

Achievements year-II Algeria

**2 nd CLCA Coordination Meeting,
Tunis-Tunisia; 5 – 6 March, 2020**

IFAD – ICARDA - CIMMYT GRANT PROJECT

“Use of conservation agriculture in crop-livestock systems (CLCA) in the drylands for enhanced water use efficiency, soil fertility and productivity in NEN and LAC countries”



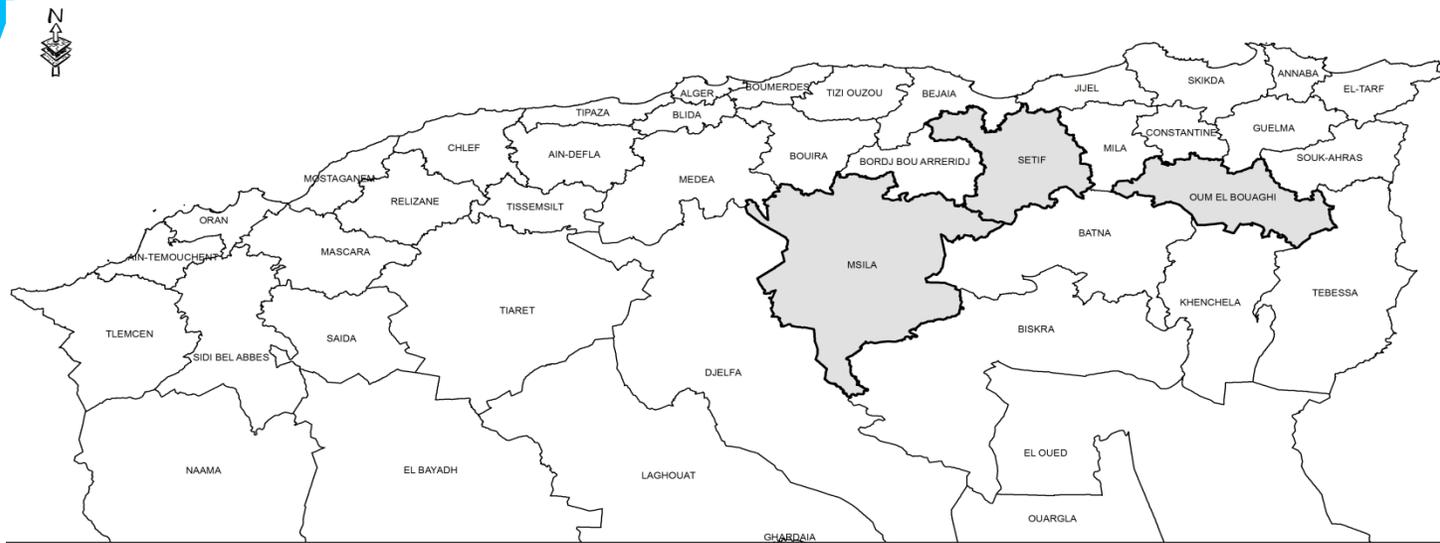
01 Assessment of the adoption of CLCA on soil erosion, SOM and WUE

02 Socio economic activities

03 Optimization of pastures on stubble under CA in semi-arid zones.

04 Scaling activities

YEAR I – 3 platforms



source: ITGC



36 Sites with 12 reference sites



316,5 ha directly involved



35 Farmer directly involved



14 ZT Seeders



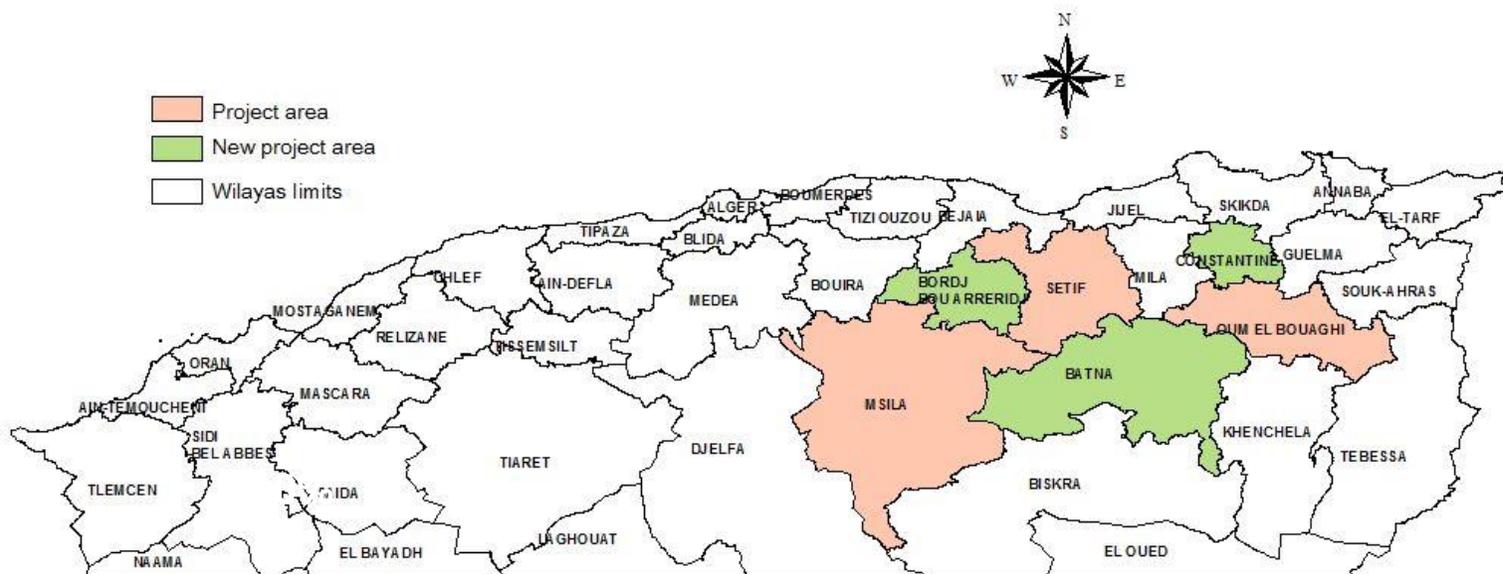
1010 farmer indirectly affected by project activities

Average Yield in 3 platform (Q/ha)

| Wheat | Barley | Tritical | Lentill | Pea | vetch | haystacks |
|-------------|-------------|-------------|----------|-----------|-------------|------------|
| 32,6 | 24,8 | 20,4 | 7 | 12 | 10,8 | 138 |

YEAR II – 6 platforms

Localization of the project area for crop season (2019/2020)



1092 sheep heads at all sites of project



242 Sites avec 12 sites de référence



982 ha directly involved



241 Farmer directly involved



24 ZT Seeders



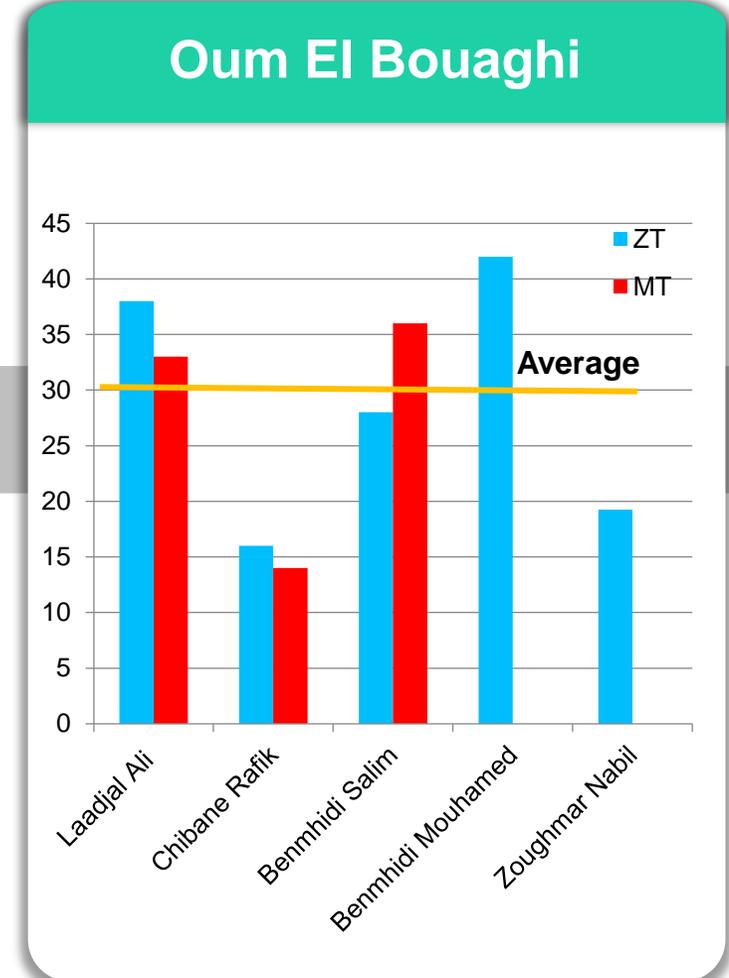
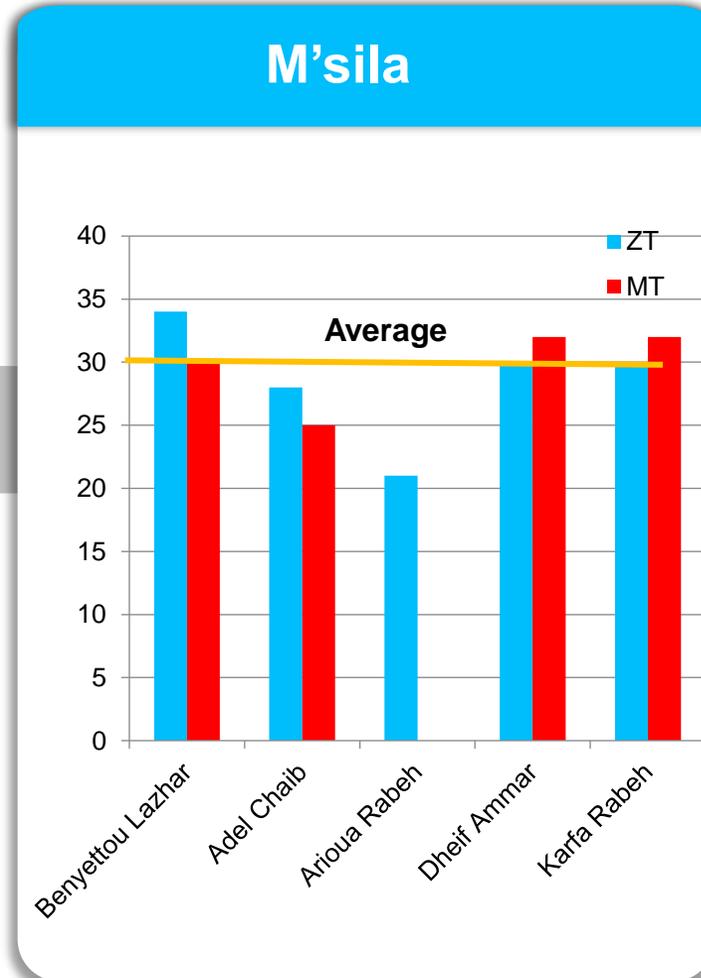
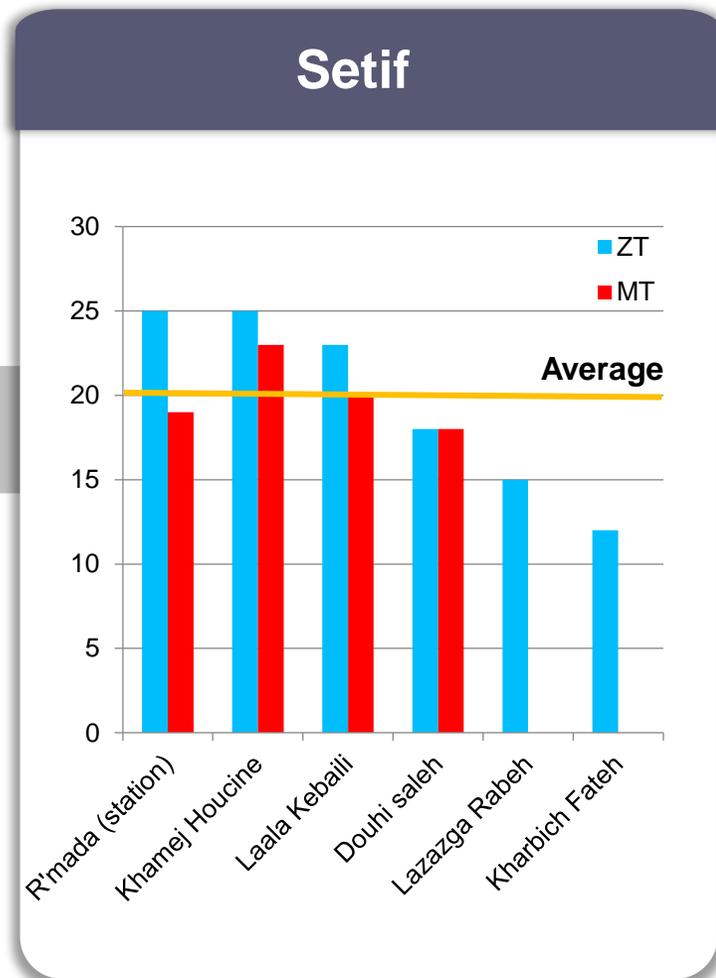
1118 farmer indirectly affected by project activities

