SAGIT vetch trials on EP

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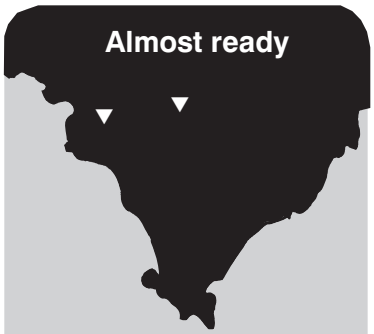
RESEARCH



Location:
Minnipa Agricultural Centre, paddock S10
Rainfall
Av. Annual: 325 mm
Av. GSR: 241 mm
2016 Total: 391 mm
2016 GSR: 268 mm
Yield
Potential: 2-2.25 t/ha (grain)
5-6.0 t/ha (dry matter)
Actual: Grain: Site mean 2.6 t/ha with highest yield 3.2 t/ha
Dry Matter: Site mean 3.3 t/ha, highest 3.7 t/ha
Paddock History
2015: Barley
2014: Barley
2013: Vetch
Soil Type
Clay loam
Plot Size
1.5 m x 10 m x 3 reps
Yield Limiting Factors
None

Location:
Piednippie/Haslam
Dion Trezona
Rainfall
Av. Annual: 324 mm
Av. GSR: 220 mm
2016 Total: 367 mm
2016 GSR: 316 mm
Yield
Potential: 2-3.00 t/ha (dry matter)
Actual: Site mean 1.9 t/ha, highest yield 2.4 t/ha
Dry Matter: Site mean 3.3 t/ha, highest 3.7 t/ha
Paddock History
2015: Mace wheat
2014: Grass free medic
2013: Axe wheat
Soil Type
Grey calcareous sand
Disease
No disease was observed
Plot Size
1.5 m x 10 m x 3 reps
Yield Limiting Factors
Poor sub soil moisture at sowing, with a residual chemical effect noted in July/August.

Key messages

- **SAGIT funded trials over the last 3 years have shown the potential of vetch on Eyre Peninsula, leading to the selection of an early flowering (90-95 days) line with increased winter vigour (SA 34876) as a new variety for low rainfall mixed farming systems.**
- **The last three seasons have been particularly good at Minnipa for both grain and hay production of vetch.**
- **Piednippie trials have not been as successful as Minnipa, but have still shown with the right management vetch could produce good hay, fodder or grazing on the grey calcareous soils.**
- **On Eyre Peninsula early sowing (mid-April) can achieve good yield and hay production but is heavily reliant on either good subsoil moisture or late follow-up rain.**
- **Herbicide choices for vetch are very dependent on local conditions so talk to your local agronomist about the best options available.**

Why do the trial?

The aim of this project (SAGIT S914) was to;

- Provide a genuine legume break crop option for cereal and mixed farmers in the marginal cropping areas of South Australia. Focusing on Western Eyre Peninsula, the Upper North and the Murray lands/Mallee.
- Trial advanced common vetch lines with specific targeted traits in replicated trials in these regions of South Australia for assessment of potential new releases.
- Validate the benefits and potential of common vetch in the targeted areas.
- Provide farmers with high yielding alternative vetch varieties that are well adapted to sandy-alkaline soils in low rainfall environments.

How was it done?

Three replicated trials have been sown on upper Eyre Peninsula, two located on Minnipa Agricultural Centre and one at Piednippie. The trial management details are outlined in Table 1.

The selection criteria for the lines/genotypes investigated in this trial was fodder production, early vigour and winter growth. The target was to find a line which had the potential to provide winter grazing or spring hay/fodder for farmers in a mixed farming system, whilst offering the cropping phase of the rotation a genuine and reliable legume option with its associated benefits of increasing soil nitrogen and reducing disease levels in the rotation for subsequent crops.

What happened?

The last three seasons at Minnipa have seen above average rainfall, producing yields above the long term averages in most crops. This has been evident in vetch production, with trials producing good yields of both grain and hay. In 2015, the grain trial mean was 1.4 t/ha with the top lines achieving 2.1 t/ha. In 2016 a long wet spring produced high grain yields with a site mean of 2.58 t/ha (Table 4). Hay yields across the three years reflected the seasons with mean yield of 3.7 t/ha, 4.1 t/ha and 3.3 t/ha for 2014, 2015 and 2016 respectively (Table 2).

