Activity 1.2
Assessment of the adoption of CLCA practices on soil erosion, SOM and WUE in Tunisia

Progress activities and main achievement, year 1

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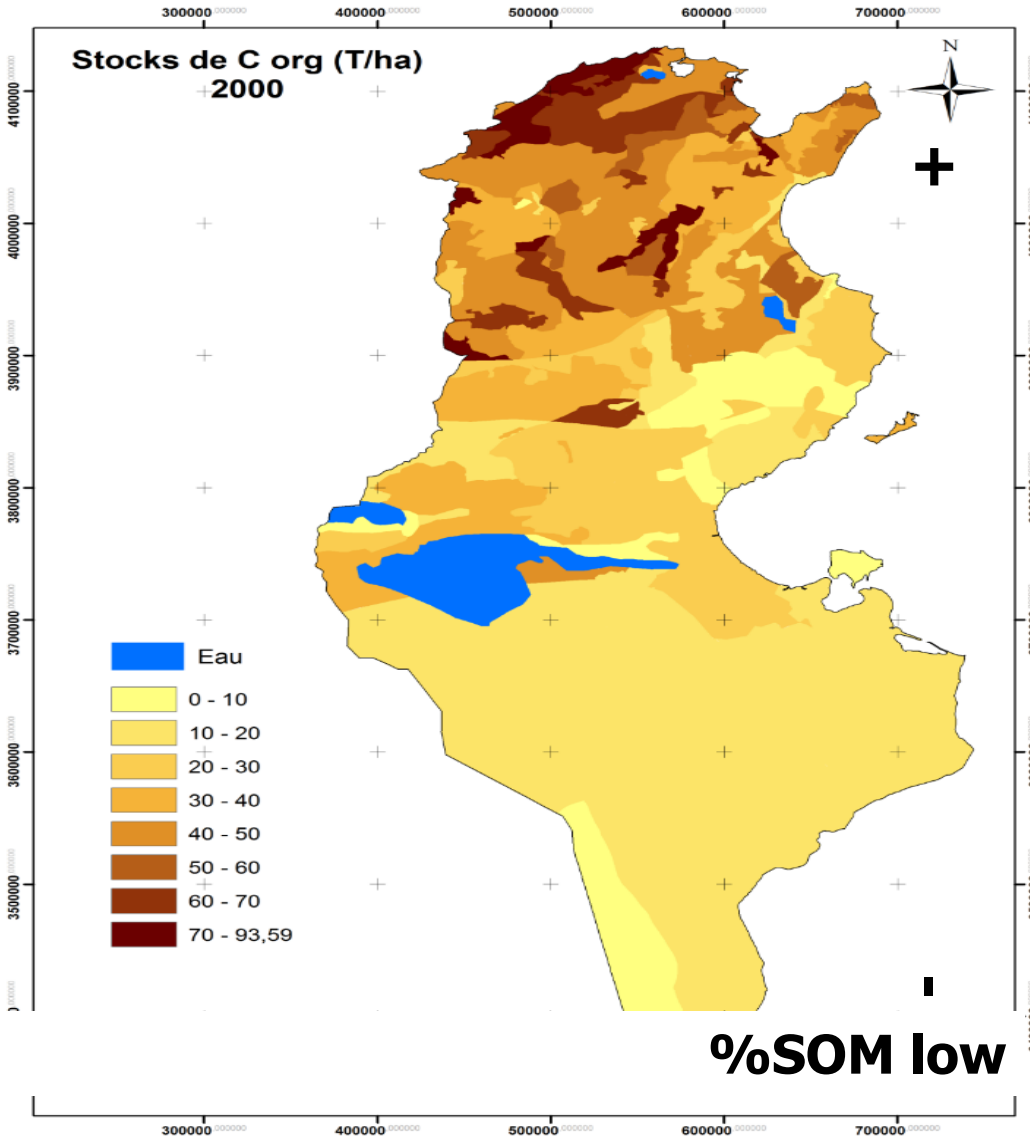
Introduction

In the context of soil degradation (water erosion in the north of Dorsal mountains) and the low productivity of rainfed crops X contrasted by CC