01

Assessment of the adoption of CLCA on soil erosion, SOM and WUE

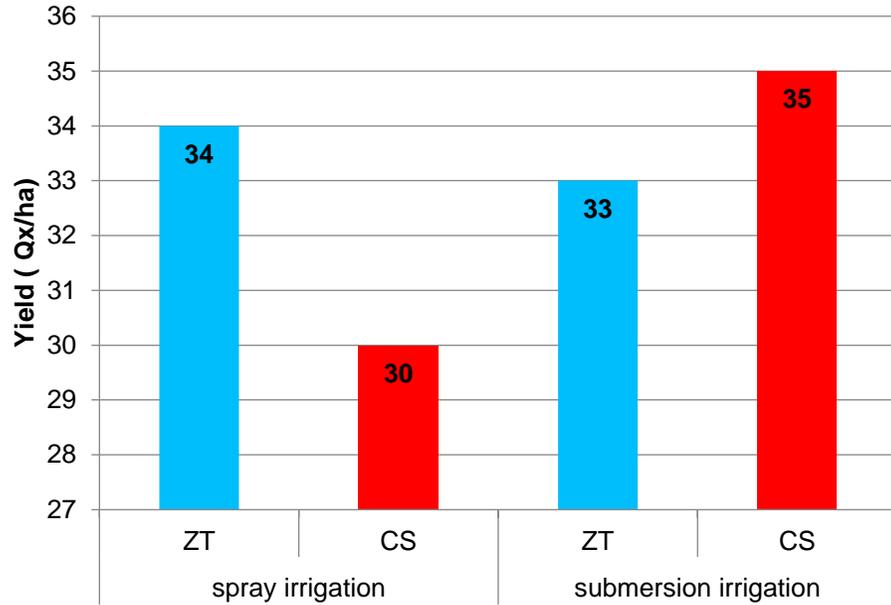


1.1. The results from first year : 2018/2019

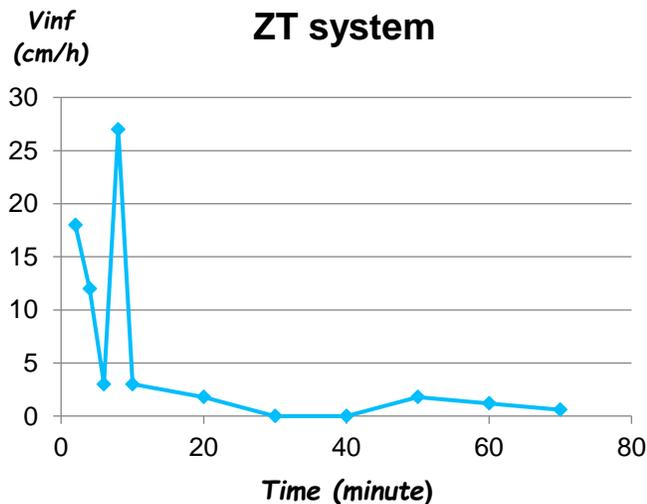


During this first year the average yield for all species is almost similar for the two systems and the difference is not significant (no more than 01 Q/ ha).

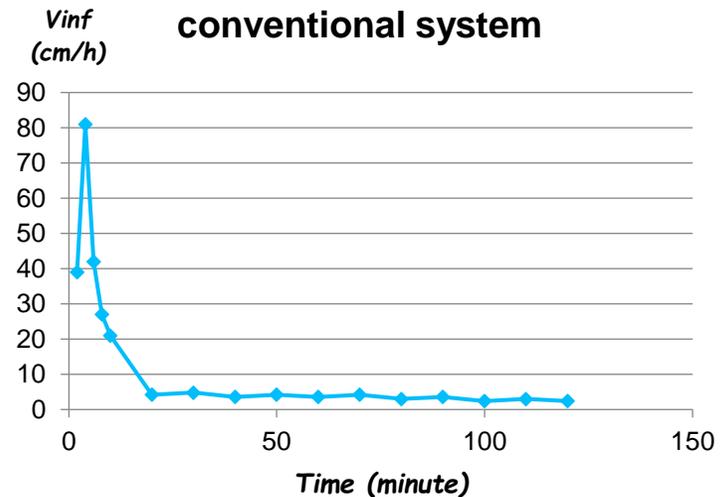
1.2. WUE under CA in M'sila



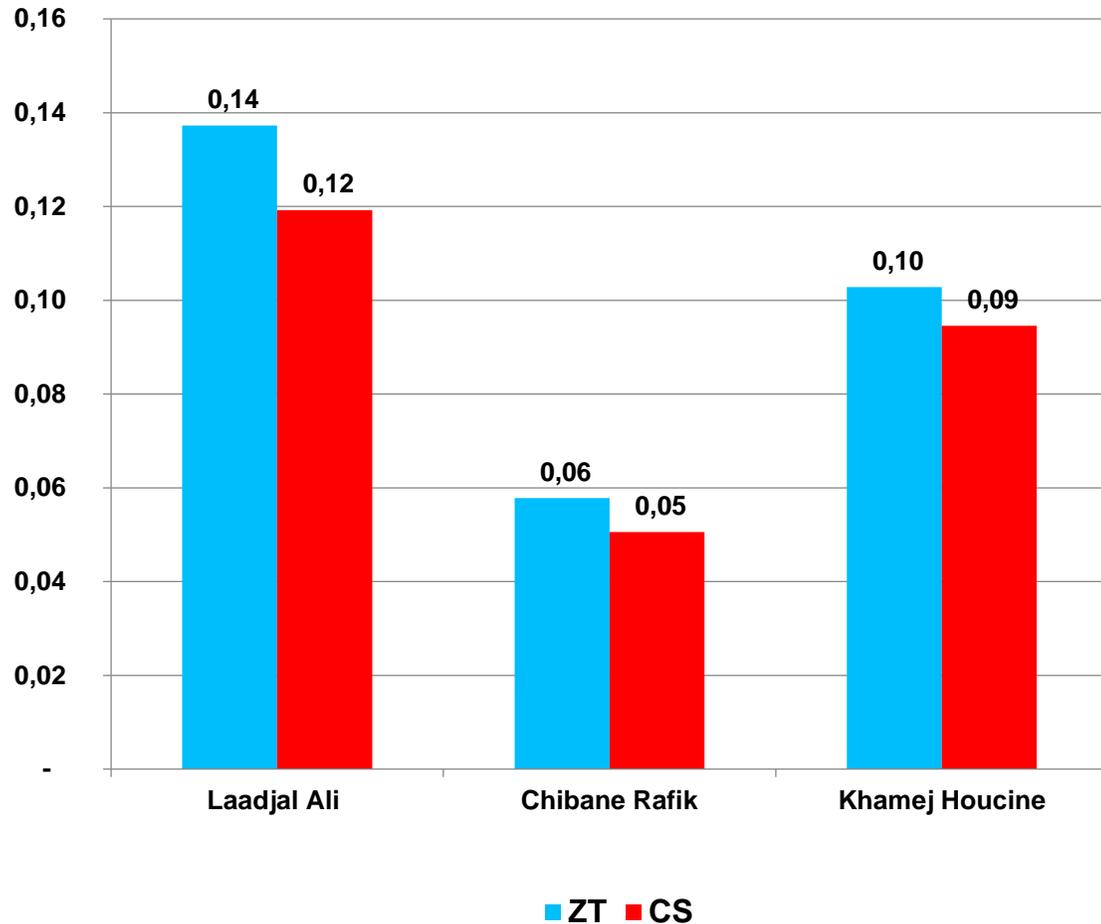
- The yield is higher in ZT with sprinkler irrigation, but the yield is higher in submersion, with a difference of 01 Q / ha,
- This difference does not cover the loads, and the ZT in sprinkling is more profitable.



influence of CA on the rate of water infiltration, and the comparison between the two systems.



