

## TWO WHEEL TRACTOR NEWSLETTER – OCTOBER 2017

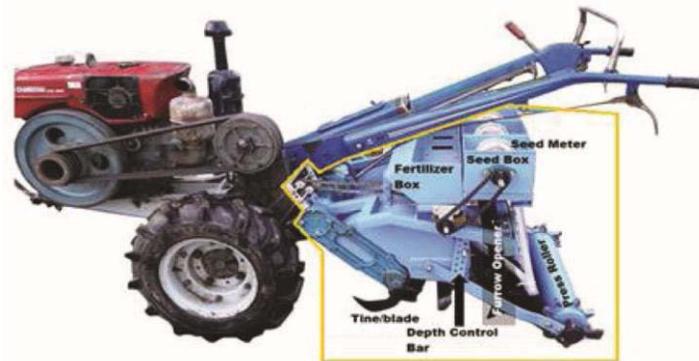
In recent times, I have moved house from Tamworth NSW to a smaller house at Scone NSW. The new house does not yet have a shed/workshop and the 2WT along with various implements in in storage while a new shed is being built. These factors have caused unavoidable delays in publication of the 2WT newsletter in recent months.

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### Progress with strip tillage seeder/planter development in Bangladesh.

Dr. Enamul Haque of Bangladesh, along with Professor Richard Bell of Murdoch University, Western Australia, and others, has been working for the last few years on the development of the Versatile Multi Planter (VMP) for 2WT. This planter is based on the standard rotavator of the Chinese built 2WT. The rotavator has been extensively modified to a rotary strip tillage unit, and seed and fertiliser boxes have been fitted. Other features from the Chinese 2BG-6A rotary tillage seed drill have also been incorporated.

At the recent 7<sup>th</sup> World congress of Conservation Agriculture, Enam presented details of progress with this seeder/planter in Bangladesh. Around 100 units have now been sold, and the planter has been extensively used for planting a variety of crops. A detailed study of the principal areas of Bangladesh being targeted has also been undertaken.



An estimated 5-10% of farmers in several districts in North West Bangladesh, are now practising some form of conservation farming, using the VMP. Many crop species have been planted and successfully grown. Results have been variable. This has depended largely on the general agronomic practices being used by the participating farmers. Some results have been excellent, whilst others have been disappointing. Challenges such as scarcity of planters when required, and financial difficulties with purchase have also emerged.

Enam informs me that progress is being made, although slow. The general scepticism of sections of the farming community and the belief that 'more tillage equals higher production' are ongoing challenges to be overcome. A full description of the VMP is at:

*A versatile multi-crop planter for smallholders' conservation agriculture in Asia and Africa* M.D. Haque & R.W. Bell. Proceedings of 7<sup>th</sup> World Congress on Conservation Agriculture September 2017 Rosario Argentina pp 101-105

[https://proceedingswcca.files.wordpress.com/2017/08/7th-wcca\\_proceedings\\_final.pdf](https://proceedingswcca.files.wordpress.com/2017/08/7th-wcca_proceedings_final.pdf)

Overall progress with conservation agriculture in various Bangladesh projects has also been recently reported. This is entitled:

*'Adoption impacts of conservation agriculture technology at farm level in Bangladesh'*

M. A. Monayem, Miah Md. Abdur Rashid, Md. Enamul Haque, Richard W. Bell. Ag. Econ. Division, BARI Bangladesh, Australian Centre for International Agricultural Research (ACIAR) Australia, Murdoch University Perth Western Australia. August 2017 44pp

For further details on the VMP and copies of the report contact Enamul Haque at

[e.haque@murdoch.edu.au](mailto:e.haque@murdoch.edu.au) or  
[enamul.haque71@gmail.com](mailto:enamul.haque71@gmail.com)

Other research organisations in Bangladesh such as CIMMYT and Bangladesh Agric Res. Institute (BARI) are also conducting development work with planters and seeders for 2WT. These ventures are mainly examining traditional tine or disc opener designs mounted to small tool bars.

### Improvements in the Eden Equipment planter from South Africa.

Adriaan Jacobs from Eden Equipment has sent me further details on the latest version of his single row planter. The planter was originally designed for animal traction, but has now been modified to fit a 2WT.



This tined planter is fitted with a 12 cell vertical seed meter from Asia (as described in recent issues of 2WT newsletter.) It also has an adjustable fluted roller fertiliser box. A cutting coulter is available as an option and either a steel or semi-pneumatic rubber tyred press/drive wheel is available. An operator stand can be used if required. There is also provision in the hitch for a full swivel, part swivel, or rigid method of attachment to the 2WT. The pair of gauge wheels have a quick release arrangement to change from operating mode (when the tyne is in the soil) to transport mode (when the tyne is raised for transport)

If the Youtube video is checked out, this will give a better view of the operation of the planter. See: <https://www.youtube.com/watch?v=sKIdJrBoop0&t=19s>

Indicative price is \$US800-1000 (ex works) depending on options nominated.

