

**The Potential of
Canary Reed Grass
as an Alternative to
Straw for Animal Bedding**

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Introduction

Research in Wales, financed by EU structural funds, has shown the potential of novel crops such as Canary Reed Grass (CRG) and Giant Reed Grass (GRG) for biomass production in the principality. Recent trials at Pwllpeiran with CRG have yielded 7 tonnes DM/ha in a single cut. Whilst initial interest in these crops was for biomass production as a biofuel, such crops also offer potential alternatives to cereal straw as a bedding material. Conventional straw availability in Wales will continue to decline through impacts of decoupling, straw chopping and soil incorporation, and an increase in straw burners for power and heat production. This will raise prices and hence winter housing costs with a potential detrimental impact on animal health and welfare, an increase in liquid wastes and an increase in diffuse pollution.

The use of woodchip as an alternative to straw for bedding material is currently being investigated as part of a large EU funded project led by HCC. This project has demonstrated that woodchips are a suitable alternative to straw, however the economics of using woodchips is still under investigation. Reed grasses offer high yields from relatively low nutrient inputs and can be harvested by conventional grassland machinery, offering a real alternative for grassland farms.

The objective of this study is to investigate the practicalities of substituting CRG for straw as a bedding material under finishing lambs, and to quantify the economics of such a system.

Experimental Protocol

A finishing lamb study was carried out using a total of 210 lambs. At the start of the experimental period, 120 weaned lambs were allocated to one of two treatment groups, using wheat straw or CRG as bedding. Two pens were used per treatment. All lambs were weighed prior to allocation and each treatment was balanced for liveweight. Initially there were 30 lambs in each pen. The total trial period was eight weeks in duration. Lambs were kept in treatment groups initially for four weeks. After this initial period, any lambs that had reached a finished condition were removed from the trial. New lambs

were then introduced to each treatment group to maintain a minimum of 28 per pen. A second selection of finished lambs was made two weeks after the first selection and again those lambs of a finished condition were removed from the trial and new lambs introduced. After a further two weeks, all animals were removed from the trial. All animals were weighed on and off the trial.

The lambs were housed in a purpose built experimental sheep shed. Animals were fed concentrates in troughs which were rotated round the pen to prevent a build up of faecal material in one particular spot. Barley straw was fed in racks down each side of the pens.

Intakes of feed were recorded for each pen. Lambs were fed ad libitum for concentrates and straw. All groups were monitored for any health problems such as lameness and respiratory problems. Cleanliness of lambs was also monitored.

Quantity of bedding material used was also monitored. This included the initial quantity used to bed each pen, how much was then used each time clean bedding was added and how often this was done.

Results

Quantities of bedding material used

All pens were initially bedded to a depth of approximately 10 cm. For both treatment groups, normal bedding management practices at Pwllpeiran were employed which aimed to maintain animal cleanliness. The quantities of bedding material used are given in Table 1.

A greater tonnage of CRG was used compared to straw. Not all variables were controlled for in this pilot study: e.g. CRG was in round bales, straw was in hestons; CRG was winter cut, straw was summer cut. These variables may have contributed to differences in usage. The dry matter content of the straw and CRG were similar suggesting that the absorption capacity would be similar for both.

Table 1 Quantities of bedding material used during the 8 week finishing lamb study

Treatment		Initial weight of bedding material	Weight of additional top-up material	Total weight of bedding material	No. of applications	Average interval between applications	Average weight of material applied
Straw	1	130 kg	542 kg	672 kg	13	3 days	41.7 kg
	2	130 kg	620 kg	750 kg	13	3 days	51.6 kg
Canary Reed	1	190 kg	850 kg	1040 kg	10	4 days	94.4 kg
	2	190 kg	850 kg	1040 kg	10	4 days	94.4 kg

Frequency of addition of fresh bedding was similar for straw and CRG (3 days vs. 4 days, respectively). The difference in frequency was again a function of bale type rather than differences in the bedding material. There was no difference in the time taken to bed the pens.

It was noted that the CRG was a dustier product than the straw. However, the CRG had been cut for straw in February and stored outside for some months. It is assumed that if CRG is cut for straw in summer and left to cure in the sun before baling this will reduce the dust content. Similarly storing under cover should also reduce the dust content.

Animal Performance

Lambs were weighed and randomly allocated to treatments at the start of the trial. After four weeks, all lambs were re-weighed and those of a finished condition were removed from the trial. Additional animals were then weighed and allocated to treatments in order to maintain a space allowance of 1.0m² per lamb within the pens. After a further two weeks, all lambs were again weighed and finished lambs removed. Once more, additional lambs were weighed and allocated to a treatment in order to maintain stocking rates. As the trial was ended two weeks later, the last cohort of lambs have been excluded from the final analysis.

Daily liveweight gains and mean number of days spent on trial are given in Table 2 below. There were no significant differences between treatments in either daily liveweight gain or on time spent on trial.

Table 2 Mean daily liveweight gain (kg) and mean number days spent on trial for finishing lambs

	CRG	Straw	SED	Sig
Daily liveweight gain (g)	90	110	30	NS
Number of days	34.5	33.4	1.68	NS

Daily liveweight gains were less than expected in this trial for both treatments. However they were similar across treatment (90 vs. 110 g for CRG and straw respectively). The similarity in daily liveweight gain is also reflected in the mean number of days spent on the trial (34.5 vs. 33.4 days for CRG and straw respectively).

Animal Feed Intakes

Feed per treatment pen was offered on an ad libitum basis. Actual intakes for each treatment pen were 38kg of a commercial lamb concentrate daily. During week 1 pens received 12.8 kg (fresh weight) of hay daily. However, in order to increase concentrate intake, this was changed to straw for the remainder of the trial. Treatment pens then received 9.2 kg of barley straw (fresh weight) daily. This level of feeding would be equivalent of each individual lamb receiving 1.3 kg of commercial lamb concentrate and 0.45kg of hay or 0.33 kg of straw.

Animal Cleanliness and Health

All lambs were assessed as having a Meat Hygiene Service cleanliness score of 1 (very clean) when allocated to treatment. This score was maintained throughout the trial period for both treatments.

The main health issue for the lambs was lameness but this was common across treatments and is a particular issue for housed animals. All lambs were put through a footbath containing 5% formalin solution on a monthly basis. 9 lambs on the CRG treatment had at least one foot trimmed and a further one also received an injection of Oxytetracycline. 13 lambs on the straw bedding treatment underwent foot trimming with a further two also receiving an injection of Oxytetracycline.

Economics

Similar quantities of CRG were used for bedding material as for straw. This would suggest that CRG makes a suitable bedding material. Whether it can become a bedding material of choice for Welsh Farmers will be determined by costs and availability. For this trial, CRG was sourced from a supplier in Herefordshire at a cost of £40 per tonne ex farm. This is similar to wheat straw costs which are currently £38 per tonne ex farm (Farmer's Weekly, Jan 2007). Haulage costs will have a major impact on both prices. Bedding costs for the lambs on the wheat straw treatment were £52.61 compared to £83.20 for the CRG treatment. This does not include haulage costs.

Because CRG can be grown and harvested using conventional grassland equipment, growing areas, even on marginal land, could be financially viable.

Discussion

In this pilot project, it has been demonstrated that CRG is a viable alternative to straw as a bedding material for housed livestock. Using CRG does not impact on the performance of the animals, neither does it present additional health and welfare issues.

Using CRG as an alternative to straw will be determined by price and availability. For some farmers, establishing their own crops may prove to be a viable alternative to buying straw.