



SOUTHERN

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CORPORATION

VETCH

SECTION 4

SEEDING

KEY POINTS | TIME OF SOWING | PRE-SEEDING WEED CONTROL | SEED
QUALITY | SEED INOCULATION AND SEED DRESSING | SEEDING SYSTEM –
DEPTH AND ROW SPACING | SOWING RATES | SEEDING FERTILISER | ROLLING

Seeding

Key points

- Time of sowing is influenced by region, variety maturity and end use
- Early sowing can produce a very bulky canopy that leads to foliar diseases such as Botrytis grey mould (BGM) in wet seasons
- Seeding equipment and row spacing can be the same as for other grain crops
- Using quality seed is important for good establishment and early vigour
- Inoculation with rhizobia is generally recommended for low organic matter and acidic soils
- Sowing depth must take into account herbicide use
- Minimal fertiliser is required at sowing

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IN FOCUS

Vigorous vetch crops can increase soil nitrogen by about 50 kg/ha after a grain crop and up to about 150 kg/ha after a green manure crop. Consequently, vetch requires minimal additional nitrogen at seeding or in-crop. However, to achieve good nitrogen fixation attention must be paid to inoculation with the correct rhizobia group and the use of management that optimises the symbiotic relationship between the rhizobia and vetch plant. More details are in sections [Section 4.4 Seed inoculation and seed dressing](#) and [Section 4.7 Seeding fertiliser](#).

Vetch is suited to no-till, reduced-tillage, stubble-retention systems. It can be sown using conventional cereal sowing equipment. Its larger seed size means it does not need to be sown very shallow like canola or other pasture species.

4.1 Time of sowing

Sowing time is influenced by rainfall, variety maturity, end use and foliar disease risk (see [Table 1](#)).

Early sowing is important for early plant vigour and to maximise forage production. Vetch can be sown dry to promote early seedling establishment and growth ([Figure 1](#)). Dry sowing on non-wetting soil is not very successful. Seedling pests such as redlegged earth mites and lucerne fleas can often be avoided when the crop is early sown to avoid emergence under cold, wet conditions.

Sowing early can increase the risk of yield loss through frost damage or leaf disease due to excessive foliage growth. Frost risk can be reduced by sowing early-maturing varieties into good stubble cover to minimise soil moisture loss. Good pre-seeding weed control to conserve moisture also helps mitigate frost damage. Frost-affected grain crops may be more profitable if conserved as forage.

Vetch grown for forage and manure crops is generally sown earlier and at higher seeding rates to produce bulkier crops and optimise forage quality and yield. In trials run by BCG in the Wimmera–Mallee to compare choice of forage crops for winter feed, Rasina[®] and Morava[®] vetch had similar production levels to the forage cereals, but the peak in production occurred one month later compared to forage cereals, shifting the feed curve for vetch to later in the season.¹

Sow vetch for grain production at a similar time to sowing wheat in the same region. Vetch hay crops can also be sown at this time.

Later sowing or grazing of early-sown vetch grain crops runs the risk of lower grain yield if high temperatures and dry conditions are experienced during flowering and pod fill. It also reduces the risk of foliar diseases, such as Botrytis grey mould (BGM), which can severely damage vetch crops prior to cutting or harvesting.

1 A Friske (2011) Choice of forage crops for winter feed, BCG. <http://www.farmtrials.com.au/trial/14067>

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Table 1: Vetch time of sowing by rainfall region, end use and variety maturity.

Rainfall zone (mm)	Optimum sowing date			
	For grain		For forage	
	Early varieties	Late varieties	Early varieties	Late varieties
<250	Mid–late April	Mid–late April	Mid–late April	Mid–late April
251–300	1st–2nd week May	1st week May	1st–2nd week May	Mid April–1st week May
301–375	3rd week May	2nd week May	2nd week May	1st week May
376–450	1st week May– 1st week June	3rd–4th week May	2nd–3rd week May	1st–2nd week May
>450	1st–4th week June	4th week May	2nd–4th week May	1st–3rd week May

Source: PIRSA (2010) Vetch the Ute Guide, GRDC – <https://grdc.com.au/vetch-the-ute-guide>

