

The potential for biological husbandry in the Falkland Islands

J.H. McAdam*

Summary

The climate, soils and farming systems in the Falkland Islands do not make the application of conventional organic husbandry practices particularly relevant. However, most of the agricultural output from the Islands is already produced without recourse to chemical additives and if increases in production are envisaged it is appropriate to consider how these might be achieved using resources indigenous to the islands.

Introduction

The Falkland Islands lie between latitudes 51° and 53°S and longitudes 57° and 62°W, about 520 km east of the South American mainland. The archipelago comprises two main islands, East Falkland (ca 5,000 km²) and West Falkland (ca 3,500 km²) and hundreds of smaller islands ranging in size from 200 km² to a few square metres in extent. The total land area of about 11,000 km² is approximately similar to that of Northern Ireland.

The cool maritime climate is characterised by a narrow temperature range (9° C in January to 2° C in July), high wind speeds (mean 29 km/h), a relatively low rainfall (635 mm evenly distributed throughout the year) and frequent cloud cover.

As a result of the cool, maritime climate and low soil bacterial activity, soil development has been very poor and the principal soils of the Islands are acid, (pH 4.0-5.0) fibrous peats. The Islands exhibit treeless grasslands with rocky outcrops and hills rising to 705 m, with less than 5 percent of the grasslands improved to any extent. The severe climate and poor soils impose restrictions on plant growth and the natural vegetation is an oceanic heath.

Falkland Islands' agriculture is almost wholly based on extensive sheep farming for wool.

There are only 73 registered farms on the Islands. These are mostly large, ranging from about 2,000-200,000 hectares with 1,000-100,000 shorn sheep in large sheep runs which are better described as ranches (McAdam, 1984).

It is difficult to obtain meaningful data on sheep performance in the Falkland Islands. However, it is clear

that the principal characteristics of sheep production are high stock losses and low lamb weaning weights emphasising that under-nutrition is a major factor limiting output (Ferguson, 1980).

In the light of declining output and its potential effect on the future of the colony (Davies, Dickson, McCrea, Mead and Williams, 1971), in 1975 the then UK Ministry of Overseas Development established an agricultural research and development unit in the Islands (the Grassland Trials Unit - now called the Agricultural Research Centre).

It is abundantly clear that any long-term improvement in this sector of the Islands' economy, must come from additional wool yield per hectare, which in turn must be based on increased nutritional benefit from the grasslands. In the absence of other sources of feed the improvement can only come from improved production and utilisation coupled with the imposition of improved management techniques on the native grasslands or from the establishment and maintenance of improved pasture.

Due to the relatively small size of the Islands and the necessary constraints on agricultural research spending, not all aspects of potential agricultural improvement are able to be explored. One such area is that of biological husbandry which, in most countries, is often considered to be outside mainstream agricultural research spending.

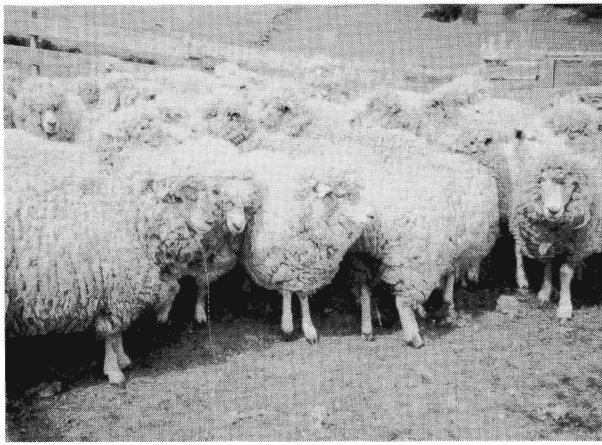
In its role as providing funding for such projects which fall outside the Government remit, the United Kingdom Falkland Islands Trust has financed a research project to investigate the potential for biological husbandry in the Falkland Islands. The initial findings from this project are reported herein.

Biological husbandry - application and potential

Within this paper the concept of biological husbandry will be used to define "those techniques of soil care and cropping which result in the efficient utilisation of the sun's energy and of dependent biological processes through the use of local resources alone" (IIBH, 1976). In situations where extensive grassland management systems are practised, the facets of production which might be improved by biological means are very limited.

In addition, a farming infra-structure whereby large, externally controlled farms operated at a low level of input did not provide great impetus to increase production. Since the Shackelton Report (Shackelton, 1976) when the initiative to promote farm subdivision

*The author is part of the Queen's University of Belfast and Agricultural Botany Research Division.

