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Greenhouse technology solves grazing problems

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Unable to afford extra land to graze an expanding ewe flock, Susan Whilding and Bert Harris are embracing greenhouse technology enabling the equivalent of 4ha (10 acres) production to be grown from little more space than a single garage. **Simon Wragg** reports.

LAND is expensive in the Monmouth area, where Susan Whilding and Bert Harris would love to add to their 40-hectare (100-acre) farm at Broad Oak, Herefordshire, where they run 100 Charollais cross Texel ewes.

"We'd like to get to 250 ewes if we had the grass, but every land auction we've been to the price has gone way over estimate," says Mr Harris.

A chance visit to last year's Dairy Event and Livestock Show put the couple in touch with Windsor-based H2O Farms, a company supplying forage growing systems which use nutrient enriched water to replace soil.

Instead of grass, barley grains are sprouted in long, vertically shelved shallow plastic trays on a seven-day cycle providing a highly digestible (NDF 50 per cent plus), rumen friendly forage of about 25 per cent protein.

"The system has been installed in a space of three metres by 10 metres in the end of a shed and is easily capable of feeding 50 ewes in the run up to lambing," says Mr Harris.

"At five ewes per acre it's equivalent to 10 acres of grazing costing £100,000 to £110,000 going on recent auction prices. The system we've put in is feeding the same ewes for a tenth of that."

System

The system takes just over an hour a day to manage and feed out. The process starts with 5kg of malting barley seed being steeped in room temperature tap water with a pH 6.8 for 24 hours. This is then drained and spread out on to a 400cm by 30cm horizontal plastic tray shelf.

Room temperature in the insulated growing room of about 18degC and humidity are controlled by a free-standing dehumidifier and wall-mounted air conditioning unit.

"Each day I come in and check the pH and nutrient content of the irrigation water holding tank with a digital meter," says Mr Harris.

"Our mains water is ideal at pH 6.8 and when more plant nutrient is needed I draw off the required amount - usually about 400ml - from drums of soluble nutrient granules we mix with water and add to the tank.

"An automated pump draws off the liquid feed and supplies it to the trays via an irrigation pipe. This runs for a minute or two each hour with surplus water draining back into the holding tank for recirculation. The seed grows in the dark so there's no need for lighting."

Mr Harris says you can see the barley sprouting after the first day. It is around 15cm tall (6in) by day four and, when ready to harvest, is a densely-matted root with 18-25cm (7-10in) of fleshy leaf material.

Harvesting the material is quick. Mr Harris finds an oblong feed bucket works well in his growing room, although feed barrows may suit larger systems. The mat of sprouted barley is lifted out and carried to the adjoining stock pens for feeding.

"The ewes and lambs have really taken to it," he says. "At first they pick off the leaf material and we find breaking up the root mat into bite-sized chunks ensures all the grain is eaten with very little waste."

Diet feeder

On larger dairy units using hydroponics - elsewhere in Europe, Australia and Bahrain - the forage is often mixed with straw in a diet feeder before feeding - a system Mr Harris is hoping to copy using a chaff cutter.

Installed last December, the couple fed 1.0-1.5kg per head per day freshweight of sprouted barley to ewes in the run up to lambing, replacing bought-in cake.

"They took to it really well," he says. "The ewes are bedded on wheat straw and offered ad-lib hay for fibre. We've not bought cake since.

"We weaned in late June lambs and put a batch on to an indoor trial feeding the sprouted barley."

Mr Harris says the lambs started strongly on the trial, gaining 3-4kg in the first week, rather than having the expected growth check. He has started feeding the sprouted barley only five days after germination, as the root mat can be torn up by the lambs, which they cannot do with more mature mats.

"Liveweight gains are being recorded individually and we see no reason why - with grazing under pressure - we can't keep them indoors through to finishing rather than having to sell as stores in August/September," he says. "This will allow us to make use of the system when ewes are out at pasture and keep that bit more margin for ourselves."

The system will be put to full use this winter with an extra 30 ewe lambs coming into the flock, with a further 40 penciled in for 2012.

"We are erecting polytunnel accommodation below the feed shed and hope to batch ewes in groups of 50 for feeding. It will be easier to expand the growing room rather than find extra acres."

Hydroponics

- H2O, the company used by Mr Harris, says the system is low input
- 700-800 litres of water for every 1,000kg of sprouted barley produced
- Estimated running cost of 6p per kg freshweight of material produced, including seed, water, power and labour
- Malting barley seed cost £285 per tonne. Cheaper barley seed can be used but is not as productive

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