



## Cotton picking: Contractors OR purchasing a new machine?

A new John Deere round bale cotton picker costs about \$1.3m+, making it one of the most expensive agricultural machines available in Australia and a major capital expenditure decision for any farm business.

There are many factors to consider when making the decision on any machinery investment. Financially, the decision is based on the additional value (revenue or cost savings) generated by the investment to justify the additional cost.

### Considerations when buying a new picker:

- The purchase price and operational costs of the machinery.
- The price, availability and reliability of contractors.
- Size and regularity of cropping programs, water availability and seasonal conditions.
- The potential cost of delays to picking.
- The skills and labour requirements of operating, maintaining and repairing machinery.
- The availability and opportunity cost of using capital that could be allocated elsewhere.

Breakeven analysis has been applied to understand the minimum number of hectares that need to be picked for an owned machine to result in the same cost as a contractor.

### Contractors

The use of contractors is widespread in the cotton industry. Rates and fee structures vary and may increase incrementally with yield. The figure adopted for this analysis is a flat rate of \$350/ha (for a yield of 12 bales/ha).



*“Each year I think about it, but I’m not sure if I grow enough hectares to make it work”*



## Total ownership cost

The total cost of machinery ownership comprises both fixed costs and the operating or variable costs. A good comparison can be made with the cost of contracting versus the cost of ownership.

### Fixed costs

Fixed costs are the annual costs incurred regardless of whether machinery is used or not. For a cotton picker we have included:

- The change in capital value of the machinery over time (real depreciation).
- The interest expenses or opportunity cost of capital invested in the machine.
- Insurance.

A new CP770 cotton picker purchased for \$1,300,000 (ex GST) and sold six years later for \$910,000 (70% value of the purchase price), has an average real depreciation of \$65,000 /year. The effect of depreciation on the tax position of each enterprise is different and so tax has not been included in this analysis.

The cost of capital is taken to be 5% and reflects the minimum return on investment. On a \$1.3m purchase this also equals \$65,000/year. The insurance is taken as 1% of machine value, or \$11,050 /year.

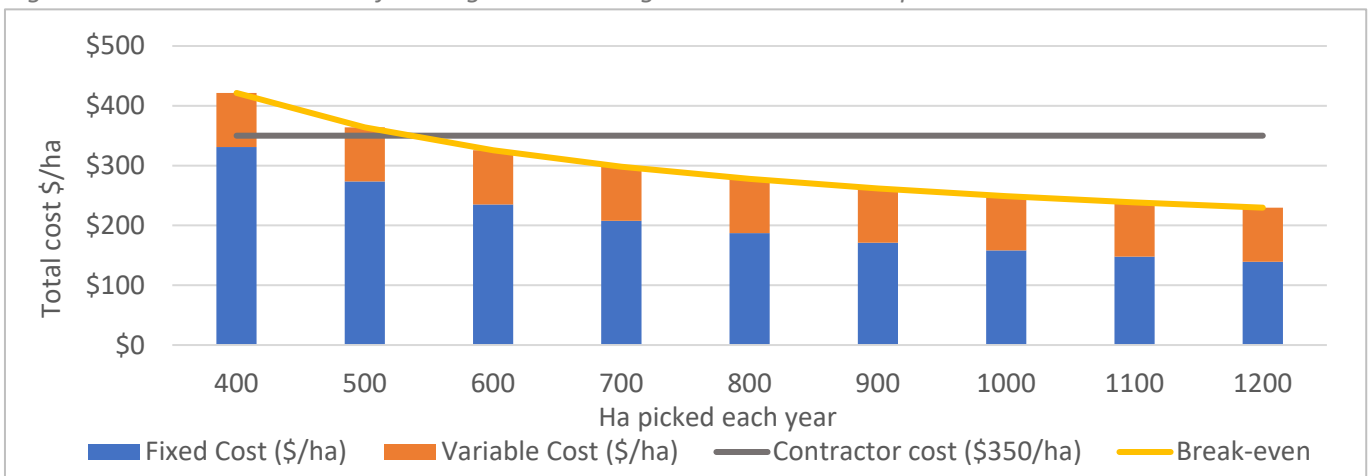
### Variable costs

Variable costs are the costs of operating machinery and include all consumables, fuel, labour, general repairs and maintenance. Because the cost of fuel and plastic wrap are covered by the farmer for both owned or contracted machines, these have been excluded from the variable ownership costs in this comparison.

Variable operating costs for a new cotton picker doing 150 fan (picking) hours a year for six years are estimated to average \$90/ha. This figure assumes machine servicing and most maintenance can be completed using existing farm staff. Variable costs will increase when comparably more expensive field service or dealership labour is required. Total (variable) operating costs increase with machinery usage and remain relatively constant on a per hectare or hourly basis.

Total ownership costs match a contractor rate of \$350/ha at approximately 536ha picked on average per year for the six years of the machine ownership (see Figure 1). Therefore, 536ha is the breakeven point. Picking more area than this will decrease the cost of picking per ha and make the investment decision more compelling.

