VACUUM SILAGE-AN AID TO MORE EFFICIENT MEAT AND WOOL PRODUCTION IN WEST OTAGO AND SOUTHLAND

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Introduction

POSSIBLY one of the more spectacular farming innovations of recent years has been vacuum silage. Encouraged by one of the wettest and most growth-promoting summers in living memory, it captured the imagination of the farming community in West Otago and Southland last season. Eighty-thousand tons of silage were made last summer compared with 3,000 tons in the same area the previous year.

Of the 650 farmers who made it, it is doubtful whether many of them gained substantial financial benefits although most probably are richer in experience. What then is the significance of vacuum silage as an aid to more efficient meat and wool production in West Otago and Southland?

Efficient meat and wool production requires the development and establishment of management techniques or systems which, working within climatic limits, combine efficient pasture and stock management in the face of a labour shortage and increasing costs. At high stocking rates of 6½ to 7 ewe equivalents per acre or above, vacuum silage appears to be a useful and profitable management technique.

The oft-maligned climate of Southland and West Otago is a good grass-growing climate. It is a cool, temperate climate having a well-distributed rainfall of 36 to 36 in. at the rate of about 2½ to 3 in. per month. Dry matter yields of 13,000 lb to 14,000 lb/acre have been recorded at Gore and Winton. Farmer-recorded production has reached 110 lb of wool/acre and almost 300 lb of meat/acre.

However, despite the use of adequate fertilizers, and good pasture species grazed by plenty of animals, pasture growth fluctuates considerably throughout the year.

Management Implications of Vacuum Silage

MANAGEMENT IN RELATION TO LAND AND CAPITAL

The management implications of such a pattern of growth and stock requirements are many. There is a distinct need for fodder conservation of one sort or another and farm managers are faced with the alternatives of forage crops, hay, silage or autumn-saved pasture. Forage crops generally are suitable only for dealing with early season surplus while autumn-saved pasture can conserve only late-season feed. The blessing of a reliable monthly rainfall of 2½ to 3 in. can be a nuisance for haymaking and seldom does a farmer get his hay in without some rain on it. Often hay is little more than cattle feed. Silage has much wider ranges of suitability and can be used at any time from early to late in the season. At high stocking rates and intensive meat and wool production, flexibility and reduction of risks are two extremely important management requirements. Because of the vagaries of climate and weather, a flexible conservation system which reduces weather risk and loss is to be preferred.

Vacuum silage is a flexible conservation system which gives intensive meat and wool farmers greater independence of weather and labour and a better chance of maintaining maximum pasture productivity.

Maximum pasture productivity is dependent on the successful integration of efficient pasture and stock management.

In conserving surplus growth, it is important that reduction in pasture productivity be kept as low as possibie. The higher the level of production, the more important this is. As silaging of one acre of pasture incurs a smaller loss in total production than does hay, silage is to be preferred particularly at high stocking rates.

In West Otago and Southland, in order to keep autumn-saved pasture and encourage early spring pasture growth, stock must be fed supplements on a small confined area for 2½ months from the end of May or early June. Good

ewe management in early pregnancy requires a reduction of the high tupping body-weight. Feeding vacuum silage integrates extremely well the autumn-saved pasture and reduced body-weight features of efficient meat and wool production. Silage feeding with or without hay should start any time between mid-May and mid-June. This past winter, stock performance ranged from a maintenance of good condition in some cases to a fairly substantial loss of condition in others. It is doubtful if ewes gained weight or maintained really heavy condition.

Hence, vacuum silage is not a supplementary feeding technique for those farmers who are luxury feeders and do not include in their management a reduction in body-weight after tupping.

To maintain or increase profits in face of a cost price squeeze, management has three alternative strategies. It can lower the cost of production by increasing output while keeping costs more or less constant; it can keep output constant and reduce direct and overhead costs; or as usually happens, it can adopt a combination of these two.

The technique of self-feeding vacuum silage at high stocking rates appears to be a feed conservation system which will lower both overhead and direct costs of production while maintaining or even increasing output.

Using the assumption that 12 bales of average quality meadow hay is the feed equivalent of 1 ton of vacuum silage, at 3s. a bale contract for everything (including storage) for hay, and 15s. per ton contract plus packs for silage, the relative costs for the same amount of feed are hay 30s. and silage 25s. If a farmer has his own equipment for hay and silage, the relative costs are 15s. to 16s. for hay and 12s. for vacuum silage. This makes no allowance for the greater weather risk, and worry, associated with hay, or the greater flexibility of vacuum silage. Both less weather risk and greater flexibility become more important as stocking rate increases above 6 or 7 ewes per acre. Also, it makes no allowance for the smaller grazing loss associated with silage.

The relative costs of vacuum silage and swedes as winter feed are dependent on whether pastures have to be renewed or not. The basis of comparison is feeding ewes for 50 days with 8 to 10 lb of silage per head or a 40

ton crop of swedes. If pastures have to be ploughed and. renewed because they have run out, for 50 days of feeding, a 40-ton crop of swedes is cheaper, costing approximately 1s. 6d. per ewe compared with 5s. per ewe (contract) or 2s. 6d. (own equipment) for vacuum silage.

However, if pastures do not have to be ploughed and renewed, vacuum silage at 8s. (contract) or 5s. 6d. (own equipment) is cheaper by 3s. to 5s. per ewe than swedes (11s.). Swedes are dearer because regrassing costs must be charged against the swede crop and there is a "loss of grazing cost" as swedes force a greater area of grazing to be lost at the time of the year when feed requirements are greatest.

