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Equipment industry implications of Controlled Traffic.

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Summary.

Adoption of Controlled Traffic in Australia has major implications for its equipment suppliers, especially in a context where the major field equipment items are currently imported, and the local industry, along with its customers, has been suffering financial stress.

Effective adoption of Controlled Traffic is likely to require two quite separate phases ;

- attached local equipment which allows use of imported major field equipment,
- a possible local development of an integral Australian sourced 'whole system'.

Pressure for a widespread adoption of Controlled Traffic in Australia, in an environment which allows the possibility of a significant re-structuring of the Australia agricultural equipment industry, might well see the former proving to be a major catalyst of the latter.

Controlled Traffic in Australia - and tractors as we have come to know them.

Some in Australia's equipment industry have a feeling that the evolutionary process where 'tractors' were simply inserted as a draft tool in lieu of their animate predecessors, and then grew larger, has now evolved to an outcome which anyway makes little engineering sense - and Controlled Traffic seems likely to accelerate the rate of in-field demonstration of that.

Australian agriculture has unique requirements in several respect, one of these being the need to allow the adoption of high productivity and sustainable practices on Australian farms sizes that range from European in scale, to North American, and then to (broad-acre) Australian.

Many of the most viable and productive Australian broad-acre farmers need to manage several thousands of hectares, and in an environment which dictates very precise timeliness,. That scale of farming has caused Australian adoption of large, heavy, and powerful tractors - with wide trailed equipment - to meet the broad-acre need.

Controlled Traffic doesn't change the needs, but its reduced power requirement does perhaps provide a choice between even wider widths with current power, or of reduced scale tractors.

Controlled Traffic the hard way.

Equipment manufacturers will still need to provide machines with widths up to at least 20m.

If we are to allow the maximum amount of flexibility in terms of total width of the various machines to be used in the field, and hence of which Controlled Traffic traC.s are to be used ;

- *we need a uniform traC. spacing across all traC.'s.*

If we are to provide equipment up to a width of 20m in width, and we don't want to make that equipment any more complicated than having it consist of FIVE sections ;

- *we need the traC. spacing to be not less than 4m.*

Most of our current large (generally articulated) tractors can physically accept single wheels at a 4m spacing - but the question of engineering integrity at that spacing remains.

Equipment industry implications of Controlled Traffic.

Modification of imported equipment.

It is hoped that the established suppliers of major field capital items will make available tractors and harvesting equipment which can be more flexible in relation to the wheel traC. spacings at which they can be applied. Our local attached equipment suppliers likewise.

During the early introductory period, it is likely that the tradition of Australia adaptation will again be required to modify its equipment to meet the need ;

- tractor wheel traC.'s, with single wheels, perhaps at a 4m spacing,
- tractor axle assemblies perhaps modified to maintain their structural integrity.

It seems likely that an Australian trailed equipment manufacturer wishing to promoted the broad-acre adoption of Controlled Traffic will need to offer some such 'tractor conversion' kit as a part of a total equipment package.

Trailed Controlled Traffic (Australian) equipment.

Apart from the obvious requirement of providing wheel locations which can be matched with a farmer's chosen traC. spacing, suitable equipment will need to offer ;

- an ability to also operate in a conventional 'full tillage' mode during transition,
- ability to ensure precision tracking in the Controlled Traffic traC.'s,
- an ability included to maintain the desired form and depth of traC.s, by reference to the crop producing beds between those traC.'s,
- an effective means of mechanical weed control in those traC.'s,
- and probably an intelligent implement wheel steering system which can maintain accurate tracking around field curves in beds, as well as on hill-side slopes,
- and perhaps, even wider equipment, as farmers seek to exploit the reduced power consumption characteristic in conjunction with existing high H.P. tractors.

