

THE AUSTRALIAN WOOL INDUSTRY: THE POTENTIAL FOR GAINS IN PRODUCTIVITY

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1. INTRODUCTION'

The scope of this-paper is restricted to the wool industry (as distinct from the more broadly based concept of a sheep industry), to provide a more commodity-oriented focal point for discussion. In addition, the reference in the title is to "productivity" rather than "profitability", to enable factors affecting demand to be excluded in preference to a more detailed examination of certain factors influencing the production and distribution of Australian wool.

II. WHAT IS PRODUCTIVITY?

An important point to clarify is the meaning of "productivity". In the broadest sense, productivity is the relationship between output and inputs. The more common usage is in the partial context of relating output to a single factor; for example, wool per sheep. Unfortunately, such usage can be extremely misleading from the point of view of determining optimum factor input. The more appropriate concept is output relative to the total mix of inputs. There are three ways 'in which productivity gains can be achieved (Powell 1977):

- improved technical processes which may be output-increasing, input-saving or a change in the input mix;
- changes in organisational structure, a particularly common example being increase in property size;
- elimination of inefficiencies caused either by poor management or a personal preference to operate at a sub-optimal productivity level.

Raising productivity cannot always be associated with a resultant increase in net income. Input-saving technical innovations quite unequivocally lead to a rise in income, but other sources of productivity gains, particularly output-increasing processes, could result in a reduction in net income. The reason is that the additional production may cause prices to drop by a percentage which is greater than the relative rise in production and/or the additional inputs associated with the new technical process may result in total input costs increasing. The experience of the wool industry in the 1960's provides one of the best examples of this type of outcome; as increasing quantities of synthetic fibres became available at lower prices, woolgrowers accelerated productivity growth in an attempt to compensate for the loss of income. The resulting increase in production aggravated the decline in prices culminating in the industry depression of 1970-71.

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It should not be concluded from this experience that improved productivity in the wool industry will necessarily lead to reduced income; indeed, following the accelerated factor cost increases of the 1970's, productivity gains are regarded by some as essential for the long-term viability of the wool industry in Australia. There is evidence that an improvement in demand has a greater potential for increasing net grower income, but nevertheless, achieving some reduction in real per unit costs of production and marketing does have a high priority.

III. PRODUCTIVITY IN PRODUCTION

Referring again to the industry's experience in the 1960's, one estimate (Hoogvliet 1973) puts the industry-wide productivity growth in that period at 2.6% per annum, ranging from a low of 0.9% in the pastoral zone to 2.9% in the high rainfall region. The major source of the productivity increase was the substantial investment in improved pastures which permitted an associated decline in labour input. Nevertheless, a feature of this period was that increases in purchased inputs (particularly fertilisers) rather than technical gains per se, were assuming an increasingly important share of total productivity growth.

This trend halted, however, with the slump in prices in the early 1970's and subsequent escalation in input costs. A sharp cut back in factor inputs has occurred; but initially productivity growth has been maintained. This is believed (Dillon 1977), however, to be a misleading short-term effect in which the production base has been sustained by the lagged impact of previous high levels of input (e.g. fertiliser application). Given the current relationship between wool prices and input costs, it is difficult to foresee any significant recovery in factor utilisation. On this basis, therefore, what are the potential sources for productivity gains in woolgrowing?

This was a topic discussed at the Kellogg Rural Adjustment Unit (KRAU) Conference held in August 1977. One conclusion based on BAE work (Easter 1977) is that the greatest potential long-term benefit rests with improved output from increased fodder availability. This applies particularly to the pastoral zone and points to the high priority that should apply to pasture yields and management and to achieving genetic improvements by which to raise feed conversion rates. Such is the constraint imposed on productivity growth by the absence of this technology, that the potential gains from other technical advances are considered relatively small. This led the BAE study to conclude, and the same point was taken up frequently during the KRAU conference, that probably the preferred medium-term approach to achieve productivity gains in the wool industry, is to concentrate on extension resources to increase the effective uptake of existing technologies. The outcome would be productivity growth based on a mix of technical progress and rearrangement of production resources.