1.3. Grain yield and water efficiency of durum wheat and Barely under rainfed mode



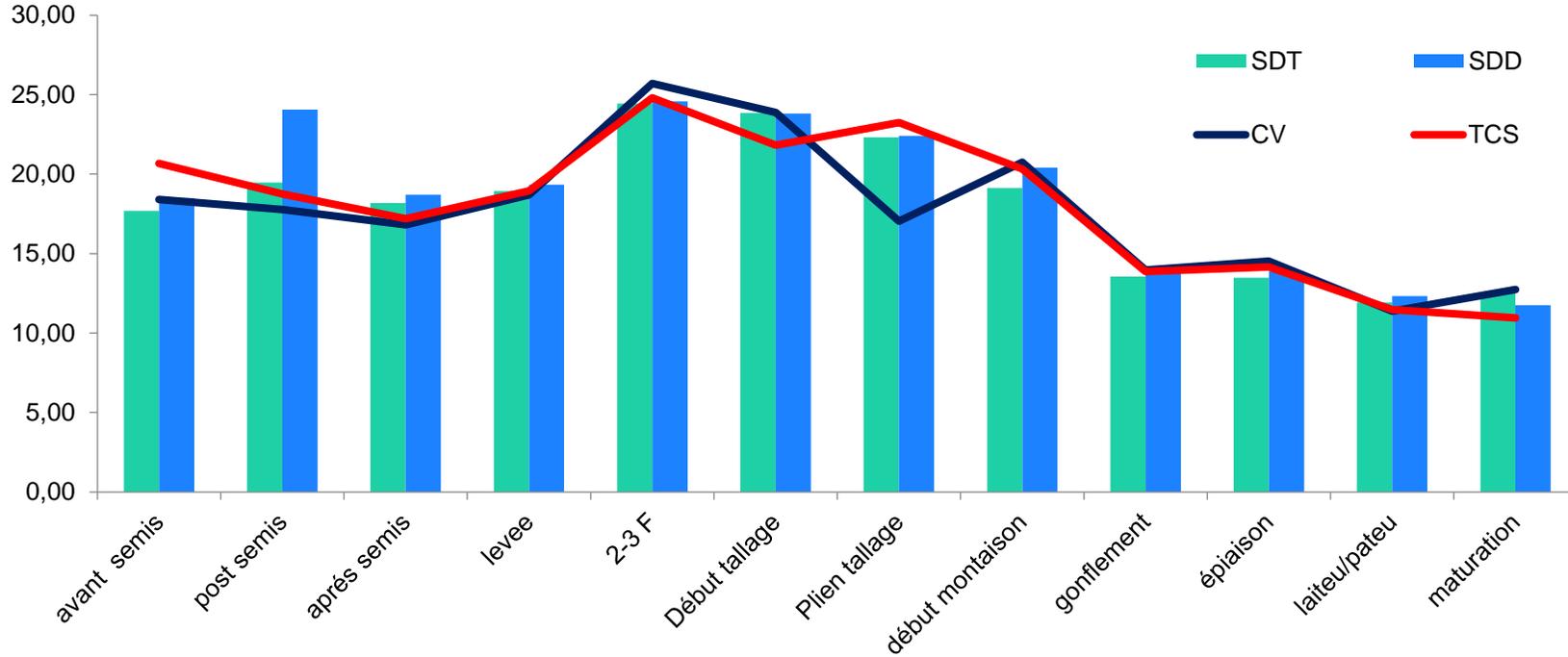
WUE in rainfed conditions of barely at Ain Mlila and Setif sites is more important in ZT compared to CS, with a difference of 9 to 15%.

$$WUE = \frac{P(\frac{q}{h})}{W(mm)} \text{ ou } \frac{P(kg)}{ETR(mm)}$$

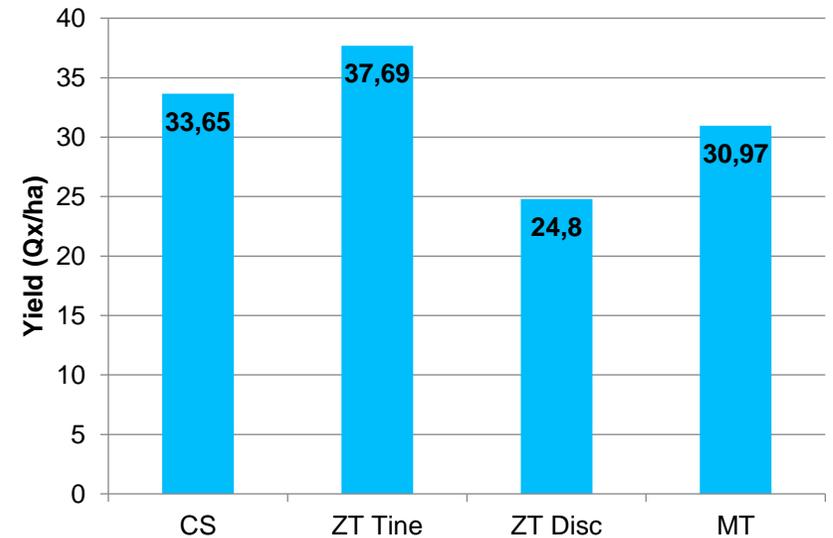
P : YIELD (Q/ha)

ETR : water consumption during wheat production cycle

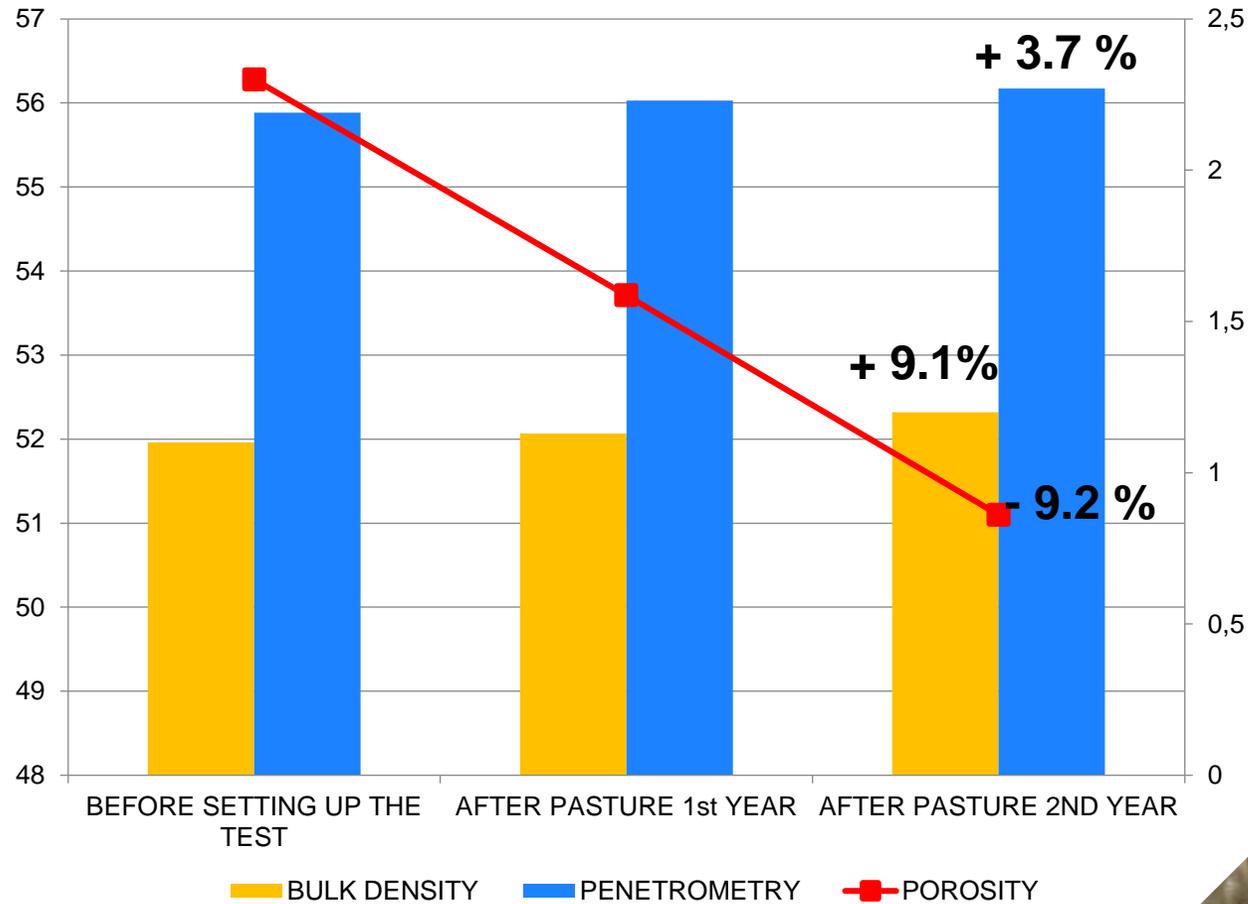
1.4. evolution of 4 sowing methods in Setif



The difference in soil humidity is not significant between the 04 modes at the end of the cycle and the yield gain obtained is due to the high rate of lift and depth control in ZT, more there is more moisture in the soil during the beginning phases of the crop.



1- 4- Effect of no-till and grazing on the physical property of the soil



After two years of overgrazing and with the absence of tillage, there is an increase in the bulk density of the soil as well as the resistivity (Penetrometer), which negatively influences the porosity of the soil.

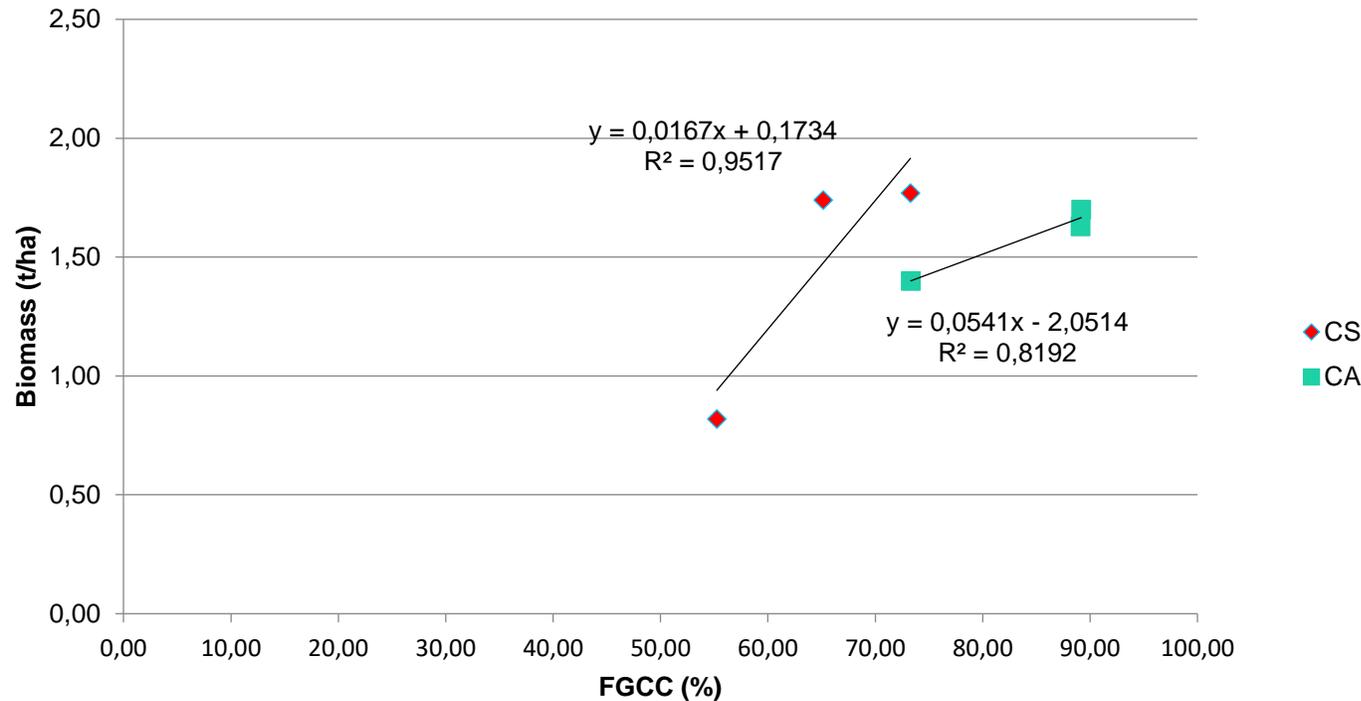


N.B: A load of 25 heads per hectare over a period of 10 days (recommendations 5-10 heads with a duration of 20 days).

