



Camelina:
a Cash Cover Crop Enhancing
water and soil conservation
in MEDiterranean
dry-farming systems

2ª reunión del panel nacional

14 Septiembre 2021

Resultados de los ensayos (WP2).

Campaña 2020-2021



Horizon 2020
European Union Funding
for Research & Innovation

WP2. Agronomic trials on tailor-made 4CE-MED systems



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The general **objective** of WP2 is to define, optimize and test under real operational conditions locally tailor-made 4CE-MED solutions adopting camelina as a **cash cover crop** in 7 different PRIMA countries.

The specific objectives are the following:

- To identify camelina **varieties** able to perfectly fit the specific 4CE-MED systems designed for each country (**Task 2.1: CCE**)
- To locally adapt the **agronomic management** of the 4CE-MED systems to country-specific conditions (**Task 2.2: CRES**)
- To fine tune the double cropping systems adopting innovative **harvesting** strategies (**Task 2.3: INRAT**)
- To demonstrate the **positive impact** of the locally tailor-made 4CE-MED solutions on the overall sustainability of the Mediterranean cereal-based farming systems (**Task 2.4: UNIBO**)

Cropping schemes

MODEL A:

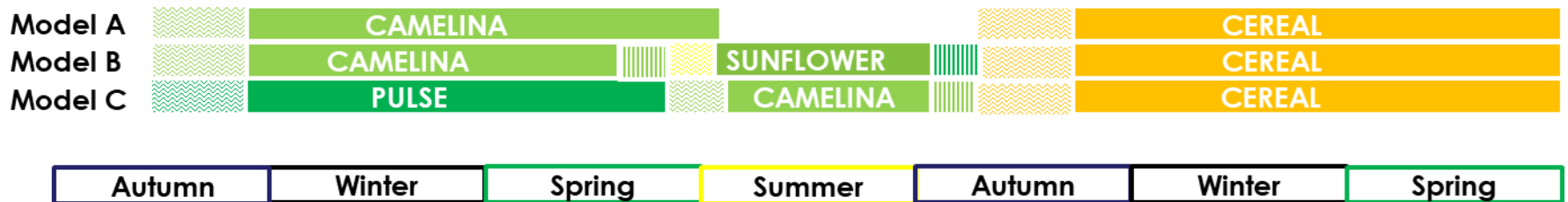
Camelina is introduced replacing fallow in winter cereal sole-cropping systems, in marginal areas with dry climate.



MODEL B:

Camelina is introduced as a double-crop in autumn to precede typical Mediterranean summer crops, e.g. sunflower, sorghum, etc., in milder climate with adequate precipitation during summer.

MODEL C:

Camelina is introduced as a double-crop in late spring/early summer in colder areas to follow winter pulses (e.g. pea) or cereals harvested as fodder.

