and split rather than squash when squeezed, and the shells are thin and leathery. Field pea pods mature from the lowest flowering node upwards. Many plants at this stage may still have green tips.
- Monitor seed moisture changes. Desiccate when seed moisture drops to around 30%. To collect seed for this, randomly pick 10–20 stems or more across the paddock (Figure 4).

Desiccating dun and white field pea

Cotyledons (splits) of these types gradually change in color from green to yellow during ripening. Desiccating these types too early can result in an unacceptable proportion of small green seeds in the harvest sample. Therefore, wait until at least 50% or more seeds have turned yellow before desiccating.







Desiccating blue peas

Cotyledons of this type remain green during the ripening process, but if left too long after ripening, tend to bleach into a mottled yellow/green color. This is termed 'blonding' and can lead to rejection. Therefore, it is safer and more desirable to desiccate these types even earlier than white types to preserve this rich green cotyledon color. Cooling during prolonged storage will also help maintain the intensity of this green colour.

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Desiccants should be applied using ground equipment. If conducted at the correct crop stage and when the crop is damp with dew, little or no damage results.



Figure 4: Guide to the timing of field pea desiccation.

Source: E Armstrong, D Carpenter (1999) Desiccation & harvest of field peas. Pulse Point 5, Second Edition, NSW Agriculture, http://www.dpi.nsw.gov.au/_data/assets/pdf file/0004/157099/pulse-point-05.pdf









Both glyphosate 540 g/L (e.g. Roundup PowerMAX®) and diquat 200 g/L (e.g. Reglone®) are registered for desiccation of field pea (Table 1). Do not use glyphosate to desiccate or crop-top field pea destined for seed or sprouting markets because it can affect the germination percentage of normal seedlings.

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The reason for desiccation will determine product choice. For example some crops may require the removal of green material to reduce moisture content in the sample (e.g. glyphosate). In other crops a very quick desiccation will speed up maturity as a harvest aid (e.g. diquat).

Seed to be used for planting or sprouting should not be desiccated with glyphosate.⁷

 Table 1: Registered products for desiccating field pea. Refer to current product label for full directions.

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. 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 <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.

* WARNING DO NOT use glyphosate to desiccate field pea that are to be used for seed or sprouting as germination is affected. Source: Extract from Regione® & Roundup Ultra Max® product labels

10.2 Crop-topping

Crop-topping is a form of desiccation; however, its timing is based on the weed stages of development (weed seedset) rather than the field peas' growth stage. This means that the field pea crop can be compromised if crop-topping is implemented too early. Product rates used to crop-top differ from those used to desiccate the crop.

Timing of crop-topping in field pea works very well in early-maturing varieties, e.g. PBA Gunyah^Φ, PBA Twlight^Φ and PBA Wharton^Φ. Timing of crop-topping can however be marginal in some years in other field pea varieties that are later maturing, e.g. Morgan^Φ. Crop-topping is generally not always possible in those later varieties because they can be too late in maturing relative to the ryegrass in a lengthy growing season.

Crop-topping of field pea too early can result in discolored seed coat or cotyledons (kernel) and either rejection at delivery or severe downgrading. Even in other pulses, growers have to be aware of grain quality defects if crop-topping occurs earlier than the optimal crop desiccation or windrowing stage.⁸



⁷ S Moore, G Cummings, L Jenkins, J Gentry (2010) Northern Region Field Pea Management Guide. Pulse Australia Ltd, <u>https://sydney.edu.au/agriculture/documents/pbi/pbi_region_north_field_pea_management_guide.pdf</u>

⁸ Pulse Australia (2016) Southern/western field pea best management practices training course, module 8-2016, Draft. Pulse Australia Limited



FEEDBACK

i) MORE INFORMATION

Crop topping trials in SA in 2008 and 2009 (Lines and McMurray) and in Victoria in 2012 (Brand and vanderMark) demonstrate that variety, time of sowing and dry spring conditions can have an impact on whether crop topping is a useful technique to target the weed of concern and whether yields are reduced by applying this technique.

Other techniques such as brown manuring maybe a suitable option where weed control, particularly herbicide resistance is an issue, and in boosting soil nitrogen reserves.

See GRDC Fact sheet on Manuring pulse crops <u>https://grdc.com.au/resources-</u> <u>and-publications/all-publications/</u> <u>factsheets/2013/09/manuring-of-</u> <u>pulse-crops</u>



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Photo 1: Desiccating green weeds in field pea.

