COMMON VETCH TRIAL RESULTS FROM THE VICTORIAN MALLEE

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TAKE HOME MESSAGES

- Choose vetch varieties on initial end use.
- Time of sowing can dictate when cutting for hay is best, so choose maturity and sowing time based on when cutting/drying is best if focusing on hay production.

BACKGROUND

Common vetch has become an integral component of many modern farming systems in the Mallee.

The National Vetch Breeding Program at SARDI (South Australian Research and Development Institute) has been conducting advanced breeding trials with BCG for several years. To give a broader understanding of the uses and potential of vetch across the broader Victorian Mallee, trials were sown at Curyo, Speed, Werrimull and Kooloonong.

Results from these trials are included in this article to demonstrate the yield potential of the most common varieties and advanced breeding lines.

These trials demonstrate varietal performance for different end uses in different areas, outling the influence of flowering and maturity on dry matter and grain yields in different environments.

AIM

To assess the suitability of existing and emerging vetch varieties in a Mallee farming system.

PADDOCK DETAILS

Location:	**Curyo** (southern Mallee)
Soil type:	Sandy clay loam
	0-10 cm; pH 7.9 $CaCl_2$ SOC 0.8%, EC 0.14 dS/m, Colwell P 30 mg/kg, Total N 7 mg/kg
	10–40 cm; pH 8.3 $CaCl_2$, EC 0.11 dS/m, Total N 6 mg/kg
Location:	**Speed** (central Mallee)
Soil type:	Sand over sandy clay loam
	0-10 cm; pH 6.6 $CaCl_2$ SOC 0.4%, EC 0.071 dS/m, Colwell P 18 mg/kg, Total N 10.4 mg/kg
	10-40 cm; pH 8 $CaCl_2$, EC 0.12 dS/m, Total N 4.9 mg/kg

Location:	**Kooloonong** (eastern Mallee)
Soil type:	Sand over sandy loam
	0-10 cm; pH 7.3 $CaCl_2$ SOC 0.16%, EC 0.1 dS/m, Colwell P 11 mg/kg, Total N 6.5 mg/kg
	10–40 cm; pH 7.3 $CaCl_2$, EC 0.05 dS/m, Total N 2 mg/kg
Location:	**Werrimull** (northern Mallee)
Soil type:	Sandy loam over sandy clay loam
	0-10 cm; pH 7.9 $CaCl_2$ SOC 0.48%, EC 0.1 dS/m, Colwell P 19 mg/kg, Total N 2.4 mg/kg
	10–40 cm; pH 8 $CaCl_2$, EC 0.1 dS/m, Total N 4.6 mg/kg

TRIAL DETAILS

Trial Management

Weeds, pests and disease were controlled according to best management practice across all trials. Seed treated with Group E inoculant at sowing across all trials.

Curyo

Sowing date:	22 April
Fertiliser:	Granulock® Z + Flutriafol @ 60kg/ha at sowing
Fodder cut date:	10 Sept Studenica, 21 Sept Morava, 14 September all other varieites. 1m^2 cut and dry to establish comparative tonnes/hectare dry matter.
Grain harvest:	16 November

Speed

Sowing date:	17 April
Fertiliser:	50 kg of Granulock® Z MAP
Fodder cut dates:	10 August and 10 September. Biomass estimates were made pre and post-flowering, from cutting 2 x 0.5 m rows and drying to establish comparative tonnes/hectare dry matter.
Grain harvest:	16 November

Kooloonong

Sowing Date:	23 April
Fertiliser:	50 kg of Granulock® Z MAP
Fodder cuts:	13 August and 31 August. Biomass estimates were made pre- and post-flowering, from cutting 2 x 0.5 m rows and drying to establish comparative tonnes/hectare dry matter.
Grain harvest:	4 December

Werrimull

Sowing Date:	12 April
Fertiliser:	50 kg of Granulock® Z MAP
Fodder cuts:	15 July and 20 August. Biomass estimates were made pre- and post-flowering, from cutting 2 x 0.5 m rows and drying to establish comparative tonnes/hectare dry matter.
Grain harvest:	19 November

RAINFALL

Table 1. 2020 growing season rainfall (mm) at Speed, Kooloonong, Werrimull and Curyo.

2020	April	May	June	July	August	September	October	Total
Speed	73	32	15	21	39	40	56	276
Kooloonong	50	4	20	2	43	42	71	232
Werrimull	52	14	14	7	43	32	60	222
Curyo	74	13	19	6	28	25	41	205

METHOD

These trials were designed to include four common vetch varieties and eight advanced lines to demonstrate varietal performance and assess the potential of advanced lines in specific regions.

