

TEN TIPS TO EARLY-SOWN CANOLA

Changing rainfall patterns, disciplined summer fallow management and improved no-till seeding systems have facilitated a shift to earlier sowing of canola, capitalising on soil moisture opportunities and reducing production risk. The Optimised Canola Profitability project, a collaborative project with co-investment from GRDC, investigated the potential for early sowing of canola in regions from northern NSW to the Eyre Peninsula of South Australia, with a focus on tactical agronomic requirements. It found...

SOWING CANOLA EARLY CAN INCREASE PRODUCTIVITY AND PROFITABILITY BY FOLLOWING 10 IMPORTANT GUIDELINES...



1 CONSIDER YOUR LOCATION

Early sowing of canola before mid-April can be successful in **most environments of southern and eastern Australia** using varieties with the appropriate phenology.

The main exceptions are:

- South Australia, where low rainfall probabilities in March-April are likely to restrict early sowing to around mid-April; and

- Northern NSW, where trials show significant yield variability with early April sowing; late April or early May is preferred.

From 2014 to 2018, the Optimised Canola Profitability project team conducted 50 trials looking at the interaction between variety and sowing date. The trials were located at 14 sites, ranging from northern NSW to the Eyre Peninsula in SA.



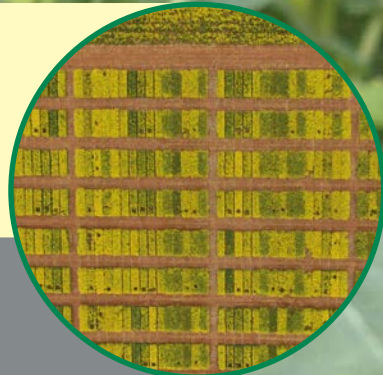
2 SELECT A SLOWER- DEVELOPING VARIETY

Early sowing amplifies differences in flowering time (phenology) between spring canola varieties.

Sow slower-developing varieties early to target the Optimal Start of Flowering period, i.e. the period when the risk of frost/heat/water stress is minimised and yield potential maximised.

Sowing faster-developing varieties early will expose them to greater frost and disease risk at flowering and can reduce yield potential.

A sowing plan that incorporates two different canola phenology types (i.e. varieties with different flowering times) can help optimise production across the enterprise.



SELECTING VARIETIES FOR EARLY SOWING...

- know your **Optimal Start of Flowering (OSF)** period – pg 2
 - target your OSF by selecting **mid-slow or slow**-developing varieties – pg 3
- #SowSlowEarly

Optimal Start of Flowering (OSF)

Target flowering to start within the acceptable range of the OSF date to minimise frost/heat/water stress and maximise yield.

NORTHERN NSW & SOUTHERN QLD

	OPTIMUM FLOWERING DATE	ACCEPTABLE RANGE (DAYS)	SOIL TYPE	WITH PAWC (mm)
Nyngan	5 Jul	33	Sandy clay loam	108
Mungindi	10 Jul	28	Brown chromosol	170
Goondiwindi	19 Jul	28	Grey vertosol	188
North Star	24 Jul	27	Grey vertosol	239
Walgett	24 Jul	26	Grey vertosol	198
Moree	24 Jul	30	Black vertosol	238
Trangie	29 Jul	28	Sandy clay loam	141
Condamine	30 Jul	27	Grey vertosol	285
Narrabri	1 Aug	29	Vertosol	218
Breeza	3 Aug	28	Grey-black vertosol	264
Gunnedah	5 Aug	23	Grey-black vertosol	264
Warwick	14 Aug	24	Brown vertosol	216

SOUTH AUSTRALIA

	OPTIMUM FLOWERING DATE	ACCEPTABLE RANGE (DAYS)	SOIL TYPE	WITH PAWC (mm)
Bute	18 Jul	42	Red sandy clay loam	139
Kadina	18 Jul	36	Calcic loam	102
Lameroo	19 Jul	32	Loamy sand	90
Yeelanna	19 Jul	53	Duplex	152
Minlaton	21 Jul	43	Red sodosol	88
Loxton	21 Jul	25	Sand	118
Wudinna	22 Jul	20	Red sandy clay loam	139
Karoonda	22 Jul	33	Sandy loam	136
Hart	25 Jul	37	Clay calcarosol	183
Booleroo	26 Jul	31	Clay loam	128
Naracoorte	28 Jul	29	Dark grey clay	80
Spalding	29 Jul	38	Red chromosol	143
Tarlee	4 Aug	47	Duplex	225
Bordertown	11 Aug	34	Grey vertosol	128

FROST

In **northern NSW**, target the later end of the OSF range to avoid severe frost damage; sow on a good moisture profile to minimise heat and water stress in later-flowering crops.

