

Why should I hire 2WT CA services? (see table 2)

Equipment	Animal Draft CA	Hire 4WT CA	Hire 2WT double row planter	Hire 2WT single row	Own 2WT double row	Own 2WT single row
Crop establishment cost	\$40/ha	\$70/ha	\$50/ha	\$50/ha	\$20/ha	\$20/ha
Capacity	4hrs/ha	1.5hrs/ha	2.5hrs/ha	4hrs/ha	2.5hrs/ha	4hrs/ha
Timeliness	1.5ha/day	5ha/day	3ha/day	48ha	3ha/day	48ha
Productivity/person	16ha	114ha	35ha	48ha	35ha	48ha
Procurement cost	\$1700	\$34000	\$6500	\$2800	\$6500	\$2800
Depreciation cost per year	\$17.6/ha	\$73/ha	\$31.3/ha	\$20/ha	\$31.3/ha	\$20/ha
Drudgery	Medium drudgery	Low drudgery	Low drudgery	Medium low drudgery	Low drudgery	Medium low drudgery

Table 2: Comparisons of Draft CA, 4WT CA and 2WT CA and costs

- Animal draft CA seems cheaper but it has medium drudgery and takes 4hrs/ha compared to the 2WT which takes 2.5hrs/ha with low drudgery to establish a hectare. This will translate to timeliness whereby you will have your land worked on within a short time than to take days wasting the season.
- Animal draft CA seems cheaper but it has medium drudgery and a low capacity of 4hrs/ha compared to the 2WT which has the capacity to cover 2.5hrs/ha and has low drudgery. This also translates to timeliness whereby you will have your land worked on within a short time than to take days wasting the season.
- If you are a farmer who have got an area which is less than 40Ha , its economic to hire , otherwise it will be a cost since from table 2 you would need 31.3 dollars per ha depreciation cost.
- The procurement cost of \$2,800 is not worthwhile if the machine will not reach its full capacity of utilisation rather it will be a cost as it will be lying idle whilst incurring its housing costs.
- 2WT services are cheaper than 4WT services which are expensive and cannot be used in small fields.
- It might be cheaper to establish a ha at \$20 with own tractor but you will not be generating money to take care of the repairs and maintenance for the tractor it will end up being a cost again.



- It would be better to just incur a cost of \$50/ha charge only for hiring than to incur a cost of \$2,800 for something that you would only use for a few months in a year.
- 2WT services are cheaper than 4WT services which are expensive and cannot be used in small fields.

Benefits of 2WT and/or Implements

- 2WT are versatile, they can be used in a wide range of soils (clay, sandy, loam, wet and dry) and vegetation cover conditions.
- Planters are versatile, they can cover a range of crops like maize, soya-bean and finger millet
- Tractor can be used to drill in Comp D fertilizer, given the erratic rains farmers do not want to plant with it but apply it later to avoid wasting resources if the rains do not come.
- It has potential for reducing production costs through reduced labor and reduced drudgery
- Reduced operations also lead to reduced costs since there wont be need for tilling. (see table 3).
- Accurate and precise placement of seed thus reducing the amount of seed wasted by thinning .
- Accurate and precise placement of fertilizer which limits fertilizer losses which constitutes 55-75% of all production costs
- Good germination rates facilitated by consistency in planting depth.
- Establishment of straight lines which facilitate post germination use of equipment. Most pre and post emergency field operations are facilitated if the crop is planted in straight lines which allow for speedy and accurate operations such as pesticide application, top dressing and crop harvesting
- Environmental conservation by reducing soil erosion and air pollution.

**Potential for improving yield through:
(Improved farmer yields mean higher net on farm incomes)**

Moisture

- ability to plant into mulch which reduces moisture loss,
- minimal disturbance of soil therefore limited exposure of moist soils to the atmosphere,
- early planting from high work rates will ensure use of full rainy season and therefore production of long season varieties with a higher yield potential

Timeliness of operations

- Early planting which allows for adoption of long season varieties with a higher yield potential,
- timely fertiliser application which ensures crop accesses a mix of nutrients to optimise yield,
- timely control of weeds and other pests to limit competition for nutrients, light and moisture,
- timely harvesting which limits in field post physiological maturity losses

Accurate determination of plant population

- correct plant population,
- correct planting depth,
- correct in row and inter row spacing,
- correct placement of seed in relation to fertiliser

Accurate fertilizer use

- accurate fertiliser application rates to reduce under application which results in yield loss and over application which is waste full
- consistency in application in relation to depth, quantity per unit length
- and correct placement of fertiliser in relation to seed location

Timely and correct application of pesticides

- will limit competition for nutrients, light and moisture for the crop from pests.

Table 3: Cost saving of mechanised CA on crop Establishment in Domboshawa

Conventional plant establishment	CA with ripper/planter crop establishment
Ploughing ranges -\$80-\$110/ha	\$40.00-\$60.00/ hectare
Discing - \$70/ha	
Planting- \$50-\$60/ha	
Total Cost \$210ha	Total Cost \$40-\$60-00/ha
Cost Saving \$210 - \$50 = 160	

The table above shows that, CA reduces the number of operations carried out in the field which consequently reduces the costs, thereby saving money for the farmer.

Picture: 2wheel tractor and planter



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**FARM POWER AND CONSERVATION
AGRICULTURE SUSTAINABLE
INTENSIFICATION**

BROCHURE FOR FARMERS

What is conservation agriculture?

Conservation agriculture combines three concepts

- Minimum soil disturbance
- Use of mulch as a soils and moisture conservation technology
- Limited use of energy

What is a two wheel tractor

- A self propelled tractor with a single axle 2 wheels), gearbox and can be used to pull/power a variety of field and off field implements and machines

What is the concept of 2WT based CA?

- This is the mechanization of CA using 2WT to power CA implements.

Table 1: Machines that can be powered by a 2WT, prices and their source

Equipment	Use
2 Wheel tractor	Powering attachments
Fitarelli double row planter	Planter
Single row planter	Planter
Cutter bar	Cutting stalks
Boomsprayer	Spraying
Sheller	Threshing/shelling