

MULTI FARMING SYSTEMS

Multi Farming Systems (MFS) Cotton Mulcher upgrade. Cotton Stalkpuller and Mulcher Trials conducted in Baralaba Australia May 2006.

Background

The Cotton Mulcher (Mulcher) from Multi Farming Systems is designed to mulch cotton bushes quickly, effectively and economically. It mulches stalks, roots and all, pulled by the Cotton Stalkpuller (Stalkpuller). It leaves an even ground covering and returns valuable nutrients to the soil. It is available in either four, six or eight row models, and is capable of mulching at speeds of 12 km per hour and above in ideal conditions. A four row model can be extended to an eight row Mulcher on request. The pickup shaft is designed with a pickup profile to match the bed profile so that the Mulcher can work over any bed layout in any field conditions.

In the 1990's, thirteen Mulchers were supplied to the cotton industry. As a result of customer feedback, one Mulcher was upgraded in April 2005, incorporating new designs to meet the needs of the cotton industry. The following alterations were made to the drive train and cutting blades:

- The drive train now has an automatic grease lubricated slip clutch. It will ALWAYS slip before the 6 v-belts get overloaded. There is no more off season seizing up of friction clutches.
- The number of cutting blades have been halved, running through double the number of cutters. This new design has resulted in a significantly more even cut and less fine dust.



▲ **Cotton Mulcher Blades.** The 5" diameter flail shaft from the **new** design runs 60 blades, 2" apart through a 60 slotted comb.

COTTON MULCHER TRIAL OBJECTIVES

1. Cut and shred cotton stalks evenly.
2. Reduce the amount of dust produced.

Trial Documentation

Cotton Stalkpuller Trials May 2006

On the 18 May 2006, the Cotton Stalkpuller and Mulcher were taken to "Harcourt" near Baralaba, Queensland Australia for trials. Two strips (Strip 1 and Strip 2) around 200m apart were left for MFS to pull and mulch. At the time we didn't know that Strip 1 had a guess row, which left the two 8 row machine configurations out of alignment, because two rows were 0.3m too close together. We did however notice that after mulching, most of the cotton was still pulled out.

On 18 May 2006, the first day of trials, the Stalkpuller pulled at 22.5km per hour over Strip 1, which was 14th gear using a John Deere 8300. Strip 2 was pulled at 12km per hour on 22 May 2006, which was very comfortable for the tractor. We were surprised that the tractor seemed to be working so hard, so the wheels may have been touching the ground on that second run.

The Stalkpuller did a good job pulling the cotton. Standard pneumatic 8 ply tyres don't heat up and are used to rip the whole bush from the ground. Bushes can be pulled up to 22-30 km per hour in the right conditions. In extremely hard ground, speeds of 12-16 km per hour are more effective.



◀ Stalkpuller and pulled cotton bushes.



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Mulcher Trials May 2006

On 22 May 2006 a John Deere 8520 tractor was used to mulch the cotton pulled earlier. The cotton in Strip 1 was 0.7m high, and was mulched in 6th gear at around 6km per hour. In Strip 2 the cotton was 1m high and generally thicker, and was mulched in 3rd gear which was 3.9km per hour. The mulcher performed comfortably at that speed, but was pulling hard. It was possible to get into 4th at times.



▲ Cotton Mulcher.

Strip 1 was mulched 4 days after being pulled, and the residue of the stalks were left white in the paddock. Lots of dust was generated and a fine white powder covered the radiator that needed to be wiped clean.

Strip 2 was mulched 3 hours after being pulled, and mulched just as successfully with hardly any dust. The residue was quite green, and there were no problems with moisture/juice from either the plants themselves or their roots. The radiator was left quite clean.

We were concerned with the amount of power that was required to operate the machine, until we realised it was an 8 row Mulcher instead of 4, which mulched the root, (which is the thickest part of the plant), and not just the top. Much less power is required to shred just the top part of the plant.

Results

The Mulcher did everything we set out to achieve. The stalks were cut evenly and shredded to facilitate decomposition. When mulched close to pulling, when the stalks were still a bit green, dust was kept to a minimum. There was no problem with moisture from juice of plant or soil around the roots.

The crop was hailed out, which meant that the cotton had no strong central terminal and more lateral roots than normal. There were self sown cotton bushes as a result which were not pulled out, but around 97% of the crop was pulled in spite of this.

The deflectors in the middle of the Stalkpuller needed further adjustment, because not all of the bushes lay within the cutting zone of the Mulcher. This meant that some of the pulled cotton stalks rolled through the middle of the Mulcher. Correction of the deflectors on the Stalkpuller would result in 100% of bushes being mulched.



▲ Mulch. The mulch from the new design provides an even sized stalk cut and jagged edges to facilitate the breaking down process.

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