

MLA CWFS Alternative Pasture Legumes in NSW Central West

The MLA CWFS Alternative Hard Seeded Legume trial is in its second year. The project aims to increase knowledge and adoption of alternative annual forage legume options available to meat producers in the low rainfall zone (LRZ) of central west NSW which have not been traditionally used. This project will show these forage options can be easily integrated into existing mixed farming operations to assist in meat production and adaptation to climate variability.

This year in the project trials and producer demonstration paddock we follow the journey of a rotation using the alternate hard seeded legumes. Since June's update and newsletter, this project's plot trials sites at Gunning Gap (GG) and Condobolin Agricultural Research Advisory Station (ARAS) along with the producer demonstration site have continued to be impacted by the wet season, as has the broader region. To re-enforce how significantly wet this season is, for the ARAS Condobolin site, the average yearly rainfall sits at 461.8 mm/yr. The site received 677 mm from January to the 14 October 2022, 215.2 mm above average. The demonstration site NW of Condobolin has received 540 mm to the 17 October 2022. It has an annual average yearly rainfall of 425 mm.

Staff have continued to assess weed management requirements, have applied 2 rust sprays to the Scepter wheat at ARAS site and 1 rust spray at Gunning Gap. They have also monitored progress of the varietal plot trial sites at Gunning Gap and ARAS, and the producer demonstration site across the year.



Figure 1: Photo of ARAS, Condobolin CWFS Cereal rotation Scepter Wheat Trial from hard seeded pasture legume treatments (left hand side) (September 2022).



Figure 2: Producer Demonstration site 16th October 2022 - Lancer wheat - Biserrula treatment on the left of the line, and Serradella on the right. (Photo: P. Sinderberry).

At the producer demonstration site, the lancer wheat had its first herbicide in-crop spray on the 25 June 2022. Inspections post application showed it was effective in controlling the targeted in-crop weeds of fleabane, mustard weed and Spiny Emex. No further application of herbicide has been applied at the site. The demonstration site had 55kg of Urea applied in Mid July 2022.

Biomass cuts were completed on 10 August, and 11 August for the ARAS and Gunning Gap plot trials respectively. The producer demonstration site had biomass cuts taken on 15 August 2022. From the wheat herbage biomass cuts shown in Figure 3 for Gunning Gap and ARAS site's legume treatments, we observed that the Dry Matter (DM) production was greatest at the Gunning Gap site on the Biserrula, Bladder clover and Annual Medic and the control Wheat plots ranging from 2.37t/ha to 3.36t/ha of Dry matter. At ARAS, the highest wheat dry matter was produced on the legume treatment from the Lucerne and the Sub Clover treatments. On ANOVA analysis, there were no significant differences recorded at the ARAS site between the +Lime and -Lime sites within the legume treatment areas across all plots in the wheat's biomass production this year.

At the producer demonstration site, from earlier in the season, plant establishment counts were slightly lower in the biserrula treatment, recorded at 39.52 plants per square metre compared to the Serradella treatment area at 41.45 plants per square metre (Figure 4). The seed germination effect may have been impacted by the very wet sowing conditions this year, but a higher level of plant biomass residual left from the pasture phase in the biserrula treatment was also noted by the grower.

From the herbage mass production monitoring, we can see that both treatment areas have produced and compensated for lower plant populations. Visually within the producer demonstration trial site, no significant difference was observed by CWFS staff and the grower between the wheat growth across the two previous pasture treatment areas across the season. However, for Dry matter production, the lancer wheat-Biserrula treatment had higher biomass production in both fresh green biomass (t/ha) and Dry Matter (t/ha) production compared to the Lancer-

Serradella treatment shown in Figure 5. The biserrula has shown the ability to compensate for slightly lower plant count numbers and produce higher plant biomass in the growing season.

All the sites in 2022 were subjected to the feed analysis tests through feed cuts taken at the same time as biomass cuts. This was done to measure the quality of feed via NIR and differences across the treatments used to determine the best livestock production levels through wheat varieties sown in 2022, and as these wheat varieties may have been qualitatively/nutritionally affected by previous pasture phase in the first year of the project. Table 1 shows the nutritional quality results of Lancer wheat-Biserrula Vs Lancer-Serradella treatments, if you were going to utilise this wheat for grazing or fodder production. Note: Due to seed availability and season both the producer demonstration site and the varietal trials had grain wheat varieties sown, not dual-purpose wheat varieties. This reflected and mirrored the commercial situation that producers in the region faced at sowing time in 2022.

