

Stubbles – their use by sheep

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- The feed value of stubbles is likely to be lower now than it was 5 to 10 years ago.
- It is important to assess the amounts of grain available before sheep are put in stubble paddocks. A simple method to measure the amount of grain available in a stubble is to use a 0.1 m² square (such as a Hoegrass® square).
- Paddocks should not be grazed after the amount of ground cover declines to 50% or less.
- In some situations there could be no point in grazing the stubble.
- Legume stubbles are potentially better than cereal stubbles as feed sources for young sheep, and for ewes before or during mating.
- To obtain maximum benefit from canola stubbles, they should be grazed before any green material that may be present wilts and dies.
- Young sheep should be removed from lupin stubbles when the average number of grains available is four or fewer per 0.1 m² (less than 50 kilogram per hectare), or when the amount of ground cover is 50% or less, whichever develops first.
- No lupin variety is totally resistant to the growth of the fungus that produces the toxin responsible for lupinosis.
- Grain poisoning, or lactic acidosis, may occur on any stubbles other than canola though it is least common on lupin and oat stubbles.
- It is essential to have a supply of good quality water that can meet the demand of sheep grazing on stubble paddocks.

General

The main feed value of stubbles is in the spilt and unharvested grain and weeds they contain.

With increased harvesting efficiency and better weed control, stubble paddocks now generally contain fewer weeds and less grain than in the past. So, the likely feed value of stubbles is lower now than it was 5 to 10 years ago.

As can be seen from the data in Table 1, which were collected in surveys in the Agricultural Area in 2002 and 2003, there are large ranges in the amount of grain left on the ground after harvest. Therefore, it is important to assess the amounts of grain available before sheep are put in stubble paddocks.

Table 1. The results of observations on crops and their stubbles for 2002 (poor season) and 2003 (good season)

Grain	Year	No. of paddocks	Yield range (kg/ha)	Grain residue range (kg/ha)	Residue/Yield (%)
Wheat	2002	16	500 – 4,000	7 – 130	0.3 – 12.0
	2003	42	1,200 – 4,000	8 – 123	0.3 – 6.2
Barley	2002	7	450 – 2,500	16 – 96	0.6 – 19.2
	2003	6	1,200 – 3,500	95 – 506	3.8 – 19.0
Lupins	2002	10	150 – 3,000	68 – 391	4.5 – 139
	2003	4	800 – 1,300	130 – 241	10.0 – 30.1
Peas	2002	1	220	80	36
Canola	2002	1	1,000	34	3.4
	2003	2	1,100 – 2,200	Less than 0.1 – 76	3.4
Oats	2002	1	2,500	13	0.5

After six weeks in any stubble paddock it is highly unlikely that sheep will be gaining weight – rather, it is more probable that most sheep will be losing weight by then. It is highly likely that there would be variations between crops in the lengths of grazing.

Because it is not possible to accurately predict the performances of sheep on stubbles it is important to weigh, or at least condition score, sheep on stubbles

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Offloading grain from a harvester near Northam

regularly (preferably at three weekly intervals) to determine when they need to be shifted or supplemented. A sample of 50 sheep will provide a good indication of the performance of the flock

As well as measuring the sheep, stubble paddocks should be monitored for the amounts of residual grains. Paddocks should not be grazed after the amount of ground cover declines to 50% or less, because the paddocks then are susceptible to erosion and degradation.

It is commonly believed that older sheep use low quality stubble material more efficiently than young sheep, but this is not true. All sheep select the more digestible components of the stubble first. The reason that adult, dry sheep seem to do better on stubbles is because they have seven or eight times more body fat, that is energy reserves, than do young sheep. A 25 kilogram weaner has only one kilogram of body fat as an energy store, and can survive for less than 10 days on this energy.

When sheep are first introduced to a stubble containing grain to which they are not accustomed, there may be a lag period of around two weeks before they begin to gain weight. This is because the sheep must learn to recognise the grain as feed, and their rumen organisms must adapt to the changed diet. It is suggested that sheep be gradually introduced to the cereal grain before they are put onto the first cereal stubble for the summer-autumn grazing to avoid a setback. Once adapted to the cereal, sheep should not have problems when moved onto fresh stubbles later.