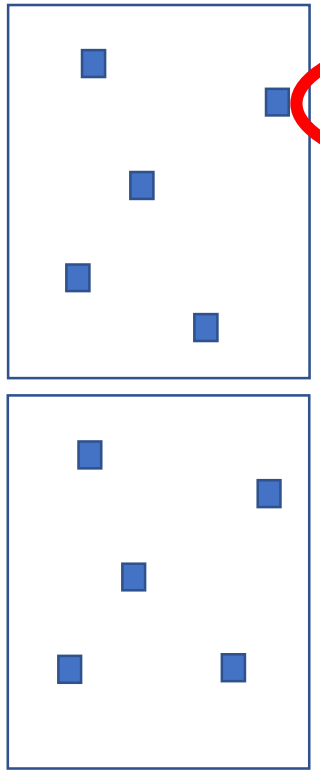
%SOM low

SETTINGS OF FIELD ACTIVITIES

Activity target outputs	On farm (farmers implementing CACL)
-50% erosion on steep slopes +3/5% SOM +20% WUE	Chournia 2 paired plots (CLCA/Control CV) El Krib 2 paired plots (CLCA/Control CV)

Farm scale

Chournia



Runoff/sediment yield - rainfall simulation by Eijkelkamp field device

Infiltration by double-ring method

Penetrometry

Aggregate stability by Le Biss. Method

Soil bulk density?

Total SOM

(POM and labile carbon,

Microbic respiration by Li-850)

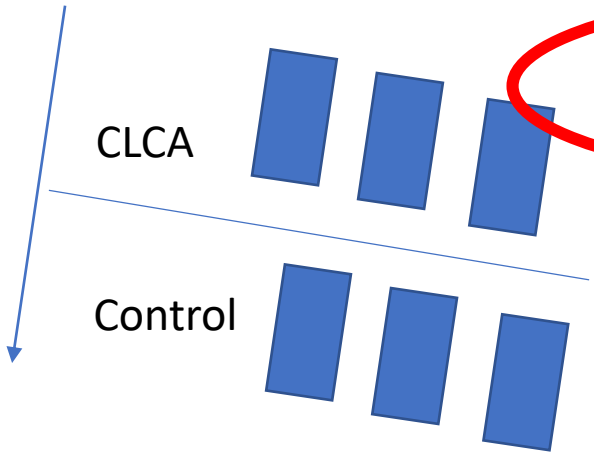
Soil water content start and end of cropping season by gravimetric method

Measurements to be done once (first year), at the same random sampling spots used for other measurements

TXT, Carbonates, EC

(composite samples, 0-20cm)

El Krib



Runoff/sediment yield - Wischmeier plots

Runoff/sediment yield - rainfall simulation by Eijkelkamp field device

Infiltration by double-ring method

Penetrometry by…. device

Aggregate stability by Le Biss. Method

Soil bulk density?

Total SOM

(POM and labile carbon,

Microbic respiration by Li-850)