DISEASE

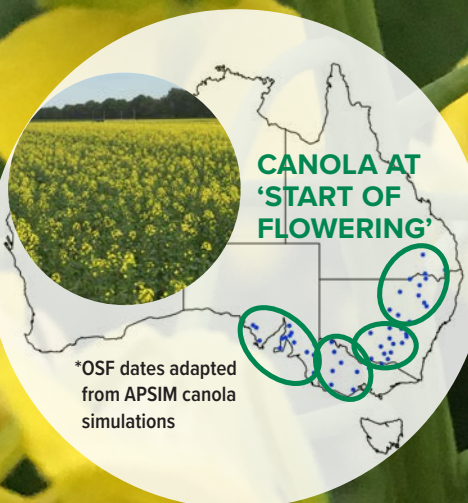
In **medium and high-rainfall areas** with high canola intensity, target the later end of the OSF range to minimise disease risk (e.g. upper canopy blackleg and sclerotinia).

CENTRAL & SOUTHERN NSW

	OPTIMUM FLOWERING DATE	ACCEPTABLE RANGE (DAYS)	SOIL TYPE	WITH PAWC (mm)
Hillston	22 Jul	23	Duplex	122
Yanco	27 Jul	24	Brown chromosol	115
Lockhart	27 Jul	26	Brown sodosol	173
Finley	28 Jul	32	Red kandosol	158
West Wyalong	2 Aug	31	Sandy clay	199
Condobolin	3 Aug	19	Red kandosol	126
Wellington	3 Aug	19	Sandy clay loam	101
Culcairn	5 Aug	35	Sandy loam	127
Canowindra	7 Aug	30	Red kandosol	150
Parkes	10 Aug	29	Sandy clay loam	197
Cowra	11 Aug	26	Red kandosol	150
Wagga Wagga	16 Aug	34	Red kandosol	147
Temora	17 Aug	25	Red chromosol	191
Young	30 Aug	34	Red kandosol	169

VICTORIA

	OPTIMUM FLOWERING DATE	ACCEPTABLE RANGE (DAYS)	SOIL TYPE	WITH PAWC (mm)
Ouyen	11 Jul	39	Sand	133
Mildura	17 Jul	24	Calcarosol	97
Birchip	26 Jul	33	Clay loam	164
Horsham	6 Aug	38	Grey cracking clay	249
Shepparton	7 Aug	39	Duplex	169
Bendigo	10 Aug	30	Sandy loam	90
Inverleigh	13 Aug	51	Clayey sand	169
Hamilton	25 Aug	49	Clay loam	194
Rutherglen	28 Aug	27	Brown chromosol	160



*OSF dates adapted from APSIM canola simulations

- short OSF range < 25 days
- medium OSF range 25–35 days
- long OSF range > 35 days

Proposed 'phenology' ratings of canola varieties compared with commercial 'maturity' ratings



34 canola varieties were included in the Optimised Canola Profitability project from 2014–2018. Phenology differences between varieties were a major yield determinant in the project, however phenology did not relate to commercial maturity ratings for early sowing. The project committee is encouraging industry to adopt more accurate phenology terminology as described here to guide sowing date decisions and target the Optimal Start of Flowering period.

**Varieties with three site-years of phenology data.*

FAST or MID-FAST developing varieties can have high yield potential but are not suited to early sowing.

Select **MID-SLOW** or **SLOW** developing varieties for sowing before mid April.

VERY SLOW (winter) dual-purpose varieties can be sown in February or March in high-rainfall zones, and in medium-rainfall zones when the moisture profile allows.