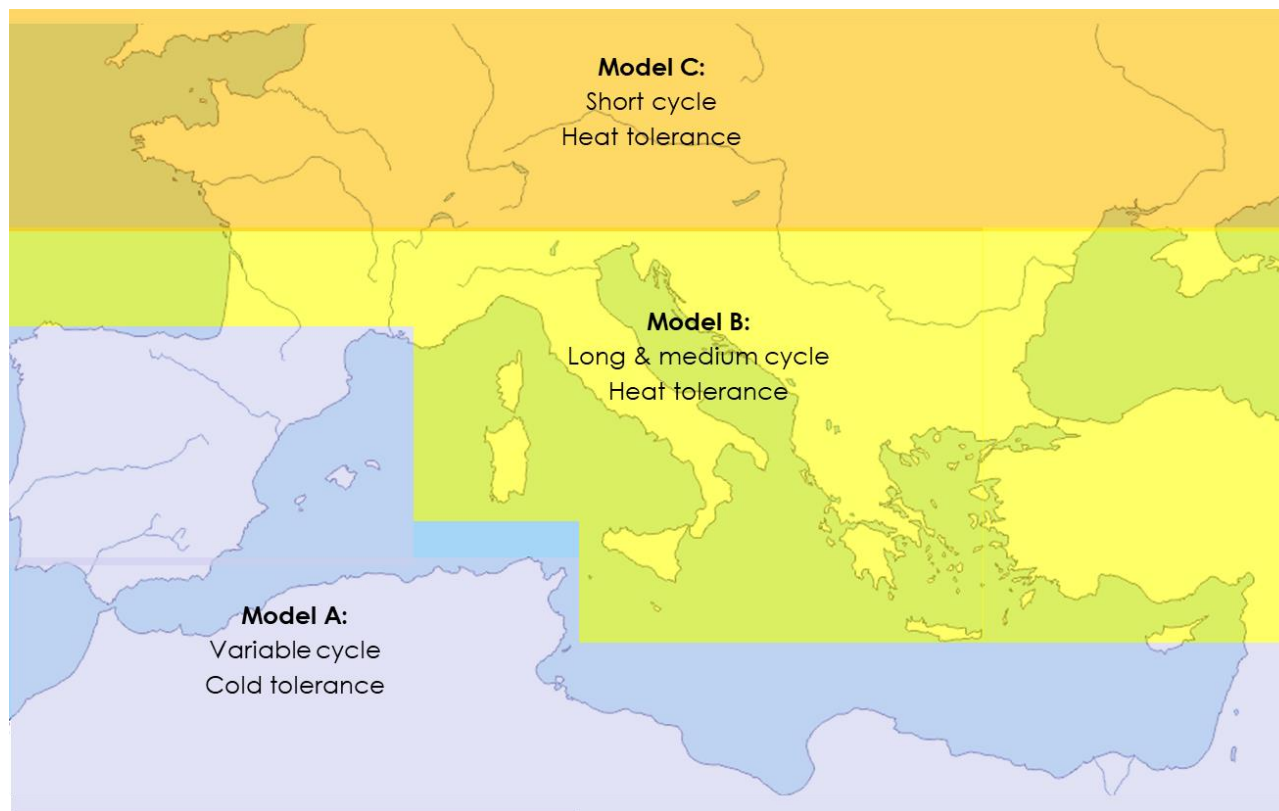


 Seeding
 Harvest or swathing

Task 2.1: Optimization of camelina variety choice (Leader: CCE)

Objective

The optimal variety choice is a key aspect for the development of camelina as a cash cover crop in the Mediterranean.



Task 2.1: Optimization of camelina variety choice



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Trials in Spain: Pictures

BBCH: 101-105 (21th Jan 2021)



BBCH: 105-109 (24th Feb 2021)



BBCH: 604-606 (20th April 2021)



BBCH: 807-808 (19th May 2021)

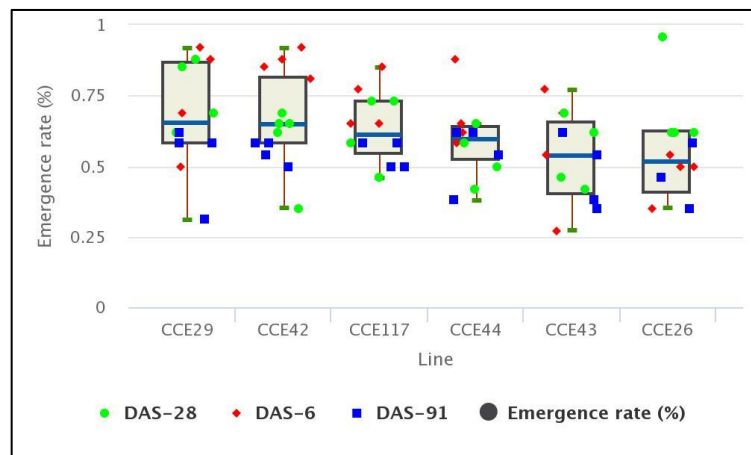
Task 2.1: Optimization of camelina variety choice



