

TOR for machinery session CLCA workshop

Background

Lack of adapted agricultural machinery is a major constraint for agricultural development in semi-arid countries like Tunisia and Algeria. Due to that we face low crop production per ha, high production costs due to high labor costs, poor seed quality, etc.

In the CLCA project we give particular attention to forage seed and feed production to reduce competition for stubbles, and zero-tillage to reduce moisture loss of soil and reduce erosion. All of these areas request adapted machinery. Successful introduction and adoption of machineries is crucial for scaling and sustainability.

Constraints and Opportunities

i) Forage seed production

Forage seeds like barley used by small scale farmers are mostly farm seeds; few farmers are actually purchasing seeds on the market. They prefer to use part of their own harvest and use it as seed in the upcoming season. They are of poor quality (mixed small and large sized seeds, impurity, etc) and have therefore low yield potential.

The introduction of a locally produced and movable seed cleaning and treatment unit is an opportunity to be considered. Such units are produced in Beja, Tunisia by a local manufacturer. Those units are already on the market and have a capacity of 800 kg / hour. It works with electricity (220 V ?) One unit costs about 4.000 US\$. The unit can be pulled by a car or a tractor. It is also an ideal opportunity for a service provider, cleaning seeds for farmers; or a farmer cooperative can use it as service for its members. The export of such a unit to Algeria could promote forage seed production. An Algerian manufacturer could replicate the unit. A further opportunity for south / south collaboration



ii) Feed production

Other than stubble, pastures and straw, livestock farmers purchase occasionally subsidized wheat bran, barley, pellets and concentrates as supplementary feed. In particular pellets and concentrates are costly as part of the ingredients are imported. The local production of high quality feed is therefore an opportunity to explore.

Two opportunities have been identified so far. The first is a grinder, which can grind barley and chop olive branches, straw, hay, cactus cladodes and fruits, etc to prepare a balanced ratio. These grinders can work with electricity (380 V) or by PTO. Just like the seed treatment unit it can be moved easily by a tractor. Its capacity is around 2 tons / day (to be verified). The price per unit is 1.000 US\$. It is produced locally in Kasserine, Tunisia by SFEMI. It can also be used as an income generating activity or a farmer cooperative. In Tunisia it is part of the subsidy program (APIA). They are already used on the market.



The second opportunity is a locally manufactured pellet machine. The machine can grind, mix and finally produce pellets. It can use agro-industrial byproducts (olive cakes, cactus pulps, etc), straw, hay, cereals, etc. The pellet machine is still only a prototype produced by SFEMI in Kasserine. It has no drying implement and no private actor is using it yet. We are currently testing the machine and verify its productivity before we can recommend it. The manufacturer states its production capacity at 2 tons / day; but it is likely to be less. Collaboration with Florence University might help in testing and improving the machine for pellet production. Farmers appreciate pellets (more than feed blocks).



iii) Zero tillage / Direct seeder

To make CA more attractive to farmers the production and scaling of a low cost local direct seeder is another opportunity to explore. Two prototypes have already been produced and tested successfully in Tunisia and Algeria.



Fig: Tunisian Direct Seeder



Fig: Algerian Direct Seeder

The local Tunisian seeder has better results compared to others seeders (Semeato, John Deere, Gil ...) in terms of adjustable and homogenous sowing depth, high germination rate and homogenous on the sowing lines and similar yield; but still need some improvements.

Some John Scherer tines have been used in the Tunisian local seeder and INGC is still working to upgrade the integration level by trying to design and manufacture a local tine. The seeder will then be more adapted to the Tunisian soil context. The design of the new prototype will also be improved.

In Algeria, the prototype "Boudour" is produced by a public society (PMAT) in collaboration with SOLA company, based in Algeria. 20 Boudour seeders are in stock. For large scale seeder production farmer's demand needs to be created. The integration level is about 70%. Algerian government provides a 30% subsidy for any machinery equipment (including this direct seeder).

The Algerian and Tunisian local direct seeders use expensive imported tines. The local production of adapted tines would make the seeders less expensive and more attractive. The collaboration with the Florence University in this respect could be very helpful. The "tine-study" could be done by INGC and ITGC. In the long run, both countries could benefit from the local tine.

Tasks for the planning workshop

- i) Identify which of the above mentioned machines should be introduced and scaled for each of the two countries
- ii) Determine how many of these machines should be ordered
- iii) Determine beneficiaries of the machines and financial participation
- iv) Determine future collaboration with University of Florence
- v) Determine roles and responsibilities of project team members regarding introduction of machines
- vi) Identify scaling activities
- vii) Establish a timeline and budget