One specific area of wool production technology which warrants mention is that of shearing. Shearing costs have risen dramatically in the past seven years from \$18 per hundred in 1970 to \$60 per 100 in the current season. Apart from the impact this trend has had on per unit production costs, it has also influenced significantly the pattern of resource utilisation (for example, an increase in owners doing their own shearing) and composition of wool produced (for example, a tendency towards less shearing of lambs and a reduction in the frequency of crutching). Research programmes presently in progress are pursuing four broad lines of technical development (Booth 1977):

- (i) The less ambitious developments are associated with "do-it-yourself" procedures, which principally comprise new devices and shed lay-outs making it more feasible for property owners to do their own shearing - particularly crutching and shearing of small flocks.
- (ii) A more radical approach involves the development of "assembly line" systems by which a sheep is held by a device during shearing, and shearers combine their efforts.
- (iii) Automated shearing is a long way from implementation at present, but it is expected that the procedure will eventually become a commercially feasible proposition. over easier parts of the sheep's body, leaving only the more difficult parts to be shorn manually.
- (iv) Chemical "de-fleecing" is probably the most dramatic of the new techniques being developed. This also requires - a lot of problems to be solved before it can be regarded as a potential alternative method of wool harvesting - for example, accuracy of the dosage, control of the fleece removal, side-effects of the chemical used and exposure of the de-fleeced sheep.

Low profitability in an industry (or, if you like, a cost-price squeeze) provides a strong incentive to seek improved productivity through a rearrangement and greater efficiency in use of existing resources. It is unfortunately true, however, that low profitability also affects the ability to finance, either through self-generated funds or from lending institutions, the purchase of, additional or alternative resources. This is the dilemma facing much of the Australian grazing industry today and it seems that access to more liberal long-term financing is an essential pre-requisite for sustained productivity growth. This is particularly true in view of the lagged adverse effect on wool production beginning to emerge as a result of reduced inputs in recent years.

From a longer-term point of view sheep genetics should be an important source of productivity gains, principally in average fleece weight, although in some regions, particularly Western Australia, any breed improvement to reduce the incidence of tender wool would be a major step forward. The industry's record to date with respect to increasing quantity and improving quality of wool from sheep, has not been one to envy. The wider use of flock selection based on objectively measured fibre qualities should, however, provide the basis for better gains over the next decade.

IV. PRODUCTIVITY TN DISTRIBUTION

Embodied in the distribution process is wool packaging and this element has emerged as potentially one of the main sources of cost saving in the distribution of wool from the farm to the mill. Behind it all, however, has been the introduction and progressive acceptance of objective measurement in the sale of wool.

- (i) Objective Measurement: This season roughly 75% of auction offerings will be on a sale-by-sample basis.
- Already important gains have been associated with the elimination of the majority of traditional showing, but the immediate objective is to raise the proportion to 100% - including many categories such as carding wools, which originally it had been imagined could not be successfully pre-sale tested.

The ultimate objective, however, is to achieve 100% sale-by-description. The savings in costs would be substantial, partly through its implications for sampling procedures and presentation of samples, but principally through the revolutionary impact it will have on the selling system. Instead of centralised auctions or tenders in which buyers come to the wool (whether shown as a sample or traditionally as an opened bale), sales could be decentralised and computerised to enable buyers to make purchases from their offices while the wool could be stored at any number of locations totally unrelated to the selling procedures.

At present there are important deficiencies in objective measurement, particularly with respect to measuring length and strength, to be overcome before widespread acceptance of sale -by-description can be expected. Other problems relate to finding a satisfactory means of defining some of the more subjective qualities of wool. Nevertheless, the Australian Wool Corporation is selling wool privately from its stocks solely on the basis of description and has gained increasing buyer confidence. In addition, the Corporation is testing a system whereby wool sold by sample will carry a full description of the wool to provide buyers with greater exposure to the use of descriptive certificates.

- (ii) Packaging: Except for a slight increase in average weight to 150 kg, the standard Australian farm bale has changed very little in terms of size in the past few decades. Recent years have brought some progress in post-sale preparation of denser bales for shipment. The more spectacular of these, although certainly not revolutionary, is the so-called "jumbo" bale of around 450 kg. It consists of an extremely dense pack of wool held together by steel bands and plastic (or wooden) battens, and wrapped in a plastic sheeting for protection from weather and contaminants.