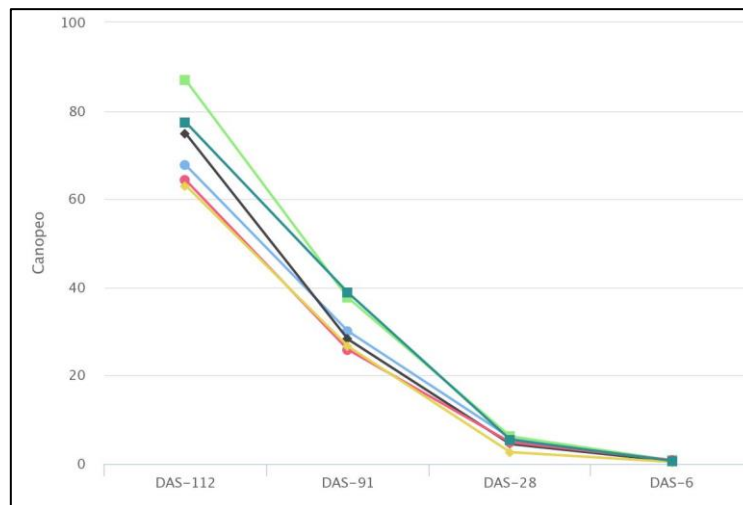
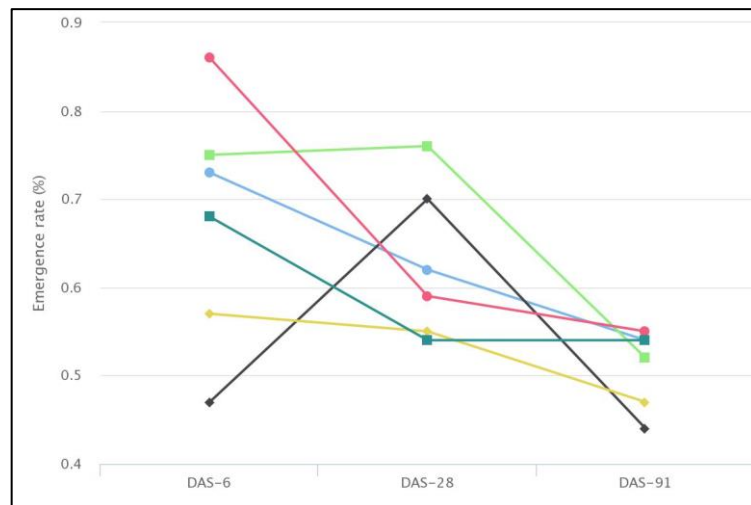
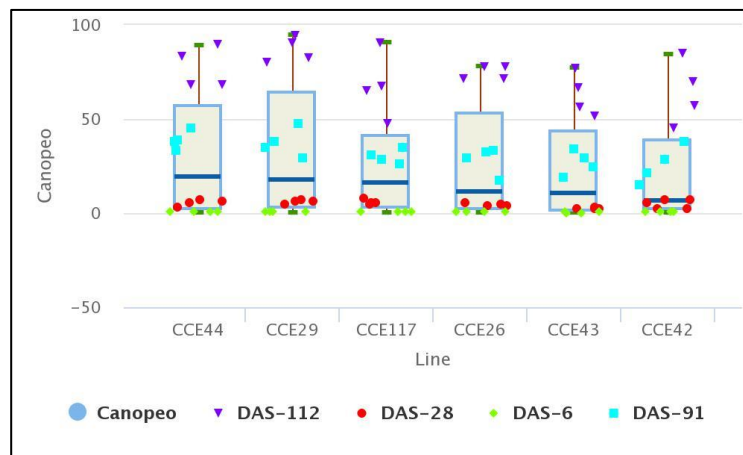
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Trials in Spain

Emergence rate (%)



Covered área (%)



