Increasing Profits with Dual Purpose Crops

While dual purpose crops have been utilized in mixed farming operations across Western Australia and the East Coast for many years there remains a requirement to continue to promote this option to increase the adoption and assist growers who are still developing their skillset in this practice. Growers in Western Australia are also becoming more interested in the opportunities that alternative grazing crops offer away from oats and are looking to understand what options such as long season wheats and grazing barleys can provide to them in their mixed farming enterprises.

Dual Purpose crops are crops planted at the break of the season that are used as a feed source for livestock through the late Autumn and Winter period and are also harvested as a cash crop at the end of the season. Dual purpose crops give growers the opportunity to address the autumn/winter feed gap through grazing with minimal or no impact to yields if managed correctly. It can provide value to the livestock part of an enterprise by providing high quality feed in June – July which replaces supplementary feeding. It also can allow the time for new pastures to establish, or to increase dry matter for later in the season.

To optimise grain production, removal of stock prior to stem elongation, as to not remove the reproductive heads, being mindful of residual biomass to allow crops to recover post-grazing to meet target yields and allow time in the season for the crop to finish post grazing.

Since 2000, there has been a general increase in summer rainfall and a corresponding decrease in winter rainfall (AEGIC data 2018). Southern Dirt rainfall records show this is also the case for the growers in the HRFCZ of WA. As a result, crop yields are being affected, as well as a larger winter feed gap for livestock requiring supplementary grain feeding for longer. Grazing winter crops can be the key to mixed farming profitability and is starting to gain traction through past programs such as grain and graze.

Winter type wheats are gaining prominence as the preferred crop as they are easier to graze than spring wheats because they remain vegetative for much longer. This means they can be grazed for longer periods of time compared to spring type wheats, with less risk of yield loss.

Table 1: 2021 Producer demonstration sites grazing data

PDS location	Katanning	Kojonup	Bridgetown
Crop	Barley Serradella	Long Season wheat	Bannister Oats
Crop entry stage	GS.23 – GS.25	GS.22 – GS.24	GS.22 – GS,24
DSE/Ha	42	20	40
Entry date	13 August 2021	14 June 2021	12 August 2021
Exit date	20 August 2021	16 July 2021	21 August 2021
Days Grazing	7	32	9
1 DSE Equivalent Days Grazing/Ha	294	640	360

Table 1 demonstrates the benefits of grazing a winter wheat compared to an oat or barley crop. All crops were grazed at a similar stage of growth, though stocking rates were different. The long season

Photo 1: Ewes and lambs entering the Oats paddock in Bridgetown on the 12th August 2021

wheat was able to provide considerably more DSE equivalent days of grazing which would allow pastures to recover and increase in biomass and remove the need to supplementary feed. The three producer demonstration sites highlighted above grazed and ungrazed crops will be harvested at the end of this season to determine if there was any impact on final yield.

Capturing the whole enterprise benefits from dual purpose crops can be difficult in a producer demonstration site. The most common methodology has been to graze the crops with lambs or ewe hoggets and measure live weight gains against the gains of lambs or ewe hoggets on the pasture paddock.

Table 2: 2020 Kojonup average daily weight gain in crop v pasture:

	Average Initial Weight (kg)	Average Final Weight (kg)	Days Grazed	Weight Gain (kg)	Daily Weight Gain (g/day)
Pasture	40.25	43.06	13	2.81	215.84
Crop - Oats	39.03	43.82	14	4.79	341.95

The results from the 2020 Kojonup demonstration site showed an improvement of 126.11 g/day/lamb for the lambs while grazing on the Williams oats crop compared to the lambs grazing on pasture. This strategy captures the benefit to changes to livestock management of the operation. Harvest data from the grazed and un-grazed dual purpose crop then determines the impact of the grazing on grain production. The two are then combined to generate the net benefit (or loss) to the mixed farming enterprise (harvest results are not available from the 2020 site).

While this is a suitable methodology for evaluating the benefit cost analysis of dual purpose crops, this method doesn't capture all producers and it may not fully capture all of the potential benefits of dual purpose crops in a mixed operation.

There is a trend among producers in the Great Southern and South West of Western Australia who manage a merino ewe flock and join 100% with Crossbred rams such as White Suffolk or Poll Dorset. Producers managing these type of livestock operations generally don't stock ewe hoggets as they buy in

Photo 2: Bannister Oats after being grazed for 9 days at 40 DSE stocking rate on the 21st August 2021.

ewes in late spring each year to be joined in January. Through producing crossbred lambs a very high percent, often 100% will have been sold prior to the break of the season ensuring that all ewes on the property when the crop is being planted have the ability to produce a lamb.

Weight gain benefits from grazing crops with lambs or ewe hoggets therefore does not apply to this group of producers. There are however significant benefits that can be achieved by this type of livestock operation through dual purpose crops.

By increasing the cropped area, with the knowledge that all crops will be grazed periodically over winter, producers will be able to maintain the same number of ewes, lambs and wool production. The increase in profitability that is generated through grain sales through producing more grain. Dual purpose crops are a system that enables producers to better capture the benefits on the spring flush.

Importantly the crops should be sown as early as possible to allow grazing to begin as early as possible in winter. Crops are grazed throughout winter enabling the pastures to establish and produce increased bulk ready for the livestock to be returned onto the pasture in late winter allowing the crops enough time to finish and reach their full yield potential. The increased carrying capacity in spring will enable the available pasture to carry the livestock and extra stubbles are then available in the summer following harvest. In the event of a poor season the extra cropping paddock/s may have to be sacrificed to livestock however this should alleviate the need to supplementary feed.

It is worth noting that this potential increase in cropping area through the use of dual purpose crops applies to all livestock producers, irrespective of flock structure.

The 2021 Producer Demonstration Site in Bridgetown currently manages a livestock operation of 100% purchased Merino ewes joined to White Suffolk and Poll Dorset Rams plus an Angus, Charolias beef production operation. One of the objectives and outcomes of the current Southern Dirt project is to understand and capture the whole of farm benefit cost analysis of increasing cropping hectares and grain production while maintaining livestock numbers. Incorporating the benefits of long season wheats into the system is expected to further improve the benefits of dual purpose crops. The knowledge generated from this PDS will be released over the next two years as the results are compiled and generated.

The outcomes from this PDS will be transferable to all mixed farming operation within the Great Southern, South Coast and South West.