VARIETY	PHENOLOGY (time from sowing to flowering when sown early)	MATURITY (as supplied by breeding companies)	HERBICIDE TOLERANCE	HYBRID or OP (open pollinated)
ATR Stringray	Fast	Early	Triazine	OP
Diamond	Fast	Early	Conventional	Hybrid
Hyola 350TT*	Fast	Early	Triazine	Hybrid
43Y23 (RR)	Fast	Early	Roundup Ready	Hybrid
Hyola 506RR*	Fast	Mid-early	Roundup Ready	Hybrid
Hyola 580CT*	Mid-fast	Mid-early	Imidazolinone/Triazine	Hybrid
Banker CL*	Mid-fast	Mid	Imidazolinone	Hybrid
InVigor R3520*	Mid-fast	Early to early-mid	Roundup Ready	Hybrid
InVigor T4510*	Mid-fast	Early mid	Triazine	Hybrid
44T02 (TT)*	Mid-fast	Early-mid	Triazine	Hybrid
DG408RR*	Mid-fast	Early-mid	Roundup Ready	Hybrid
DG460RR*	Mid-fast	Early-mid	Roundup Ready	Hybrid
43Y92 (CL)*	Mid-fast	Early	Imidazolinone	Hybrid
ATR Bonito	Mid-fast	Early to early-mid	Triazine	OP
44Y27 (RR)*	Mid-fast	Early-mid	Roundup Ready	Hybrid
44Y90 (CL)	Mid-fast	Early-mid	Imidazolinone	Hybrid
ATR Mako	Mid-fast	Mid-early	Triazine	OP
HyTTec Trophy*	Mid	Early to early-mid	Triazine	Hybrid
Quartz*	Mid	Mid to mid-early	Conventional	Hybrid
Turbine*	Mid	Early-mid	Triazine	Hybrid
Hyola 559TT	Mid	Mid	Triazine	Hybrid
AV Garnet	Mid	Mid to mid-early	Conventional	OP
ATR Gem	Mid	Mid-early	Triazine	OP
DG 670TT*	Mid	Mid-late	Triazine	Hybrid
GT-53*	Mid	Mid	Roundup Ready	Hybrid
45Y91 (CL)	Mid	Mid	Imidazolinone	Hybrid
InVigor R5520P*	Mid	Mid	Roundup Ready	Hybrid
SF Ignite*	Mid-slow	Mid to mid-late	Triazine	Hybrid
ATR Wahoo	Mid-slow	Mid-late	Triazine	OP
45Y25 (RR)	Mid-slow	Mid	Roundup Ready	Hybrid
Archer	Slow	Mid-late	Imidazolinone	Hybrid
Victory 7001 (CL)	Slow	Mid-late	Imidazolinone	Hybrid
Phoenix CL*	Very slow (Winter)	Winter	Imidazolinone	Hybrid
Edimax CL	Very slow (Winter)	Winter	Imidazolinone	Hybrid
Hyola 970CL	Very slow (Winter)	Winter	Imidazolinone	Hybrid

TARGET YOUR OSF
(Optimal Start of Flowering)
by selecting appropriate varieties and sowing dates.
In suitable environments, **sow slower-developing varieties before mid-April** to maximise yield potential.

Research showed...
where variety had the main effect in trials, yields were generally ranked in the order:
1. hybrid non-TT
2. hybrid TT and OP conventional
3. OP TT
with yields primarily related to higher biomass

Research showed...
slower-developing varieties sown across a range of sowing dates produced similar flowering times and yields, allowing flexibility to widen the sowing window if required (except in very dry environments).
In contrast, some faster varieties sown early flowered weeks before the later sown.



Sowing time guidelines for phenology types at various eastern Australia locations



TOO EARLY
Avoid sowing fast varieties too early – this has caused the largest yield penalty.

TOO LATE
Sowing varieties later than recommended sowing time reduces yield by 5–8% per week.

Optimum sowing time
Earlier or later than optimal, or little experimental data available

	Week	March				April				May			
		1	2	3	4	1	2	3	4	1	2	3	4
Breeza	Slow												
	Mid												
	Fast												
Narrabri	Slow												
	Mid												
	Fast												
Wellington	Slow												
	Mid												
	Fast												
Trangie	Slow												
	Mid												
	Fast												
Condobolin	Slow												
	Mid												
	Fast												
Young	Slow												
	Mid												
	Fast												
Wagga Wagga	Slow												
	Mid												
	Fast												
Lockhart	Slow												
	Mid												
	Fast												
Yarrawonga	Slow												
	Mid												
	Fast												
Swan Hill	Slow												
	Mid												
	Fast												
Horsham	Slow												
	Mid												
	Fast												
Lake Bolac	Slow												
	Mid												
	Fast												
Lameroo	Slow												
	Mid												
	Fast												
Hart	Slow												
	Mid												
	Fast												
Yeelanna	Slow												
	Mid												
	Fast												



3 MANAGE FALLOWS & RESIDUES

Management of soil moisture in the fallow period is critical for successful canola establishment:
Spread residue evenly at harvest and retain until sowing to reduce moisture loss.
Control fallow weeds when they are small and before they start to use soil moisture.
Consider potential residues, particularly from Group B herbicides (e.g. Logran, Glean,

Broadstrike) and Group I herbicides (e.g. 2,4 D amine or ester) in the previous crop and fallow.

Consider sowing canola after pulses, brown manure or long fallow (double break) to increase residual moisture in lower-rainfall areas.

The mid-slow developing ATR Wahoo is a good OP triazine-tolerant option for early sowing. Pictured here sown late March 2017 at Ganmain NSW, with approx. 150mm growing season rainfall.



4 MANAGE SEED PLACEMENT

If sowing retained OP seed, **grade to at least 2mm** diameter to maximise establishment. Ensure the furrow is closed above the seed but **avoid heavy presswheel pressure**, particularly on hard-setting soils and if rain is expected.
 Disc seeding will minimise moisture loss and reduce clods when sowing early into marginal conditions, but be aware of fertiliser toxicity.

