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Reasons for the changes

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Reasons for the Changes

The Western Australian statistics confirm an increasing cropping intensity throughout most agricultural areas.
According to agricultural economist and former chief executive officer of the Rural and Allied Industries Council A.W. Hogstrom*, this will continue.
He sees good economic reasons for the changes, and identifies them here.

*Mr Hogstrom has since been appointed Chief Executive Officer of the Agriculture Protection Board.

Comparative Profitability
The simple explanation for the trend is that cropping is more profitable than stock raising. The wheat price is at its highest-ever absolute level. Wool prices are consistently at levels only exceeded in the boom year of 1950-51, but product price is not the only answer.

Costs, ease of management and even the age structure of the farming community contribute to increased cropping.
It is important to assess the financial effects of increased cropping.

Net farm income
One measure of profitability is the net farm income. This is the amount left to pay income tax and to service any debt; in other words, it is the return on the capital invested.
Budgets were prepared for the three Shires referred to by Mr Falconer, (Kojonup, Wongan-Ballidu and Merredin) based on the average farm as indicated by statistics for the years 1968-69 and 1979-80.
The Kojonup farm shows an increase in size from 841 to 943 hectares (12 per cent) but little increase in crop. The change in crop type and yield has increased net farm income from $6,000 to $28,000, but this would have been only $13,000 if the 1968-69 farm size and management had been maintained. By switching to a 30 per cent wheat rotation from the present 18 per cent the income could be increased to $44,000. How far can a Kojonup farm increase its crop and still be more profitable than sheep?
The low-rainfall Merredin farm increased in size from 1,304 to 1,721 hectares (32 per cent). Cropping increased from 42 per cent to 49 per cent of cleared area. Fertiliser used decreased by 43 per cent thus reducing cropping costs without affecting yield.
Net farm income on the 1968-69 type farm would have only risen from $11,000 to $12,000 by 1980, whereas it increased to $33,000 on the 1980 type farm. Without the increase in farm size, but changing the management the result would have been a net farm income of $20,000.
In the more-assured rainfall and pasture area of Wongan-Ballidu, average farm size rose to even more than at Merredin. The total area increased from 1,515 to 1,882 hectares (24 per cent). Crop increased from 420 to 750 hectares (30 to 45 per cent of cleared area).

Net farm income on the 1968-69 farm would have risen from $19,000 to $31,000 without change in size or management, but on the average 1980 farm it was $59,000. Without the increase in farm size, but changing the management the result would have been a net farm income of $46,000.

We can conclude from this that the 1968 management system is still profitable if the stocking rate is high enough (at Kojonup and Wongan) but that at Merredin the increase in sheep income based on 1980 prices, is barely sufficient to cover the increase in costs, in particular fertiliser.

But in all cases, the net income could be increased even further by changing the management to incorporate more cropping, thus demonstrating the greater profitability of cropping even after taking account of the capital costs.

**Gross margins**

The simplest comparison of sheep and cropping is to look at the gross margins, that is, the surplus of income from each enterprise after meeting the variable costs associated with that enterprise. They work out at $6.50 per dry sheep equivalent (d.s.e.) for sheep and $60 per hectare for wheat on old clover land. This simply means that at 9.2 d.s.e. per hectare (4 sheep per acre) they would break even. This helps to explain the move to crop. But it is not that simple. For example, in 9 d.s.e. per ha country (Kojonup) the wheat yield may be higher than budgeted due to the extra rainfall and fertility; or lower, if affected by disease and weeds.

Another example: at Wongan it is easy to maintain a 1:2 crop:pasture ratio. But 1:1 is harder to manage, and 2:1 is quite difficult. It probably needs applied nitrogen (thus reducing the gross margin). With continuous cropping, there is a need for $30-35 per hectare to be spent on weed control and nitrogenous fertiliser. This reduces the gross margin to about $25 per hectare; or equivalent to 4 d.s.e. per hectare.

The real break-even points between crop and livestock depend on many things which can be specific to an individual farm. For example, yield, machinery, capital, direct drilling, labour and scale of activity.

A gross margin is a very poor basis for comparison because it only looks at one point in the spectrum and can only take account of small (marginal) changes.

