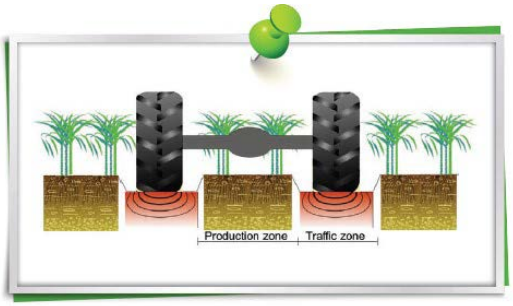
Information Sheet

6.11 Controlled infield traffic in sugarcane production

The term 'controlled traffic' refers to a system that does not allow the wheels of any infield vehicles or equipment to drive over the cane rows. The reason for this is simple: sugarcane stools suffer damage when driven over, resulting in significant yield losses.

Soil compaction versus stool damage



▲ Wheels of infield equipment should be kept in the traffic zone. The production zone can consist of more than one cane row if spacing permits.

For a very long time, yield losses from stool damage were attributed to soil compaction. To fully appreciate the benefits of a controlled traffic system, stool damage and soil compaction have to be considered separately as causes of yield loss. While it is true that soil compaction will cause some reduction in yield, stool damage by infield vehicles is clearly the bigger culprit. In fact, under certain circumstances, soil compaction can be seen as beneficial, for example, it provides a firm surface for improved traction to infield vehicles. Stool damage, however, will never be regarded as beneficial under any circumstances and is responsible for severe reductions in yield. A controlled traffic system keeps wheels away from the sugarcane stools and restricts them to the traffic zones where compaction is less harmful to the ratooning crop.

Making the switch

So where does one start with implementing a controlled traffic system? The answer to that question will depends on what the current practices are, and on how much one is prepared to change. Some situations may simply require an adjustment of the wheel spacing of infield vehicles and equipment to match the traffic zone spacing. Other cases may require a change in farm and field layout so that traffic zone spacing matches equipment wheel spacing. Yet other scenarios may call for a combination of adjustments, i.e. to both field layout and vehicle wheel spacing. The various permutations are discussed in detail in the SASRI booklet, *Controlled infield traffic in sugarcane production: a guide to sugarcane production systems aimed at eliminating stool damage*.

Impact on field operations

When making such a major change to the sugarcane production system, the farmer has to consider the implications of the change on various farm operations such as method of seedbed preparation, amount of seedcane per hectare, placement of fertilisers, where to sample for soil analyses, how to combat weeds, position of dripper tapes, and how to prepare the field for replanting.

The two major areas where fundamental changes have to be made when moving to a controlled traffic system, are field layout and mechanisation.

Field layout

In planning the new field layout, all aspects of the farming operation need to be considered. These include the daily rateable delivery (DRD), fertiliser and herbicide application methods, harvesting and loading operations, your irrigation system and surface water management (to prevent erosion). The accepted Land Use Planning (LUP) norms must also be adhered to when considering field layout which may require the updating of an existing land use plan or the drafting of a new LUP. The SASRI Controlled Traffic booklet provides considerations for slope, row spacing, row length, raised production beds, irrigation and drainage infrastructure, and harvesting.

Mechanisation

The mechanisation requirements for controlled traffic depend on the changes required to convert an existing system to a controlled traffic system. The changes are quick if the existing traffic zone spacing is suitable to allow for once-off adjustment of all equipment wheel spacings to match the traffic zone spacing.

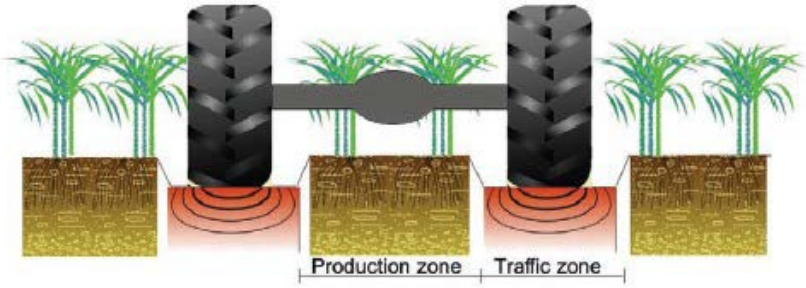
A partially controlled traffic system could also be adopted where a particular component of the harvesting system does not allow for full adoption (e.g. land owners using non-slewing loaders). In such cases, infield extraction equipment could be made to follow the same traffic paths year after year, thus reducing the amount of uncontrolled traffic to areas affected by the cane loaders alone. The damage caused by non-slewing loading systems may range between 3% to 10% yield reduction per year.

The mechanisation section of the SASRI Controlled Traffic booklet also has useful information on additional equipment, break crops, crop eradication, planting, harvesting, loading and transport.

▲ Production bed formers.

Other operations

Consideration must also be given to how other farming operations may have to be modified to align with a control traffic system. These include fertilisation, irrigation, weed control, pest management and variety selection.



▲ Fertilisers should be applied on the production zone, not on the traffic zone.

Costs

Switching from a conventional field layout to a controlled traffic system will require an initial investment. It is not possible to provide an estimate due the number of variables involved, and the volatility of costs. Additionally, the situation is different and unique to each farm and an estimate of costs might suit one farm but might be misleading to another. It is for these reasons that an economist should be approached for professional advice. Nevertheless, the SASRI Controlled Traffic booklet does provide the expected economic impact of various operations when comparing the controlled traffic system to the conventional field layout system.

Based on our knowledge regarding the costs of the various activities that make up a controlled traffic system, we are confident that farmers will benefit economically from such a system because of reduced stool damage, reduced weed control costs, increased number of ratoons and increased yields. International literature suggests that increase in yields alone could be up to 25%. Growers considering the implementation of a controlled traffic system should, in the first instance, contact their SASRI Extension Specialist for advice and guidance.

Rianto Van Antwerpen (Senior Soil Scientist)

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