Photo: GRDC (2010), Late season herbicide use Fact Sheet found at this link <u>http://www.goodfoodworld.com/wp-content/uploads/2015/02/</u> <u>GRDC_LateSeasonHerbicideUse_FS.pdf</u>

10.2.1 Field trial

Southern Farming Systems and Victorian Department of Primary Industries trial data 2012: faba bean and field pea varieties and management Westmere, Victoria

Key message: Early sowing, concurrent with previous research, was highest yielding in 2012. There appear to be several promising new varieties available for southern Victoria, offering a range of grain types and forage options, associated with excellent yield potential. **Crop-topping results highlight the importance of growers and advisers being aware of both weed and crop growth stages, otherwise significant grain yield loss could occur.**

Seasonal conditions at Westmere were excellent for pulse production, with adequate rainfall and few high or low temperature events that impacted on yield. Grain yields ranged from 2.3 t/ha for PBA Hayman^(b) sown 4 July to 5.0 t/ha for Kaspa^(b) sown 9 May.

See summary of trial below or full details: <u>http://www.farmtrials.com.au/trial/16030</u>

Westmere trial data 2012

Aim

The field trial at Westmere 2012 aimed to investigate the adaptability of a range of field pea varieties to varying sowing dates, crop-topping and disease control.

Treatments

Varieties: Kaspa^{*\phi*}, PBA Oura^{*\phi*}, PBA Hayman^{*\phi*}, Morgan^{*\phi*}, PBA Pearl^{*\phi*}, OZP0805, OZP1103, OZP1101.

Sowing dates: 9 May (early), 6 June (mid), 4 July (late).

Crop-topping: mid – applied at ryegrass milky dough.

Disease control: fortnightly – chlorothalonil 500 @ 2 L/ha applied fortnightly starting 6 weeks after emergence; early – mancozeb @ 2 kg applied at 9 Node + early flower

Other details

Stubble: cultivated

Row spacing: 20 cm

Fertiliser: MAP @ 60 kg/ha at sowing

Plant density: 35 plants/m²

A summary for each of the agronomic treatments is outlined below.

- **Disease management** there was no impact of disease management in field peas for 2012.
- **Sowing dates** as there was no impact of disease management, data for sowing dates has been averaged across all disease management treatments (but excludes the crop-topping treatment (<u>Table 2</u>)). Generally, the early (9 May) and mid (6 June) sowing dates had similar yields, while the later sowing date







(4 July) was 30% lower yielding (Table 1). However, there were some varietal differences to this trend. PBA Hayman^(b) showed a slight yield increase at the mid sowing date and no yield loss at the last sowing date. OZP1103 generally showed lower yield loss with delayed sowing compared with all varieties except PBA Hayman^(b). Conversely, PBA Oura^(b) appeared to show the greatest yield loss between the early, mid and late sowing times. Comparing the overall yield of varieties, Kaspa^(b) and OZP0805 were highest and PBA Hayman^(b) lowest (Table 2).

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Crop-topping – yield loss from crop-topping in 2012 ranged from 5–65% (Table 3). Generally, the yield reductions were least at the latest sowing date and highest at the early sowing date. PBA Hayman^(b) showed the greatest yield loss with the crop-topping treatment at all sowing dates, while there was little difference between other varieties at the early and mid-sowing dates. At the latest sowing date, OZP1101 and OZP1103 appeared to show the least yield loss (Table 3).

Table 2: Effect of sowing date on grain yield (t/ha) of field pea varieties grown atWestmere, Victoria, in 2012.

Variety	9 May	6 June	4 July	Mean (t/ha)
OZP0805	4.89	4.73	3.54	4.39
Kaspa ^{(b}	4.98	4.72	3.38	4.36
OZP1103	4.55	4.54	3.73	4.27
OZP1101	4.80	4.76	3.03	4.20
PBA Pearl®	4.54	4.25	2.84	3.88
Morgan®	4.50	4.06	2.94	3.84
PBA Oura®	4.69	4.06	2.74	3.83
PBA Hayman [®]	2.44	2.91	2.28	2.54
Mean (t/ha)	4.42	4.25	3.06	3.91

Source: www.farmtrials.com.au/trial/16030

Table 3: Grain yield reduction (%) from crop-topping treatment applied to new fieldpea varieties sown at three dates at Westmere, Victoria, in 2012.