Consider placing seed slightly deeper (25–40mm) for early sowing to account for higher evaporation rates. Reduce to 15–20mm when dry sowing.

Avoid placing high rates of fertiliser in direct contact with the seed; **don't exceed 10–12kg/ha P**.

Variety selection is just one component of successful early sowing. Manage seed placement (picture shows ATR-Wahoo, retained open pollinated seed graded to 2mm, disc sown into wheat stubble early April 2017 at Tootool NSW).



5 ADJUST SEEDING RATES

Establishment rates are usually lower when sowing early, with typically warmer temperatures and marginal moisture.
 As a guide, **assume 40–50% establishment for early sowing** compared with 60–70% for later sowing; use the higher end of the range for hybrid and large-seeded OP seed. Increase seeding rates accordingly.

A seeding rate calculator based on the size of retained canola seed can be found at: www.agric.wa.gov.au

RESEARCH SHOWED... lower plant density (15–20 plants/m²) of hybrid canola can yield as much as a higher density (40–50 plants/m²) when sown early. But reducing target populations can be risky, with potential plant losses from insects in retained stubble or from hard-setting soils.

6 CAREFULLY MANAGE WEEDS

Early sowing usually occurs before annual weeds can germinate on the main autumn break.

Select paddocks with a low weed burden and use a robust pre-emergent herbicide strategy.

Select the herbicide tolerance package best suited to the weed spectrum and herbicide resistance status of the paddock.

Vigorous, early sown crops will help suppress weeds but monitor crop growth stage for post-emergent herbicide applications as the timing will be earlier, possibly while still sowing later crops.

Hyola® 970CL is a slow developing, dual purpose winter variety suited to very early sowing in high/medium rainfall areas. Pictured here at Marrar NSW in late-April; sown late March 2017 into retained wheat stubble.



7 SELECT FERTILE PADDOCKS

Select paddocks high in nitrogen (N) to fully capture the higher yield potential of early sown crops.

Aim for 80kg/ha N per tonne grain (includes soil mineral + N mineralised N in-crop + fertiliser N); canola will not 'hay off' with excess N, but oil often declines.

The rate of N is more important than the timing, although early sowing allows more opportunities for top-dressing applications.

In higher-risk, low-rainfall areas, sowing canola early with adequate N at seeding or early top-dressing is a successful strategy. Consider the use of legume N (e.g. pulse prior to canola) to support production in riskier environments.

RESEARCH SHOWED...

a strong relationship between biomass at maturity and grain yield. Biomass is strongly driven by nitrogen, with results showing N rates are more important than timing. None of the trials 'hayed off' despite the combination of early sowing, hybrid seed and high N input.

8 CONSIDER PESTS & INSECTS

Aphid pressure can increase with early sowing but risks are reduced by controlling host weeds in the fallow period.

Early sowing decreases the risk of red legged earth mite.

Other pests, including slugs, earwigs and slaters, are more influenced by rotation and residue management than sowing time, although stubble retention is a successful

strategy for early sowing. Slugs are a common problem for canola in zero-till systems, particularly where heavy cereal residue remains from the previous year. Early monitoring is critical, with damage often first appearing next to dams and drainage lines.

Slug damage in Hyola® 970CL canola at Junee NSW, sown into lupin stubble with a single disc seeder in late March 2017, with wheat residue remaining from previous years.





9 CONSIDER DISEASE PRESSURE

Early sowing can reduce the risk of blackleg crown canker in canola as young plants often develop before the onset of spore showers in autumn.

Slow developing varieties sown early will flower at similar times to fast varieties sown later. Pressure from upper canopy blackleg and sclerotinia stem rot will therefore be similar and the same management practices apply.

Crops flowering earlier than optimum may require fungicide sprays to manage upper canopy blackleg. See [canola-disease guidelines](#).



45Y91 CL is a slower developing imi-tolerant canola suited to early sowing, (Picture taken at Wallacetown, NSW sown mid-April 2017).



10 ASSESS CROPTOP/ WINDROW TIMING

Early-sown crops will generally branch more, particularly at lower plant densities, so a **higher proportion of grain yield will be derived from branches than the main stem.**

Seed on branches matures later than on the main stem. When assessing croptop or windrow timing, **check seed colour change across the whole plant**, not just the main stem.

Canola can be croptopped when 20% of seeds have changed colour from green to red/brown/black. Windrowing should commence when 60% of seeds have changed colour.



Diamond canola plots at Wallendbeen NSW. The cultivar Diamond was noted for its consistently high harvest index, outperforming earlier-sown slower varieties, but was penalised when sown too early.