

Vetches and their potential in WA farming systems

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Key messages

- Vetches can adapt to the lower pH soils in Western Australia
- Inoculating with appropriate Rhizobium which is suited to acidic soils is strongly recommended
- Choose the species of vetch and variety depending on your end goals

Aims

To demonstrate the potential and opportunities for the use of vetches in Western Australian farming systems, particularly mixed farming enterprises looking for a short-term legume option that fits into their cropping rotation.

Method/Background

A vetch crop has the ability to offer substantial improvements in soil fertility, structure and organic matter as well as offering a weed and disease break for cereals in a crop rotation. National Vetch Breeding Program results have shown; across 5 sites in SA over three years after a vetch grain crop total nitrogen in the soil increased by 56kg/ha. From two sites over two years after hay production there was 94kg/ha of nitrogen returned to the soil and 145kg/ha after green manuring. These results come from low to medium rainfall areas and a range of soil types, from non-wetting sands to heavier clay loams.

Vetches are a multipurpose crop from the perspective of end use. During the season, vetch producers can choose the best end use option for their vetch crop. If the season is not finishing well and the crop may have insufficient water to produce good grain, it can be better to cut the crop for hay, graze it or take the opportunity to use it as green or brown manure. This can prove more beneficial in the long term than keeping an underperforming grain crop. As it offers the opportunity to attack herbicide resistant grass weeds before they set seed and potentially provides an excellent fodder source or income in the form of hay.

Traditionally vetch has been seen as a low rainfall legume best suited to sandy, neutral to alkaline soils. However trials conducted in WA and NSW at sites with lower pH soils have demonstrated that vetch can produce good yields in these soils and also offer farmers in these areas all the benefits associated with a productive and reliable legume in their rotations.

Trials conducted in WA at Cunderdin had a pH range 6.3-6.8 in the top 10cm down to 4.5-6.2 at 20-30cm. the Kojunup trials had pH ranges from 5.0-5.6 in the top 10cm to between 4.5-5.0 at 10-30cm. Grain yields across the last 4 years at Cunderdin averaged 1.0t/ha, grain yields at Kojunup in 2015 and 16 averaged 1.2t/ha. These yields were comparable with similar rainfall sites in South Australia.

Farmers in WA are seeing opportunities for using vetch in their rotations in a number of ways. To produce hay/fodder, grazing, for soil remediation and even grain. While providing these outputs vetches have the ability to offer substantial improvements in soil fertility, soil structure and organic matter as well as offering a weed and disease break for cereals in a crop rotation.

This gives farmers an extra tool in the fight against herbicide resistant weeds and cereal diseases while still offering the opportunity for a profitable enterpriser in the cropping year and benefits that flow on for 2-3 subsequent crops.

The growing interest in vetch means there are several matters that need to be reiterated.

Vetch is not Vetch.

There are three different species of vetch grown in Australia, common vetch (*Vicia sativa*) and woolly pod vetch (*Vicia villosa*) being the two most popular species, and purple vetch (*Vicia benghalensis*) which has a much smaller part of the market. These different species all have different characteristics, need different management and suite different conditions, but all produce good fodder and can return significant amounts of nitrogen to the soil.

Common vetch (CV)

Varieties include Morava^(b), Timok^(b), Volga^(b), Rasina^(b), Blanchefleur and Languedoc

Common vetch is the most widely grown species, predominately grown in low rainfall areas in SA, Vic, WA and NSW, where it is seen as a good, reliable legume option in farming systems. It offers flexibility to the farmer and is an excellent tool in a farmers fight against issues like soil borne diseases and herbicide resistant grass weeds, while still offering good returns in the form of fodder/grazing, hay, improved soil nitrogen and organic matter levels.

Common vetches are generally shorter season than the other species (varieties flower between 95 and 115 days), and are more tolerant to grazing. They are palatable at any growth stage, either green or dry, and the grain is a high protein feed (on average 29% crude protein and 12.5MJ/kg DM metabolisable energy) that can be used for all ruminants.

The Australian bred and released varieties Morava^(b), Timok^(b), Volga^(b) and Rasina^(b) are all resistant to rust, where as the older varieties Blanchefleur and Languedoc are highly susceptible to this disease. This is important because rust can drastically reduce yields and may induce abortions in pregnant livestock if they are fed heavily infested plant material.

Management issues to consider. Grow rust resistant varieties whenever possible. In higher rainfall areas monitor for Botrytis symptoms, this disease can greatly reduce yields. In all vetches regrowth after grazing is very dependent on seasonal conditions, good moisture and favourable environmental conditions.

Woolly pod vetch (WPV)

Varieties include Capello^(b), Haymaker^(b), RM 4^(b) and Namoi.

