



# Machinery requirements

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Machinery is an important consideration for new cotton growers. There are some operations such as spraying and picking that can be done by a contractor. In some seasons the demand for these services is going to be great and the availability limited. Examine the cost of not doing the job on time versus the cost of financing new equipment.

Before purchasing new equipment, look at the existing equipment already on the farm and see what can be used or modified to suit. For example, most conventional broad acre boom sprayers can be cheaply modified to successfully spray cotton. Planting equipment used for summer crop planting of sunflower or sorghum should be adequate. A toolbar is quite easy to modify or build for inter-row weed control. Lay-by chemicals can be applied with conventional spray equipment by selecting different nozzles and reducing spray pressures.

Alternatively it may be possible to cooperate with a neighbour in some operations.

Determine how much time is available to complete the task and then compare this with the existing capacity to do the job.

BE CAREFUL – most people overestimate a machine's capacity.

## Acceptable time periods to complete various tasks

- Planting – 7 days
- Spraying – 2 days
- Inter-row cultivate – 7 days
- Harvest – 21 days

## Typical machinery requirements for 200–400ha of cotton

- Tractor (150kW)
- Planter – 8 row (12m)
- Spray Rig – 24m
- Nurse Tank – 8000 litres
- Inter-row Cultivator – 12m
- Slasher
- Module Tarps (100) + Cotton Ropes

## BE AWARE OF

- Minimise cost by modifying and adapting existing equipment.
- Check availability of contractors.
- Match work rates to the area planted.

## Work Rates

- Planting 6ha/hr
- Spraying 16ha/hr
- Picking: Stripper – (4 row) 2.4ha/hr  
Spindle – (4 row) 1.2ha/hr

## Tractors

While all types of tractors are being successfully used on cotton farms, the Front Wheel Assist design is becoming very popular. This design is ideally suited to a row crop situation because:

- Larger percentage of weight over the front axle gives better stability when using heavy 3pt linkage equipment.
- Larger diameter front tyres can carry large spray tanks with less damage to axle and tyres.
- Front tyres can be operated at lower pressure and therefore help reduce soil compaction.
- Better tractive efficiency allows more engine power to be utilised at the drawbar.

While this type of tractor has many advantages over 2WD, major inefficiencies can occur if the tractor is operated with insufficient lead on the front tyres. The front tyre must run 2–5% faster than the rear tyre. The lead is altered by changing the weight distribution front to rear, increasing or decreasing tyre pressures and the fitment of dual tyres.

Common symptoms of incorrect lead are:

- Excessive wear on the rear tyres;
- A rough ride;
- The tractor running easier when in 2WD; and,
- Leaking front differential seals.

More details on assessing lead are contained in the Qld DPI publication Tractor Performance Handbook.

If alterations have been made to the tractor's original set-up then at least check that the weight split is 40% front: 60% rear and the front tyres pressures are at least 30kPa higher than the rear tyres.

## Planting machinery

Planting machines need to be able to meter the seed accurately and place the seed consistently at depths no greater than 5cm.

### Deep planting **MUST BE AVOIDED**

Precision planters are becoming more common in dry land cotton. Problems have been encountered when double disc openers have been used on uneven, wet seedbeds.

When planting into raised beds the double discs are kept free from a build up of mud because of the dry crust on the surface. When planting 'on the flat', wet spots in the field can cause mud build up and as a result may require planting to be delayed. While precision planters are preferable, combines and air seeders have given satisfactory results. A press wheel is required with all

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machines and pressures similar to that for sunflower are necessary (1–2kg/cm width).

Improvements to the metering/placement accuracy for both combines and air seeders can be attained by:

- Rotating the fluted/peg roller at the maximum speed while exposing as little of the roller as possible to achieve the desired seedling rate.
- Replacing older convoluted hoses with modern smooth bore hoses.
- Keeping air velocities up in the hoses leading to the distribution heads.
- Using two distributors head outlets per row.
- Ensuring adequate diffusion of air in the seed tubes leading to the planting boot. Drilling of holes in the seed tube may be necessary.
- Using a stronger planting Tyne and a small duck foot planting boot.

A compromise between the precision planter and the combine/airseeder is the press wheel planter unit that can be retro-fitted to the latter units. This type of unit improves sowing depth control and includes a press wheel. The major disadvantage of adding these units is that the extra weight at the back of the machine may cause problems especially in lifting.

Hilling up is not necessary for dry land cotton planting

but some hilling during inter-row cultivation can improve harvesting. It provides a shallow furrow for the picker wheels allowing the picking closer to the ground.

### Moisture seeking

Removing the surface layer of dry crusted soil may allow the seed to be placed into moisture at the correct depth. While this technique allows for timely planting it may help to concentrate chemicals in the furrow if a heavy rainfall event occurs. If soil is washed back into the furrows immediately after planting, seedling establishment time will be increased and seedling vigour decreased due to the increased depth from which seedlings must emerge.