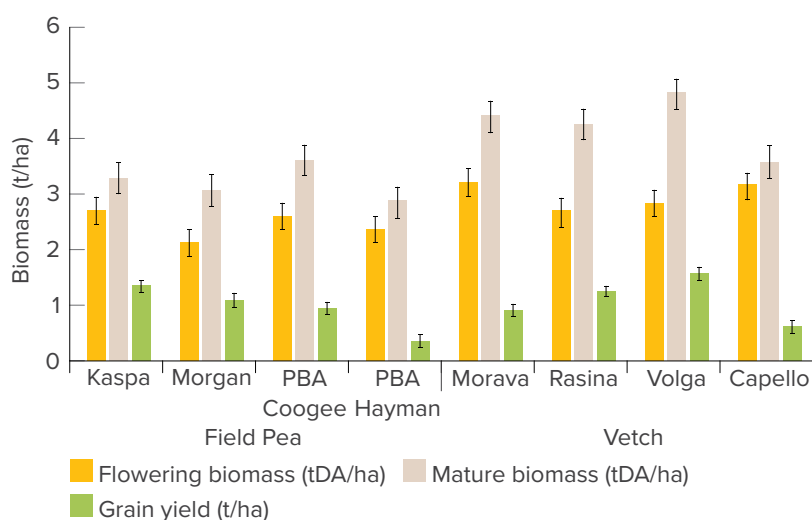


Figure 1: Biomass yield at flowering and at maturity (tDM/ha), and grain yield (t/ha) of field pea and vetch varieties, Minnipa 2013

MORE INFORMATION

Information on disease-testing services around Australia is at: <http://extensionaus.com.au>

Pulse inoculation techniques www.pulseaus.com.au/growing-pulses/publications/pulse-inoculation

Germination testing and seed rate calculator Fact Sheet http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0005/157442/pulse-point-20.pdf

4.2 Pre-seeding weed control

There are only limited herbicides registered for use in vetch for grass control. For broadleaf weeds, post-sowing pre-emergent (PSPE) herbicide is the only option. Achieving good weed control pre-sowing is crucial (see [Section 3.3](#)).

The importance of cleaning and decontaminating spray equipment before the application of herbicides cannot be overstated. Traces of sulfonylurea herbicides (such as chlorsulfuron, metsulfuron or triasulfuron) in spray equipment can cause severe damage to vetch and other legumes.²

Pulse crops can be severely damaged by some hormone herbicide sprays, such as 2,4-D ester, drifting into the crop. This can happen when these sprays are applied nearby in very windy or still conditions, especially where there is an inversion layer of air on a cool morning.³

Vetch is not tolerant to the phenoxy-based herbicides (e.g. MCPA).

Taking some general precautions can help to reduce the likelihood of crop damage with residual herbicides that are registered for use in vetch at planting:

² Best Management Guide Faba Bean Production Southern and Western region (2016), Pulse Australia. <http://www.pulseaus.com.au/growing-pulses/bmp/faba-and-broad-bean/southern-guide>

³ PIRSA (2010) Vetch the Ute Guide, GRDC – <https://grdc.com.au/vetch-the-ute-guide>

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- Do not apply residual herbicides if heavy rain is imminent.
- Maintain at least 7.5–10 cm soil coverage over the seed.
- Avoid leaving a furrow or depression above the seed that could allow water (and chemical) to concentrate around the seed or seedling.
- Avoid leaving an exposed, open slot over the seed with disc openers and avoid a cloddy, rough tilth with tyned openers.

4.3 Seed quality

Quality seed is vital for crop establishment and ultimate production. Good seedling vigour is also important as it helps improve establishment.

Weathering of crops after ripening and poor storage can substantially reduce viability of seed (see [Section 10 In-crop management – environmental impacts](#)).

Germination and vigour may deteriorate in storage if seed is more than one year old, frosted or weather-damaged (see [Section 11.2.1](#)).

Check germination percentage and purity before purchasing seed and ask for the test certificate. Ideally the germination percentage should be more than 90%. Experience from the Australian National Vetch Breeding Program (ANVBP) found that a germination percentage of more than 95% is required for Common vetch and more than 92% for Woolly pod.

If it is low (below 80%), increase the seeding rate or obtain new seed with a higher germination percentage.