These varieties are better suited to medium-high rainfall areas, doing best in regions receiving a minimum of 450mm annual rainfall. All the varieties of WPV are later than the common vetch varieties, not flowering until around 125 days after sowing. Regions looking for later hay varieties should consider WPV. They have superior hay yields to CV, on average yielding approximately 1.5t/ha more dry matter in the same environment (yields between 5-12t/ha can be achieved), however grain yields are much lower (0.8t/ha average) and it can be difficult to harvest/thresh.

WPV grows well in mixed crops situations and can tolerate some shading from competition, which makes it a good companion plant in forage mixes

The grain of Woolly pod vetch varieties should not be fed to any livestock, as it contains high levels of toxin and can cause death in ruminants if consumed at high levels. These varieties/species should not be grazed before 15 nodes of growth or after pods have formed seed due to the toxicity of the grain. Care should be taken when grazing, as this species is susceptible to over grazing early due to its slower growth through winter

Management issues to consider. Make sure paddocks are relatively free of broadleaf weeds as there are limited options for control in this crop and WPV is a poor competitor for weeds in early growth stages. Herbicide options are limited for broadleaf weed control, especially in crop. The best option is to use registries herbicides post sowing pre-emergent. Don't graze early (before 15 nodes), ensure you cut hay or graze before pod start to set seed. Be aware this species has hard seeds (RM 4^(b), 5-7%, to Namoi > 30%) and can appear as volunteers in subsequent crops. This species is cross pollinated, and if you are producing or/multiplying seeds from RM 4^(b) which has a low hard seed level, isolation from higher hard seed varieties like Namoi needs to be >1km.

Purple vetch (PV)

Varieties include Popany and Barloo.

This species is similar to WPV in flowering time (>125 days), it is suited to medium to high rainfall areas with a good finish, it is a high fodder producer in these areas, but it is not suited to lower rainfall zones. PV can tolerate some waterlogging compared to other vetch species, again grain cannot be used to feed ruminants but there is a small market as birdseed.

Management issues to consider. Like WPV this species has very slow winter growth and does not compete well with weeds early. One advantage is that Broadstrike is registered for use in Popany vetch, allowing for control of a range of broadleaf weeds in crop. It should not be grazed before 10 nodes or grazed/cut for hay after pods start to set seed.

For specific details on vetch variety characteristics please refer to the 2019 SA field Crop Sowing Guide

<https://grdc.com.au/resources-and-publications/all-publications/publications/2019/south-australian-crop-sowing-guide>

Or Pastures Australia fact sheets on the three species

https://keys.lucidcentral.org/keys/v3/pastures/Html/Common_vetch.htm

https://keys.lucidcentral.org/keys/v3/pastures/Html/Woolly_pod_vetch.htm

https://keys.lucidcentral.org/keys/v3/pastures/Html/Purple_vetch.htm

Conclusion

Vetches have the ability and potential to fit into modern farming rotations in WA, particularly in mixed farming systems where farmers are looking for a versatile break option that stills allows for strategic action against specific cropping problems. Unlike pulses and other break crops, the focus is not solely on grain production. Vetch can be used as a tool against herbicide resistant grass weeds and still produce a return with hay, grazing or grain and have an impact on subsequent cereals with increased levels of soil nitrogen.

A successful vetch crop can;

- Increases yields and grain protein of following cereal and oilseed crops.
- Allow an extended phase of cropping.
- Decrease many cereal diseases – grass-free vetch crops can break the life cycle of root diseases, preventing multiplication and build-up of disease levels
- Provide an opportunity to control grass weeds: Especially in forage use – hay is cut before many grasses set seed providing a chemical free option to avoid weed resistance, green/brown manuring can be used with vetches to control competitive weeds which are difficult to control in other crops, eg brome grass and barley grass.
- Available soil nitrogen is maintained and can be improved by an average of 56, 92 and 145kg/ha after grain, hay and green manuring, respectively (data from 3yrs x 5 sites).
- Grain and hay/silage from Common vetch varieties can be used to feed ruminants without limit,

The key to a successful vetch crop and achieving the maximum benefits from vetch is to treat it as a crop, not as a set and forget break option. Inoculate with appropriate rhizobia, control weeds where possible and monitor for insects and disease.

When successfully grown vetch can be an effective risk management tool on farm. Allowing for a reduction in fertilizer and chemical use in following crops, reducing costs and the risks involved with in crop nitrogen applications. This can have a significant impact on profitability and the stress levels associated with these decisions.

Key words

Vetch, Vicia, break crops

Ⓓ Varieties displaying this symbol beside them are protected under the Plant Breeders Rights Act 1994.

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