Soil water content start and end of cropping season by gravimetric method

Measurements to be done once (only if not available), near W plots

TXT, Carbonates, EC

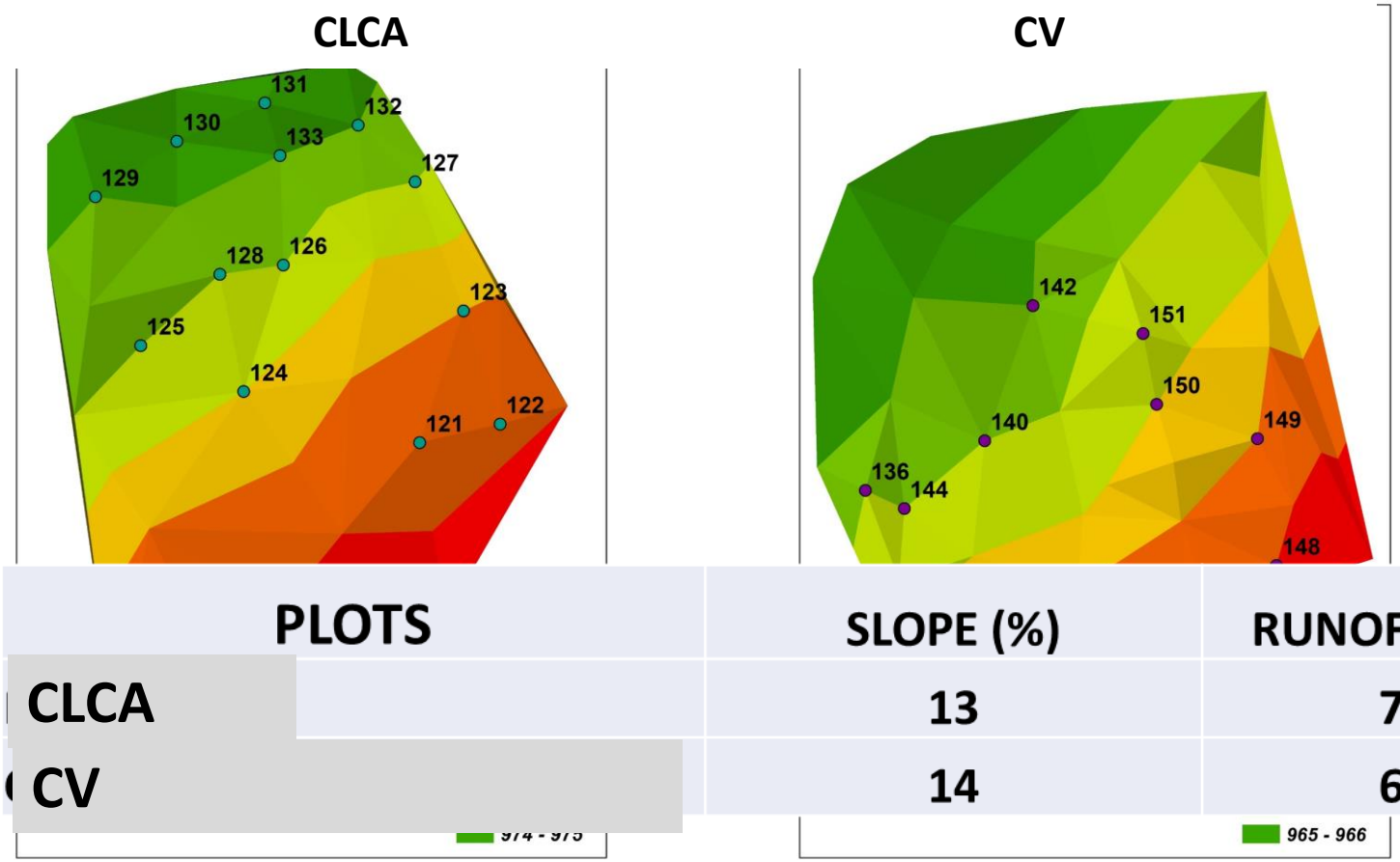
Farm site : Chournia

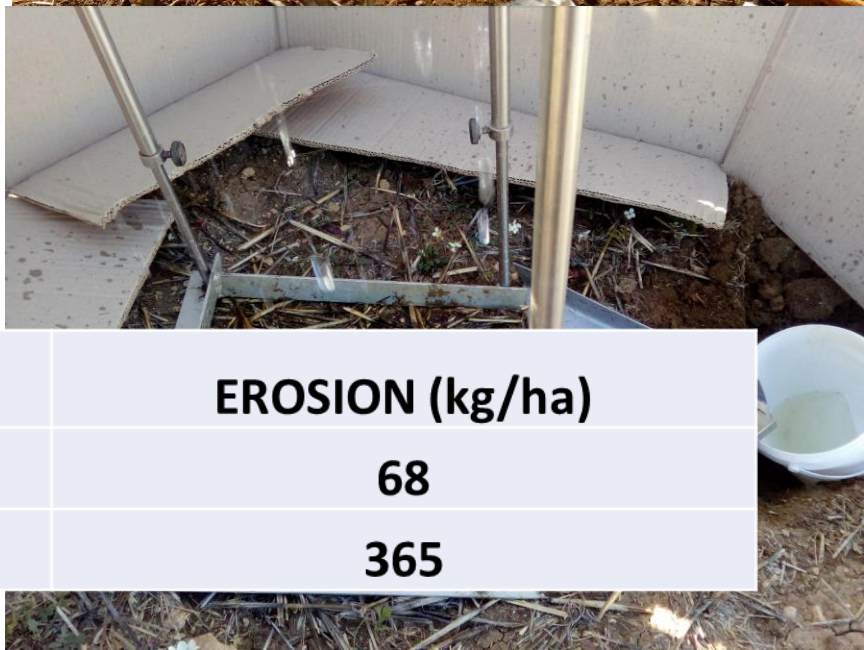
Tow paired plots in Chouarnia area (CLCA vs CV)