Home-saved seed should be cleaned and graded to ensure seed is free from weed and crop seed contamination.

Retain seed from the healthiest crop where Ascochyta, Botrytis grey mould and chocolate spot levels are the lowest. Seed disease testing services are available and ideally sow seed with nil infection.

Seed-borne inoculum is usually less important for vetch diseases than stubble-borne inoculum.



Photo 1: Quality seed is vital for crop establishment and ultimate production. Avoid sowing seed that is shrivelled or contains too many cracked seeds or seeds without seed coat. Seeding rates should be modified for germination percentage.

Photo: Emma Leonard, AgriKnowHow

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MORE INFORMATION

Alnuculating legumes: a practical guide <https://grdc.com.au/GRDC-Booklet-InoculatingLegumes>

GRDC Nitrogen fixation Fact Sheet <https://grdc.com.au/GRDC-FS-NFixation-Legumes>

GRDC Rhizobial inoculants Fact Sheet www.grdc.com.au/GRDC-FS-RhizobialInoculants

MORE INFORMATION

A fact sheet on controlled traffic and farming set up is at: [www.spaa.com.au/pdf/253_SPAA_fact_sheet_\(controlled_traffic\).pdf](http://www.spaa.com.au/pdf/253_SPAA_fact_sheet_(controlled_traffic).pdf)

<http://www.naturalresources.sa.gov.au/files/15e99f33-a569-4fcd-b8c5-a38700a74fe3/inter-row-in-fodder-shrubs-gen.pdf>

4.4 Seed inoculation and seed dressing

To achieve nitrogen fixation, the correct strain of rhizobia must be present to form a symbiotic relationship with the vetch. The same species of rhizobia can nodulate legumes in inoculant Group E and Group F. Group E is recommended for vetch, especially in acidic soils. Rhizobia suited to vetch have been widely distributed in most cropping areas in the southern region. However, these rhizobia have moderate sensitivity to soil acidity, which means rhizobia levels can fall below that needed for optimal nodulation.

Inoculants can be applied either on the seed, in-furrow by water injection or in a granular form.

Vetch requires the same strain of rhizobia as pea, lentil and faba bean. If these crops have been grown during the past five years, the correct rhizobia may be present. This is especially true for alkaline, self-mulching grey clays where high numbers of rhizobia may be found.

On acidic soils (pH <5.2), vetch often nodulates poorly. Lupin rhizobia, which is Group G, is acid-tolerant but not suited to vetch. Use of granular inoculums and application of lime may make some acidic soils suitable for growing vetches.⁴

Inoculation is generally recommended. It is especially important on acidic soils prone to waterlogging and poorly structured soils with low organic matter where survival of rhizobia is poor.

Use of fungal seed dressing is seldom beneficial. Thiram plus thiabendazole is registered for use on vetch to provide protection against seedling root rots (*Fusarium* spp. and *Pythium* spp.). Use of fungal seed dressing can minimise the risk of introduction of disease into new vetch-growing areas.

Insecticide seed dressings (dimethoate) or an in-crop spray of omethoate can be used as part of an integrated approach to the control of redlegged earth mite.

If the seed dressing is compatible with inoculum, apply the seed dressing first and then inoculate immediately before seeding. Do not mix inoculants and seed dressing together unless the inoculant label specifies compatibility. Do not use fungicide seed dressings with a seed-applied inoculant in acid soils as this can reduce rhizobia number.

A granular inoculant may assist in rhizobia survival, particularly in acidic soils, when sown dry or fungicide seed treatments are used.

4.5 Seeding system – depth and row spacing

Vetch as a pure stand or vetch mixes for forage or manure crops can be sown together using an air-seeder. Mixes can be sown with the other seed or in alternate rows using a combine seeder.

4.5.1 Sowing depth

Seed should be sown at a depth of 2–4 cm as for wheat in a similar rainfall district.

Sowing can be deeper on lighter soils. Vetch can be broadcast onto dry soil and buried by trampling by sheep or harrowing, so sowing depth can vary from very shallow to deep. Shallow-sown vetch is more prone to damage by soil-active herbicide.