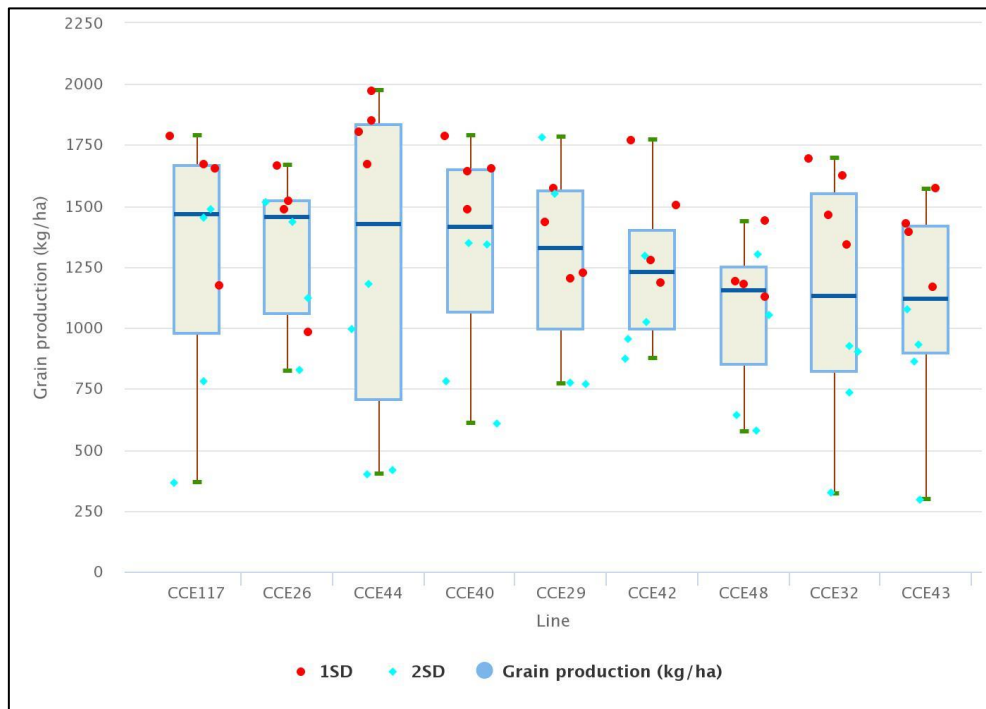
CCE117
CCE26
CCE29
CCE42
CCE43
CCE44

Task 2.1: Optimization of camelina variety choice



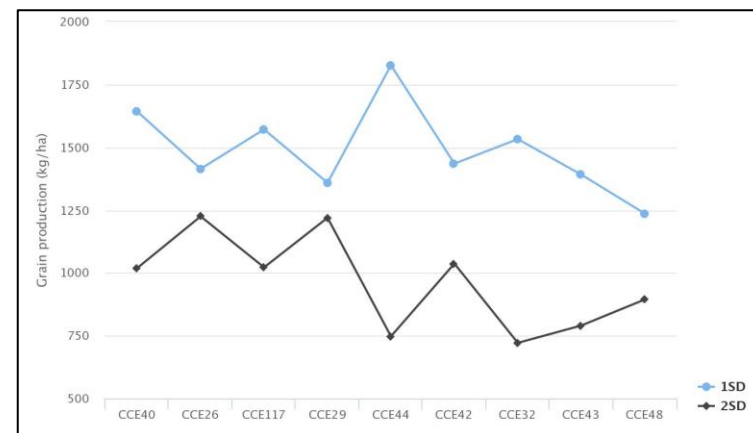
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Trials in Spain



Grain production (kg/ha)

- First sowing date > Second sowing date
- First sowing date: Long and winter varieties
- Second sowing dates: Short and spring varieties



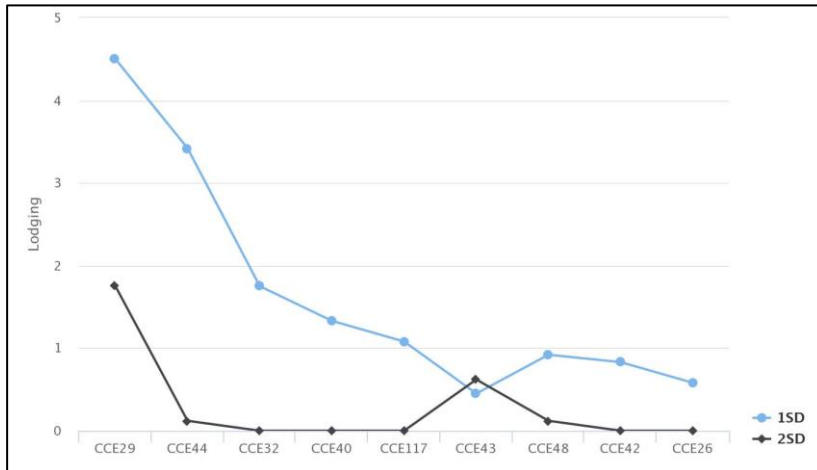
Task 2.1: Optimization of camelina variety choice



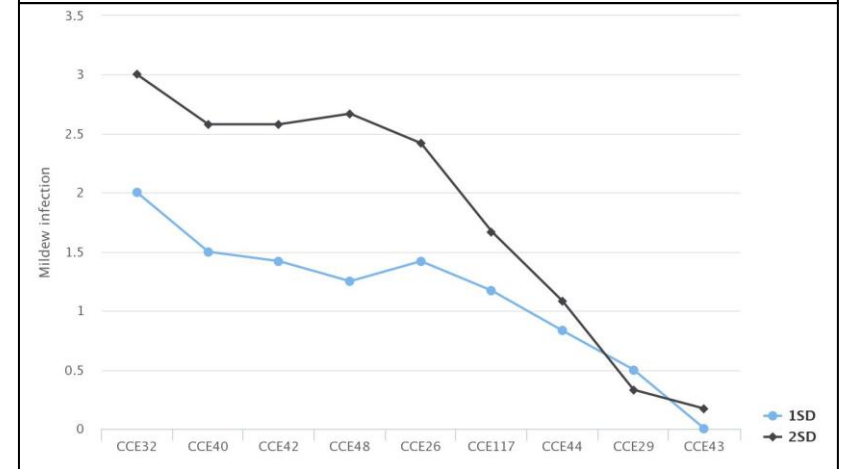
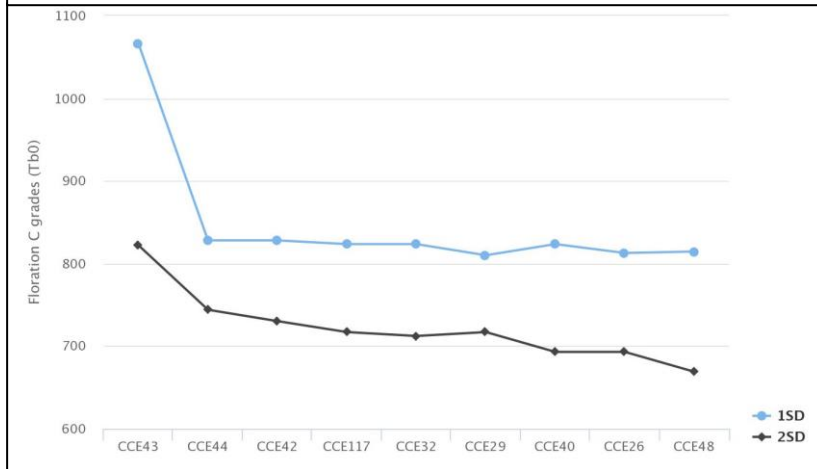
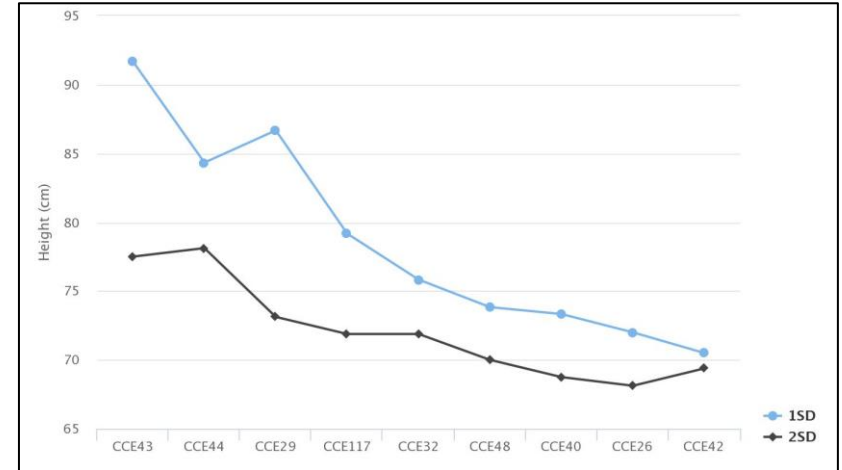
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Trials in Spain

