

MECHANICAL CANE HARVESTING

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Sugar cane was originally cut and topped by hand, manually loaded onto four wheel trucks in the field, then pushed to more permanent lines for small locomotives (or river punts) to haul a 'rake' of trucks to the nearby mill. Horses or oxen often replaced manpower for shifting the trucks along the in-field temporary tracks or lower quality 'horse lines', and mechanical rakes and/or tippers were used for unloading at the mill, but the actual harvesting and loading remained manual tasks.

While there was some exploration of mechanical cutting and handling prior to and during the first half of the 20th century, it took the labour shortages during and following World War II to finally develop reliable mechanical harvesters and related cane handling equipment. Australia had converted completely to mechanical harvesting by 1979, but its long tradition of manufacturing cane harvesters came to an end in the early years of this century with Austoff's purchase by Case IH and the subsequent transfer of manufacturing to Brazil.

Early experiments in mechanical cane harvesting produced some pretty weird machines, ranging from a hand operated, sledge hammer powered blade, to huge wheeled or tracked machines weighing several tons. By the 1950s the Toft Brothers of Bundaberg and other Australians were demonstrating more successful machines, both self-powered and mounted on farm tractors or crawler units. (See the Kerr book and video for details.)

Today mechanically harvested sugar cane is typically topped with a rotating blade or flail, then cut close to the ground and elevated up into the harvester where it is cut into 200-400mm billets. Leaves and other trash are separated with blowers and billets are discharged into an accompanying bin or in-field transporter.

Modern harvesters, like modern tractors, are large/powerful computer-controlled machines fully equipped with air conditioning, sound-proofed cabins and GPS systems. They are expensive units, some individually owned but others owned and operated by harvesting contractors. Some farmers use cane railway bins with tractor-hauled trailers or trucks but many of the more expensive in-field transporters are provided by contractors.

The Case IH 7000 series harvester was the biggest harvester available in Australia prior to Austoff's closure. The 7700 is simply the same machine with full tracks for wet ground. Engine options were a Cummins M11 or a Komatsu 6A6D125-1, both with a hydrostatic transmission.

As far as I am aware, there is only one source of model cane harvesters: 1:80 scale models of the older Toft 6000/6500 series harvester from Tom's Model Tractors. However, since many of the harvesters were built on a commercial tractor chassis, it shouldn't be too hard to scratch-build a harvester starting from an appropriate tractor kit/model.

Acknowledgments and References

Kerr, Bill, *They're All Half Crazy: 100 years of mechanical cane harvesting*, Canegrowers, Brisbane, QLD, 1995. Traces mechanisation from 1888 to present, includes rare footage of Kanakas cutting cane as well as harvesters; VHS 22 min.

Kerr, Bill, and Blyth, Ken (Comp), *They're All Half Crazy: 100 years of mechanised cane harvesting*, Canegrowers, Brisbane, 1993.

Photos by Lynn Zelmer. Additional photos, details of Tom's Model Tractors and several Case IH brochures (c 2003) can be found on the CaneSIG web site (<http://www.zelmeroz.com/canesig>).



TOP: Toft 6000 wheeled machine from Tom's Model Tractors ((tomb@whitsunday.net.au)). All photos by Lynn Zelmer

ABOVE: Cane harvester and in-field transporter working in the Bundaberg area, September 2005. The topping mechanism is raised to operating height or above and may be missing some of the cane tops. The elevator is almost at right angles to the harvester to load the transporter's two compartments. Trash is being blown onto the field behind the harvester.



ABOVE: Massey-Harris Model 305 wheeled cane harvester, back view, c 1990. The chopped cane is discharged out the bottom of the elevator mechanism, which can be rotated over the accompanying bin. Trash is blown out of the hood located above and behind the cab.



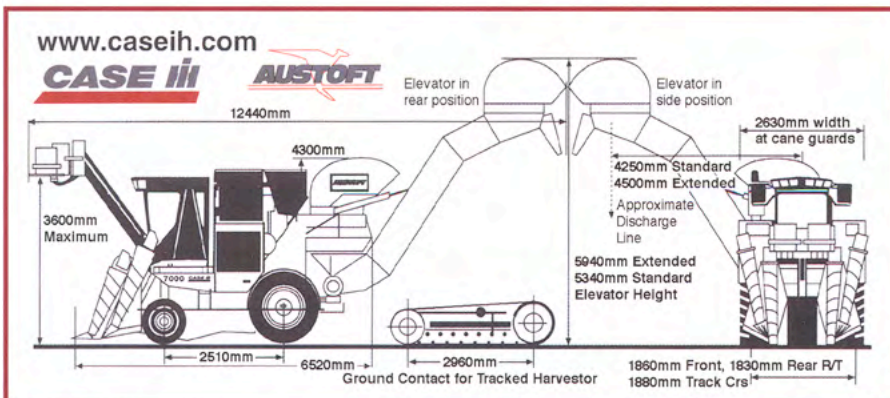
ABOVE: Massey-Harris Model 305 wheeled cane harvester, front view with the topping mechanism raised part way to cutting height, c 1990.



ABOVE LEFT: Austoft 7000 mechanism for topping the cane during harvesting. The topping mechanism is raised to an appropriate height to optimise the amount of harvestable cane while removing the top leaves.



ABOVE RIGHT: Austoft 7000 roller mechanism. With the topping mechanism raised out of the way the rollers turn towards the centre to guide cane into the cutting blades. The stalks then move into the machine where they are cut to length, elevated and separated from leaves and other trash.



LEFT: Case IH Austoft 7000 cane harvester, available both in wheeled and tracked versions, as sold in Australia from 2001. Case IH harvesters are now manufactured in Brazil. From Case IH Sugar Cane Equipment brochure (2001, Form PMA Cane09/01).