Some stubble paddocks do not contain sufficient feed to maintain or grow sheep, especially young sheep, even immediately after harvest. Therefore, it is important to assess the potential value of stubbles before putting sheep onto them. In some situations there could be no point in grazing the stubble. So care is needed in evaluating the costs and benefits of grazing them.

A simple method to measure the amount of grain available in a stubble is to use a 0.1 m² (such as a Hoegrass®) square. At least 20 counts on a line across each paddock at right angles to the harvest runs are



A typical cereal stubble after harvest

needed to get an indication of the average levels of residual grains. One hundred kilograms of grain per hectare approximately equals, on average:

Wheat and oats	28 grains per square
Barley	25 grains per square
Lupins	8 grains per square
Field peas	5 grains per square
Chick peas	5 grains per square
Faba beans	2 grains per square

The yield of grain harvested from a paddock bears no reliable relationship to the subsequent value of the stubble for stock feed.

Following harvest there is a decline in the digestibility of unharvested stubble of about one per cent per week, and the rate will be greater if there is summer rain.

Stubble is less prone to weathering causing a decline in digestibility than is senesced annual pasture but droughted crop stubbles tend to be more digestible and probably are less resistant to weathering.

Water

It is essential to have a supply of good quality water that can meet the demand of sheep grazing on stubble paddocks. Depending on the weather, the feed type and the salt content of the water, weaners can drink up to seven litres per day and adults more than this.

Water troughs in stubble paddocks need to be cleaned regularly to encourage sheep to drink enough water so that their performances aren't affected.

Cereal stubbles

Young sheep on cereal stubbles are unlikely to achieve weight gains of more than 80 grams per head per day but this can be improved by supplementation with 100 to 150 grams of lupins per head per day. This supplement can be given once a week and can be spread across the paddock using a spreader, or it can be put on a hard surface to avoid contamination.

Barley is the most useful cereal stubble and farmers often comment that sheep do better on barley stubbles than on other cereal stubbles. Pastures after barley crops are often much better than those following wheat or oat crops and baled barley stubble has proven to be a good feed source for adult sheep.

High protein crop stubbles

Stock on high protein diets, for example legume and green canola stubbles, will drink more water than those on cereal stubbles or green feed. Weaners may drink as much as seven litres per day and adult sheep more. Therefore, it's essential to have a supply of good quality water for sheep on stubble paddocks.

Weaner sheep on lupin stubbles, and probably other high protein stubbles, will not travel much more than 600 to 800 metres from the water supply to graze. This may result in parts of large paddocks being overgrazed and developing the potential to erode. There is also the possibility of stock developing lupinosis.

The distant parts of the paddock may have feed that is barely used so multiple or movable water troughs will allow large paddocks to be grazed more evenly.

Legume stubbles are potentially better than cereal stubbles as feed sources for young animals, and for ewes before or during mating. This is because of the higher protein content of the grains.

Stock will eat out a faba bean stubble faster than a lupin stubble with an equivalent amount of grain, perhaps because faba beans are larger or more palatable.

Pea stubbles are very fragile. Although the residual grain is highly nutritious, it is important to assess the condition of the other parts of the stubble in determining when to take sheep off these stubbles. If sheep are left on these stubbles too long the paddocks will become an erosion hazard. Sheep usually can't be left on pea stubbles as long as they can on some cereal and lupin stubbles.



Most stubbles now do not have much grain in them after harvest

Canola stubbles

If canola stubbles contain green leaf and stem material, they will provide high quality feed that is most beneficial to young stock and ewes being flushed for mating. It is common for ewes to be joined on canola stubbles.

Canola stubbles should be grazed before the green material wilts and the plant dies.

Because of their high palatability, green canola stubbles will be grazed out quickly and rates of weight gain will decline once the green material has been eaten.

Weight gain of stock on dead, brown canola stubble will be no better than that on cereal stubbles, that is, less than 100 grams per head per day.

Lupin stubbles

If a lupin stubble contains, on average, less than four grains per 0.1 m² then weaner sheep will lose weight on that paddock and be at risk of developing lupinosis. Young sheep should be removed from lupin stubbles when the average number of grains available is four or fewer per 0.1 m² (less than 50 kilogram per hectare), or when the amount of ground cover is 50% or less, whichever develops first.