Lodging



Height (cm)



Floration (°C)

Mildew infection

Task 2.2. Camelina sowing strategies for the locally adapted 4CE-MED systems



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Model A: Tunisia, Morocco, Algeria, Spain

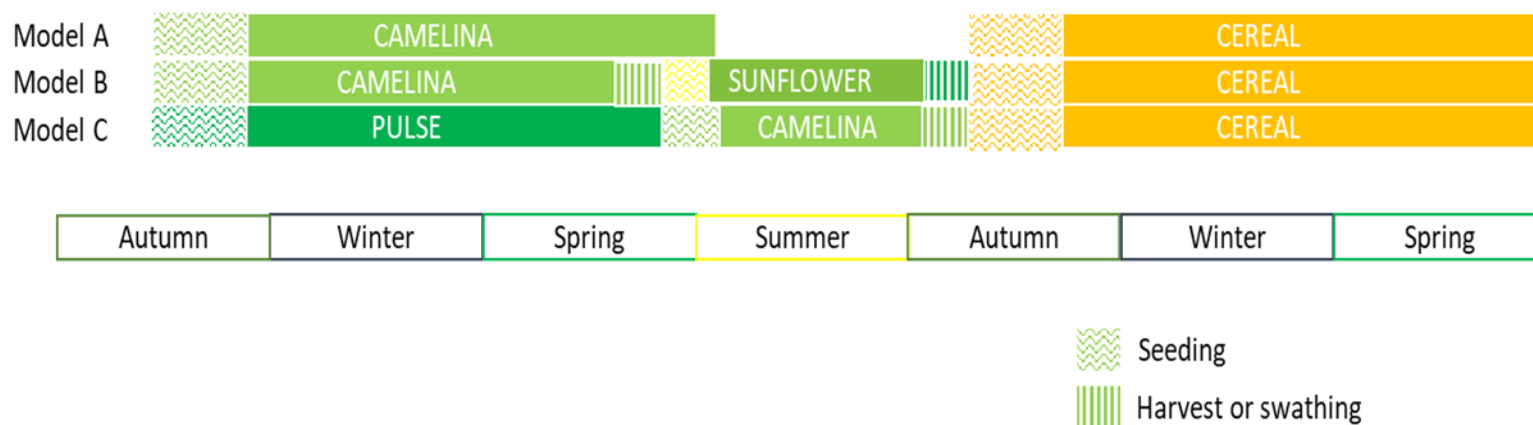
Camelina is introduced replacing fallow in winter cereal sole-cropping systems, in marginal areas with very dry climate.

Model B: Italy, Greece, Southern France

Camelina is introduced as a double-cropping in autumn to precede typical Mediterranean summer crops, e.g. sunflower, soybean, sorghum etc., in milder climate with adequate precipitation during summer.