Whichever of these two situations a farmer is in is fairly closely related to his overall stocking rate. It seems that farms carrying 6 to 7½ ewe equivalents/acre or more find that they are ploughing good pasture solely for the purpose of growing swedes. Farmers carrying less than 6 ewe equivalents/acre will have run-out pastures to plough. This being the case, vacuum silage as winter feed instead of swedes is a profitable system only for the highly-stocked farmer carrying 6 to 7. ewes/acre or more. The higher his stocking rate, the greater the profit advantage. At 8 ewes/acre, an addition to net profit of 5s. per ewe is likely if vacuum silage replaces swedes.

MANAGEMENT IN RELATION TO LABOUR SHORTAGE AND LABOUR COSTS

For the farm manager faced with a labour shortage and increased labour costs, vacuum silage can increase the production of existing labour in two ways. First, as a fodder conservation technique, vacuum silage requires less labour than hay. As an illustration, last season in eastern Southland two men (a contractor and a farmer) in four days made silage equivalent in feed value to 3,000 bales of hay. Also, because of its weather tolerance and the simple harvesting operation required, it fits into the overall farm work and holiday programme much more easily than hay.

Second, by self-feeding vacuum silage to sheep and cattle, the labour required for winter feeding is reduced and so the existing labour force can cope with more stock. One intensive meat and wool farmer who has successfully

self-fed vacuum silage considers that, with good silage and good organization one man can probably cope successfully with 3,000 ewes in the winter. Last winter, this farmer had two labour units looking after 1,500 hoggets and 3,000 ewes. Of these, 2,000 ewes were being self-fed on excellent vacuum silage.

Summary

Many of the points made could, no doubt, be claimed for well-made conventional silage. However, the vacuum process has three important managerial benefits which conventional silage techniques cannot provide.

(1) Provided there is reasonable care, less technical knowledge is required to obtain, regularly, good nutritive silage of the high palatability which is important for sheep feeding. This is important in an area that has very little knowledge, experience, or facilities for making excellent silage in the conventional way.

(2) Vacuum silage lends itself to self-feeding of sheep and so offers winter labour advantages.

(3) It provides flexibility and room for managerial manoeuvring within restrictions imposed by climate conditions, pasture management, stock management and the availability of labour.

Labour savings and flexibility assume greater managerial importance as stocking rate and intensity of meat and wool production increase. It is only when a farmer is carrying 6 ewes per acre or more and is striving for maximum profit that vacuum silage begins to offer worthwhile managerial and cost advantages.

The only advantages to the lightly-stocked man is that it might replace his hay feeding with some saving in costs and a reduction in labour and weather worries. The weather risk is probably more of a nuisance than a critical factor, however, for the lightly-stocked man.

For the farmer carrying 6 to 7 ewe equivalents per acre or more, vacuum silage offers more benefits.

(1) It can replace hay and so provide more feed from the same limited amount of surplus grass with a saving in costs.

(2) It can replace swedes and so reduce wintering costs—this results in an additional 3s. to 5s. per ewe net profit.

(3) Labour problems and overheads are reduced because of the ease of making and self-feeding.

(4) It provides flexibility in the integration of sound pasture and stock management.

(5) It reduces vulnerability to weather.

Vacuum silage as a management technique is most applicable to the farmer carrying 6 ewes per acre or more in West Otago and Southland.

DISCUSSION

What costs are involved in overcoming pugged and damaged pasture in self-feeding paddocks?

Provided ewes are held at no more than 80 to 100 per acre while self-feeding on reasonably well-drained (artificial or natural) soils, permanent pasture damage on most soils in Southland and Otago will be confined to an area of 1 to 1½ chain radius around the stack.

All that is required on this ground is a light surface cultivation to level it and to prepare a seedbed, and the subsequent broadcasting of a bushel of perennial or ariki ryegrass with 2 to 3lb of white clover.

Pasture in the rest of the paddock is not severely pugged or damaged (especially if well drained) and nothing other than time is required to regain full pasture production. The pasture fully recovers by November and usually is ryegrass/white clover dominant. Self-feeding a mob of ewes on a poor pasture in Otapo and Southland can be a very cheap and convenient way of improving the sward and quickly lifting its production.

With increased carrying capacity, should not the amounf of silage made decrease? 'This is what is happening *on* North *Island dairy farms. With the reduced need for conservation, would not vacuum silage become less efficient?*

As carrying capacity increases, soil fertility increases and pastures grow further into the winter and come away earlier in the spring. The amount of winter feed required per 1,000 ewes does decrease. This does not necessarily mean a decrease in total amount of winter feed required on a farm.

Winter feed can be bought as well as being provided by conserving surplus summer growth. With increased carrying capacity, where the aim is to harvest and convert directly to meat and wool as much summer growth as possible, there is less surplus summer feed and hence

less opportunity for fodder conservation. However, the better pasture control and management associated with increases in carrying capacity improves summer and autumn pasture production in the good summer rainfall areas of Otago and Southland and so the opportunity for feed conservation is not reduced as much as would be expected. At present, evidence suggests that, even at eight ewe equivalents per acre, there still is a need for winter feed, and in a normal season there is still summer and early autumn surplus feed and hence an opportunity for feed conservation.

Certainly using small amounts of vacuum silage will be less efficient than making and using larger quantities. However, it may still be the most efficient fodder conservation technique when a farm's stocking rate is considered in relation to its climate, labour and plant position and the possible alternatives.

What is the minimum economic size for vacuum silage?

This cannot be answered generally. It depends on many things-the main one being what are the alternatives available to a particular farmer on a particular farm.