





Winter Wheats the Ideal Dual Purpose Crop

Dual-purpose crops can provide valuable winter forage in livestock production systems and greatly reduce the frequency of feed gaps in winter and can allow higher winter stocking rates. By removing grazing pressure on pastures at this time they can also increase subsequent pasture availability.

Winter wheats have grown in prominence in the lower Great Southern region of Western Australia in recent years as producers look to push yields (potential) beyond those of the spring wheats by taking advantage of early breaks without completely exposing the crops to frost risks. Trial and commercial yield data have demonstrated early sown winter wheat can yield in the 6 to 8 ton/Ha range and have the ability to miss frost events when sown in late March to mid April. A further advantage of bringing winter wheats into the rotation is that they allow seeding equipment to be utilized over a wider sowing period and improving the overall utilization of growers plant and equipment.

Mixed farming operations growing winter wheat in this region have begun grazing the paddocks in early winter to help fill this feed gap and aide the pastures in 'getting away'.

Growing Winter Wheats

Winter wheats do well on a wide range of soil types but prefer deep well-drained soils although they can tolerate waterlogging for short periods, with some reduced production. Generally winter wheats perform best where the surface and sub-soil pH is 4.7 or higher, and with little or no soluble aluminum.

Winter wheat is generally sown on the first autumn rain event and there is often no chance to control winter weeds prior to sowing. Many winter weeds, such as brome grass, annual ryegrass, raddish and capeweeds also don't normally begin germinating until well into autumn/winter, long after the crop has been sown. Good weed control in the previous winter along with pre-emergent herbicides is important to optimize weed control especially in grasses where there are limited post emergent options.

When planning herbicide weed control programs it is important to check stock withholding periods. Some products have a withholding period (before stock can graze the paddock following application) as long as 70 days. Fortunately, there often are good alternatives with short withholding periods for many weed problems.

If winter wheat is to achieve a high winter dry matter production, followed by good grain recovery, it must be sown early. Later sowing results in slow growth, poor total winter production, although grain recovery can still be very good. Growth rates from early sowing can be as high as 100 kg/ha/DM/day in mid/late autumn when soil moisture is adequate, and temperatures are mild. Growth through to the end of grazing typically average 30–60 kg/ha/DM/day, from early sowing, given good moisture, high soil fertility, and sound management. Often pastures at that time of the year grow at 5–10 kg/ha/DM/ day.

Trial work within the lower great southern area has shown that winter wheats when sown late or in the traditional spring wheat window have the ability to yield similarly (often better) than the best spring wheats. This is of considerable benefit to growers as they don't need to double the seed stock on hand requirements to have varieties for different sowing windows depending on the seasons break.







The below varieties have been trialed and grown on commercial scale throughout the lower great southern region of WA:

Illabo – dual purpose winter wheat (grazing and grain production) variety, APH quality, mid winter maturity and excellent resistance to stripe rust and good resistance to black point and stem rust.

Denison – slow-very slow spring wheat, APW quality, suited to mid to late April sowing and high yielding when early sown.

Accroc – medium to long growing season winter wheat, short stiff straw, good disease resistance profile and suited to winter grazing where appropriate.

While Accroc and Illabo are the true winter wheat types there are other spring wheat varieties similar to Denison which are later maturing and have the ability to delay head emergence with earlier sowing, such as Zanzibar and Catapault. The sowing window for the longer type spring wheat is late April early May.

Higher sowing rates generally increase dry matter production, especially in early grazing, generally the first six to 14 weeks after sowing. High sowing rates normally have no negative effect on grain yield or quality. Suggested sowing rates range from 100 to 120 kg/ha (220 to 240 plants square metre) for colder and higher rainfall areas.