Model C: Northern France

Camelina is introduced as a double-cropping in late spring/early summer in colder areas to follow winter pulses (e.g. pea) or cereals harvested as fodder.



Task 2.2. Camelina sowing strategies for the locally adapted 4CE-MED systems



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Larger plots size: > 10 m² (each partner will customize the size depending on local conditions)

Within each cropping system: A, B, C, the studied factor will be:

- a) **Tillage system**: sod seeding vs. minimum tillage,
- b) **Sowing date**: early vs. late (for each selected cropping system)
- c) **Seeding rate**: high (about 800 seeds/m² broadcast) vs. low (about 600 seeds/m² row seeding)

In all trials one camelina cultivar will be used provided by CCE (ALBA)

2 locations for each partner

- **Fertilization**: N only as top dressing at rosette stage at 50-60 kg/ha as urea.
- **Preceding crop**: if possible winter cereal

Task 2.2. Camelina sowing strategies for the locally adapted 4CE-MED systems



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Trials in Spain: Pictures



Location: Entresieras (Ciudad Real)



Location: El Encín (Madrid)

Task 2.2. Camelina sowing strategies for the locally adapted 4CE-MED systems



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Broadcast sowing
On No-Tilling

Rows sowing
On No-Tilling

Task 2.2. Camelina sowing strategies for the locally adapted 4CE-MED systems



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Trials in Spain: Pictures



BBCH: 604-606 (Full flowering)

BBCH: 806-808 (Maturity)



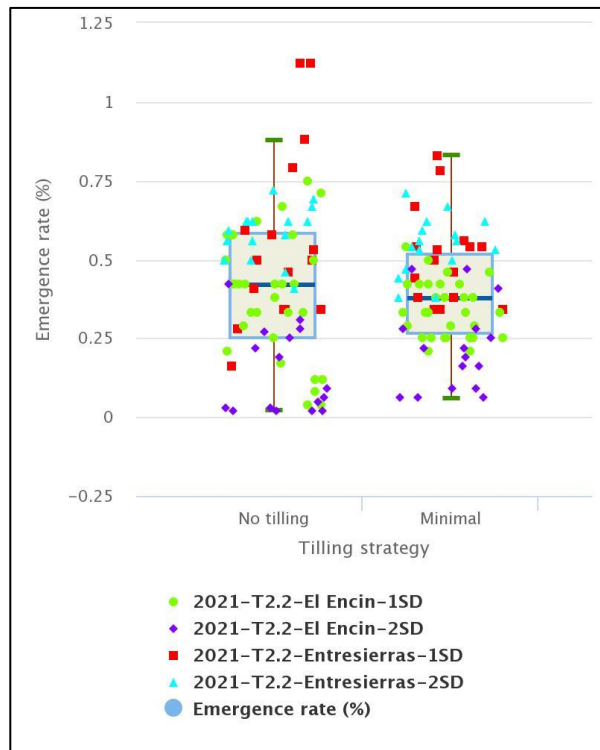
Task 2.2. Camelina sowing strategies for the locally adapted 4CE-MED systems



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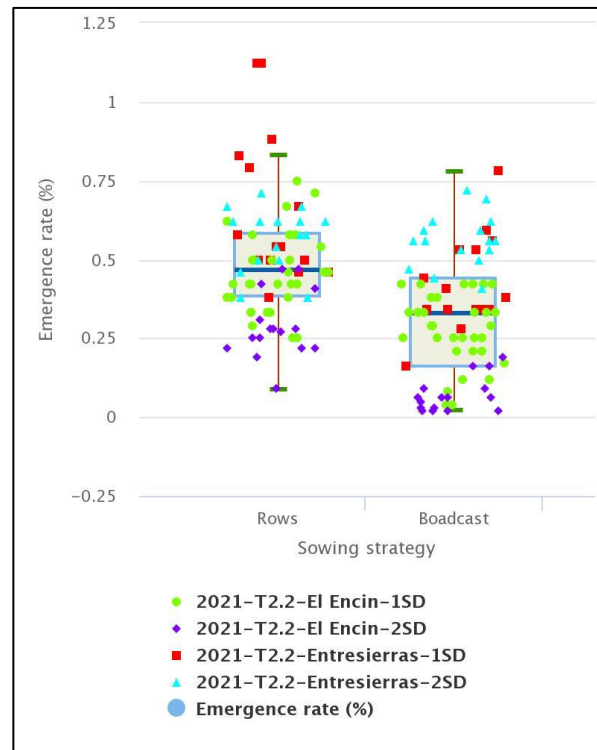
Trials in Spain: Emergence rate

