

Leading Edge, supported by the Society for Engineering in Agriculture and the Australian Centre for Precision Agriculture, provides a local and worldwide window on engineering and PA research.

Wanted — machinery research dollars

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The term obsolete usually brings to mind those bits of equipment — disc ploughs and combine planters — that now rust away in the corner of a paddock. We forget the days when these were the top of the Australian farm machinery range.

Now most of the farm equipment industry in Australia has shut down, and the international farm machine companies are struggling after a decade or more of amalgamations and downsizing. The big biotech companies are a better place to invest. Plant variety rights have meant that the intellectual property (IP) in a line of seed is now just as obviously a proprietary item (to be paid for by farmers) as a patented aspect of tractor design.

More importantly, a mechanical design

Australian Society for Engineering in Agriculture

The society contributes to the development of a strong engineering involvement in agriculture to aid economic growth and environmental sustainability for the entire Australian community.

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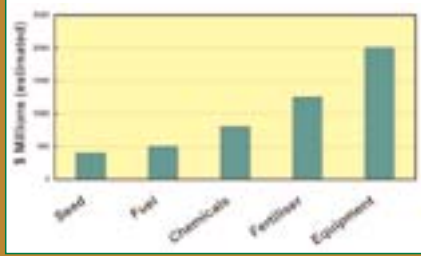
Membership is open to anyone interested in the application of engineering to agriculture and related industries. This includes scientists, farmers, surveyors, technical officers, engineers, manufacturers, distributors and processors.

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FIGURE 1: Annual expenditure by grain farmers



feature is valuable only in what it allows a farmer to do with a piece of equipment — how it works is usually obvious. Competitors and farmers can find an alternative way to achieve the same end, so machinery related research rarely generates defensible IP.

Mechanisation issues are often the major obstruction to more profitable and sustainable farming, but they still attract only a derisory proportion of institutional funding. Let's look at the data.

Where the research dollar goes

Estimates of industry research and development expenditure in Australia are not much better than guesses, but there would probably be little argument that the seeds industry spends about \$30 million per annum on R&D, the fertiliser industry \$40 million, and the crop chemical industry perhaps \$100 million. A large proportion of GRDC's \$100 million annual budget is also spent on these issues.

Farm machinery companies, on the other hand, acknowledge that they do little R&D in Australia, and GRDC currently spends very little directly on machinery issues.

Sources like the ABS Agricultural Finance Survey and industry groups can give us a rough estimate of grain farmers' expenditure on different categories of input costs (Figure 1). These suggest that farmers' expenditure on operating their busi-

nesses is almost the reverse of our institutional research investment. The total cost of owning and operating farm machinery (fuel, parts, maintenance, new equipment) is about equal to the cost of all other major farm inputs combined. But we spend almost nothing on machinery research and development and demonstration!

The value of machinery research

Machinery-focused controlled traffic farming system research is delivering large improvements in crop production and sustainability, combined with major reductions in input costs. Precision guidance will allow a further revolution in crop management.

These improvements will be demonstrated in terms of agronomy and soil science, but a mechanisation perspective is the driving force for change. GRDC is one of the few organisations with the capacity to change this funding imbalance.

GRDC funding has become more important as state departments and universities have downsized their agricultural machinery groups, to the point where most don't exist. There are few agricultural engineers left working on field machinery in Australia and at the present rate of decline, there will soon be none funded to work for growers' interests.

Engineers don't have a monopoly of wisdom on farm machinery, any more than geneticists have a monopoly of wisdom on plant breeding. But most people accept that it would be foolish to attempt serious plant breeding research without input from geneticists. It is equally silly to look at applied farm systems research without input from engineers and machinery specialists.

Unless there is a positive commitment to focus significant investment in this area soon, people with the required skills will no longer be available.