Vetch in Australian farming systems

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Key messages

- **Vetch is a versatile crop that can be used for grain, pasture, hay/silage or green manure.**
- **Common vetches can be successfully grown in lower to mid rainfall areas of southern Australia where no other legume crops perform consistently well.**
- **It offers disease and weed breaks in rotation and also returns significant amounts of nitrogen to the soil.**
- **New vetch species are showing potential in very low rainfall areas, with trials to be conducted on Eyre Peninsula in 2012.**

Background, the National Vetch Breeding Program

Since it began in 1992 the National Vetch Breeding Program (NVBP) funded by the Grains Research and Development Corporation (GRDC) has focused on breeding common vetch *(Vicia sativa)* varieties for Australian farmers for use as hay/silage, grazing, grain and green manuring. In 2005 the program also included the breeding/selection of woolly pod vetches *(Vicia villosa)* for grazing, hay/silage and green manuring. A South Australian Grains Industry Trust Fund (SAGIT) project was added to the program in 2008, investigating the potential of new vetch species/varieties for very low rainfall areas in Southern Australia. This program is investigating *Vicia palaestina* (leaf dense vetch – LDV), *V. macrocarpa* (big leaf vetch – BLV), *V. articulate* (Bard vetch) and *V. obicularis* (small erect vetch). From this SAGIT project Leaf dense vetch *(V. palaestina)* has shown the best results in areas <300 mm average annual rainfall and the program will concentrate on this species to deliver varieties to farmers for grazing, hay/silage, green manuring and further investigate its potential for grain use.

Vetch uses and benefits

Vetch is a significant component of cereal farming rotations in Australia's low and medium rainfall zones. Its versatility has allowed it to spread into areas where no other legume crops perform well (G. Castleman, 2000). As a legume component in these farming systems, vetch can provide assistance in managing diseases and weed resistance in subsequent crops.

Vetch crops are well adapted to no-till, standing stubble systems aimed at improving soil sustainability. It is a multi-purpose crop grown mostly as a disease break crop in a rotation with cereals in a wide range of soil types from light sands to heavier clay soils. Vetches *(Vicia spp.)* are classified broadly as either grain or forage. The versatility of vetch allows it to be used for: cropping intended for grain or hay production, early grazing as green pasture or for dry grazing, or green manure.

Grain vetches (common vetches) can be successfully grown in lower to mid rainfall cereal areas of southern Australia, vetch crops needs less water per tonne of production than peas, faba beans, medics or clovers (International Centre for Agricultural Research in the Dry Areas – ICARDA, 2000). They do however have poor tolerance to water logging.

Vetches fit well in cereal and canola rotations. Grass-free crops reduce cereal root diseases and provide the added option of crop topping to clean up grass-problem paddocks and prevent herbicide-resistant weeds setting seed.

Previously, the primary constaints for production included diseases such as rust, ascochyta and grey mould. But these constraints have eased with the release of Morava and Rasina, both resistant to rust and tolerant of ascochyta. These varieties can be successfully grown without chemical/fungicide use. Another potential limiting factor is the perceived weediness of vetches, although this has again been overcome by the release of Morava and Rasina which have 98-100% soft seeds together with the availability of herbicides to control volunteer vetch in cereal crops.

An important benefit derived from vetch production is the significant amounts of nitrogen returned back into the soil and the improved levels of organic matter and microbial activity in the soil. Depending on end use, it can return 57, 97, and 136 kg/ha of nitrogen after the production of grain, hay/grazing and green manuring respectively (NVBP data from 5 sites over 3 years), reducing on-farm reliance on chemicals and mineral fertilisers which has both environmental and economic benefits.

Table 1 Grain and dry matter yields for three vetch varieties and advanced lines, from a minimum of 4 sites/year in South Australia in t/ha

Variety/Line	2009		2010		2011	
	Grain	Hay	Grain	Hay	Grain	Hay
Blanchefleur	1.5	3.4	2.7	5.3	2.1	na
Morava	1.0	3.5	2.4	5.5	2.6	4.0
Rasina	1.5	2.9	2.4	5.2	2.9	3.9
SA-34823	2.0	3.7	2.9	5.6	3.2	4.8
SA-34748	2.3	3.7	2.4	5.3	2.9	4.7
SA-35103	1.7	3.4	2.8	5.3	2.9	4.2
SA-34883	na	na	2.8	6.0	3.2	5.1
SA-34884	1.8	3.6	2.6	5.6	3.2	4.8

Importantly common vetch is also an excellent fodder source for ruminants as green grazing, hay or even grain. The grain can be fed ad lib to ruminants and can also be included as up to 25% of the diet in rations for pigs (for details of these trials please contact the NVBP).

In 2012 the NVBP will be conductiong experiments on Eyre Peninsula investigating the performance of advanced breeding lines, which are competing for release as new varieties, with exsisting varieties. As well as trialling the new vetch species for the first time in this area, their perfomance under Eyre Peninsula farming conditions will be evaluated.

For recent results of released varieties compared to advanced lines see Table 1.

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