Figure 1: The cost breakdown of owning or contracting a round bale cotton picker



## Changing the numbers

If a cotton picker increases work in a season, it spreads the fixed costs out and lowers the total ownership cost in \$/ha. As seen in Figure 1, fixed costs (represented in blue) are the largest portion of the overall machinery-ownership expense.

Rather than breakeven, you could compare the cost of contracting to the cost of ownership of a new machine for a particular area of picking (i.e. \$326/ha when picking 600ha).

## Purchase price and exchange rates

The AUD/USD exchange rate has a large impact on the purchase price of new cotton pickers, as they are imported from the United States. Any movement in the exchange has a direct and potentially large impact on price.

The purchase price and subsequent real depreciation is one of the biggest costs of owning a cotton picker.

An example for a \$100,000 increase or decrease in purchase price (down to \$1.2m and up to \$1.4m) changes results +/- \$8/ha in ownership cost (when picking 600ha). An increase in purchase price by \$100,000 shifts the annual hectares that need to be picked to breakeven with contracting rates from 544ha to 564ha.

## Cost of capital

If there is a higher finance cost or a higher required return on capital, the annual usage (hectares picked) needed to breakeven increases significantly. For example, when the required return for investing \$1.3m in a new cotton picker is moved from 5% to 10%, the total ownership cost (at 600ha/year picked) increases from \$326/ha to \$434/ha, a 33% increase. The required hectares of picking each year to breakeven increases from approximately 536ha to 828ha.

## Resale value

Recent production and shipping disruptions caused by COVID are an example of how underlying supply and demand can influence the second-hand market. Within this analysis, the estimated resale value of the machine after six years and 900hrs was \$910,000 (70% of the purchase price).

A change in the resale value changes the total ownership and breakeven results. For example, when the re-sale value moves from 70% to 80% of the purchase price, the total ownership cost (at 600ha /year picked) drops from \$326/ha to \$291/ha, an 11% reduction. Additionally, the annual hectares needed to be picked to breakeven compared to contracting, changes from 536ha to 468ha.





## Other benefits?

**Timing and weather** have a significant impact on cotton fibre quality and downgrades can be costly.

For example, a 1% reduction in income due to weather related yield or quality downgrades on a cotton crop of 12 bales/ ha at \$600 a bale = \$72/ha. Increasing the cost of contracting by \$72/ha, would shift the hectares needing to be picked to breakeven from 536ha to 400ha.

Somewhat surprisingly, when picking 600ha/year a \$72/ha change in ownership cost is equivalent to more than an \$800,000 change in purchase price (still assuming a six-year, 70% resale value).

The direct cost comparison between using contractors or purchasing your own machine may be less important than the question of whether using contractors is going to increase or decrease weather related risks.

- Is using contractors able to decrease risk when the contractor has more machines than you would own yourself? Picking over a compressed harvest period can shorten the overall weather risk exposure.
- Or, are weather related risks increased with contractors who may not always being able to start exactly when required compared to owning your own machine?

**Labour** availability and retention are a key concern for agricultural enterprises in Australia. Each farm has a unique mix of resources, but a couple of labour related considerations are;

- Can the existing labour units in the farming business run the machine? If not, how will the machine be manned - casual labour or an additional permanent staff member?
- Will ownership of the machine help attract or retain skilled staff?
- Can maintenance generally be performed using farm labour? If not, variable costs are likely to be higher when using field services or dealership labour.



**“Having access to reliable contractors with who you have a good relationship is a crucial part of the decision-making process”**

## Conclusion

The investment in a new cotton picker is significant for both the upfront capital requirement and ongoing costs. By comparison, the variable operating expenses are a much smaller portion of the overall cost of owning a cotton picker and it is the fixed ownership costs averaged out over more hectares that has a significant effect on the viability of the purchase. Any operations that experience large fluctuations in annual water availability have the added risk of the large capital cost of carrying the machine through dry years.

From the values this analysis considered, the breakeven point on a \$1.3m purchase price and a 5% cost of capital (or finance) is around 536ha/year. This is the point where ownership costs are approximately \$350/ha and the equivalent cost of using contractors.

While 536ha is above the average Australian cotton farms 467ha of annual production it is the potential benefit of reducing or avoiding weather related downgrades that makes the investment decision more complex and it is this factor that is likely to have the biggest impact on the purchase decision.

One option to further consider is owning and also contracting out your own cotton picker. This could be beneficial for a smaller farming operation that sees advantages in owning their own cotton picker and need to increase its utilisation (ha per annum) to help cover the ownership costs.

This analysis can be used to understand the relationships of the underlying factors needed to compare the purchase of a new cotton picker to using a contractor. When making a large purchase it is prudent to complete budgeting and analysis using figures estimated for your own business.



## Further information:

GRDC released a 2022 guide to machinery investment. You can find it here:

<https://grdc.com.au/machinery-investment-and-replacement-for-australian-grain-growers>