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The machinery crisis

By W.T. Brown*

"The end of the world is at hand"

Is there really a crisis? I have a friend who tells me that his family has been farming for over a hundred years, and in that time they have never seen an average year. I am sure he is not alone, and that there is a process of natural selection that has ensured that the surviving farmers are those who can move from crisis to crisis with calm confidence.

It is not my intention to be a prophet of doom and disaster; rather, I want to pause to look at our present position and where we are going.

I believe we have passed one critical period and are approaching another. The first crisis was the cost-price squeeze, the coming one is the fuel crisis. Both will have far reaching effects on the future of farming. I would point out that I am talking about machinery, and not discussing the possible crisis in marketing, or of the distribution of food to starving nations, or of the consequences of the outbreak of animal diseases such as foot-and-mouth or rabies.

The cost-price squeeze

I believe we have come through a crisis in farming efficiency. For a long time, the farmer has been squeezed between relatively constant returns for his production and escalating prices of machinery, labour and most other inputs. To maintain his income, the farmer has had to reduce his cost of production, or increase the production per man. He has done this by climbing to a new plateau of efficiency, and he expanded or got out; he has substituted capital for labour.

In 1971 only 3 per cent of tractors sold in Australia were over 75 kW, but by 1976, more than 30 per cent of tractors sold were over 75 kW. In terms of installed power, this represents a big increase in the power available to farmers. The increase in tractor size has been accompanied by an increase in the area covered by each operator. It means that farmers have more capital invested in their operation.

Make machinery and make money

On the face of it we might expect the machinery manufacturers to be delighted with this trend to bigger machines and more capital investment. But the financial reports of the firms don't bear out such an expectation, as one representative of a trans-national commented ruefully, shortly after they announced another $3 million "subsidy" to Australian agriculture.

The crisis the established machinery firms went through was the sudden demand for large tractors and for the gear to go behind them. The big firms are committed to a pre-planned production schedule, to a routine of development from prototype through field trials, to production drawings, tooling up and so on. It is a long chain from idea to article.

By comparison, the small local firm producing machines on demand, not on a production line, can change the model in the process of building the next one. Modifications are quickly incorporated. There is no pre-scheduling and very little inertia in the system.

But the small firms may lack depth of expertise. Though they can produce a quick answer, it may not be the best for production, for reliability or whatever. It may be cheaper because the small firms do not have the overheads of the bigger firms.

Big firms have to be sure there is a market to justify allocating time on the assembly line, to get the benefits of cheaper production through mass production. If there is a market of sufficient size, then the large firms should be able to produce the machine cheaper, and are more likely to offer back up of parts and service.

The management of the agricultural machinery firms must continually struggle with the balance between instant response to market demands and the advantages for cost and after-sales service of mass production. Lack of response from large firms opens the way for the small firms, and the swing to bigger gear contributed to the proliferation of firms selling on the Australian market.

The large number of firms is not only due to the demand for variety of machines, but can also be attributed to export incentive schemes overseas, and the desire of some countries to balance their trade with Australia. With many firms, there will be fewer units sold of any given machine, and the cost per machine of holding spare parts and of providing after-sales service will be higher. Alternatively, no after-sales service is provided; no spare parts are stocked.

The problem of ensuring adequate parts and service caused some Canadian provincial governments to control the sale of agricultural machinery. Legislation laid down standards for warranty and for satisfactory performance. It also called for licencing of dealers or importers to ensure that supplies of parts were reasonably available.

There has been pressure for similar legislation to be introduced in some States in Australia. However, in the long term, unsatisfactory machinery or poor service back up soon becomes known. Unfortunately somebody is left with no after-sales service and no resale value.

