

TWO WHEEL TRACTOR NEWSLETTER – MARCH 2014

Do you recognise this seed drill?



These pictures show an early model Øyjord seed drill being used in Norway behind 2WT. It is from the early 1960's.

The 2WT is an Agria 1700 and the cone seeder plot drill was developed by Egil Øyjord, a well-known Norwegian Ag. Engineer who was the founder of IAMFE (International Association for the Mechanisation of Field Experiments)

Ukrainian 2WT with two row seed drill.



This Ukrainian 2WT is fitted with a quite sophisticated vacuum type seed drill. It is suited to a range of vegetable seeds. It is powered by a Briggs and Stratton petrol motor. Other implements are also available. Full details are at:

<http://www.ast-dnepr.com.ua/>

However the language is Russian and you will need to use Google Translate to read the details.

Videos of the 2WT and vacuum seed drill are at:

<http://youtu.be/vjrJAR0Mfoo>

<https://www.youtube.com/watch?v=bGIh6FG6tqg>

Enquiries were made with the Ukrainian manufacturer and a price list in \$US is available. Although the seed drill appears to be an excellent unit, it is too costly for use in the developing world (\$US500 per metering unit – plus vacuum air supply, ducting, and switchgear)

(This website and associated information was brought to my attention by Mike Cottam, a UK Ag. Engineer who is a member of our forum)

Ground following opener for 2WT seed drill.

I have been examining options for a versatile and affordable ground following opener for the Gongli Africa 2WT seed drill. I quote from the February 2014 newsletter.

A re-design of some of the seed drills is required, so that superior ground following ability is incorporated into the soil engaging components of the planter. We found that East African fields can be very uneven, due to old ploughing and tillage practice, cattle hoofmarks and tramping, termite mounds etc.

Two options are shown on the next two pages.

Of necessity the two opener assemblies must be able to fit under the existing Gongli tool bar. The tool bar has an underframe clearance of 450mm and a front to rear distance of 700mm.

They must also be able to travel up and down independently of the rest of the implement. The seed and fertiliser boxes and support structure must be positioned such that these parts do not obstruct the tine assemblies when they are raised. A satisfactory seed drop angle must also be maintained.

In both opener assemblies a 50 x 12 x 700mm high tensile steel tine (as on the Gongli seed drill) is used. The coulter size is 356mm (14 inches) and a 265mm (10.5 inch) rubber press wheel is used.

As the Gongli tool bar is now fixed, and need not to be raised at the end of the row, an operator seat and swivelling steerable tail wheel can be fitted, similar to that being currently used on Chinese 2WT when fitted with a rotavator. The existing Gongli press wheels are not required.

A manual lift system with a spring assist will be built, something similar to the lift system fitted to the Ndume 2WT seed drill (see picture).

However the Ndume drill has the operator in front of the tine openers, whilst the proposed unit has the operator seated behind the openers. Thus the lift system will have to be reversed. An added advantage of the Ndume system is that the compression spring also helps penetration by exerting positive downward pressure on the tine assemblies.



Option 1 – Parallelogram tine opener.



The large picture shows the wooden mock-up of this opener. This design has been derived from a relatively common parallelogram floating tine opener. (Centre insert). A Buffalo tine planter unit (RH insert) is shown as an example. There are many rowcrop planters of this configuration. Early types had the tine only, and most later units now have a cutting coulter as well.

To fit this type of opener to the Gongli frame (LH insert) the complete assembly is bolted to the centre tool bar (B). The cutting coulter is positioned between the front and centre bars (A & B). The press wheel assembly would sit behind the rear bar (C).

The cutting coulter is optional, and may not be required for low residue situations. It can be fitted with a depth band if required.

The press wheel is adjustable for depth control, and also the tine is adjustable to control depth of planting.

I have photo shopped the down pressure compression spring on to the mock-up photo.

This design has the advantage of a level lift. However it is relatively complex compared to Option 2. (8 pivot points vs. one pivot in Option 2)

Option 2 – Single pivot Tine opener



The large picture shows the wooden mock-up of this opener. This design has been derived from a Canadian seed drill fabricated by Stumborg *et al* for an Inner Mongolia aid project in the early 2000's – (reference available on request). The Stumborg outline is shown in the central inset picture. To fit this type of opener to the Gongli frame (LH insert) the centre tool bar (B) is removed (or perhaps retained and repositioned to preserve the structural strength). The openers are bolted to front tool bar (A). The press wheel assembly would sit under the rear bar (C).

There is sufficient space to fit an optional cutting coulter in front of the tine assembly.

This design is something similar to a single row Fitarelli 2WT seed drill (LH insert)

The cutting coulter is optional, and may not be required for low residue situations.

The press wheel is adjustable for depth control, and also the tine is adjustable to control depth of planting.

I have photo shopped the down pressure compression spring on to the mock-up photo.

This unit is simpler compared to Option 1 (one only major pivot point). It is not level lift, and as a result the coulter clearance will be less than the tine when the openers are raised. However the coulter has the option of a swivel mechanism (as on the Fitarelli)

What do you think? Which opener assembly is superior? (taking into account simplicity, cost, and ease of operation as well as your individual experience).

The next step is to do a trial fit of these assemblies under the Gongli tool bar, and after modification (if any); a pair of prototype steel units will be fabricated. I already have press wheels, tines, and coulters on hand to do this, and Paul Nash (see below) is willing to assist. Following this, a new frame with the seed and metering systems is to be built.

I acknowledge the expertise, comment and publications of the following persons, who have assisted me in the formulation of the proposed 2WT soil engaging tool systems.

Rick Brendon- Ndume Ltd. Gilgil Kenya

Mark Stumborg,- Formerly Chief Ag. Engineer, Swift Current Res. Station Saskatchewan, Canada.

Paul Nash – Senior Technical Officer NSW Dept. of Primary Industries, Tamworth NSW Aust.

Several African colleagues have enquired regarding the availability of a small maize harvester to fit to a 2WT. Both of these harvesters are advertised on Alibaba trade site. They are Chinese made and are based on a Chinese 2WT which has been extensively altered. These units pick the cobs and remove the husk, but do not thresh the grain.



The unit on the left is quoted at \$US4000 (FOB) and that on the right at \$US3000 (FOB)

For further information, check out the links below.

http://www.alibaba.com/product-detail/Walking-Tractor-Maize-Harvester-0086-18810361798_924187690.html

http://www.alibaba.com/product-detail/1-Row-Corn-Maize-Harvester-Machine_566429131.html

If forum members know of any other maize harvesters to suit 2WT, please let me know.

Errata: In the last issue I inadvertently referred to Dr. John Sariah of Tanzania (who is part of the FACASI team there) as Ken Sariah. Sorry for the error.

Feel free to send comment and opinion on any aspect of the subjects being discussed.

Back issues of the 2WT Newsletter can be found at:

<http://conservationagriculture.mannlib.cornell.edu/pages/resources/twowheel.html>

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.

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