While all of the above factors are additional complication by comparison with current practice alternatives, a range of Controlled Traffic trailed equipment will also be simplified ;

- less expensive and less intrusive wheel equipment will be required as a result of the reduced need to offer 'high flotation',
- depth control will be improved by operation of those wheels on firm traC.'s,
- special equipment which is presently required to try to compensate where ground engaging tools follow tractor wheel tracks will no longer be necessary,
- more equipment can be integrated into a single machine as a result of the improved wheel load bearing characteristic of the traC.'s,
- the range of required alternative implement sizes may be reduced by evolution of some agreed standards of Controlled Traffic traC. spacing,
- today's wide range of alternative 'digging ability' equipment should be reduced by elimination of the need to be able to remove prior soil compaction effects,
- the need for, and cost of, high levels of 'trash handling', as it is now measured, may be reduced by the inherent 'precision location' feature of Controlled Traffic - which can allow precision inter-row placement of consecutive crop plantings.

The new equipment required by the above will severely tax an agricultural equipment industry which has suffered a number of years of depressed market conditions, and which will find a need, alongside the above, for new conventional 'non Controlled Traffic' equipment.

Equipment industry implications of Controlled Traffic.

Achieving 'critical mass'.

As is common in the commercial world, the introductory phase of a cycle having *"no adoption, means no equipment, which means no adoption"* will be difficult to break.

Small scale research demonstrations of the benefits of Controlled Traffic are unlikely to create the necessary demand on their own. 'Farm scale' demonstrations, at the hands of leading and respected farmers are likely to be necessary. Some applications of this type have been placed with G.R.D.C. in the hope of accelerating the realisation of the evident benefits.

Alternatively perhaps, the more widely established recognition of the benefits of Controlled Traffic within Australia's cotton industry, in conjunction with an established willingness to invest in justified - even if costly - capital equipment, might be fruitful in assisting adoption.

Australia's financially healthy sugar industry, seeming also to provide potential to benefit from Controlled Traffic, should also provide some mutually beneficial opportunities.

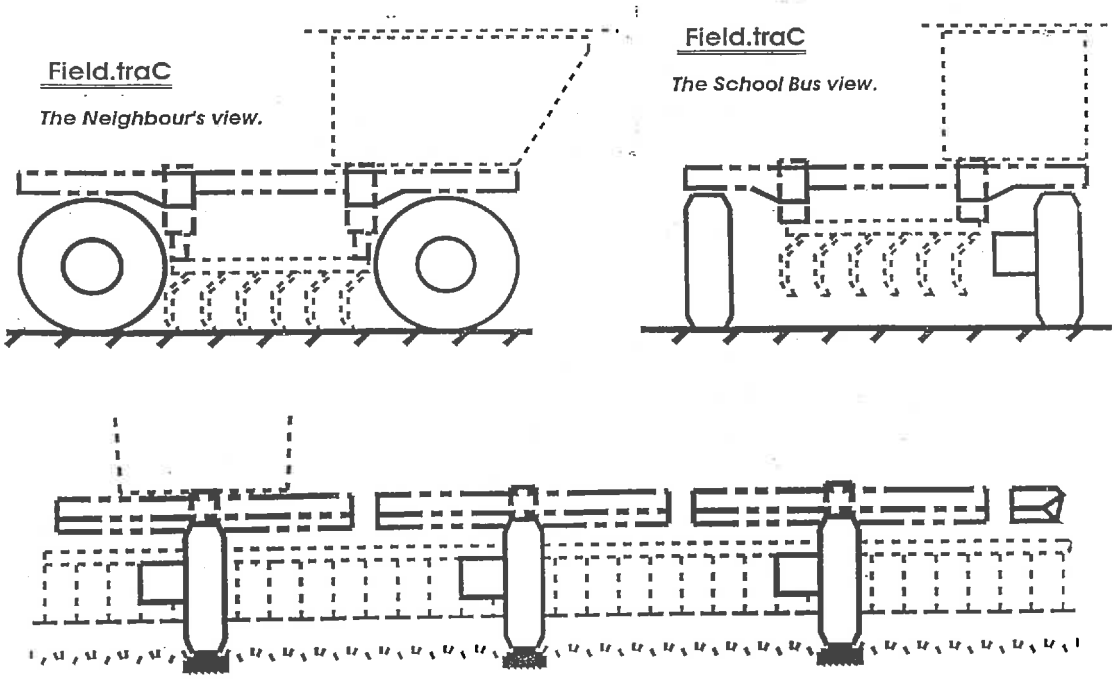
A logical Controlled Traffic equipment alternative.