Table 1 2016 vetch trial details at Minnipa and Piednippie

	Treatment	Date of application
Minnipa SAGIT Hay Trial		
Sowing date		6 May
Fertiliser	No fertiliser applied	
Pre sowing chemicals	1.5 L/ha Sprayseed +1.2 L/ha Treflan	6 May
Post sowing/pre-emergent chemicals	150 g/ha Lexone + 400 g/ha Diuron + 1 L/ha Lorsban	8 May
	400 g/ha Diuron and 100 g/ha Metrabuzin	10 May
Insecticides	1 L/ha Lorsban and Karate 0.8 L/ha	20 May
Grass herbicides	400 ml/ha Select and 350 ml/ha Lemat and 1 L/100L Kwiken	14 June
Harvest/cut for hay		8 Sep
Minnipa GRDC Grain Trial		
Sowing date		11 May
Fertiliser	No fertiliser applied	
Pre sowing chemicals	2.0 L/ha Roundup +1.2 L/ha Treflan+60 ml/ha Hammer+ 1 L/ha Lorsban+500 ml/100 L LI700	11 May
Insecticides	1 L/ha Lorsban and Karate 0.8 L/ha	20 May
Grass herbicides	400 ml/ha Select and 350 ml/ha Lemat and 1 L/100 L Kwiken	14 June
Grain harvest		31 Oct
Piednippie SAGIT Hay Trial		
Sowing date		20 May
Fertiliser	No fertiliser applied	
Pre sowing chemicals	2 L/ha Glyphosate DST +1.5 L/ha TriflurX+ 60 ml/ha Hammer + 800 g SoA/100 L water	20 May
Post sowing pre-emergent chemicals	1.5 L/ha Gramoxone + 1 L/ha Lorsban	23 May
Post sowing pre-emergent chemicals	300 g/ha Diuron + 100 g/ha Lexone	23 May
Insecticides	200 ml/ha Lorsban and Karate 0.8 L/ha	27 May
Grass herbicides	400 ml/ha Select and 350 ml/ha Lemat and 1 L/100 L Kwiken	14 June
Insecticides	200 ml/ha Lorsban and Karate 0.8 L/ha and 1 L/100 L Kwiken	21 July
Harvest/cut for hay		7 Sep

In 2014 the trial at Piednippie showed good early vigour, before suffering spray damage. It produced a mean dry matter yield of 1.6 t/ha, but showed the potential of vetch on the grey calcareous sands given the right treatments. In 2015 the trial at Piednippie was poor, suffering from moisture stress post emergence which stunted growth and limited the potential once the crop received rain in mid-June. The site mean in 2015 was only 1.1 t/ha of dry matter. In 2016 the trial was sown in late May and again struggled with poor early vigour. It appeared to have issues with residual chemicals from 2015 and did not grow through this until late in August, reducing yields and achieving a site mean of 2.0 t/ha dry matter (Table 3).

Table 2 Minnipa hay results

Genotype	2014 (t/ha)	2015 (t/ha)	2016 (t/ha)
34559	2.97	4.12	2.95
34748	4.95	4.01	3.37
34822	3.65	4.23	3.40
34831	4.47	4.11	3.69
34842	3.61	4.37	3.77
34876	4.11	4.14	3.48
34883	3.66	3.98	2.99
34885	3.31	4.29	3.17
35019	4.57	3.82	3.02
35036	4.06	3.85	3.12
35122	4.2	4.07	3.17
37003	3.03	4.05	3.21
37058	3.98	4.15	3.57
37107	4.97	3.69	3.21
37457	-	3.96	3.19
34823-2	4.61	4.20	3.18
35427-1	-	3.99	3.16
Rasina	-	3.98	3.69
Timok	3.9	4.26	3.57
Volga	3.95	4.01	3.34
Mean	**4.00**	**4.06**	**3.31**

Table 3 Piednippie hay results

Genotype	2014 (t/ha)	2015 (t/ha)	2016 (t/ha)
34559	1.22	1.02	1.91
34748	1.99	1.28	2.02
34822	1.66	1.03	2.19
34831	1.63	1.22	1.86
34842	1.70	1.22	2.11
34876	1.74	1.15	2.09
34883	1.71	1.32	1.98
34885	1.44	1.26	2.01
35019	1.69	1.08	1.58
35036	1.60	1.08	1.84
35122	1.88	1.33	2.14
37003	1.28	1.07	1.72
37058	1.79	1.22	2.22
37107	1.84	1.09	1.84
37457	-	1.30	1.87
34823-2	1.74	1.23	1.96
35427-1	-	1.02	1.83
Rasina	-	1.02	2.16
Timok	1.68	1.16	1.85
Volga	1.91	1.51	2.49
Mean	**1.71**	**1.18**	**1.98**

Table 4 Grain yield of selected lines from Minnipa GRDC primary trial

Genotype	2015 (t/ha)	2016 (t/ha)
34876	1.72	2.87
37102	1.91	-
37107	1.62	3.19
37654	2.02	-
37670	2.09	2.63
37695	2.03	-
37731	2.16	2.40
35427-1	1.94	3.06
35444-3	2.04	-
Blanchefleur	1.35	2.56
Morava	1.15	2.73
Rasina	1.51	2.32
Timok	1.76	2.32
Volga	1.86	3.08
Mean	**1.41**	**2.58**

What does this mean?

The trials conducted at Minnipa and Piednippie were replicated in the Upper North and Northern Mallee/Riverland. Grain yield was also assessed in 2015 and 2016 at multiple sites with grain yields from GRDC trials providing additional data. The results from the multiple sites across the given seasons have been;

- There was strong correlation between Minnipa and Morchard in both dry matter and grain production.
- Even though the trials at Piednippie have been poor there is correlation between the years, and some correlation with results from Minnipa and Morchard.
- The Mallee trials at Karoonda and Loxton do not correlate with the rest of the sites.
- Discussion with different farmer groups indicated that early vigour and winter growth were extremely desirable traits for a legume option in lower rainfall mixed farming systems. These traits were considered more important than maturity, as dry matter production has a direct correlation to nitrogen fixation, as well as potential fodder yields.
- Even though the seasons at Minnipa and Morchard were above average in 2015 and 2016, farmers did comment that it was important to see the potential of the crop in a good season to understand what can be achieved with this crop.
- The trials conducted in this project have shown that the line SA 34876 has the best potential to provide farmers in the lower rainfall more marginal cropping areas of South Australia with a viable and consistent legume option, with the ability to be used for grain, grazing and or hay production depending on the season and the farming system.

Acknowledgements

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