These pressures of profitability probably cover most of the reason for an increase in cropping area. Several other factors could be responsible for the increase. These are

- land value
- machinery
- labour cost and productivity

**Land value**

At $400 per hectare for Kojonup land, a 1980 average farm could carry a debt of $170,000 (33 per cent) over 15 years. At $750 per hectare it could only service a 20 per cent debt. But, by cropping to 30 per cent wheat and increasing the cash flow, a debt of $250,000 or 30 per cent could be serviced.
But why are people paying $750 per hectare?
Firstly, those expanding from a no-debt situation can afford it.
Secondly, Eastern States and Overseas buyers bid up the prices by comparing production and rainfall elsewhere and concluding that Western Australian values are low.
Thirdly, high wheat prices and profits in the wheatbelt push up the price for lower rainfall land. The price for better situated land also increases, to stay in front.
The consequence of the increased land price is the need to increase cropping to pay for the land. This phenomenon is being experienced in U.K., U.S.A. and other developed countries. It is now spreading to Western Australia.

Machinery
Farm Machinery has been getting bigger, relatively cheaper and easier to buy.
The average size of tractor sold has doubled in the last 10 years.
Research by the Bureau of Agricultural Economics has shown that the real price per unit of power has declined steadily, with the greatest decline for medium to large tractors. Another result is increased fuel efficiency per unit of power and less fuel used per hectare or per tonne.
Finance for machinery purchase is also very easy to obtain compared to finance for other uses (e.g. a new larger shearing shed). Increased production is therefore readily financed.
As a result of these factors, there has been a substitution of machinery for labour and a growth in machinery size and capability.

Labour cost
Labour has become increasingly expensive relative to other costs. Bureau of Agricultural Economics data indicate this. One result is the fall in employment of non-family labour. Since family labour is somewhat fixed, another result is the increase in farm size so as to achieve an increase in production per labour unit. Thirdly, there has been the substitution of machinery for labour.

Thus labour cost can influence farm size and machinery purchase (which in turn has an effect of farm size) resulting in increases in land price. All the same factors (including land price) also could influence the increase in cropping.

Labour productivity
It is easier to increase productivity per man in cropping than in sheep. Every sheep has to be handled individually for most operations, and despite developments in sheep handling devices, this makes sheep a labour-intensive enterprise.
In cropping, you merely buy a bigger (wider) machine, as you do not have to check every head of wheat as long as the average sample is satisfactory.
Bureau of Agricultural Economics data indicate little change in the input of labour on wheat/sheep or high rainfall farms, an increase in productivity attributable to cropping in the wheat/sheep zone, and to beef, pigs and off-farm work in the high rainfall areas. From the farm economics standpoint, increased cropping will affect capital requirement, finance availability and income stability.

Capital requirement
The capital needs will be raised by increased cropping due to the capital cost of machinery. These may be offset by reduction in sheep capital, but there will still be a need to maintain fences, water, sheds and yards, while any sheep are retained.

Finance availability
Machinery finance is very easy to obtain. However, working capital may be more restricted since stock firms will not lend for fertiliser without livestock turnover to cover it. Also to emphasise one cropping enterprise will increase the working capital requirement since the income will not be spread over the year.

Income stability
The more specialisation into one enterprise, then the more subject the farmer is to fluctuations in the price, yield and profitability of that enterprise.

Data indicate that wheat income has been more variable than sheep income over the past ten years, largely due to the greater effect of season on yield.
If a farm runs two or more enterprises there is a possibility that income will be more stable, as there is less likelihood that both will crash or boom at the same time. However, data do not suggest that the peaks and troughs for wheat and wool offset each other.
Greater dependence on cropping suggests the need for bigger financial reserves to carry the farm through the troughs. Such dependence also suggests that a farmer would have less flexibility to move to another activity. If you are cropping 70 per cent of 2,000 hectares and running only 1,800 sheep (d.s.e./ha), it would take a long time to move back to 30 per cent crop with 4,200 sheep. Otherwise the cost of buying the sheep would be extremely high as everyone tried to increase sheep numbers.

Will the soil suffer?
Changes in cropping practice which involve more-frequent tillage will result in depletion of soil organic matter, according to research officer I. Sills of the University’s Department of Soil Science.
The results of this were reduction in soil nitrogen, deterioration of soil structure, and fewer soil animals.
Mr Sills pointed out that the proportion of organic matter in the soil could affect the rate of mineralisation of elements such as nitrogen. More-frequent cropping of many soil types by conventional means therefore could create a need for more fertiliser to maintain yields.
Pasture, on the other hand, rapidly rebuild soil organic matter levels, and restored soil structure.
He observed that cropping by minimum tillage or direct drilling might maintain organic matter levels and minimise the adverse effects of increased cropping.