The wheat's feed test comparison results taken from each pasture legume treatment was compared for crude protein, metabolizable energy and dry matter/ biomass production. Further work by CWFS using the CSIRO Grazfeed® decision support modelling program has enabled these nutrition analysis results to be used to compare the effect of various treatments on livestock production systems. The Grazfeed model was run using the following values and figures which are best related to the local region.

The main grasses are temperate and legume percentage is 100%. Land levelled. Latitude is 35° South. The effect of season/weather was not considered in this context. No supplements were included. Livestock type is mature ewes, non-pregnant/lactating of large Merino breed type.

- Ewe's mature weight (kg) - 65
- Ewe's average fleece weight (kg) - 6.5
- Ewe's fleece yield (%) - 70
- Live weight (kg) - 60
- Age (months)- 24

The CWFS staff presented at the NSW DPI ARAS Condobolin Field Day held on the 7 September, which was a wet rainy day. On the day, the project results from last year were presented and discussed and an overview provided of activities this year in the cereal cropping phase.

Unfortunately, due to waterlogging the ARAS site could not be visited on the day. The scheduled Gunning Gap varietal trial plots and the producer demonstration site field walk were also cancelled, due to waterlogging and poor access to the sites due to continued rain.

This Producer Demonstration Site is funded by Meat & Livestock Australia.

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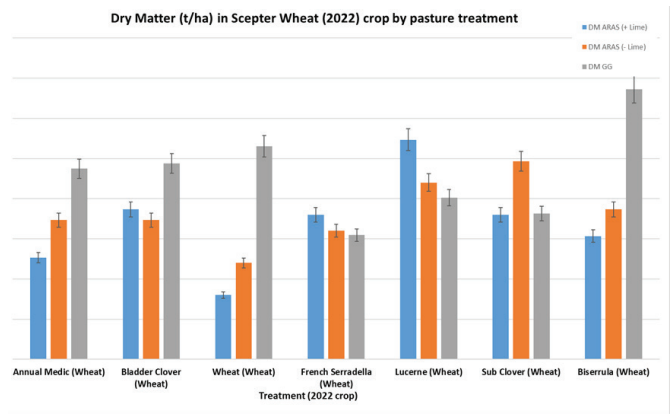


Figure 3: Gunning Gap and ARAS Sites Scepter Wheat- Cereal Phase Biomass (tonnes Dry Matter/ha) results 2022 across the 6 alternate legume variety 2021 treatment areas.

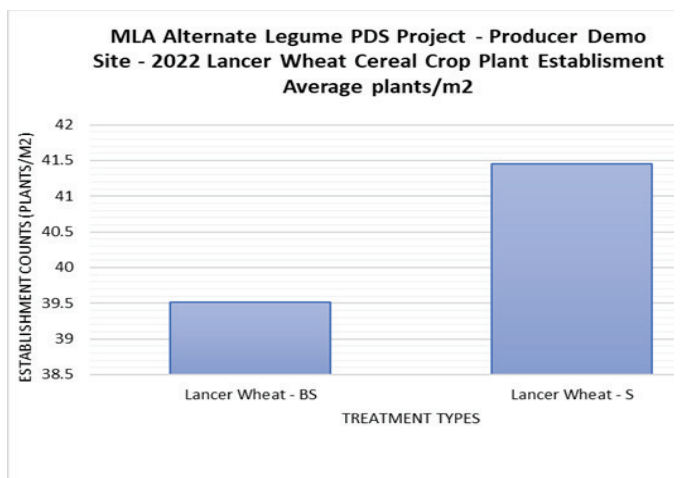


Figure 4: Plant establishment counts at the Producer Demonstration Site - Lancer Wheat 2022 in Biserrula (BS) vs Lancer Wheat 2022 in Serradella 2021 treatment areas.

Treatment	Metabolizable Energy (MJ/Kg DM)	Crude Protein (%)	Acid Detergent Fibre (ADF %)	Neutral Detergent Fibre (NDF %)	Digestibility of Dry Matter (DMD %)
Lancer Wheat 2022- Biserrula 2021	12.8	16.7	19.3	40.0	83.9
Lancer Wheat 2022 - Serradella 2021	13.2	12.9	21.0	39.0	85.3

Table 1: Feed test results of Lancer Wheat taken at Producer Demonstration Site 15/8/2022 comparing the 2021 pasture phase treatments effects on forage nutrition for livestock.