When dry sowing, sow at 4–8 cm deep to ensure good moisture conditions before germination and to protect applied inoculum from high temperatures near the soil surface. If the opening rains are delayed some weeks, deep-sown crops can be slower to establish and grow when soil temperatures fall.

⁴ Pulse Australia (2014). Southern/western lentil best management practices training course. Pulse Australia Limited.

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Deeper sowing is also required to minimise damage from residual herbicides used for vetch.

Vetch cotyledons remain below the soil surface and only the shoot pushes through, so reshooting is possible if the initial shoots are damaged by insects or vermin.

4.5.2 Row spacing

Vetch is generally sown on the same row spacing as used for cereal production. It can also be broadcast and incorporated by sheep or harrows, so there is no specific row spacing.

Some growers use a medium to wide row spacing (25–36 cm) to suit trash clearance, inter-row weed control or to have a more open canopy to reduce the development of diseases such as Botrytis grey mould.

Wider-spaced crops risk lower forage production and are less competitive with weeds. Weed control can be more difficult with wider row spacing unless sown with adequate stubble cover, or a shielded sprayer is used for inter-row weed control.

4.5.3 Wheel tracking

Consider tramlining and controlled-traffic farming set-ups to avoid physical damage to the crop from machinery. This damage can provide 'hotspots' for disease.



Photo 2: Vetch can be sown with the same equipment as cereals and pulse crops. Row spacing is generally the same as for other crops in the rotation but seeding depth needs to vary in relation to access to soil moisture and the use of residual herbicide.

Photo: Emma Leonard, AgriKnowHow

4.6 Sowing rates

Seeding rates are determined by the end use and vetch subspecies. Rates also depend on the expected rainfall and time of sowing and should be adjusted for germination percentage.

Aim for a lower plant density in regions averaging less than 350 mm of annual rainfall and higher densities in areas with more than 500 mm annual rainfall.

Seeding rates can be increased by 10–15% for manure crops and if sowing is delayed beyond the optimum time ([Table 1](#)).

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For mixtures of vetch and cereal hay use a 1:1 or 1:2 cereal:vetch mix at a total seeding rate of:

- 40 kg/ha in areas with less than 400 mm annual rainfall;
- 60 kg/ha in areas with 400–550 mm annual rainfall; and
- 60–100 kg/ha in areas with more than 550 mm annual rainfall.⁵

A lower plant population results in a less bulky crop, reducing the potential grain or forage yield but lowering the risk of foliar disease.

Sowing overlaps (for example, headlands) can exacerbate disease development due to more bulky crop growth. The use of precision agricultural tools including guidance, autosteer and section control and controlled-traffic farming systems can help minimise sowing overlaps.

4.6.1 Calculating seed rate

The number of seeds that emerge is often less than the seeds sown due to non-viable seed, seedlings with poor vigour, disease, herbicide damage or poor soil structure.

Seeding rate (kg/ha) = plant density (plants/square m) x 1000 seed weight (g) ÷ emergence percentage (from germination test).

Table 2: Target plant density and common seeding rates for vetch by end use and subspecies.

	End use	Common vetch varieties		Purple vetch varieties		Woolly pod	
	Plant density (plants/m ²)	Sowing rate (kg/ha)		Plant density (plants/m ²)	Sowing rate (kg/ha)	Plant density (plants/m ²)	Sowing rate (kg/ha)
Grain/seed	40–60	40–50*		60	20–40	50	20–40
Green manure	60–70	50–60		65	25–40	50	25–40
Hay	50–70	50–60		60	25–35	50	25–35
Grazing	50–70	50–60		65	25–40	50	25–40
Regenerating pasture	40–60	40–60		-	20–40	40	20–40

* In WA, target a plant population up to 50 kg/ha unless high grain yields expected.

Source: PIRSA/GRDC (2010) Vetch: the Ute Guide. PIRSA/GRDC – <https://grdc.com.au/vetch-the-ute-guide>

4.7 Seeding fertiliser

The nutrient requirements of vetches are similar to other legumes. Generally Common vetches are grown in rotation with cereals; this provides enough residual nutrients to maintain soil fertility for vetch growth.