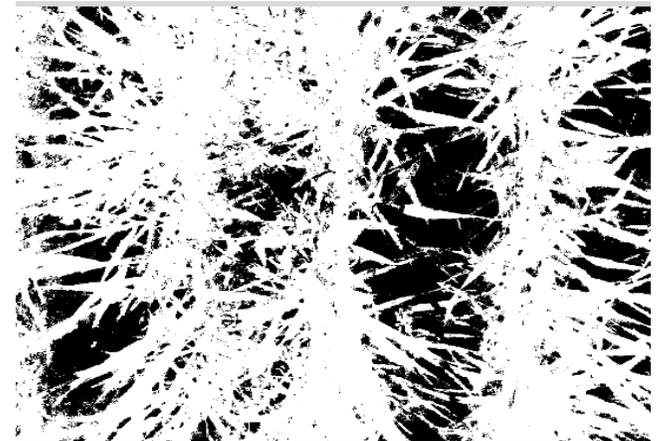
1.5. Estimating wheat biomass using fractional green canopy cover

Wheat canopy cover was measured using the mobile device application, Canopeo® at different height to capture three rows of crops (camera height and length of row varied based on canopy height).

Correlation between biomass and FGCC



72,52 %



72,52 %

02

Socio economic activities



1. CONVENTIONNAL SURVEY

- a) *Key informant tool for the enhancement of crop–livestock systems under conservation agriculture (CLCA)*”.
- Objective : *enabling policy and institutional options to promote CLCA adoption*
 - **sample** 140 farms: 117 were surveyed
- b) 2nd survey with a sample of 140 farms in setif and OEB to identify a farm typology (in course)

2. FOCUS GROUP

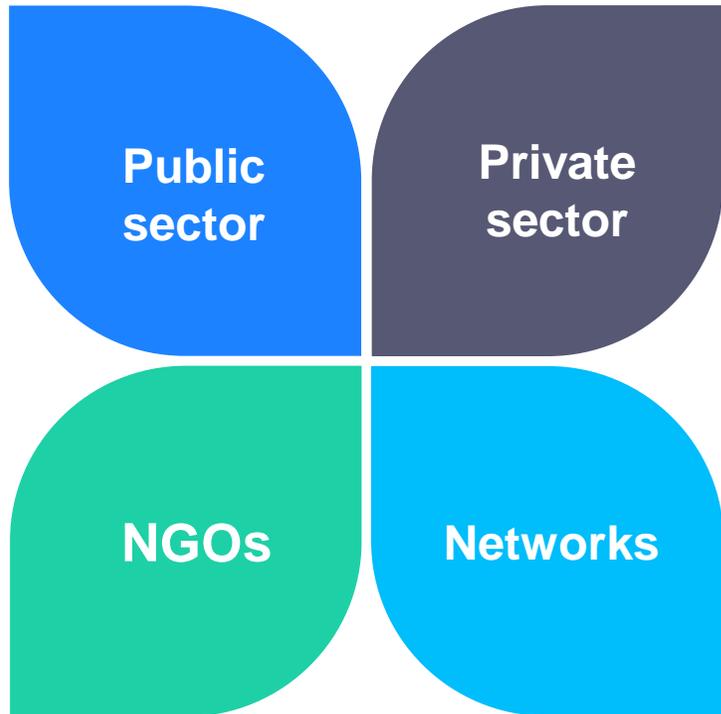
a) **a focus group was held with 16 women farmers in setif to provide informations about their activities and their perception on CA**

3. Economic Evaluation of CA technology

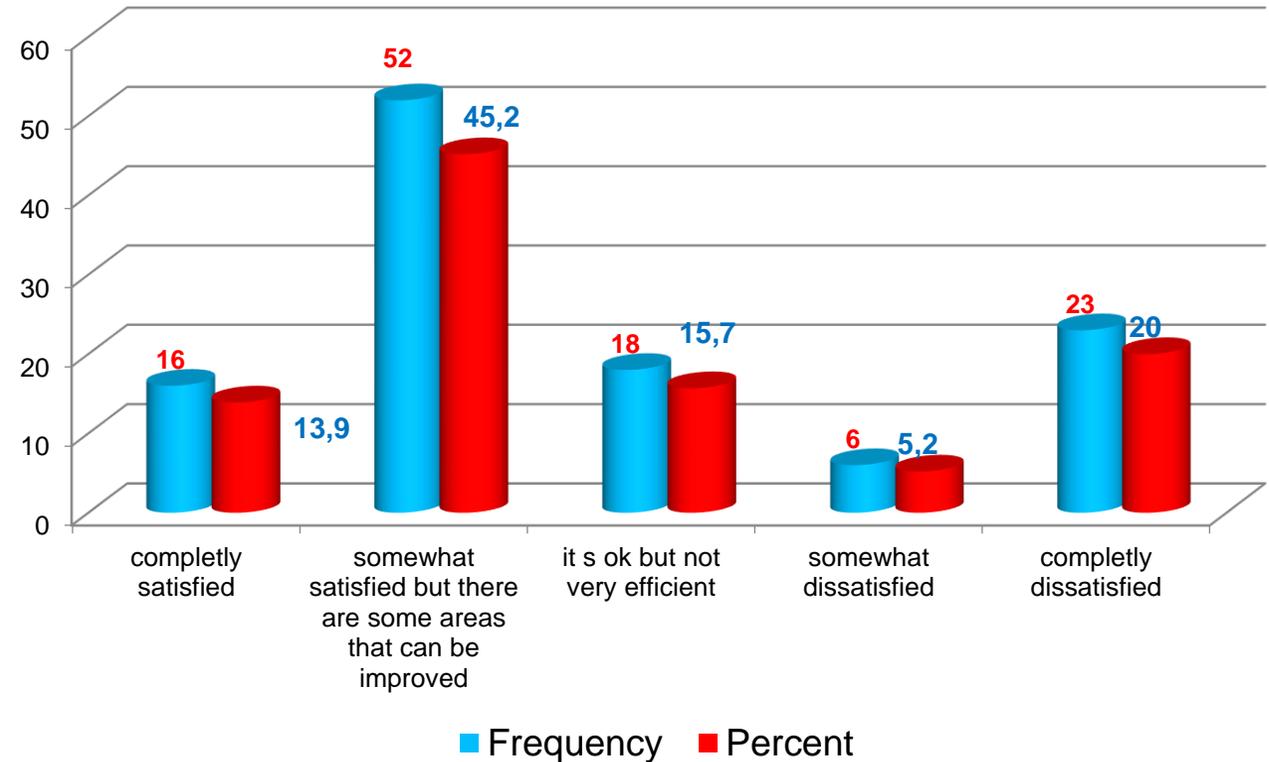
- c) Financial feasibility of investing in no-till drill – Boudour Seeder

Perceived Effectiveness of Agricultural Transfer Methods for CLCA improved Technologies: Evidence from extension and technical agents in Algeria

Extension Survey Results



EFFECTIVENESS OF THE AGRICULTURAL EXTENSION SYSTEM



PRIORITY ACTIVITIES IN STRENGTHENING AGRICULTURAL EXTENSION AND ADVISORY SYSTEMS

| | Mean rank | rank |
|--|-----------|-------|
| increase technical capacity of extensions agents | 8,04 | 1st |
| increase number of experts and subject matter specialists | 8,13 | 2nd |
| enhance capacity of extension program managers and agents on participatory and new extension approaches | 8,21 | 3rd |
| Increase capacity of extension personnel on marketing value chain and post harvest | 8,23 | 4th |
| enhance capacity of extension program managers and agents on inclusion of woman as direct beneficiaries | 8,37 | 5Th |
| organize farmers into farmers associations/orgaizations./community | 8,63 | 6th |
| increase number of extension services | 8,80 | 7th |
| stregthen information and communication technology for farmers -(SMS expert systems; online discussions) | 8,80 | 8th |
| change the extension policy toward more decentralization | 8,87 | 9th |
| change the extension policy toward more market oriented approaches | 8,92 | 10th |
| develop model farms and conduct on farm reserach and demonstration activities | 8,94 | 11th |
| establish / enhance connections with universities ; reserach and development institutions and organizations | 8,96 | 12 th |
| devlopimprove training facilities and equipment at the regional and sub regional offices | 9,13 | 13th |
| increase number of vehicles available for extension activities | 9,22 | 14th |
| stregthen the involmment of agricultural inputs companies in extension services | 9,59 | 15th |
| develop or enhance private advisory services to serve medium to large farmers or farmers associations against direct payment | 9,91 | 16th |
| involve private campanies in delivering services to serve medium to large farmers or farmers associations against direct payment | 12,25 | 17th |

Effectiveness of agricultural technology transfer methods for CLCA improved technologies

| | Mean Rank | rank |
|---|-----------|-------|
| extension staff visits | 4,91 | 1st |
| farmers field school | 4,92 | 2nd |
| study groups traveling workshops training | 5,19 | 3rd |
| School lecture | 5,29 | 4th |
| individual farm visit | 5,44 | 5Th |
| research center -(demonstration center trials) | 5,48 | 6th |
| hh/neighbouring | 5,80 | 7th |
| farmers to farmers | 5,90 | 8th |
| mass media - radio | 5,98 | 9th |
| field days | 6,09 | 10 th |

FACTORS AFFECTING EFFECTIVENESS OF THE EXTENSION METHODES

| | Mean | Rank |
|--|------|-------|
| type of farmer being targeted | 5,17 | 1st |
| Cost of the extension method | 5,21 | 2nd |
| age of extension officers | 7,43 | 3rd |
| sex of extension officers | 7,44 | 4th |
| ability to reach women beneficiaries | 7,49 | 5Th |
| sociocultural conditions of the farmer | 7,62 | 6th |
| number of farmers per extension officer and categories of farmers | 7,65 | 7th |
| qualifications/ skills of extension officers | 7,77 | 8th |
| location and avaiability of extension offices | 7,84 | 9th |
| years of experience of extension services | 7,92 | 10th |
| avaibility of resources (transport for extension officers ; information technology and equipment) | 7,99 | 11th |
| economic conditions of the farmer | 8,00 | 12 th |
| nature of the technology transferred (elements of the technology) | 8,40 | 13th |
| geographic location of the farmer | 9,07 | 14th |