Variety	9 May	6 June	4 July	Mean (%)
OZP0805	26	42	16	28
Kaspa ^{(b}	25	32	21	26
OZP1103	34	45	6	28
OZP1101	32	36	5	24
PBA Pearl®	31	37	25	31
Morgan₫	31	47	22	33
PBA Oura®	30	38	12	27
PBA Hayman [⊕]	65	63	46	58
Mean (%)	34	42	19	32

Source: www.farmtrials.com.au/trial/16030







Key findings and comments

Varieties – Kaspa^(b) and its potential replacement OZP0805 (PBA Wharton^(b)), performed extremely well at Westmere in 2012, with yields in the top three lines across all sowing dates. The new white pea PBA Pearl^(b) also showed promise and offers different marketing opportunities. Also of note is OZP1103, which showed both excellent yields and biomass (data not shown) as this variety has potential for dual-purpose cropping (i.e. both forage and grain). Further varietal details below.

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- Sowing dates as has been seen in previous research, early sowing produced the highest yields. Based on yields achieved of the earlier sown treatments (4.5 t/ha), peas could have achieved a gross profit of approximately \$1300/ha based on management costs of \$250/ha and grain price at \$340/t. Results from 2011 at Lake Bolac, Victoria, showed that sowing early increases grain yield. The three sowing dates used in 2011 were later than the ones used in 2012, the latest being 9 August. All varieties yielded particularly badly compared to the earlier sowing dates of 20 May and 16 June. Kaspa^(b), PBA Oura^(b) and PBA Hayman^(b) were the varieties grown in both 2011 and 2012, and all produced similar yield in both trials. The earliest sowing date produced the greatest yields, followed by the mid sowing date, followed by the late sowing date for both Kaspa^(b) and PBA Oura^(b) and PBA Hayman^(b) were the variety followed by the late in both years.
- Crop-topping in 2012 at Westmere, crop-topping targeting ryegrass at the milky dough stage caused significant yield loss in all varieties grown. This could be expected as the crop was too green and seed not sufficiently developed for application of a desiccant. This highlights the importance of growers and advisers being aware of both weed and crop growth stages, otherwise significant grain yield loss could occur. Results from a similar trial in 2011 at Lake Bolac did not show any overall effect of crop-topping on grain yield. This again indicates that if the crop-top is applied at the correct timing, the risk of reducing grain yield is reduced.
 - **Disease management** these treatments were implemented to assess the effect disease is having on grain yields of field pea in a high-rainfall zone. Unlike 2011, there was no response to disease control as disease pressure was low. A fortnightly fungicide regime is unlikely to be economically viable, unless yields are above 2 t/ha and differences are in excess of 20% when using a fungicide. However, the early strategy, although not economically profitable, may be a risk management strategy to minimise the chance of yield loss from disease like black spot.⁹



⁹ J Brand & E vanderMark (2012) Faba Bean and Field Pea Varieties and Management – 2012 Results Westmere. <u>https://www.farmtrials.com.au/trial/16030?search_num=4</u>







Photo 2: Weeds in a mature field pea crop may need desiccation to enable easier harvest without green contamination in the grain sample.

Photo: Emma Leonard (2014), Pre-harvest herbicide use. GRDC Fact Sheet, www.grdc.com.au/GRDC-FS-PreHarvestHerbicide

10.2.2 Timing

The major differences between desiccation and crop-topping are:

- application timing is different and initiated by different criteria; •
- herbicides for crop-topping and desiccation are not always the same (Table 4); •
- herbicide rates for desiccation are higher than that required for croptopping (Table 4);
- crop-topping will advance the harvest timing in some pulse crops; and
- both crop-topping and desiccation chemicals will cause reduced grain quality and yield if applied at the wrong maturity stage of the crop.



Pre-harvest herbicide use Fact Sheet GRDC (2014) https://grdc.com.au/GRDC-FS-**PreHarvestHerbicide**



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10.3 Windrowing

Windrowing of field pea is possible, but not common practice like it is for pulses faba bean. It is a practice primarily used to bring the harvest date forward, uniformly ripen the crop, protect the crop from shattering where harvest is to be delayed, or used as part of general management to reduce weed seedset.

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Windrowing of field pea crops for uniform ripening and earlier harvest is generally considered impractical because field pea 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, some growers have had success with semi-leafless peas like Kaspa^{\! (\! \! \ \! \! \!)} by placing wide swathes doubled into a bulkier windrow and using a 'cotton wheel roller' to compact the windrow (Photo 3 and Photo 4). Risk is reduced and harvesting efficiency improved because of the larger, compact windrow and wide swathe covered in the harvesting pass.



