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A 1935 McDonald TWB operating on a sugar plantation in Northern Queensland. (Courtesy Neil McDonald)

laboriously dug by manual labour utilising picks and shovels, with horse drawn carts used to convey the soil to form the banks.

The few tractors that existed in 1911 were mainly powered by two or four cylinder engines producing between 20 and 30 horse power. Accordingly, as it obviously required a more powerful and robust engine to operate the big machine, A. H. MacDonald designed and built a four cylinder water cooled petrol unit

capable of producing 120 hp. To do so proved quite a challenge. But in the end the engine performed adequately and posed no problems, apart from a horrendous fuel consumption.

When the construction of this gargantuan tractor was completed, the rear brick wall of the A. H. McDonald and Company factory at Richmond, Victoria, had to be demolished in order to permit the machine to venture out into the big wide world.

The McDonald Castles was then required to be driven to the State Government Werribee Research Farm for mandatory testing. As the majority of Melbourne's bridges in 1911 were designed for horse traffic, it was essential to survey a special route for the 20 tonne machine, which also included not having to travel under bridges – remembering that its height was 4.88 metres (16 feet). Despite having a travelling speed of a mere 5 km per hour (3 mph), without the aid of power steering, navigating along the winding roads was a nightmare and required an enormous degree of physical strength on behalf of the operator.

But all went well until the suburb of Clifton Hill was encountered. Upon having to descend a steep hill, the operator confidently eased back on the throttle control. Nothing happened! A rod had become disconnected! The 20 tonne tractor picked up speed – not gradually but rapidly. In a matter of moments it went hurtling down hill at near breakneck speed.

Fortunately a steep bank slowed its progress, plus a paling fence and a brick wall, without which it would have demolished a cottage, which lay directly in its path. There is no record of the operator's heart beat as the machine jolted to a halt, centimetres from the aforementioned cottage.

Little more is known of the McDonald Castles, despite my research. But apparently, following extensive work in the irrigation regions of Victoria, the unit was put to work digging ditches for the overland railway, somewhere west of Port Augusta in South Australia.

Perhaps this unique tractor now lies abandoned deep in the Nullarbor, where decades of sighing winds would have gently entombed it in the desert sands.

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IAN'S MYSTERY TRACTOR QUIZ

Question: Can you identify this very attractive crawler tractor?

Clue: It is British and powered by a side valve Ford V8.

Degree of difficulty: Hard – unless you have read Ian M. Johnston's books!

Answer: See page 72.



Germinating ideas

Compiled by the
CSD Extension and Development Team

WELCOME to Germinating Ideas. In this edition we discuss some of the options for growing cotton with limited water allocation.

In recent seasons many growers have faced the dilemma of trying to work out what area of cotton to plant with limited water allocations at the start of each season. Skip row cotton provides an 'in between' option for increasing the area of cotton which can be grown, allowing some upside in production if conditions improve and far less downside in potential fibre quality discounts if the season deteriorates. In some cases, inherent growing characteristics such as soil type and location may mean there is minimal advantage in adopting skip row practices. These considerations are discussed in the following sections.

Skip row configurations have long been successfully used by dryland cotton growers as a tool for achieving the best balance of yield, fibre quality and cost management under uncertain climatic conditions. These techniques have on occasions been 'borrowed' by irrigators as a 'one off' in a low water year and subsequently there has not always been the same degree of planning as to how to get the best out of skip row options. Skip row configurations function by increasing the volume of soil that plants have to explore, providing a bigger reservoir of available moisture and allowing the plants to hold on for longer during dry periods.

The practice of skip row configurations

- Extends the planted area, utilising full moisture profiles.
- Buys some time in which to benefit from in-crop rainfall.

FIGURE 1a: Yield comparison between solid and skip row planting configurations



Source: "Impact of row configuration on high fruit retention (transgenic) rain-fed cotton systems." Bange, et al. 2006.

- Minimises the potential for fibre quality discounts.
- Technology traits allow easier crop, weed and insect management.
- Offers some variable cost savings over solid planting.
- Maximises the return per megalitre of water.
- Reduces fallow area and maximises productive capacity in low water years.

In limited water years, growers will weigh up a range of options when determining what area of irrigated cotton to grow:

Option 1: Plant a large area to capitalise on in-crop rain

This scenario runs the greatest risk of significant losses in yield, potential fibre quality discounts and failing to break even if the area is not reduced sufficiently. But it also has the greatest opportunity to capitalise on a favourable break. Growers adopting this strategy are punting on good in-season rainfall, future highflow events or options to purchase water during the season to finish the crop.

Option 2: Plant a reduced area and aim for higher yield

Reducing the area of cotton proportional to the reduced allocation ensures there is adequate water for the crop to reach maximum potential. While this is the optimum strategy for maximising the returns per hectare, other strategies may provide better returns per megalitre of water. There is also the risk of a lost opportunity if subsequent in-season rain is adequate to grow a larger area.

Option 3: Combination of options 1 and 2 (somewhere in between)

This strategy takes into consideration that every season is different and making the most out of limited resources requires planning and prioritisation. Some fields might be planted solid on a full water basis, some fields may be planted solid or in skip row configuration on a partial water budget and some may be ear-marked to be ploughed out before first irrigation if no water becomes available.

Another sideline benefit as a result of having a skip row planting area is in cash flow management. The extra area not in fallow will deliver returns in a shorter timeframe from summer rainfall. Summer rainfall onto fallow country will only generate income after a winter crop is harvested, six to eight months later.

Selecting a row configuration

There are a range of different configurations being used by growers across the cotton industry in semi-irrigated situations.