On-farm practice is often 50–75 kg/ha triple superphosphate (0N:20.6P:0N:1S) or 100 kg of single superphosphate (0N:9P:0K:11S) at sowing to provide a good start and growth. However, many growers choose to sow without any fertiliser with good results.⁶

4.7.1 Phosphorus (P)

If soil levels are low then 10–30 kg P/ha may be required to gain good forage and seed yields. Where levels are high, maintenance levels to meet removal (Table 3) are all that is required (5–15 kg P/ha).

⁵ B. Bull; A Mayfield (1992) Growing Vetch – out of print

⁶ R Matic, S Nagel, G Kirby (2008) Common Vetch Fact Sheet. Pastures Australia http://keys.lucidcentral.org/keys/v3/pastures/Html/Common_vetch.htm

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4.7.2 Nitrogen (N)

Vetch should be self-sufficient for nitrogen (N) if well-nodulated. Rates of 5–15 kg N/ha at seeding to aid establishment may be useful on lighter and slightly acid soils.⁷ Hay crops of cereal and vetch can benefit from up to 30 kg N/ha at seeding, particularly if early grazing is also required.

4.7.3 Potassium (K)

In higher-rainfall areas where hay is often cut, rates of 15–30 kg K/ha at seeding may be required if soils are low in potassium.

4.7.4 Sulfur (S)

If soils in the region generally respond to sulfur then apply 5–2 kg S/ha at sowing. Soils that leach or have grown canola are more likely to require sulfur.

4.7.5 Zinc (Zn)

Zinc is required for vetch on alkaline soils but use of zinc in other parts of the rotation may be sufficient and so it generally does not need to be applied to the vetch.⁸

4.7.6 Copper (Cu)

In south-eastern Australia responses to copper on legumes is rare.

4.7.7 Manganese (Mn)

A response to manganese may be seen in high pH soils (pH >8). This is usually applied in-crop as a foliar application.

4.7.8 Molybdenum (Mo)

This may be required on acidic soils where molybdenum becomes unavailable. Rates of 50–60 g Mo/ha should be applied if no applications have been made in the past five years.⁹

Table 3: Guide to nutrient removal by one tonne of vetch grain.

Major nutrients	Kg removed in grain	Minor nutrients	Kg removed in grain
Nitrogen	44	Copper	8*
Phosphorus	3.8	Zinc	26*
Potassium	10*	Manganese	12*
Sulfur	1.5*		
Calcium	0.8		
Magnesium	1.2		

* Value for field pea, estimated to be same for vetch

Source: PIRSA/GRDC (2010) Vetch: the Ute Guide. PIRSA/GRDC – <https://grdc.com.au/vetch-the-ute-guide>

7 PIRSA (2010) Vetch the Ute Guide, GRDC – <https://grdc.com.au/vetch-the-ute-guide>

8 Better Soils (1998) Advisory Board of Agriculture, http://soilwater.com.au/bettersoils/module2/2_7.htm

9 B. Bull; A Mayfield (1992) Growing Vetch – out of print)

4.8 Rolling

Surface rolling or prickle chaining flattens clods and ridges caused by sowing or press-wheels, and presses rocks and sticks into the soil, leaving a flat surface to allow the harvester comb or forage harvester to cut close to ground level. Rolling helps to reduce harvest losses, machinery wear and contamination in the seed or forage sample.

Rolling should be carried out post-sowing, pre-emergence and is best done with a rubber-tyred roller, when the soil is moist.

It may have to be delayed until the crop has emerged if the soil is prone to hard-setting, crusting or eroding on sandy or sloping country. Emerging shoots can be broken off if rolling when plants are just at emergence.

If rolling is carried out post-emergence, it should be done later in the day in warm weather so plants are limp and not brittle from cold or frosty conditions.

Avoid rolling two weeks before or after applying a post-emergent herbicide.

Rolling vetch post-emergence could increase the possibility of early leaf diseases, aiding the early spread of disease later within the crop.

Both rubber-tyred and steel rollers can be used successfully although a lighter roller is preferred when rolling post-emergence. However, the choice of roller is largely dictated by soil conditions and the type of material being rolled. The heavier the roller, the better the job of levelling. This is especially true on heavier soil types and when pushing rocks and sticks below the soil surface. Lighter rollers work well on sandier soils.