The farmer's choice

The multiplicity of choice in purchasing does not make the farmer's task easier. He has to weigh up the merits of the innovative new machine, perhaps produced by a small company, against its risk of poor reliability, unsatisfactory field performance, and unknown service back-up. The
consequences of the choice are far greater than in the past. The introduction of the big rigs has not been a simple exercise in buying. The increase in power of tractors has not always been followed by an increase in output — buying extra capacity does not automatically give more output. The Kondinin and Districts Farm Improvement Group is widely recognised for its contribution to understanding of the problems. A change in technology calls for improved management. We are still learning how to operate big machines successfully. When scaling up, there is a need for matching of implements to tractors; big tillage gear must be available; we must improve the apparently small details of machine operation; and we must organise our work pattern and farm layout to suit the new scale of operations. Delay and breakdown, mismatching and bad handling are of much greater consequence to financial returns at the new level of operations. The farmer must choose soundly and manage well.

This is easier said than done. How do you assess air-seeders? How do you evaluate the rotary header? In the future there will be more innovations as needs for higher capacity and better management are met by the machinery firms. We can expect more automation and more sensing devices to help get the most out of the machine. Microprocessors and solid-state electronics have made it possible to make the detecting, analysing and controlling devices that previously were only pipedreams. Farmers will have to decide whether to use these innovations, and which of several to buy. Advice will be needed on the benefits and penalties of the new gear, and this advice will only be available from farmers who have tried the equipment. The Department of Agriculture is unlikely to have had enough experience on which to offer advice. Extension services are very aware of the limitations of resources to meet this need.

But it is not only in selection of equipment that there are increasing demands. The new machinery will be more complex, and will require more sophisticated operation and maintenance. Where will the expertise to operate and service the machines come from? Who will train you? Who will recruit and train the servicemen?

If the past is a guide, and if we can take lessons from other industries, then the training may not be much of a problem, but servicing will be. More specialisation in the servicing role may lead to longer delays at breakdown, or higher costs through the adoption of the "replace rather than repair" philosophy.

**Is there a future?**

The cost/price squeeze is a clearly defined crisis. Some solutions have been found, others can be envisaged. This is less true for the coming crisis, the liquid fuel supply crisis. In reality the energy crisis is a crisis of oil for transport. The bulk of our liquid fuel is used to move goods and people; about 60 per cent of our oil supplies are used in transport. Agriculture uses less than 20 per cent of oil supplies but is an essential quantity. Present policy appears to be to let market forces determine the allocation of the available supplies. If this continues then agriculture will be paying a high price for its energy, situated as it is at the end of a long transport pipeline. This will have consequences for the cost of food and fibre produced on farms. The two relevant alternatives are to use what we will have available as efficiently as possible, or to find an alternative fuel. The efficient use of available fuel depends on tractor-implement matching, which is discussed in a later article. However, the gains may be comparatively marginal, as agriculture already relies on the diesel engine, the most efficient internal combustion engine. Efficient use will encourage the search for energy saving in cropping, that is low draft implements, and cultural techniques such as direct-drilling. These new methods will require re-education in our management practices.

There is no outstanding contender for the replacement for diesel fuel. Ethanol, methanol and LPG do not lend themselves to simple conversions of the diesel engine as they do for the spark-ignition engine. The oil-from-coal conversion is not yet established as an economic possibility, though given the investment in existing diesel engines, it and shale oil must have the best prospects at the moment. The steam engine has characteristics that make it highly suitable for agriculture, but the cost of development and conversion may count against it. Because the alternatives are not fully developed, because the conversion techniques are not well known in Australia, and because the price of oil will inevitably rise, there may be a crisis in agriculture not only through the cost-price squeeze, but also through short-term fuel shortages. Developments must be watched keenly and the needs of agriculture must be kept before the attention of the decision makers.

**Where do we go?**

The good manager is the manager who can define his task, and look for an appropriate solution. The purpose of this seminar is to look at the problems and to offer some solutions. To arrive at decisions we need to understand the problem, to examine as broad a range of experience as possible, and to share as much information as possible. Every crisis brings its problems, but also offers its opportunities. As I suggested earlier, I have confidence that Australian agriculture has the will, the competence and the initiative to survive, but it will require us to define the crisis, to seek information and to postulate a solution. It will then need us to educate ourselves in new skills and turn from the crisis towards a better future.