Measure	Method/device	Sampling approach
Soil surface erodibility and runoff	Rainfall simulator	Random plots
Infiltration	Double-ring method	Random points
Penetrometry	Static penetrometer (SP)	Random points
Soil water content	Sampling with auger	Random plots (0-20, 20-40 and 40-60 cm)
Soil aggregate stability	Le Bissonnais method	Random points on soil surface (0-10 cm)
Soil bulk density	Steel ring	Random points (0-20 cm depth)
Soil organic matter (SOM)	Walkley-Black method	Random points (0-10 cm, 10-20 depth)
Soil microbial activity	Incubation (XPU 44-163)	Random points
SOM biodegradability	Soil microbial activity, % of SOM	Random points

Rainfall simulation

Rainfall simulations using the rainfall simulator in order to estimate the runoff and erosion (15 for CLCA) and (9 for CV).

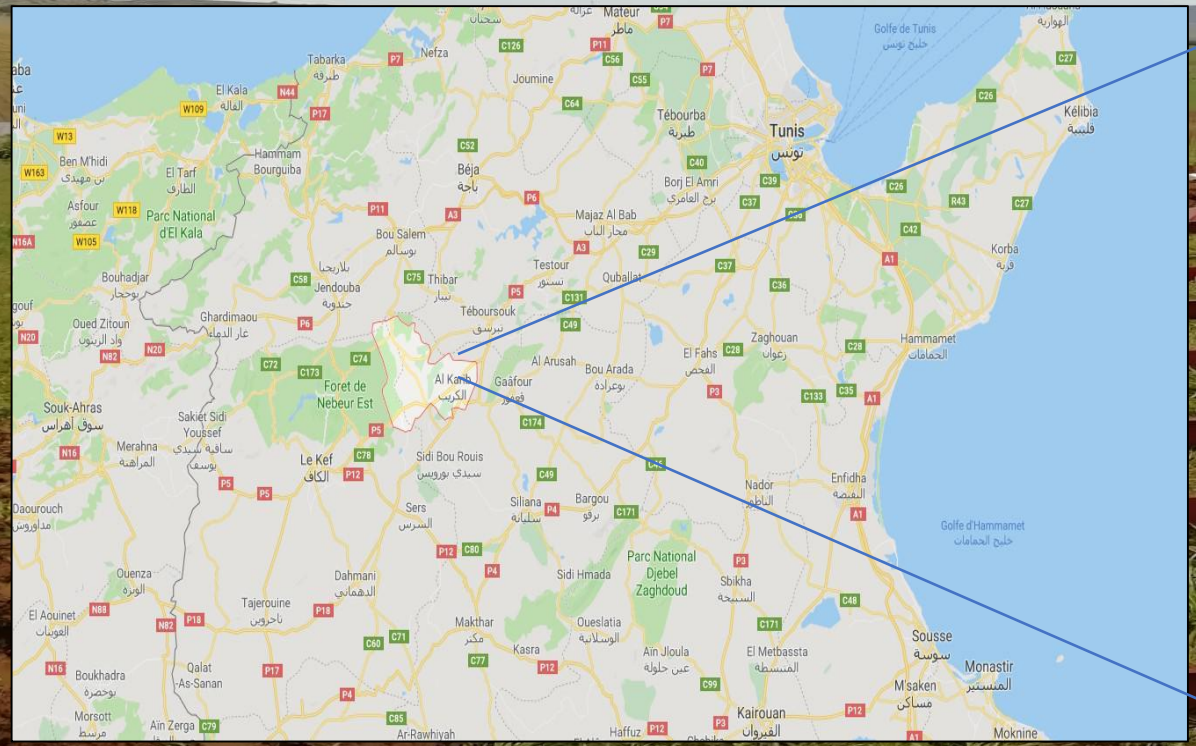




PLOTS	SLOPE (%)	RUNOFF (mm)	EROSION (kg/ha)
CLCA	13	71	68
CV	14	65	365

Erosion: Wischmeier Dispositive

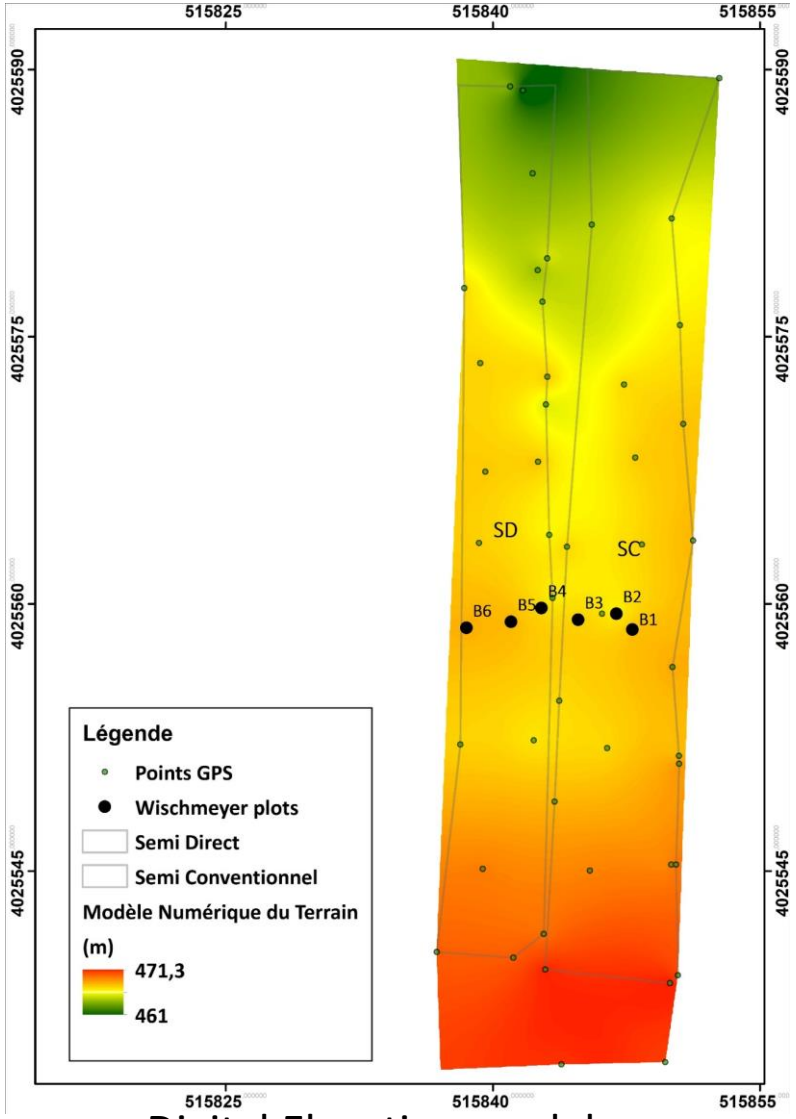
Estimate of soil erosion (CLCA vs CV): site Krib