Grazing yield + grain yield		kg/Ha nutrient requirement				
Ton/Ha DM	Ton/Ha grain	Nitrogen	Phosphorus	Potassium	Sulphur	
2	2	112	11	44	6.4	
2	4	154	16	52	10	
2	6	196	22	62	13.6	
4	2	182	16	80	9.2	
4	4	224	22	88	12.8	
4	6	266	27	96	16.4	
6	2	252	2	116	12	
6	4	294	27	124	15.6	
6	6	336	32	132	19.2	

Table 1: Nutrient required to grow a winter wheat crop

Grazing yield + grain yield		kg/Ha nutrient removal				
Ton/Ha DM	Ton/Ha grain	Nitrogen	Phosphorus	Potassium	Sulphur	
2	2	55	6.8	8.4	3.8	
2	4	101	12.8	16.4	6.8	
2	6	147	18.8	24.4	9.8	
4	2	64	7.6	8.8	4.6	
4	4	110	13.6	16.8	7.6	
4	6	156	19.6	24.8	10.6	
6	2	73	8.4	9.2	5.4	
6	4	119	14.4	17.2	8.4	
6	6	165	20.4	25.2	11.4	







Table 2: Nutrient removal by a winter wheat crop

Winter wheat crops require high nutrition especially where there is high yield potential. Table 1 indicates the amount of the major nutrients required for a winter wheat crop at various grazing/grain yield levels. While total nutrient requirement is high, a lot is recycled during the grazing operation via urine, dung, and trampled plant material rotting back into the soil. However, in the main these will not be re-available for the current crop and therefore to reach the targeted grain production additional fertiliser is required to be applied post grazing. Table 1 is for budgeting a crop's nutrient requirements and table 2 is for assessing long term paddock nutrient balances and need to be accounted for the following years rotation.

Southern Dirt as part of it's Dual Purpose Crop project with the MLA is examining the results of increasing nitrogen rates further along the potential production curve in 2022. Previous work has demonstrated the benefits of using winter wheats as a dual purpose crop and the focus has now shifted to better understanding the production potential of this strategy in the final year.

Grazing Management

Timing of grazing is critical in terms of minimizing the impact on yield and optimizing the dry matter availability. An early time of sowing (establishment) enables early plant growth and an earlier start to the grazing period. This allows lower stocking rates to be utilized and longer grazing period.

Later establishment may result in the need to crash graze the crops at much higher stocking rates to enable the stock to be pulled out in time and allowing the crops to recover ready for harvest.

Stocking rates can vary from 10 to 45 DSE/Ha depending on length of grazing. Higher stocking



Photo 1: Sheep enter an oat crop ready to graze.

rates will generally result in more even grazing across the paddock. However current commercial practices have seen producers grazing crops at lower stocking densities (10 - 15 DSE) for longer periods which allow pasture paddocks to establish and increase food on offer ahead of spring.

Time of Grazing

Timing of grazing is essential to minimize the impact of crop grazing on final yield. Work carried out by Southern Dirt in conjunction with the MLA showed that grazing beyond the middle of July considerably impacted yield even in the event of a soft finish. In 2021 three demonstrations were carried out. Sheep exit dates were 16 July, 13 August and 21 August. In the demonstration where the sheep exited the paddock on the 16th of July the grazed crop yielded 99.6% of the ungrazed crop. Compared to the other two demonstrations where the sheep exited in the middle of August, the grazed crops yielded 88.33% and 89.15% respectively of the ungrazed crops.







From the work carried out in 2021 it is recommended that the stock exit the paddock in the last two weeks of July.

Grazing breeding stock

Producers in the lower Great Southern of WA have shifted to grazing breeding stock, in particular ewes and lambs instead of grazing lambs or ewe hoggets. The primary driver for this change is to either increase ewe numbers of the total operation, while maintaining cropping area, to produce more lambs or to maintain ewe/livestock numbers and increase cropping area.

In the event of a poor season and the pasture paddock are unable to maintain the livestock through spring, a cropping paddock can be sacrificed for grazing to maintain livestock.

Dual purpose crops offer an exciting strategy which allows producers to increase production potential and in particular to take advantage of better seasons through either increasing sheep or grain production while maintaining a safety net in the event of poor seasonal conditions. Winter in the Great Southern as been particularly successful in this strategy due to its fit into the farming system through early sowing, frost risk tolerance, potential grain yield, ability to recover from grazing and early fodder growth produced as a result of Autumn sowing.

Reference

Freebairn B, 2005, 'Productive dual purpose winter wheats', NSW Department of Primary Industries agnote DPI 438.

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