

BENEFITS OF 2WT

- Potential for improving yield through improved soil moisture, timeliness of operations, accurate determination of plant populations
- Potential for increasing production though high work rates which translates to increased area coverage
- Potential for reducing production costs through reduced labor and reduced drudgery
- Reduced operations reducing costs as shown in table 2.
- Accurate and precise placement of fertilizer and seed thus reducing the amount of seed wasted by thinning and limits fertilizer losses which constitutes 55-75% of all production costs
- Good germination rates facilitated by consistency in planting depth.
- Environmental conservation by reducing soil erosion and air pollution
- Low entry point (procurement costs) thus \$2,000 for a 2WT and \$800 for a single row planter.
- Low operational costs of the order of US\$15-20/Ha for a sheller (labour, fuel, maintenance, overheads which include interest and depreciation capital, relatively high work rates) resulting in high margins
- Low maintenance requirements for selected systems (from preliminary indications)

- Low set up times for equipment in the field limit down time which in turn improves daily throughputs.
- Versatility in terms of tractor use, versatility of planters which cover a range of crops, versatility in terms of use in a wide range of soil and vegetation cover conditions.

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

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 1.5ha/day	1.5hrs/ha 5ha/day	2.5hrs/ha 3ha/day	4hrs/ha	2.5hrs/ha 3ha/day	4hrs/ha
Timeliness	32ha	114ha	69ha	48ha	69ha	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

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

- 2WT can cover up to 48ha per season but it can be accessed at a low entry cost of \$2,800, which an ordinary farmer can access unlike a 4WT.
- Cattle seem to have a low entry point but they have a lot of drudgery and cattle can only work 6hours a day limiting the amount of money one can make in a day.
- 2WT are versatile, they can be used with various attachments which ensures full capacity utilisation of the tractor in a year and more money for the SP
- 2WT and planters are versatile and hence SP can reach out to different types of farmers from communal to commercial farmers to offer planting services.
- SP business is also viable in that a 2WT is versatile and can reach out to many smallholder farmer fields where a 4WT cannot be used.
- When one owns a 2WT and implements it will be cheaper (\$20) to establish a hectare compared to hiring whilst at the same time you can make extra money through offering services at \$50/ha for the extra capacity.
- The depreciation cost (cost of saving to replace the machine), which is the biggest cost for machines of a 2WT is affordable since one can recover the money through offering services to the community
- 2WT are associated with low to medium low drudgery depending on implements, which enables one to cover more area and consequently make more cash.
- Due to its versatility you can procure more implements eg sheller or trailer to ensure full capacity utilisation use of the 2WT, hence making more money.
- 2WT and implements are portable that they can fit at the back of a pick up truck to transport to another site, hence increasing coverage area.

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	

As shown in the table above, 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 trailer



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FARM POWER AND CONSERVATION AGRICULTURE SUSTAINABLE INTENSIFICATION

BROCHURE FOR SERVICE PROVIDERS

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

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