Photo 3: Swathing semi-leafless field pea. Photo: I Pritchard (2014) Machinery used for swathing semi-leafless field peas, https://www.agric.wa.gov.au/field-pea field-pea









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Photo 4: Rolling swathes of semi-leafless field pea. Photo: I Pritchard (2014) Machinery used for swathing semi-leafless field peas, <u>https://www.agric.wa.gov.au/field-peas/swathing-semi-leafless-field-peaa</u>

10.3.1 Windrow (swathing) or direct-heading field pea

Swathing

Swathing field pea reduces the risk of putting a stone through the header, which is more of a risk with direct-heading. Some growers would prefer to use the swather over the harvester, which costs more to operate per hectare. Swathing and harvesting can be carried out at around 9–10 km/h, whereas direct-heading is performed at slower speeds of around 6.5 km/h.

Timing is critical for proper swathing. Too early and field pea won't cut as well, while later timing increases the amount of shatter loss. Choosing the best timing can be difficult with variability of maturity throughout the field. Swathing at the right maturity time can help reduce the amount of time field pea lay in the swathe. In Australia and Canada growers aim for the field pea to be picked up in 7–10 days, depending on the weather.

Direct-heading

Some field pea growers prefer direct-heading (straight cutting) after desiccation (or crop-topping). Success can be attributed to having the right harvest equipment. Using a flex header with air reels can mean virtually no shatter on the knife, provided they can keep the speed of the combine harvester up. 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 stand than a thick crop.

A key benefit of direct-heading field peas for many growers is time management. For some the time taken for field pea swathing can be too long and can overlap with when canola needs swathing/windrowing. Desiccating field peas can be completed in a fraction of the time of swathing, so allowing growers more time for management of other crops.









For more information: See <u>Section 11.4 Modifications and</u> <u>harvest aids</u>

AVPMA webpage: PubCRIS database https://services.apvma.gov.au/web/ guest/pubcris

While swathing/windrowing field pea preserves better colour, it is not necessarily enough of an advantage compared to the time saved using other methods.¹⁰

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10.4 Chemical products registered for use in field pea

Pre-harvest chemical application to crops increases the risk of detectable herbicide residues in harvested grain, potentially leading to breaches of maximum residue limits (MRLs). MRLs vary according to herbicide, crop and market and these need to be understood. Detection of chemical residues above MRLs will jeopardise market access and the future of the Australian grains industry.

Follow product labels correctly and adhere to withholding periods for harvest and grazing or cutting for stock feed (GSF) (Table 4).

Glyphosate is **NOT REGISTERED** for seed crops and should not be used in pulses intended for seed production or sprouting

Table 4: Registered products for desiccation and crop-topping of field pea.

Herbicide	Example trade names	Operation	Crop	Rate	Withholding period
Diquat 200g/L	Regione®	Desiccation	Chickpea, faba bean, dry pea, lentil, lupin, mungbean	2 to 3 L/ha	Grazing/stockfeed (GSF): 1 day Harvest: 0 days (lupin/dry pea) 2 days (chickpea, lentil, faba bean)
Paraquat 250g/L	Gramoxone®	Crop-topping	Chickpea, faba bean, field pea, lentil, lupin, vetch	400 to 800 mL/ha	GSF: 1 day (7 days for horses) Stock must be removed from treated areas 3 days before slaughter Harvest: 7 days
Glyphosate 480g/L	Ripper 480®	Crop-topping	Faba bean, field pea	360 to 765 mL/ha	GSF: 7 days Harvest: 7 days
		Desiccation	Chickpea, faba bean, field pea, lentil, mungbean	765 mL to 2.025 L/ha	GSF: 7 days Harvest: 7 days
Glyphosate 500g/L	Touchdown Hi Tech®	Crop-topping	Faba bean, field pea	300 to 700 mL/ha	GSF: 7 days Harvest: 7 days
Glyphosate 540g/L	Roundup PowerMAX®	Crop-topping	Faba bean, field pea	320 to 680 mL/ha	GSF: 7 days Harvest: 7 days
		Desiccation	Chickpea, faba bean, field pea, lentil, mungbean	680 mL/ha to 1.8 L/ha	GSF: 7 days Harvest: 7 days
Saflufenacil	Sharpen®	Desiccation	Field pea, faba/broad bean, chickpea, lentil, lupin	34 g/ha plus recommended label rate of glyphosate or paraquat herbicide plus 1% Hasten® or high quality MSO	GSF: 7 days Harvest: 7 days

*GSF – withholding period for grazing or cutting for stock food.

Observe the harvest withholding period and GSF for each crop. Always read the label supplied with the product before each use.

Source: Pulse Australia, Australian Pulse Bulletin, Desiccation and Crop-topping in pulses, http://www.pulseaus.com.au/growing-pulses/publications/desiccation-and-croptopping



¹⁰ Pulse Australia (2016) Southern/western field pea best management practices training course, module 8-2016, Draft. Pulse Australia Limited