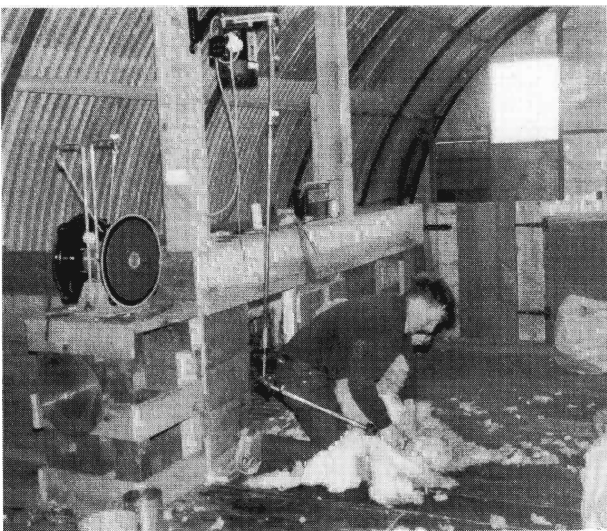


Corriedale sheep reared for wool production in the Falkland Islands.

was taken, land ownership has changed considerably towards a number of smaller, family-owned units with the emphasis still on sheep production for wool. Within such a rural infra-structure there is more incentive than before to increase production and practices previously considered unsuitable because of problems of scale can now be seen in a different light.

At present, the main limitations of agricultural production are poor individual sheep performance in terms of growth rate and fertility and high losses in the sheep population. These can be related to the poor nutritional status and unfavourable growth pattern of the natural grasslands, and the adverse climate for plant growth and livestock performance.

Year-long, free range, set-stocked pastoral systems inevitably produce a cyclical pattern of nutrition. The dietary energy requirements of ewes are characterised by a minor increase over maintenance requirements in the immediate pre-mating period (April/May) followed by a mid-gestation requirement for maintenance energy intake only. The most important periods in the cycle are



Following subdivision most farms are now run as one-family units.



None of the pastures in the Falklands have ever been sprayed, only a small proportion have been cultivated and the productivity of coastal pastures comes from natural sources.

the last six weeks of pregnancy (September/October) and the lactation period (November/January) over which period the dietary requirements may increase to up to three times maintenance levels. In order to achieve acceptable levels of production it is essential that this annual cycle of energy demand is met, especially during the critical late pregnancy and lactation periods.

The isolation of the Islands virtually excludes the widespread use of purchased concentrated feedstuffs and fertiliser and conditions are unsuitable for the growing of fodder and cereal crops. Hence the main resource available is the natural grasslands.

Attempts to improve pasture have been very limited, and even though scientifically based information on suitable methods is available economic returns from such investment are generally poor.

Within such a framework improvement might be achieved by:

- (1) supplementing the animals diet with some form of



There are huge resources of kelp in the waters around the Falkland Islands.

- high-energy feedstuff;
- (2) improving pasture quality and productivity;
 - (3) providing some form of shelter.

In relation to (1), there is little opportunity for cereal growing by organic or any other means though the project has investigated the growth of triticale in an improved soil situation. The use of fishmeal and ground seaweed might be feasible on a limited, more intensive scale. It is in the field of pasture improvement that biological husbandry might have a viable role. In 1985, fertiliser accounted for 63 percent of the cost of reseeding and Gwyer (1984) has stated that "on present calculations the prospects of producing a [reseeding] package [in the Falklands] dependent on imported fertiliser, which is financially attractive to farmers, are remote without subsidies". The natural resources available which have potential fertiliser value are the processed carcasses of cull sheep, bird droppings, commercially produced fish meal or locally-harvested seaweed (kelp).

In the context of pasture improvement these materials might be shown to have fertiliser value on native or reseeded pasture though obviously the response of a reseed would be greater than that of native pasture to any material applied. The introduction of a pasture legume, such as white clover, into the soil plant system could be of considerable benefit.

The value of shelter from trees in upland, exposed areas has long been recognised in many parts of the world. Historically, there have been few serious attempts to plant trees in the Falkland Islands and in many instances the causes of failure have not been properly evaluated (McAdam, 1982). Improvement of the soil medium for growing trees using biological husbandry techniques may offer a means of establishing shelter belts with subsequent beneficial effects on stock survival and pasture growth (McAdam, 1985).

It is clear that within the farming system currently practised in the Falkland Islands, a switch to conventional organic farming is not a meaningful concept. Sheep graze native grassland which has almost certainly had no artificial fertiliser added, only a very small proportion of the land has been reseeded and even that receives fertiliser at irregular intervals, no sprays of any kind are used, most sheep are not dipped, growth-stimulant hormones are not used nor are anti-helminthic and other drugs to any great extent.

Hence it is only in the context of improvement and increasing output that the use of biological means as an alternative to conventional inorganic-based methods arises. As already outlined, the only means by which output can be realistically increased is by increasing pasture production and hence improving nutrition and stock carrying capacity. In this context, the only indigenous source of fertilisers are, at present, sheep carcasses and seaweed (kelp). Despite the large numbers of sheep, the quantities available are small and there would be a need for further processing. They may, however, have some value as a high-nitrogen catalyst source in a composting process.



The manurial action of seabirds can greatly improve coastal pastures.

Hence, it can be concluded that the most promising avenue of research into increasing productivity by biological means in the Falkland Islands is by investigating the potential of seaweed as a fertiliser.

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- [To be continued in the next issue. Editor]