

# FINAL REPORT

KDI00004

## Developing machinery for Australian controlled traffic farming systems

### PROJECT DETAILS

PROJECT CODE: KDI00004

PROJECT TITLE: DEVELOPING MACHINERY FOR AUSTRALIAN CONTROLLED TRAFFIC FARMING SYSTEMS

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### Summary

The achievements and recommendations set out in this report are an outcome of Australia-wide consultation involving more than 500 growers and 70 machinery industry personnel.

The most significant achievement of the project to date has been its success in encouraging overseas and Australian manufacturers to produce tractors and harvesting equipment compatible with Controlled Traffic Farming (CTF). John Deere will shortly be marketing the 3m front wheel assist (FWA) tractor announced recently, and warranted 3m units are already available from Buhler and JCB. Harvesters with centred fronts and extended augers will be available next year from Case and JD.

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## Outcomes

### Economic Outcomes

Such adoption produces many economic benefits on-farm including increased yields, reduced inputs and better targeting of inputs. The BDA Group's review of LWA investments for 1990-2000, for instance, found the adoption of 500,000 ha of CTF returned a net profit value (NPV) of \$79 million for a relatively small investment. More recently Gaffney and Wilson (2003) recently demonstrated a \$46/ha/yr improvement from controlled traffic and zero till in southwest QLD. Similar major benefits have been demonstrated in VIC, and several locations in WA.

Economic studies can only take account of quantifiable costs and benefits. They rarely account for the more subtle CTF effects such as the greater ease of set-up and operation, improved accessibility and timeliness and more frequent opportunities for double cropping. Interestingly, these more subtle effects are often more important in the adoption process.

With GRDC's adoption of the recommendations discussed above, the area under CTF could double annually. It would be expected that similar rates of return could be achieved, giving a benefit in excess of \$150 million per year.

### Environmental Outcomes

The environmental benefits of increased adoption of CTF are well documented. The most striking is the rapid turnaround in compaction induced soil degradation and the return of beneficial soil flora and fauna, while improved timeliness and precision have significantly reduced total herbicide active ingredient usage, and double coverage with seed, fertiliser and herbicide.

CTF has been a major factor enabling the application of zero till technology in the northern region, substantially reducing tillage, increasing residue cover levels and reducing soil loss. Use of permanent wheel-tracks to prevent concentration of runoff has been shown to reduce soil erosion by a factor of 10 in high-intensity rainfall events (Cannon et al, 1998).

CTF provides a major reduction in soil disturbance and on-farm fuel requirements. It is also the mechanism of substantial reductions in waterlogging, and hence nitrous oxide emissions, particularly areas of seasonal high rainfall. All of these are significant sources of greenhouse gas emissions.

### Social Outcomes

CTF provides improved returns on-farm leading to more sustainable agricultural enterprises with flow-on benefits to rural enterprises and towns.

## Other research

Other projects for consideration under a GRDC machinery initiative and flagged by the focus groups include:-

1. Development of minimal disturbance seeding and fertilising equipment for CTF and raised beds.
2. Overcoming front losses of pulses across Australia.
3. Manipulating harvest residues for planting opportunities and weed control.
4. Multi croc system for Tasmanian growers.
5. Fertiliser placement for improved utilisation.

Neville Gould has been continuing the process commenced at the GRDC Search Conference (Anon, 1996) to compile a list of best bet machinery related projects.