Potential impacts of extension activities on the livelihood of adopters/ plannersof CLCA Technologies

| | Mean | rank |
|---|------|------|
| improved the nutrition qualityof your hh | 3,01 | 1st |
| improved your ability to identify your own needs and problems and to solve them | 3,67 | 2nd |
| increased your rate of adoption of new clca technologies | 3,86 | 3rd |
| improved your abilities to effectively understand marketing issues | 3,90 | 4th |
| improved your managment practices | 4,23 | 5Th |
| improved the food security of your hh | 4,84 | 6th |
| decreased the farming work burden | 5,52 | 7th |
| improved your farm production yield and profitability | 6,97 | 8th |

Economic evaluation of conservation agriculture practice in comparison with the conventional system under the crop-livestock system

| Year : 2016- 2017 | Minimum tillage | CA | Conventional Seeding |
|--------------------------------|-----------------|-------|----------------------|
| M'Sila site (under irrigation) | 1.774 | 2.019 | 1.960 |
| Setif Site (rainfed area) | 2.428 | 3.292 | 3.327 |

| Rotation:2017/18 – 2018/19 | | | |
|--------------------------------|-----------------|-------------------|-------------------|
| Setif Site (rainfed area) | Wheat / Barley | Wheat / feedpea | Wheat / vetch-oat |
| | 0.4 | 1.5 | 0.6 |
| | Wheat / lentil | Barley / feed pea | Barely / vetch |
| | 1.4 | 1.2 | 4.6 |
| | | | |
| M'Sila site (under irrigation) | Barley / barley | Wheat / barley | |
| | 0.1 | 0.5 | |

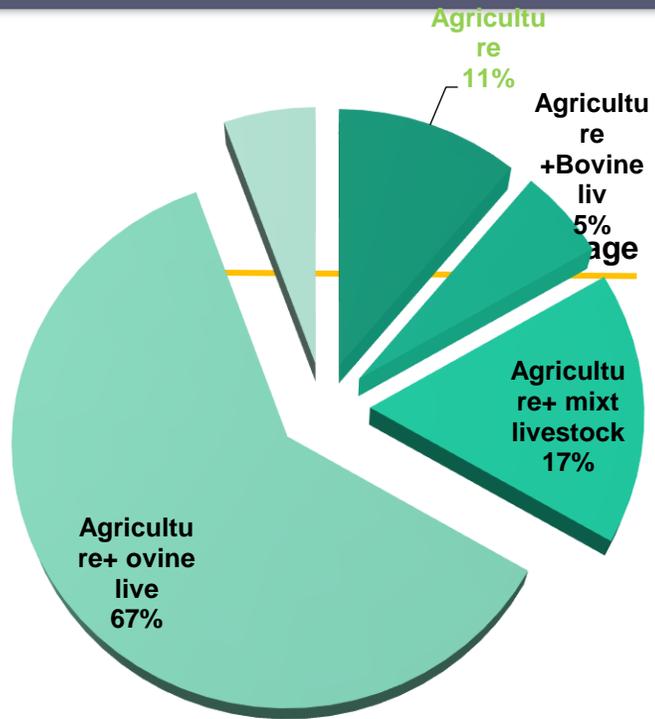


Gender perception towards CLCA practices



1.1. The results from first year : 2018/2019

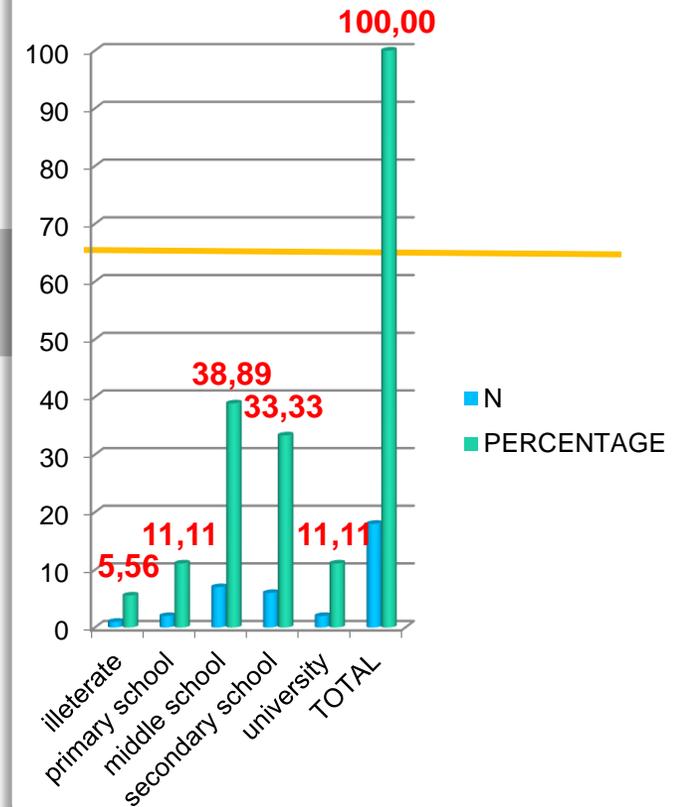
activities



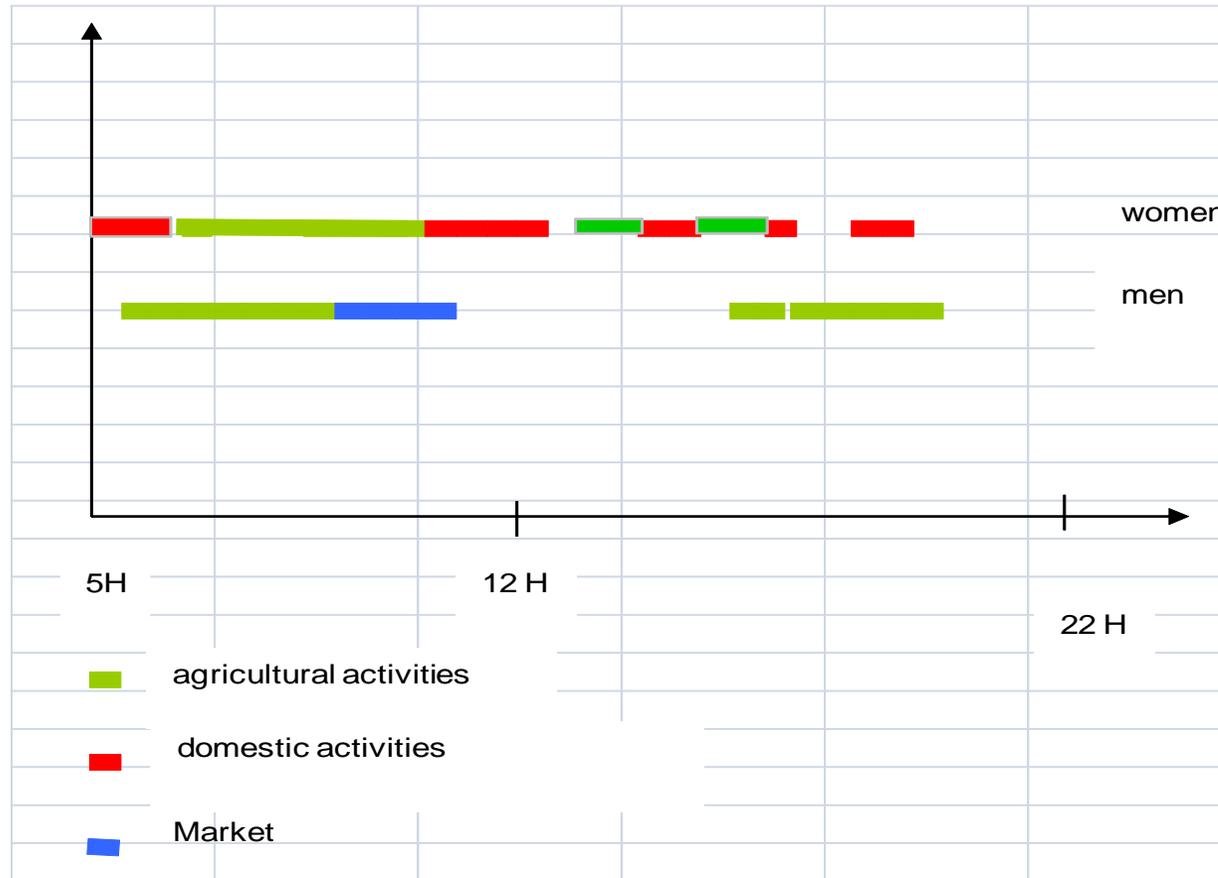
Land tenure

| | N | % |
|--------------------------------------|-----------|------------|
| land ownership | 4 | 22 |
| Individual agricole Entreprise (EAI) | 14 | 78 |
| TOTAL | 18 | 100 |

Level education



Work burden between women and men



- stables cleaning of the stables
- livestock Feeding of, allotment (small + female)
- 7:00 am milking
- Verification of the livestock health (make vaccines; care in case of illnesses)
- 30 % woman takes out the livestock for grazing
- 1pm return of the herd; animal inspection
- supplemental Feeding
- Bring out the livestock for grazing (summer days)
- 5pm return of the livestock to stables
- Inspection of livestock and feeding livestock until 10 p.m (mixt livestock ovines +bovines).

Women Perception on CLCA package I

Postive Attitude

- Lessen the work burden
- Gain of time
- More profitability than CS (the charges of the

Negative attitude

- problems of weed control (price of glyphosat)
- no availibility of direct seeders and if available the prices are too high
- Necessity of a powerful tractor
- Information lack on the technique
- Let t

Women Perception on Clca package II

conservation agriculture, animal husbandry, animal health; livestock feed ...)

request extension system agents to inform and invite women farmers to extension days

Postive Attitude

- forage Availability for feeding livestock with the practice of rotations

Negative attitude

- More burden with a supplemental feeding

women recommendations

- organize training courses for women farmers and rural women on: conservation agriculture practices, livestock ;animal health; livestock feeding ...)
- Request extension system agents to inform and invite women farmers to extension days

03

Optimization of pastures on stubble under CA in semi-arid zones.