For further enquiry please contact Adriaan Jacobs at [eden.equip@gmail.com](mailto:eden.equip@gmail.com)

Physical address is 177 Kock Street Potchefstroom Republic of South Africa

Tel: (+27) 18 297 4784 Cell: (+27) 82 728 1213 <http://www.eden-equip.co.za/>

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### **A radical new approach to mechanisation with a small 4WT.**

I do not normally discuss at length the relative strengths and weaknesses of both 2WT and 4WT. This, in summary is how I view the relative pluses and minuses of this analysis.

#### Two wheel tractor advantages:

Low capital cost  
Simple mechanical principle.  
No differential.  
Easy to service and repair.

Commonality of parts  
Well suited to very small fields.  
Motor can easily be removed and used for other purposes

#### Two Wheel tractor disadvantages.

Light weight– low tractive ability.  
Restricted to low horsepower motors  
Handling challenges for single axle.  
No facility for power lift.  
Limited space under handlebars for implements.

Some safety issues.  
Mostly no provision for operator to be seated  
Low work rate.

#### Four wheel tractor advantages:

Greater range of implements available.  
3PL available.  
Operator always seated  
Less safety issues.

Greater range of power options.  
Both 2WD and 4WD options available.  
Higher work rate  
Greater area of land can be farmed)

#### Four wheel tractor disadvantages.

Very high capital cost  
High capital cost implements.  
Very complex motors & transmissions-  
High skills needed for repairs

Higher level of maintenance  
Reliability issues with cheaper models.  
Little commonality of parts  
Poorer manoeuvrability in small fields.

However a new concept is now being investigated, and is summarised below. This is the Ogun tractor.

This is a joint venture between the University of Illinois, University of Missouri, and Mr. Horace Clemmons of Cleber tractor Co. of Alabama USA. It is being funded by US Govt. aid programs.



The Oggun tractor is an 'open source' unit and is not covered by any patents or complex licensing agreements. It is a 2WD tractor of 'tool carrier' type design. Implements can be mounted in the centre, in front of the operator, or behind on a 3PL. The unit can be powered by a variety of motors, either petrol or diesel, with water or air cooled design. Motors of 18-25HP are preferred. The motor drives a single hydraulic pump, which operates all of the functions of the tractor. Forward and rearward motion, speed and implement operation are all hydraulically powered. To increase speed, simply operate a lever to supply more hydraulic oil to the wheel circuit. To reverse, re-direct the oil flow backwards in the system. Similarly oil flow can be directed to raise and lower implements, or operate a power steering mechanism. There is no need for a clutch or gearbox of any kind.

The local manufacturer can nominate the motor of his choice and the frame is fabricated from locally available steel sections and parts.

The basic power platform can also be used to produce other things such as a small truck or a combine. It can be fabricated in the developing world under a simple licensing agreement (\$250 per tractor)

Local fabricators can buy as many parts as they want from Cleber (from none to all), but all parts can also be either self-made (fender, frame, etc.) or ordered directly from local suppliers (such as the hydraulics and motor)

All parts are off the shelf and have at least two international suppliers

The design is simple and can be added upon as a farmer's needs grow

It is a very unimimidating design

Entrepreneurs can add to the basic unit with new tool ideas and market their own innovations without having to design a different power platform

A universal power platform used everywhere will lower prices and increase production and marketing efficiencies

A horizontal business model using open source technology allows more people to participate as innovators, parts suppliers, repair operations, service providers, etc.

Indications are that the base price of an Oggun tractor made in USA (or other Western country) would be \$US12-13000. To fabricate in a workshop of the developing world using local parts may only cost \$US6-7000



What do you think?

Would the open source design with freedom of local manufacture be an advantage?

Would there be less difficulty with maintenance and spare parts?

Would the hydraulic principle with absence of clutch or traditional transmission be of value?

For more information please contact research workers at University of Missouri or University of Illinois, or Maurice Clemmons the manufacturer.

Peter Goldsmith – University of Illinois [pgoldsmi@illinois.edu](mailto:pgoldsmi@illinois.edu)

Kerry Clark – University of Missouri [ClarkK@missouri.edu](mailto:ClarkK@missouri.edu)

Horace Clemmons [horace@cleberllc.com](mailto:horace@cleberllc.com)

Also please check the links below.

<https://www.youtube.com/watch?v=IrnjKQRQP3g&t=33s>

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If you have any comment on this newsletter, please let me know.

Back issues of the 2WT Newsletter can be found at

[:http://conservationagriculture.mannlib.cornell.edu/pages/resources/twowheel.html](http://conservationagriculture.mannlib.cornell.edu/pages/resources/twowheel.html)

Facebook 2WT discussions: (Mike Cottam UK)

<https://www.facebook.com/groups/1609120186059164/>

*Note: This newsletter has been sent in a low resolution pdf. format for those on slow internet connections. If you require the newsletter or parts of it in higher resolution please let me know.*

R. J. Esdaile,  
Agricultural Consultant,  
3 Somerset Place,  
SCONE NSW 2337 Australia.

Email: [rjesdaile@bigpond.com](mailto:rjesdaile@bigpond.com)

[rjesdaile@gmail.com](mailto:rjesdaile@gmail.com) (alternate)

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