The four trials were individually designed as randomised complete block designs. All trials were assessed for emergence, vigor, time to flowering, dry matter production and grain yield.

The trials at Werrimull, Koolooonong and Speed were sampled for dry matter production in early autumn and again at early flat pod. This was done to assess early grazing potential in mixed farming/livestock systems. The Curyo trial was sampled for dry matter at late flowering/early flat pod. All trials were harvested for grain yield at full maturity.

RESULTS AND INTERPRETATION

The results below give an excellent example of the regional potential of the released varieties.

Studenica demonstrated early growth and vigor, showing its potential for early fodder production/grazing, by topping all the early fodder cuts (Table 2). The more traditional hay timing showed the mid maturity varieties can grow on through September and significantly increase production. Morava, a late maturing variety can still produce excellent hay yields but requires rain later in the season to fulfill its potential for fodder production.

The grain yields (Table 3) show Studenica does not out yield other varieties unless rainfall cuts off early, the mid and later maturing varieties make the most of spring growth to produce higher grain yields. Timok and Volga consistently out yielded other varieties.

The advanced line, SA 37107, included in the results is a likely candidate for release in the future. As a mid-maturing line, flowering at a similar time to Timok, it had the highest hay yield at any site 9.7t/ha at Speed, as well as topping the grain yields at all sites.

Table 2. Biomass yields (tDM/ha) of common vetch varieties and an advanced line at four sites in the Victorian Mallee in 2020.

Variety	Speed		Kooloonong		Werrimull		Curyo
	10 Aug	10 Sep	13 Aug	31 Aug	15 Jul	20 Aug	14 Sep
Morava	3.6	8.3	1.6	3.1	2.6	5.1	3.8
Studenica	3.9	7.3	2.6	3.3	3.7	7.1	4.2
Timok	3.7	8.5	2.3	3.5	3.1	5.5	4.9
Volga	3.4	7.0	2.3	4.0	3.3	6.2	4.5
SA 37107	3.8	9.7	1.9	2.8	3.6	5.3	4.1
Sig. diff. LSD (P=0.05)	**NS**	**NS**	**NS**	**P<0.05 0.79**	**P<0.05 0.97**	**P<0.05 1.53**	**P<0.05 0.69**

Table 3. Grain yields (t/ha) of common vetch varieties and an advanced line at four sites in the Victorian Mallee in 2020.

Variety	Speed	Kooloonong	Werrimull	Curyo
Morava	2.2	1.6	2.1	1.8
Studenica	1.7	1.3	2.4	1.7
Timok	2.6	1.9	2.7	1.8
Volga	2.6	1.9	2.4	1.9
SA 37107	2.9	2.0	2.9	2.0
Sig. diff. LSD (P=0.05)	**P<0.05 0.45**	**P<0.05 0.39**	**P<0.05 0.51**	**P<0.05 0.15**

COMMERCIAL PRACTICE AND ON-FARM PROFITABILITY

The new variety, Studenica, demonstrated its potential for use as an early fodder source in mixed farming systems, particularly for winter grazing. This variety has very early flowering and maturity, so does not always suit spring hay production unless sown later.

For more traditional hay production, the later maturing varieties can make the most of spring growth, they also allow for cutting at a better time of the season for curing/drying of hay.

In the areas where the trials were conducted, Timok and Volga produced the best hay yields, with Morava requiring more soil moisture late in the season, to produce its best.

The advanced line SA 37107 showed good results across all sites, it has consistently been among the best lines across all vetch growing regions over the last two years. It has also shown improved adaption to low pH soils, consistently topping trials of both hay and grain at sites with <5.5 pH $CaCl_2$.

With the increase in vetch use across the Mallee it is important to choose varieties by growers' initial end use goals. Time to flowering and maturity are important considerations when targeting specific end uses and will dictate the optimum seeding window. With the increasing diversity of maturity in vetch varieties, it is now possible to swap varieties if growers can't sow vetch until later in the program or if it is to be the first in the ground. For specific varietal details see the 2021 Victorian Crop Sowing Guide.

REFERENCES

Brown S. 2020, 2021 Victorian Crop Sowing Guide,2020, Agriculture Victoria, <https://grdc.com.au/2021-victorian-crop-sowing-guide>.

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