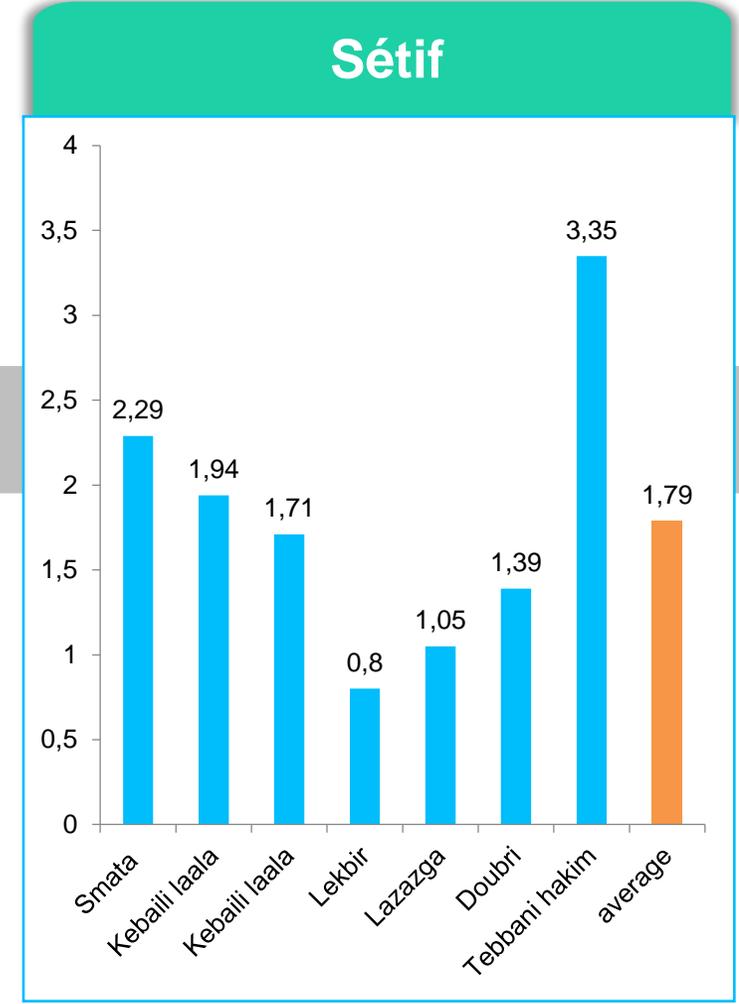
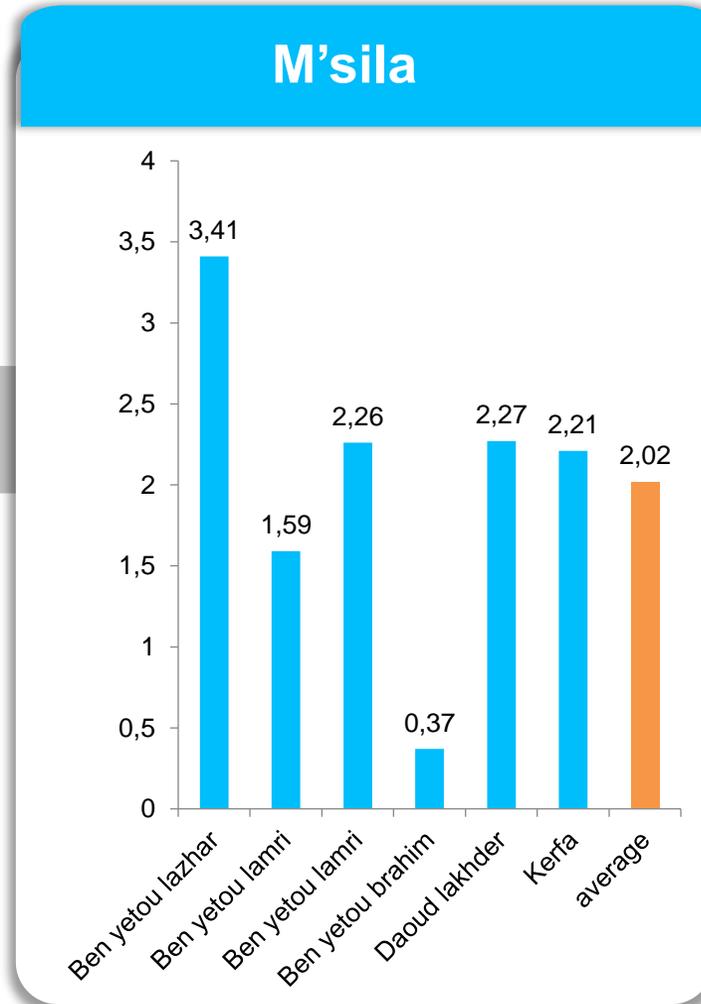
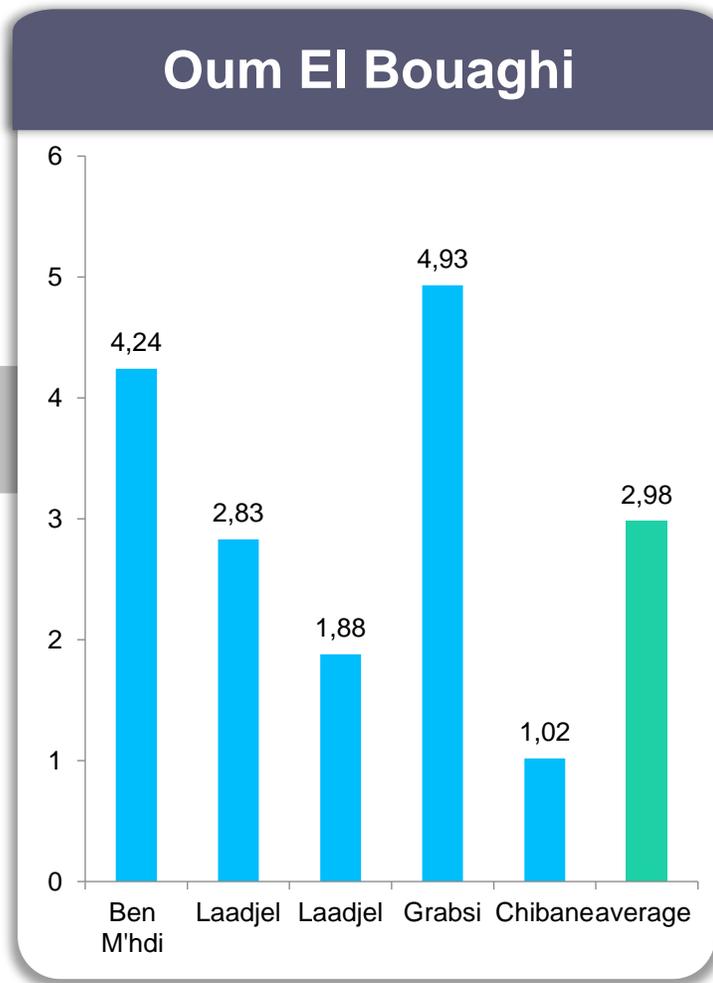
The stubbles were estimated at the three wilaya of the project between June and august (Sétif, Oum El Bouaghi and M'sila)

The observations were taken before and after grazing ewes

The biomass was estimated by tons of dry matter left on the ground (tons DM/ha)

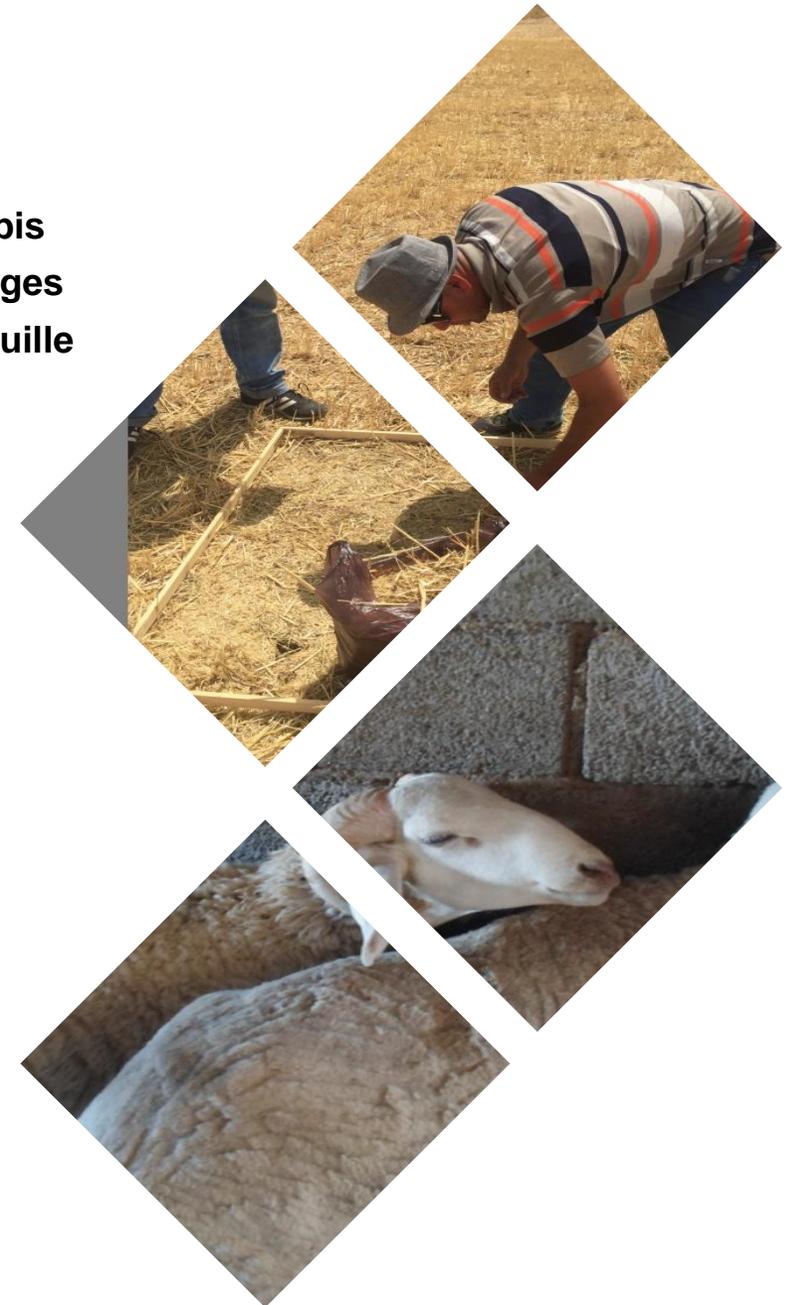
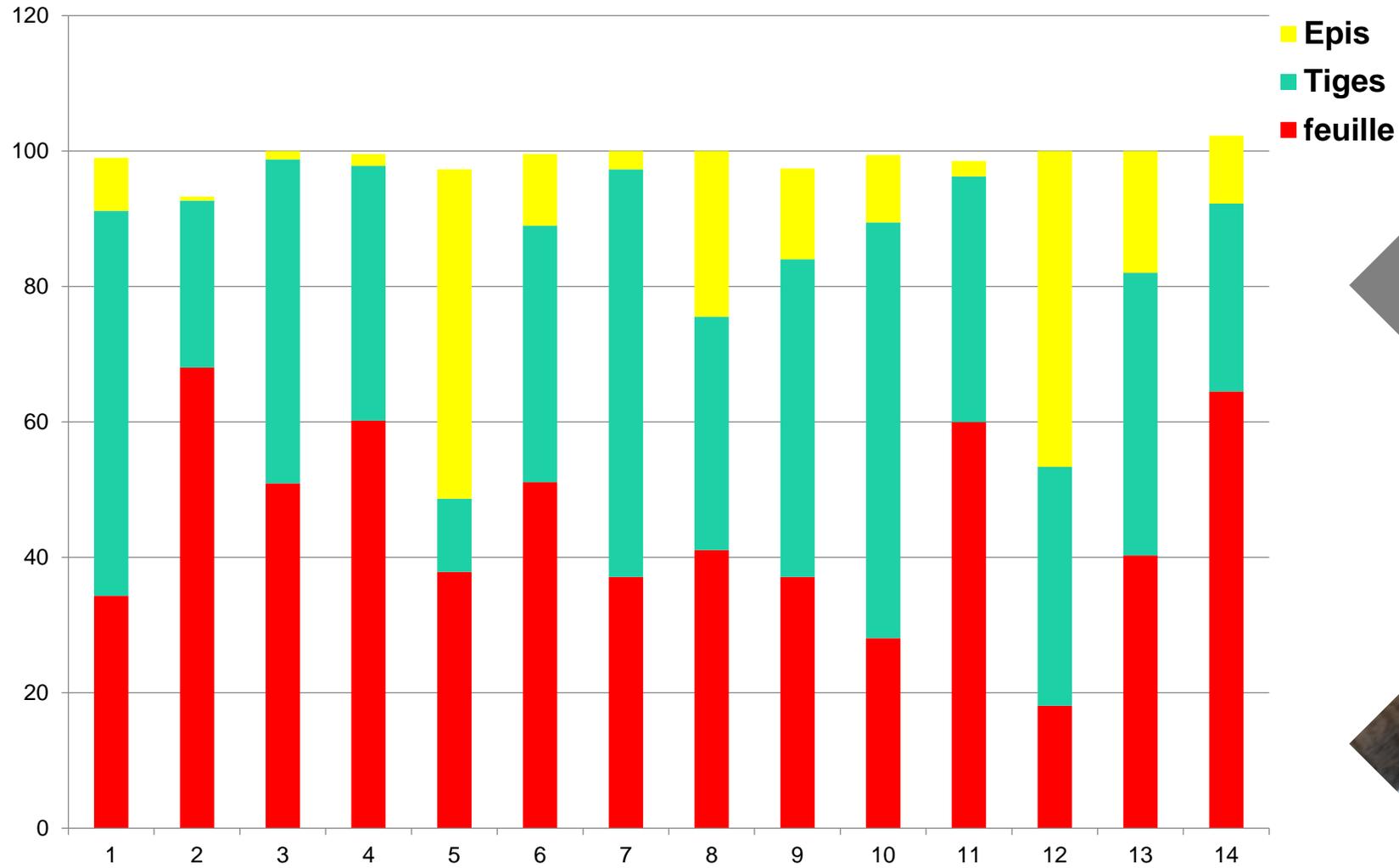