Providing there is no potential erosion hazard, the paddocks could be grazed with older sheep after the weaners are taken off the stubbles. They are better scroungers and aren't so susceptible to the development of lupinosis.

Weaner sheep on lupin stubbles may gain weight at up to 200 grams per head per day, but gains are more often in the range of 100 to 150 grams per head per day.

Mineral and trace element supplements

Cereal grains are low in sodium and calcium so sheep grazed on these stubbles for long periods may have an inadequate intake of these essential minerals.

Many farmers provide loose mineral mixes or blocks just in case sheep may require some mineral or trace element. Provision of salt may assist in the prevention of urinary calculi and ice plant poisoning.

Various trace elements are included in most commercial mineral mixes but there are no proven benefits of using them. The levels of inclusion of the minerals are low enough to ensure there is no risk of poisoning, but if sheep are truly deficient in one of the trace elements, the inclusion rate and intake may be inadequate to correct the deficiency. **If trace element deficiency is suspected, seek professional advice on its diagnosis and the most effective means of treatment.**

Urea supplementation, via block-licks, loose mineral mixes or molasses-based licks, has not been shown to be commercially helpful when sheep have access to adequate roughage and grain but inadequate protein. The response to urea supplementation is variable and unpredictable. Supplementation with lupins, or other grain legumes, is a more reliable way to raise dietary protein levels.

Health issues

The risk of lupinosis occurring in sheep grazing lupin stubbles is increased:

- The longer the time after harvest before sheep are put onto the stubble;
- As the amount of lupin seed available declines (particularly below about 50 kilogram per hectare);
- If the sheep have no prior experience of eating lupin seed;
- Following significant rainfall (about 10 millimetres);
- With varieties (such as Danja) that are more susceptible to the fungus responsible for lupinosis. No lupin variety is totally resistant to the growth of the fungus that produces the toxin responsible for lupinosis.

Urinary calculi (waterbelly) in rams and wethers has a number of causes. It occurs most commonly in summer and autumn when many sheep are grazing cereal stubbles. Continuous provision of salt as a loose mix or in blocks, may aid in the prevention of waterbelly by promoting increased water intake, resulting in more dilute urine.

Health problems in sheep grazing canola stubble in Western Australia have been rare, but farmers should be aware of the following potential problems:

- A small number of Western Australian farmers have reported that sheep on green canola stubble produced a profuse foul-smelling scour;
- Two Western Australian farms experienced sheep deaths on canola stubble, which subsequently were found to be due to lesser loosestrife poisoning. This plant prefers wet to waterlogged areas;
- Brassicas in general, including canola, can cause nitrate poisoning, pulmonary emphysema and haemolytic anaemia in stock. These conditions have occurred occasionally in sheep in eastern Australia, but not in Western Australia.

Ice plant poisoning generally occurs within a few days after sheep are put into a new stubble paddock, particularly cereal stubbles. The sheep seek out and avidly eat the dead dry plant, perhaps because of its salty taste. Continuous provision of plain salt, in a loose mix or blocks, may satisfy any craving for salt and reduce the likelihood that sheep will eat ice plant.

Grain poisoning, or lactic acidosis, may occur on any stubbles other than canola though it is least common on lupin and oat stubbles.

- The risk of acidosis is increased if:
- The sheep have not previously been eating the grain;
- There are heaps of spilt grain or considerable amounts of unharvested grain; or
- The sheep are hungry on entry to the paddock.

Other diseases that may occur in sheep that are grazing stubbles include polioencephalomalacia (polio), enterotoxemia (pulpy kidney), annual ryegrass toxicity, scabby mouth, pink eye and caltrop poisoning. These diseases do not have a particular association with any type of stubble and may also occur in sheep in other situations.

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Other reading

Farmnote 67/2002 The amount of stubble needed to reduce wind erosion.

Farmnote 61/2005 Grazing weaner sheep on *Phomopsis*-resistant lupin stubbles

Farmnote 77/96 Pea stubbles: Wind erosion control and grazing management