Tilling strategy



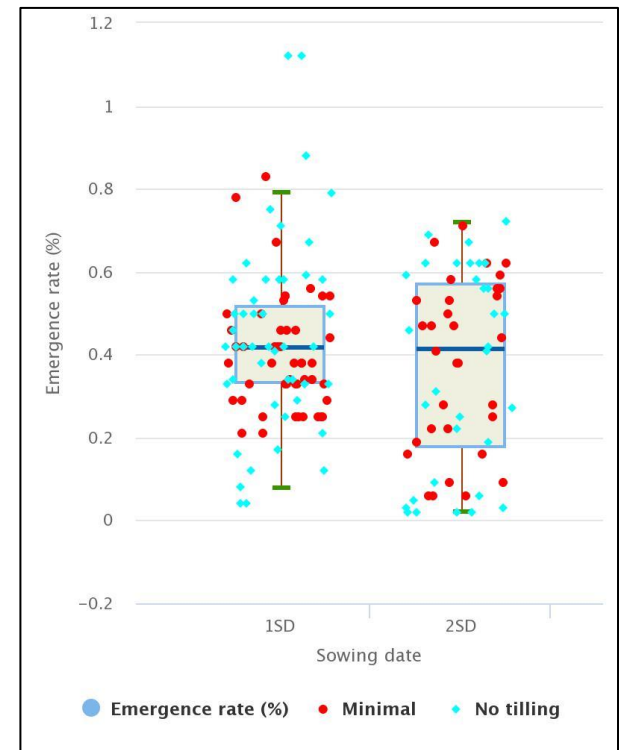
No significant differences

Sowing strategy



Rows sowing > Broadcast sowing

Sowing date



No significant differences

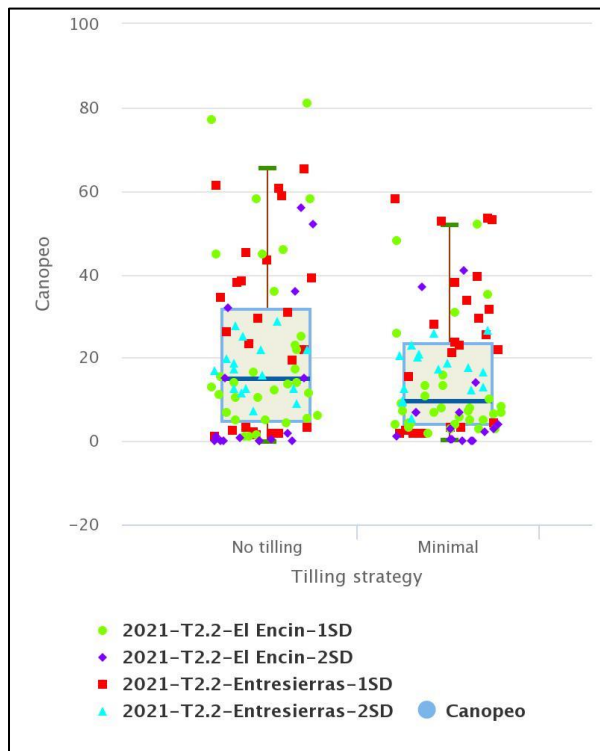
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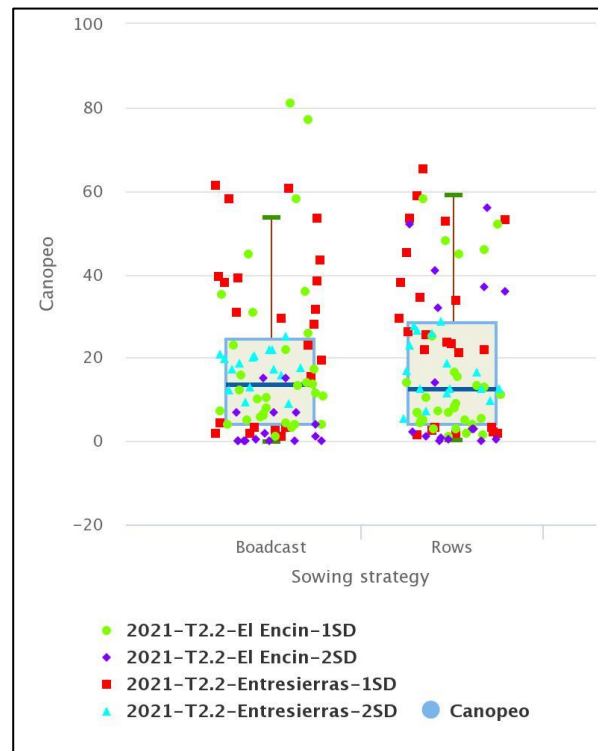
Trials in Spain: Covered area (Canopeo)