1.1. Stubble Biomass in the project zone: 2018/2019

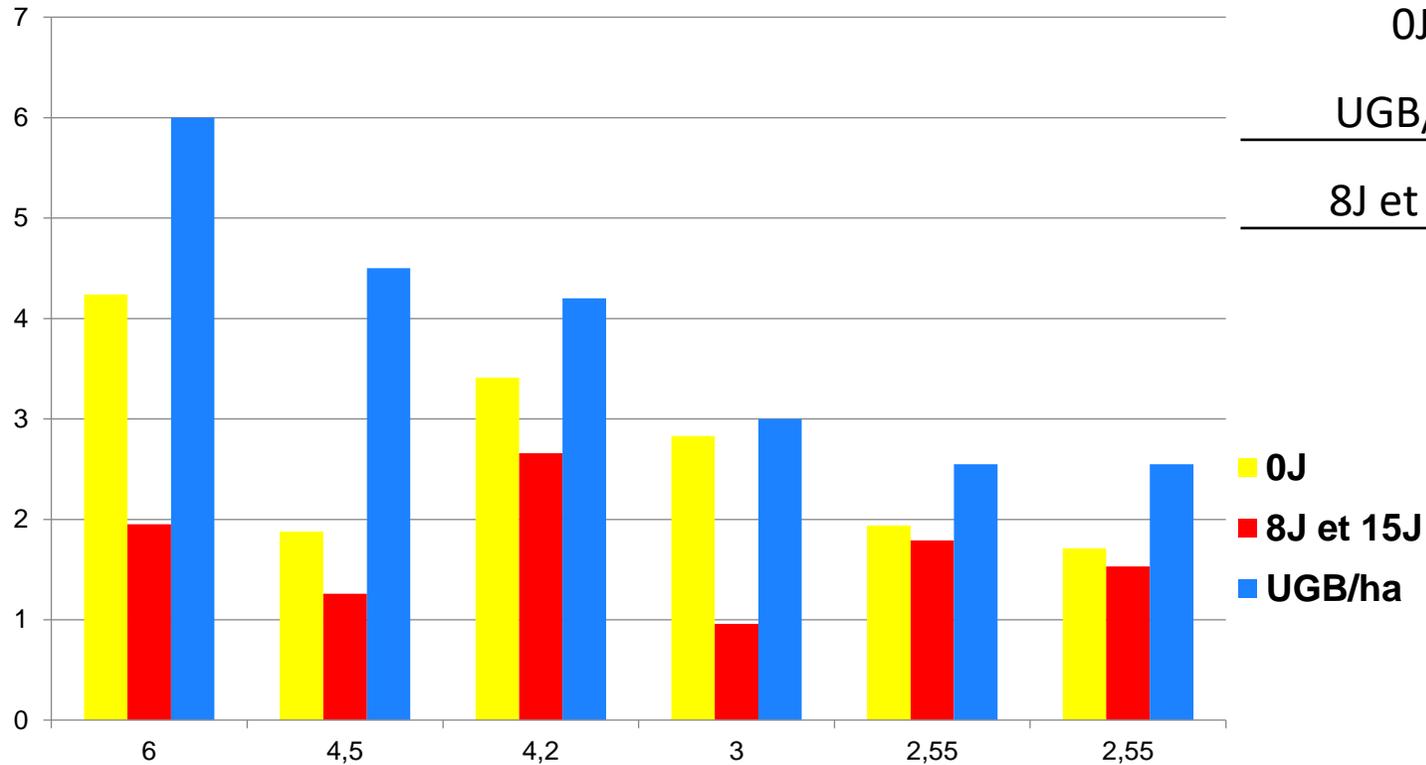


Stubble yield tons/ha

Seeds leaves and steams quantities of stubbles %



Stubble evolution during grazing (Tons/ha)

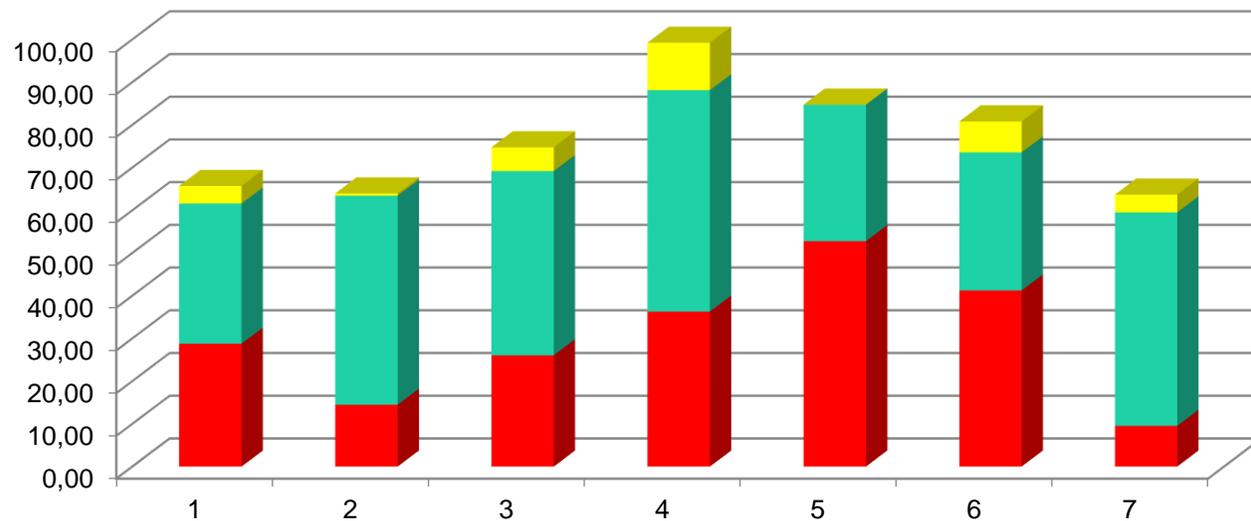
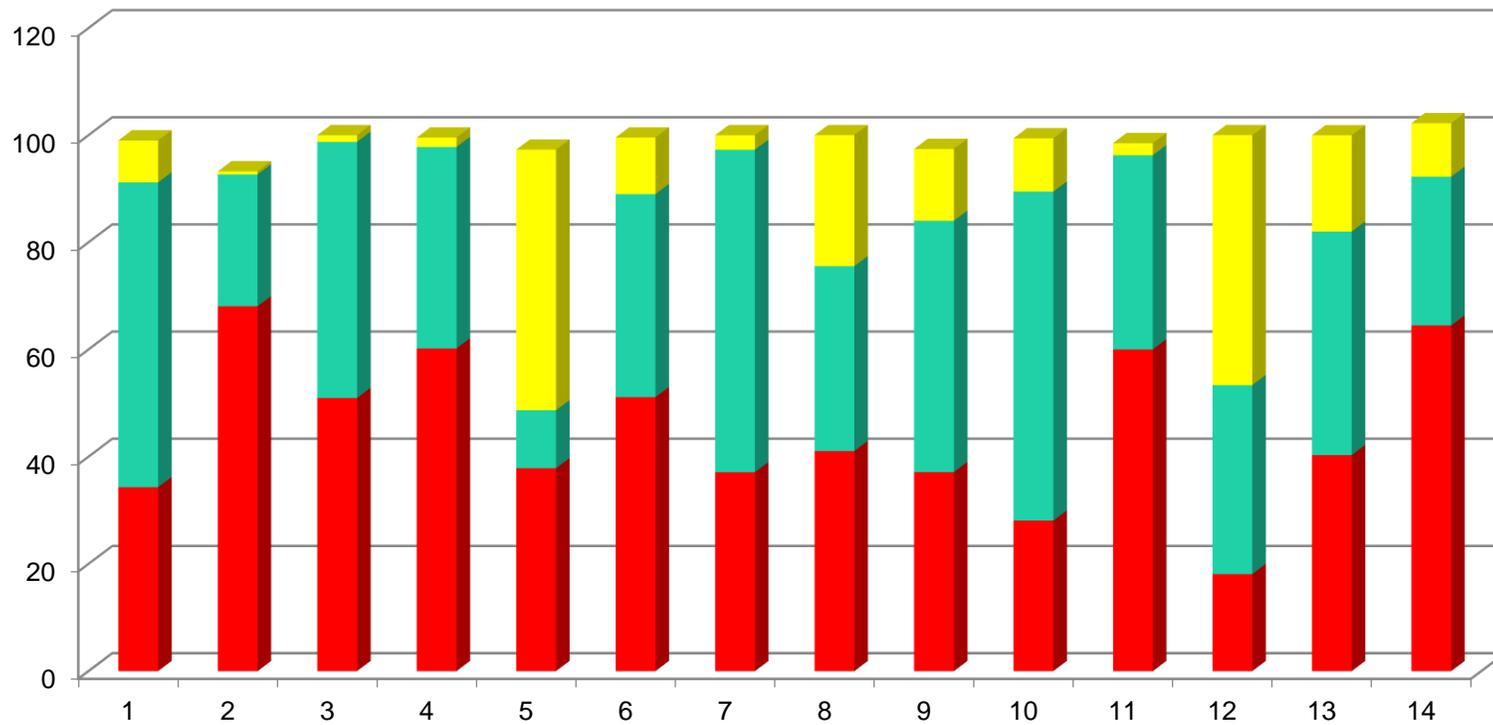


| <i>R</i> | <i>OJ</i> | <i>UGB/ha</i> |
|---------------|-----------|---------------|
| <i>OJ</i> | 1 | |
| <i>UGB/ha</i> | 0,75 | 1 |
| 8J et 15J | 0,48 | 0,33 |

correlation test



The grazing ewes during less than 20 days left more stubbles on the ground



-Initial biomass quantities are very variable in each of project site. With a minimum of 0,37 t/ha to maximum of 4,93 t/ha

