

# Report on business development of cooperatives using mobile seed treatment units for their members in Tunisia

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Fig: Testing of mobile seed cleaning machine (Photo: Udo Rudiger/ICARDA)

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Editing, design and layout—(Organization Name) .....

Cover photo—Caption (photo credit: Organization Name/Name of photographer).

ISBN: .....

Citation: Name(s) of author(s). Year. Title of the document. Organization name (type of document – Research Report, Discussion paper etc.). City, Country: Organization name.

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# Report on business development of cooperatives using mobile seed treatment units for their members in Tunisia

## 1. Background

The conventional national seed system in Tunisia is not providing enough quality forage seeds. Forage seed production like barley, faba beans or luzerne is mainly done by two large seed producing state-cooperatives who are subcontracting with individual farmers. Only one private seed enterprise and OEP<sup>3</sup> are equally engaged in professional forage seed production.

Due to insufficient forage seed supply, but also to save costs, many small-scale farmers prefer using their own farm seed. The quality of these farm seeds is generally low as they are normally cleaned manually, so the final product still contains some unproductive seeds (broken seeds or small sized seeds). In addition, these seeds are sometimes attacked by pests and diseases as they are not treated. The results of using these poor-quality farm seeds are low forage yields and low income.

## 2. Project intervention

To tackle this constraint the CRP livestock feed and forage project promoted the use of innovative locally produced seed cleaning and treatment units to develop business for lead farmers and SME around forage seed production. After discussing with national partners (INRAT<sup>4</sup>, OEP and INGC<sup>5</sup>) the business idea was found more suitable for small or medium SMSA (Société Mutuelle des Services Agricoles) as the machine would benefit more farmers. SMSAs are a kind of farmer cooperatives providing services to their members. The cooperatives can provide seed cleaning and treatment services for their members. The business can help to provide additional income for the cooperative and forage seed production of their members. The seeds are used by the members themselves.



*Mobile seed cleaning and treatment unit designed and developed with support from ICARDA.  
(Photo: Zied Idoudi, ICARDA)*

A local manufacturer in collaboration with ICARDA and its national partners in Tunisia designed and developed a prototype of a “mobile seed cleaning and treatment unit” which has been locally manufactured at low cost. One unit costs 12.500 TND (about 4.350 US\$) and has a capacity of about 800 kg / hour depending on the kind of seeds treated. Four (4) units have been delivered and distributed to

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<sup>3</sup> OEP = Office de l’Elevage et des Pâturages (: Livestock and Pasture Agency)

<sup>4</sup> INRAT = Institut National de la Recherche Agronomique en Tunisie (National Agricultural Research Institute)

<sup>5</sup> INGC = Institut National des Grands Cultures (National Institute of Field Crops)

four SMSA having between 150 and 350 members each and are in the Central and North-Western region of Tunisia (on average, over 1,000 small-scale farmers can benefit directly from these units).

With the help of these mobile seed cleaning and treatment unit, members of these farmer cooperatives can significantly increase their seed quality and consequently their fodder production. In addition, the unit can serve as an income generating activity for the cooperative as farmers have to pay renting fees to use the machine. The project monitors and coaches these associations to see how this unit is managed in an economically sustainable way. Beneficiaries, who have been carefully selected based on their interest and need for the machine, contributed with 10 % (1.250 TND / 435 US\$). The 10 % contribution is considered as a proof of farmers motivation and engagement for getting the machine and using it in its operations. Financial contribution of beneficiaries is essential to create ownership.

### 3. Output and results

The first training day was organized in October 2019 at INGC, with the presence of other national partners of ICARDA such as OEP, CRDA<sup>6</sup>) and AVFA<sup>7</sup>. A demonstration of the machine by the local manufacturer and by the ICARDA-INGC team was done during this reception event.

In 2020 the manufacturer of the seed cleaning and treatment unit (machine) has visited the four cooperatives each twice to do necessary adjustment and assure good functioning of the machine.

Tab 1: Use of seed cleaning and treatment unit by four farmer cooperatives (SMSA) in 2019 and 2020

Cooperative (SMSA)	2019						2020		
	Number of Coop members	Qtt Seeds Cleaned only (t)	Qtt Seeds cleaned and treated (t)	Cleaning / Treatment Price (TND/t)	Total Benefit (TND)	Number of Users (Farmers)	Qt seeds cleaned and / or treated	Total Benefit (TND)	Number of Users (Farmers)
El Amen	320	24.2	0	35	315	12	38.4	575	21
El Felah	200	4.7	42.6	10 / 80	-13	20	60.8	1,520	33
Ettaouen	350	14..6	131.1	20 / 70	1467	95	480	11,520	220
Melyen	150	22.5	0	20 / 50	225	11	111.7	3,594	25
<b>Total</b>	1,020	66	173.7	N/R	1,994	138	690.9	17,209	299

The above table shows the evolution of the use of the units from October 2019 to November 2020. The total quantity of cleaned and treated seeds increased from 240 tons to 691 tons; the total benefit for all 4 SMSA from almost 2,000 TND to over 17,200 TND and the number of users from 138 to almost 300.