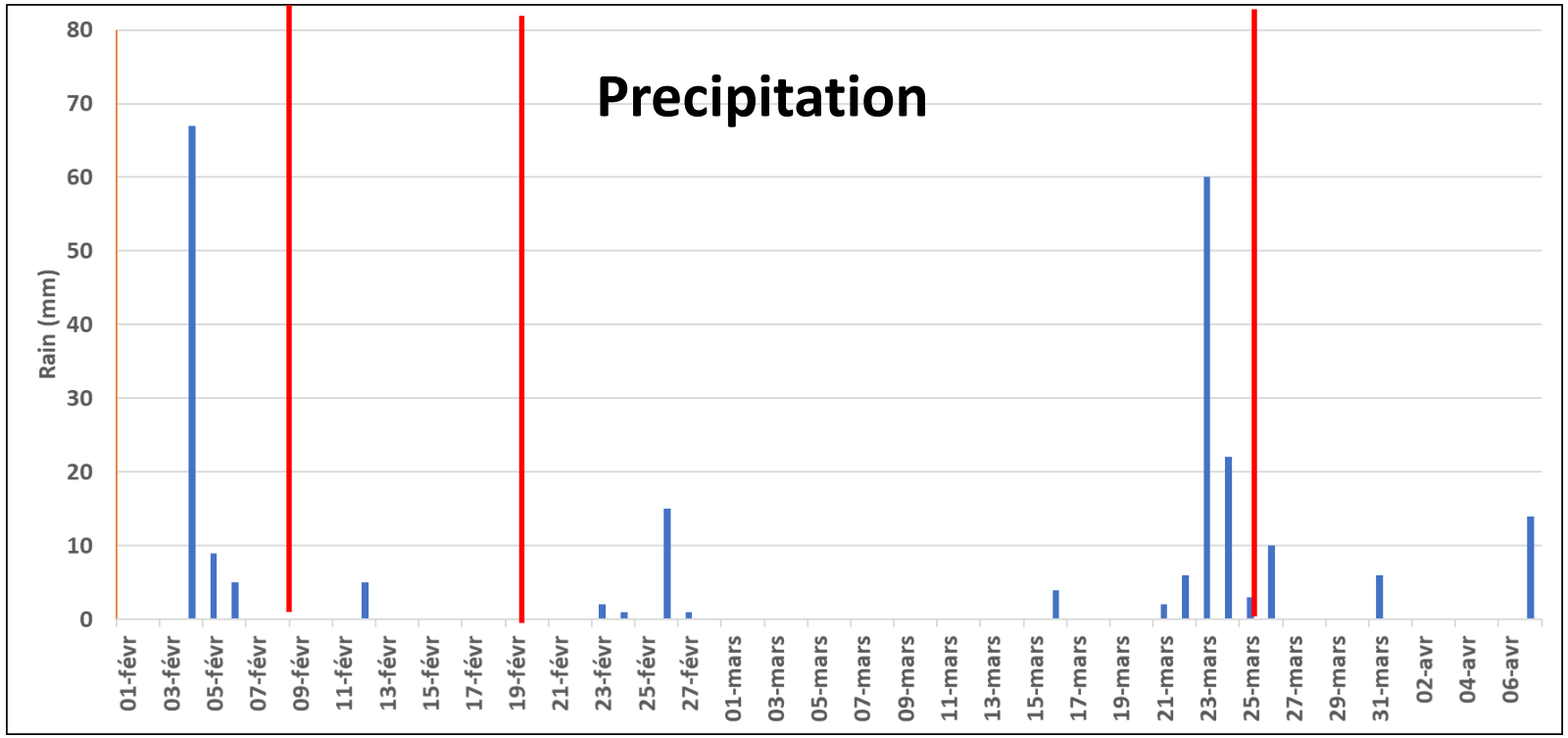
Erosion

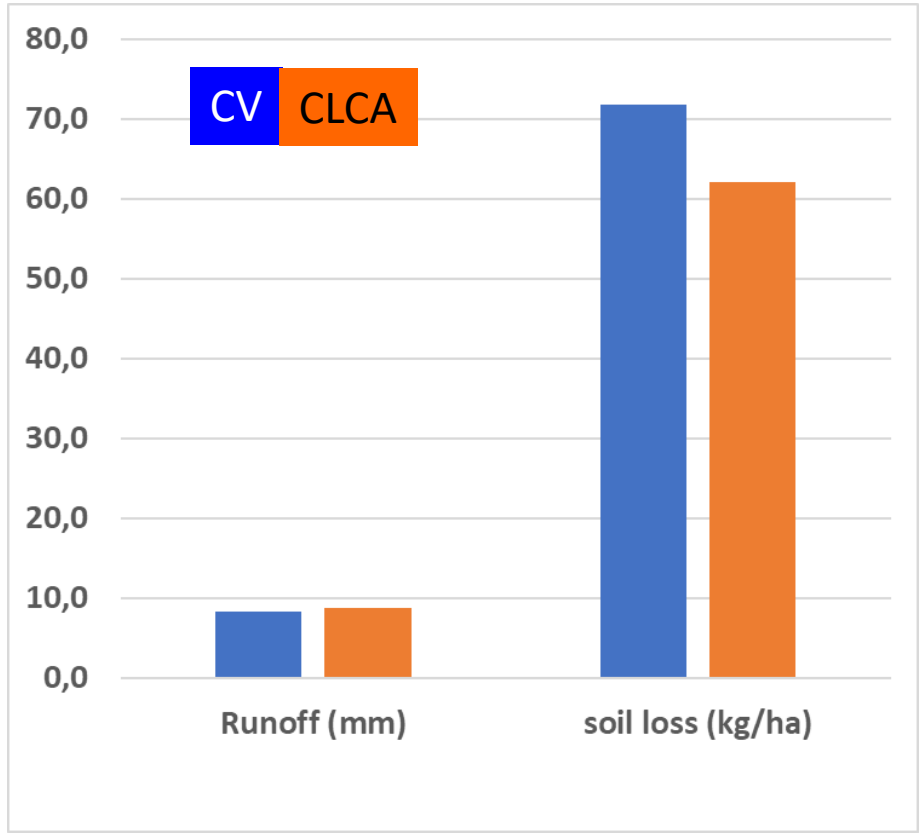
The Wischmeier dispostive are designed to collect rain water and sediments in the collectors (can B1 to B6).

Implementation of Wischmeier plots : 31 January 2019



Digital Elevation model


Precipitation
Rain (mm)
80
70
60
50
40
30
20
10
0
01-févr
03-févr
05-févr
07-févr
09-févr
11-févr
13-févr
15-févr
17-févr
19-févr
21-févr
23-févr
25-févr
27-févr
01-mars
03-mars
05-mars
07-mars
09-mars
11-mars
13-mars
15-mars
17-mars
19-mars
21-mars
23-mars
25-mars
27-mars
29-mars
31-mars
02-avr
04-avr
06-avr


80,0
70,0
60,0
50,0
40,0
30,0
20,0
10,0
0,0
CV
CLCA
Runoff (mm)
soil loss (kg/ha)

SETTINGS OF FIELD ACTIVITIES

On farm
(farmers implementing CACL)

-50% erosion on steep slopes

+3/5% SOM

+20% WUE

Farm scale

Chournia
2 paired plots (CLCA/Control)

Soil surface (erodibility, runoff gen).

SOM + compl. properties

Soil water balance

El Krib
2 paired plots (CLCA/Control)

Wischmeier plots +

Soil surface (erodibility, runoff gen).

SOM + compl. properties

Soil water balance

Landscape scale

Baseline survey of (20) new CACL farms;
Second survey end of project

Soil surface (erodibility & runoff gen).

SOM + compl. properties

Soil water balance

SETTINGS OF FIELD ACTIVITIES, + station

-50% erosion on steep slopes

+3/5% SOM

+20% WUE in rainfed

-30% water use in irrigated in Algeria

On farm
(farmers implementing CACL)

Farm scale

Chournia

2 paired plots (CLCA/Control)

Soil surface (erodibility, runoff gen).

SOM + compl. properties

Soil water balance

El Krib

2 paired plots (CLCA/Control)

Wischmeier plots +

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Landscape scale

Baseline survey of (20) new CACL farms;
Second survey end of project

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Soil water balance

Experimental station
(filling research gaps; ongoing long-term trials)

To be explored:

Collaboration with long-term trial at El Kef station for SOM and WUE under controlled conditions (trials include rotations similar to those of CACL)

Thank you for your attention