



SAGIT Research Snapshot

S0511: Assessment of new vetch species for low rainfall cropping areas

FAST FACTS

The details

Start: July 1, 2011

Finish: June 30, 2014

Project participants: SARDI – principle investigator Stuart Nagel, and research staff Gregg Kirby.

Related SAGIT-funded projects: S0708R, S914

The problem

South Australian growers in lower rainfall areas are continually looking for new legume options that are better adapted to local conditions and with improved agronomic, disease and quality performance to replace current varieties, such as Morava.

The research

SARDI assessed four Middle Eastern vetch varieties to see whether they were suitable for South Australian low rainfall environments.

BACKGROUND

The idea to trial new vetch varieties arose following senior tech breeder, Rade Matic's, research trip to the Middle East. Visual observations, in combination with data received from the International Centre for Agricultural Research in Dry Areas (ICARDA, Syria) and the 2007 Forage Legumes Symposium at Novi Sad, Serbia, reported that these species were considered some of the best dry matter producers in very low rainfall areas (including Syria, Jordan, Egypt and Cyprus) and warranted testing in Australia.

RESEARCH AIMS

- Assess four novel species of vetch – *Vicia articulata*, *V. palaestina*, *V. macrocarpa* and

In a nutshell

SARDI assessed four novel vetch species to determine their potential for release in South Australia's low rainfall zone but they failed to outperform or offer any significant advantage over the standard common vetch variety, Morava.

V. orbicularis – for their agronomic, disease and quality performance in the low rainfall zone.

- Trial these species in replicated trials in the upper Eyre Peninsula, the Upper North and the SA Mallee.
- Test feed quality of dry matter and grain, as well as hard seededness and evaluate the disease resistance for advanced lines.
- Provide growers with high yielding vetch varieties that are well adapted to sandy alkaline soils in low rainfall environments.
- Provide producers and users with agronomic packages for new germplasm.

IN THE FIELD

Trials were conducted in 2011 on all advanced material selected from a previous project (S0708R). The material was assessed in replicated trial sites at Morchard and Charlick (near Strathalbyn). Only two sites were sown due to limited seed availability.

Four sites were sown in 2012 and 2013 in low rainfall regions at Lameroo, Morchard, Minnipa and Strathalbyn. Fodder samples were taken from all lines in trial and analysed by Feedtest for fodder quality.

RESULTS

- *V. articulate* and *V. macrocarpa* were removed from trials after the 2011 season because they did not meet targeted traits or requirements.
- The species trialled all showed excellent results for feed quality and were at the higher end of quality levels expected for legume hay.
- Yields at all sites, except for Charlick, were disappointing. The soft finish at Charlick enabled good, late season growth.
- Cutting early at Minnipa and Morchard and again one month later did not produce significant regrowth.
- Mixtures of new species and common vetch were trialled at Lameroo, Morchard and Charlick. The common vetch completely outcompeted the other species and choked them out after satisfactory emergence from all lines.
- Morava vetch outyielded all lines in the trials.



SARDI senior vetch breeder Rade Matic assesses *V. palaestina* in 2011 at Strathalbyn. The vetch performance is contrasted with attempting to cut hay in 2012 at Morchard.



The four species showed poor seedling vigour, lack of competitiveness against weeds and other crops, poor regrowth after cutting or grazing, poor yields, susceptibility to rhizobia and needed long, mild springs to reach full potential.

- All species, particularly *V. palaestina*, showed very poor early vigour and establishment, which was worse at the cold sites, like Morchard. *V. articulate* shattered before full maturity and was low yielding.
- As a prostrate plant type, *V. macrocarpa* lacked enough bulk to provide adequate fodder or groundcover. *V. orbicularis* initially showed promise in dry matter production at Morchard but had very poor seed production.
- While *V. palaestina* had excellent fodder quality and hay yields, it was a very poor competitor with weeds, and when planted in

combination with any other crop it is out competed and fails to develop.

- *V. palaestina* and *V. orbicularis* were very susceptible to rhizoctonia.
- All lines were susceptible to Simazone, post sowing pre emergence when significant rainfall was recorded post emergence at Lameroo.
- No lines were selected for release as a new variety so no seed was multiplied and an agronomy technical package for growers was not required.

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