The difference between the level of benefit per SMSA depends amongst other things on the cooperative's marketing strategy. Some coops like to maximize the benefit to invest in other technologies and offer more services, like the SMSA Ettaouan. Others, like the SMSA Melyen don't aim to maximize their profit but rather to satisfy the needs of their members at low costs and attract more members. SMSA El Felah did a combined strategy. In 2019 they offered many services (like transport of the machine) free of charge, leading to a loss in 2019. In 2020 they changed the strategy and obtained the highest benefit per ton of cleaned / treated seeds of 25 TD /ton, followed by Ettaouen with 24 TD/ ton.

All four cooperatives employed one person on a temporary basis to make functioning the unit. Some cooperatives led the unit be stationed at the cooperatives' base, others allow the farmers to take it

<sup>6</sup> CRDA= Commissariat Regional de Développement Agricole; (Regional department for agricultural development)

<sup>7</sup> AVFA = Agence de Vulgarisation et de la Formation Agricole ; (Agricultural Training and Extension Agency)

and use it at the farmers' site. In any case it was the cooperatives employee who was responsible for manipulating the unit.

The SMSA Ettaouen which used the machine to improve almost 150 t of seeds in 2019 and 480 t in 2020 is already considering the purchase of a second machine as the demand is high and treating period limited. One unit will be placed permanently at the cooperatives site and the other will be allowed to move from farmer to farmer. Hence, a second person will be employed on a temporary basis during the seed treatment period (July – December).

The project also supports the integration of legume crops into the crop livestock production system to make it more sustainable. Sensitizing and training farmers convinced them to increase legume production. The lack or insufficiency of legume forage seeds on the Tunisian market motivated the cooperatives to produce their own legume forage seeds with the help of the mobile seed treatment unit.

In July 2020 the four farmer cooperatives have received additional special sieves for the seed treatment unit. These sieves have different sized holes and allow the cooperatives to clean a variety of different sized forage crop seeds like faba beans, berseem and vetch.

A total of 11 sieves (2-3 per coop) were co-financed by the project. As cooperatives are increasingly satisfied with the technology, ownership has increased; hence the project subsidy could be reduced to 50% of the sieve prices. One additional sieve costs 800 TD (300\$).



Fig 2: Different sized sieves for legume seeds (Photo: Udo Rudiger – ICARDA)

Tab 2: Different forage crop seeds cleaned by cooperatives in 2019 and 2020

	barley	wheat	faba beans	oats	vetch	berseem	Total
SMSA Melyen	18	66	25	25	0	0	134
SMSA Ettaouan	205	395	0	26	0	0	626
SMSA El Amen	5	42	7	0	9	0	63
SMSA El Feleh	0	90	7	0	8	2	107
Total	228	593	39	51	17	2	930

The table above shows that a total amount of 930 tons have been cleaned by the four cooperatives since acquisition of the machines. Cleaning and treatment are mainly done for wheat seeds, other crops are cleaned only. In 2019, mainly wheat and barley seeds were improved. Through the distribution of different sized sieves in 2020, the cleaning of 58 tons of legume seeds (faba beans, vetch, berseem) has been realized.

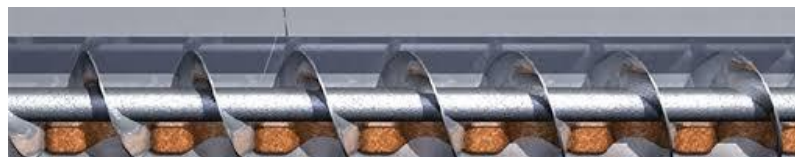


Fig 3 – 5: Changing sieves, cleaning unit in action, cleaned seeds (Photos: Udo Rudiger – ICARDA)

## 4. Challenges and Conclusion

After two seasons of seed cleaning (2019 and 2020) farmers have identified another challenge. The increasing number of tons of seeds to be cleaned makes it very tiring and exhausting for the machine manipulating worker. He has to lift the bags of uncleaned seeds to the entering funnel at the top of the machine which is about 2 m above the ground.

Seed bags weigh between 30 and 50 kg. A single person can't do it on its own for long time. Additional labor is needed, which makes the operation more costly. The solution will be the development of a "conveyor screw" which will transport uncleaned seeds from the ground to the entering funnel. The conveyor screw will not only reduce the workload for the employee but also save time and increase production per hour, hence more farmers can benefit from the machine in the future and more benefit can be generated for the cooperatives. It is expected that the conveyor screw will double its capacity.



The manufacturer of the four mobile unit has already developed a prototype of such a funnel. Three of the four cooperatives are interested in this essential additional implement, necessary to improve production capacity of the unit.

The price per conveyor screw is 4,300 TD (1,600 \$). The cooperatives will contribute again with 50% of the price. Just like for the new sieves this contribution shows that it's a real need from the farmers. The project has ordered three conveyor screws which are likely to be available beginning of 2021; well before the next season starting in July 2021.

Fi 6 and 7: Conveyor screw for seed transportation

This research and development project enables farmer cooperatives to generate income and improve the seed quality of their members. Through different sized sieves the cleaning of forage legume seeds is made feasible, improving quality and quantity of produced forages in Tunisia. Monitoring of the use of the machine through project staff and national partners, taking into account farmers remarks and suggestions, helped to continually improve the machine and make seed production interesting for other actors.