To realise the benefits of a large, dense and uncontaminated bale, however, the wool needs 'to go into such bales from the outset, and not be transferred from farm bales, an unnecessary exercise in double handling. Some trials have been carried out by the Corporation in which wool is delivered from the farm to a regional store, in large loosely packed bins and then packed into Jumbo bales. The concept needs a lot more work, and an alternative on which more progress has been made is a portable press which facilitates high density dumping on farms. The important objective, however, is to 'achieve reduced storage and freight costs through highly compressed bales and to achieve it with a minimum amount of handling. This can be classed as one of the more feasible objectives, although full implementation and acceptance will inevitably take years.

One final comment needs to be made on packaging. The type of packing material may not seem like a source of productivity, but so serious is the contamination being caused by existing packs, that any improvement will reduce primary processing losses. The problem rests presently with the polypropylene and polyethylene packs which tend to weaken in sunlight and fibrillate when punctured - a frequent occurrence following the introduction of corkscrew lifts, core-testing and claw sampling. Trials have commenced on a range of new packs of standard dimensions (eg paper-nylon laminate) and, although an early solution is essential, the ultimate answer is more likely to be found in a variation on the jumbo bale in which the packaging is a protective cover and not used to contain the densely packed wool.

- (iii) Handling: The nature of the handling procedures is defined" to a large extent by the use of objective measurement, the type and place of baling and the method of sale. There are, however, additional ways of using resources more effectively. One of these is for wool to lose its identity with a particular grower from the time of its receipt into store (at which point it has been weighed, cored and sampled). This can only occur if the grower is "paid out" for the wool at the receipt point so that all wool is then handled under single ownership. The advantage lies in easier in-store handling, amalgamation into suitable mill lots and the scheduling of a selling date to suit the market instead of the need to facilitate early payment to growers. This was a feature of the Corporation's 1973 wool marketing proposals and has been introduced this season by the Corporation in its Limited Offer to Purchase Scheme. It has also been introduced by a growers' co-operative (Grazcos), but it seems difficult to achieve the joint benefits of more efficient handling and an optimum sales programme without single ownership for the whole clip - a controversial proposition in certain sectors of the industry.

Another significant cost-saving benefit that would come from ownership of the clip by the Corporation, is a reduction in the costs of the reserve price scheme. At present wool handling costs are increased by around four cents per kg greasy if the

Corporation intervenes in the auction to buy wool instead of allowing it to pass to the trade. The differential is still higher, possibly 7.5 cents, for wool relocated from AWC stores in Australia to stores leased by the Corporation overseas. It is conceded by most that the benefits of the reserve price operations outweigh these additional handling costs. It is significant, however, that the same market stabilising function could be pursued by the Corporation without the extra handling costs, if wool could be amalgamated into sale lots immediately after arrival into store and then directed to a particular store where it would remain untouched until sold.

V. CONCLUSIONS

The prospect of making substantial gains in productivity in wool production are not good in either the short- or long-term. Improved extension facilities to ensure a better uptake of existing technology aided by improved long-term financing arrangements appear to have the best prospect of success. Property amalgamation or improved shed and yard lay-outs are specific areas of potential productivity improvement. Some gains can also be expected from modified shearing techniques, but more radical innovations comprise a more distant time horizon. Improved output from increased fodder availability is an area of long-term potential; given the high cost of pasture management and fodder storage, a more fruitful approach could be to raise fleece weights and improve fibre quality through genetic breeding programmes.

With respect to distribution of the clip, the universal use of high density bales packed only once (at the farm or a regional store) and wrapped in synthetic pack, seems a likely outcome. There will emerge, also, an increasing number of selling brokers offering store-door payment and handling wool with the benefit of single ownership. Such an outcome will lead inevitably to acquisition of the whole clip by the Corporation. This would, in turn, facilitate a less costly method of price support, a more optimal pattern of selling, and result eventually in the introduction of sale-by-description. To place a potential cost-saving on these innovations is a hazardous exercise, and one likely to promote instant dispute. As a reasonably conservative estimate, however, at current prices, the joint introduction of these measures could lower distribution costs by at least 20%, a relatively significant productivity gain.

VI. REFERENCES

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