If it were accepted that today's state of evolution of a separated draft (net input) element (tractor) and draft consumer (implement) were illogical and inefficient anyway, and that Controlled Traffic will create a demand for a whole new generation of field equipment, it might seem logical to now completely review what would constitute logical equipment.

A debilitated condition within a key economic input element (agricultural equipment) of 'Australian Agriculture Inc.' might support an argument for such a review. Reviews of the factors that sustain 'natural advantage' industries in the economies of the world highlight the importance of having multiple, healthy, competitive, and local sources of all of major inputs.

Even if Controlled Traffic were to be widely adopted in the agricultural sectors of those Northern Hemisphere countries that now supply our major capital equipment items, the outcome equipment is unlikely to be closely matched to the wide range of different conditions that are the agricultural sector of Australia - but, only 3% of the world's equipment market.

Illustrations below are included as an example of one kind of new concept that might be an outcome of such a review seeking a logical new Controlled Traffic equipment approach.



Equipment industry implications of Controlled Traffic.

A logical new configuration might be called a Modular Agricultural Gantry, where ;

- the number of modules can be chosen and adjusted to match the requirements of any farm size of this year or next - or contractor's program,
- with an integral power source being provided within each module,
- with the width of each module being readily offered as a variable to suit the diverse farming conditions across Australia,
- with the cost of each of the under-carriage modules being around half of the equivalent trailed implement of today's technology,
- with the under-carriage nature of the modules avoiding most of the problems listed previously in relation to the adoption of Controlled Traffic with trailed equipment,
- with the same prime-mover element being employed for all field operations - tillage, seeding, spraying, and harvesting,
    - automatically ensuring reproducible location of equipment for each task,
    - providing equally high rates of productivity for the harvesting operation,
- with intelligent control systems that can allow operation of modules at 'multiples of the basic spacing' - to enhance productivity, for example for spraying,
    - with the inherent high load bearing capability of the concept allowing, for example, the use of more effective, heavier, high productivity sprayers,
    - and that ability also allowing a possibility of carrying out more on-board functions on the machine - for example, compacted cotton shipping units,
- with the same basic configuration being applicable in a wide range of Australian crops - broad-acre grain, cotton, sugar, viticulture, etc. - providing a potential breadth of market that can justify Australian development of such a product.

While Controlled Traffic is not a wholly essential component in determining the logic of such an equipment development, it does seem highly fortuitous that the advent of Controlled Traffic should coincide with several others factors that indicate a fundamental review of our Australian agricultural equipment inventory ;

- little R. & D. for a decade which means that many of the products being offered from Australia suppliers are less productive than they might be,
- similarly low levels of investment in manufacturing resources - the replacement of which would best be done in the context of a 'next generation' of products,
- an advanced age of the inventory of agricultural equipment on the farms of Australia, which will dictate replacement as economic conditions improve - obviously with that replacement being more effective if it occurs with a new generation of more productive equipment.

However, an Australia realisation of such a major new equipment development is a major R. & D. investment in the context of today's Australian equipment industry. That industry nevertheless recognises its key role in facilitating the realisation of the benefits of adoption of Controlled Traffic in Australian agriculture.

That same industry, in return, would wish to receive whatever support other sectors of 'Australian Agriculture Inc.' can provide in assisting that equipment realisation.