- the most important biomass permits the increase of stocking head per hectare more than five or ten

- Grazing more than 20 days the stubble quality become lesser



Reduction of stubble grazing by introduction of oat pea hay

Ewes Control lot

- stubble grazing
- 0.75kg Oat or barley hay/ head
- Concentrate 500g / Head

Ewes Experimental lot

- 1.3 Kg of Oat Hay Pea /Head
- 500 g of concentrate / Head

Average daily gain

238,85±25,73

225,88±30,36

the difference in the gain means is not significant

P> 0\0,05



Gestion des chaumes des différentes régions

Chaume ain
mlila
0,2-0,3kg/jr



luzerne

0,5kg/jr

Chaume
setif
0,4kg/jr



0,4 kg/jr

Chaume
msila

0,3 kg/jr



0,5 kg/jr



orge

0,5 kg/jr



Grignon

0,3 kg/jr



Brebis
gestante

Première
scenarior

Gestion des chaumes

Deuxième scenario

Chaume mlila
0,4-0,7kg/jr



+

luzerne
0,2kg/jr



Chaume setif
0,8kg/jr



luzerne
0,1kg/jr



Chaume msila
0,7-0,8kg/jr



luzerne
0,2kg/jr



0,3 kg/jr



0,3 kg/jr



0,3 kg/jr



Cas de la région Ain M'Lila

Deuxième scenario



Chaume mlila
0,2-0,3kg/jr

+

luzerne
0,2kg/jr

This block shows a landscape with a sheep and a smaller lamb. A blue plus sign is between the two feed items. The first item is 'Chaume mlila' with a consumption rate of 0,2-0,3kg/jr. The second item is 'luzerne' (alfalfa) with a consumption rate of 0,2kg/jr.



Chaume setif
0,4kg/jr

luzerne
0,2kg/jr

This block shows a barn in a field. The first item is 'Chaume setif' with a consumption rate of 0,4kg/jr. The second item is 'luzerne' (alfalfa) with a consumption rate of 0,2kg/jr.



Chaume msila
0,3kg/jr

luzerne
0,2kg/jr

This block shows a field with hay bales. The first item is 'Chaume msila' with a consumption rate of 0,3kg/jr. The second item is 'luzerne' (alfalfa) with a consumption rate of 0,2kg/jr.



Grignon
0,3 kg/jr

This block shows a pile of dark brown feed. The item is 'Grignon' with a consumption rate of 0,3 kg/jr.



Grignon
0,3 kg/jr

This block shows a pile of dark brown feed. The item is 'Grignon' with a consumption rate of 0,3 kg/jr.



Orzo
0,1 kg/jr

This block shows a pile of yellowish-brown grains. The item is 'Orzo' (barley) with a consumption rate of 0,1 kg/jr.



Grignon
0,3 kg/jr

This block shows a pile of dark brown feed. The item is 'Grignon' with a consumption rate of 0,3 kg/jr.



Agneaux en croissance

This block shows several white lambs in a pen. The item is 'Agneaux en croissance' (growing lambs).

04

Scaling activities



Best agronomic packages (CLCA packages)

1- CA as a way to reduce water loss irrigation in irrigated areas.



2 – Oat vetch or Triticale vetch is the best mixture, and vetch is the specie that produces more biomass.



3 – The disc seeder retains more water, but with tines ensures better performance.



4 – A late total weed control strategy with a dose between 540 -720 g / ha ensures good control, followed by a weed control of early catching up.



5 – The lentil is the best precedent, followed by vetch.



6 – Grazing management according to the method recommended by the ITELV.





Low cost ZT seeder - BOUDOUR



**BOUDOUR seeders for sale
to farmers and cooperatives**



**A low cost ZT seed drill
(13 000 \$) supported at 30%
(9 100 \$) and 40 % (7 800 \$)**



**Acquisition by farmers at Bordj
Bou Arreridj and launch of
provider services.**

Training of farmers and students

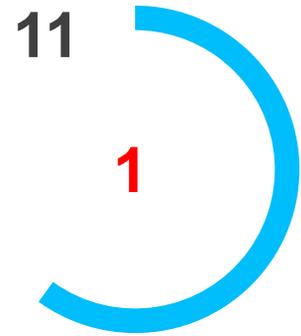


15 local and regional events that indirectly affected
1118 farmers and technicians

- **15** students (master and doctorate) follow the project activities
- **02** Flayers : sprayer setting and Rational management of stubble

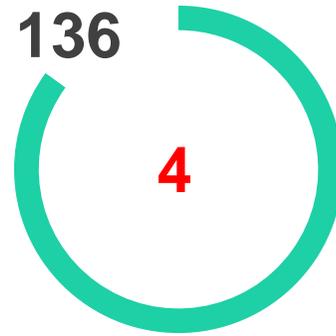


Farmers Training by ITELV programs 2019



Women

Cheese making



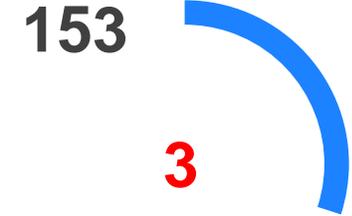
Mixte

**Management of
goat sheep
farming**



Mixte

Cheese making



Mixte

**Management of
sheep farming**

Diffusion through medias



- facebook.com/ltgcSetif/ : 13 457 total subscribers
- facebook.com/ALGERIACLCAPROJECT/ : 149 total subscribers
- facebook.com/ITGCouedsmar/ : 11 913 total subscribers



Twitter : Algeria CLCA Project



Data SIM Application : SMS service for 530 farmers and managers, 13% of whom are women



02 short videos on the project and 01 for weed control in preparation



07 Radio broadcast on local and national radios

Year 01

Year 02

Station and sites



36
exploitations

242
exploitations

+ 1118 Farmer and Tech.

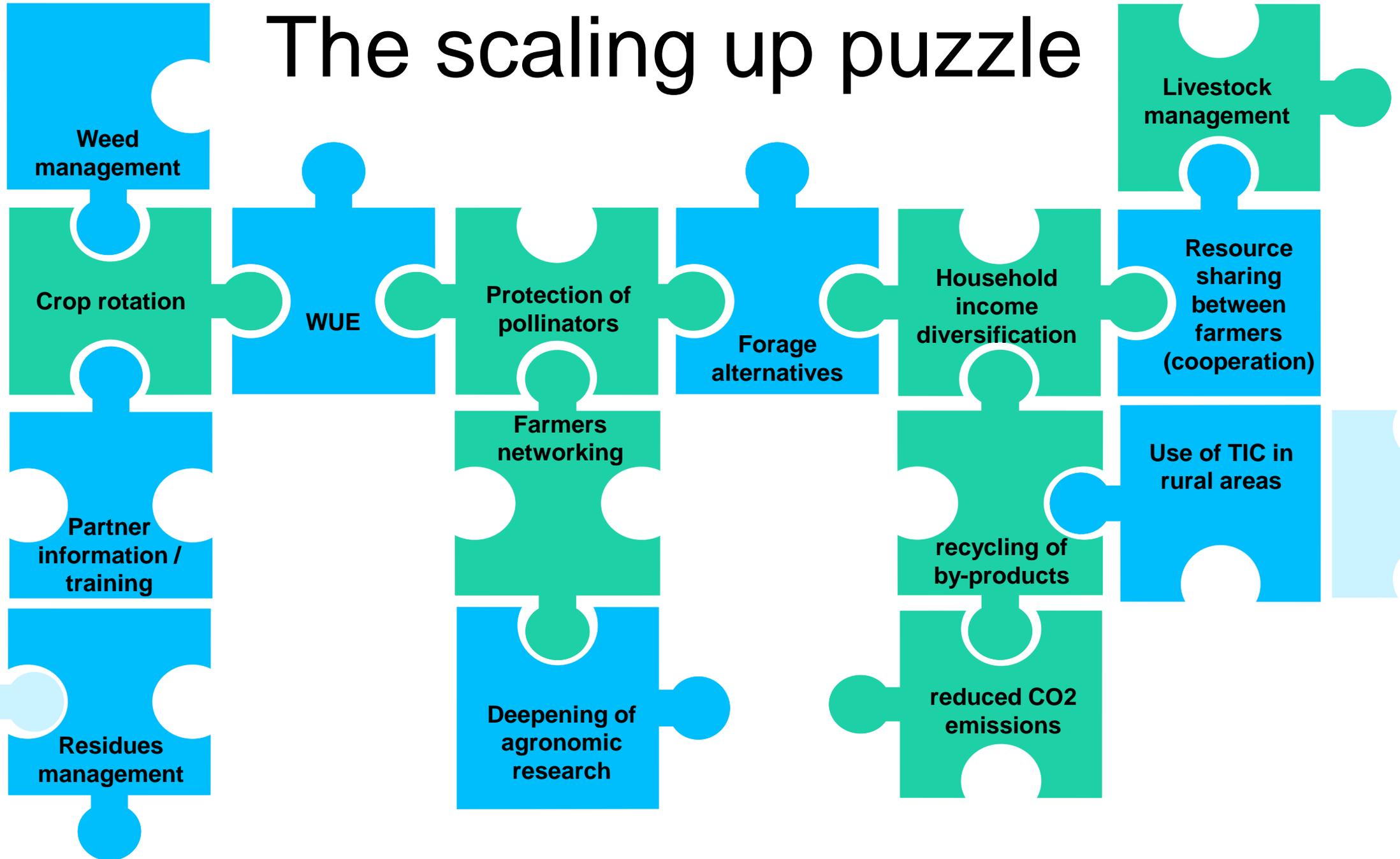
1010
Farmer and Tech.

Feedback

SCALING STRATEGY



The scaling up puzzle



Thank You