Tilling strategy



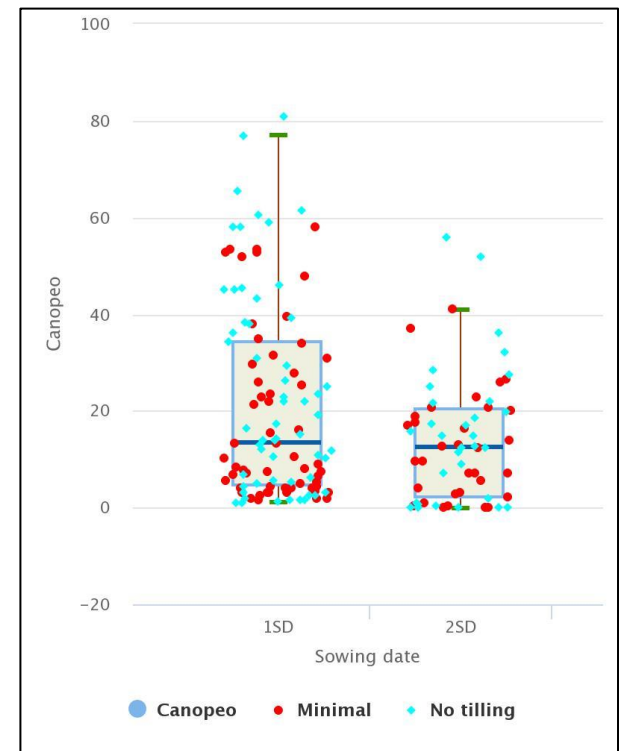
No tilling > Minimal tilling

Sowing strategy



No significant differences

Sowing date



*1st sowing date > 2nd sowing date
(BBCH: 105-109)*

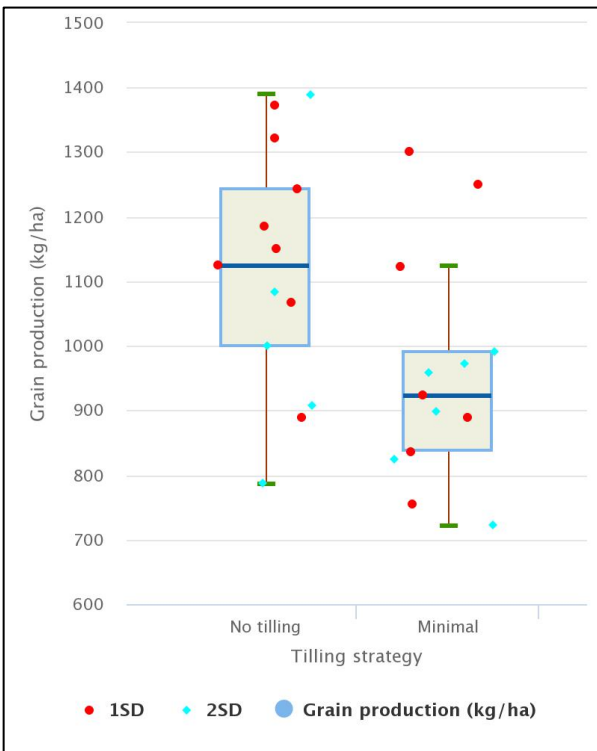
Task 2.2. Camelina sowing strategies for the locally adapted 4CE-MED systems



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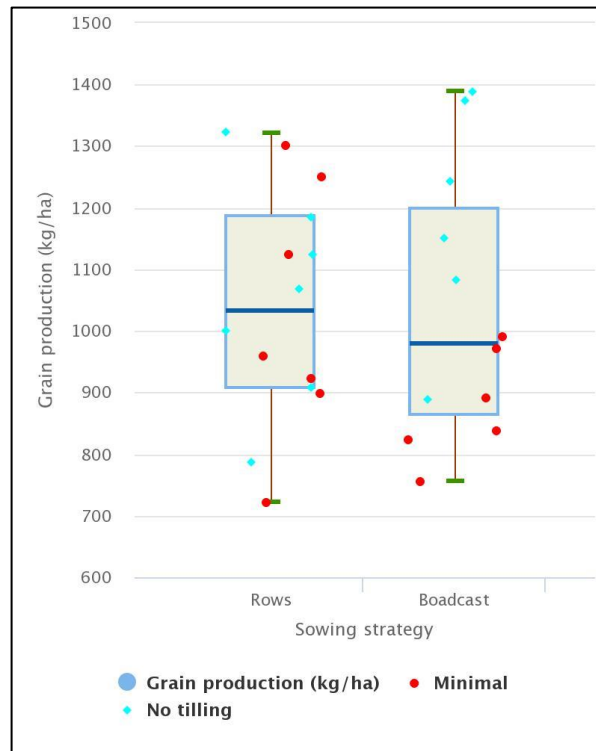
Trials in Spain: Grain production

Tilling strategy



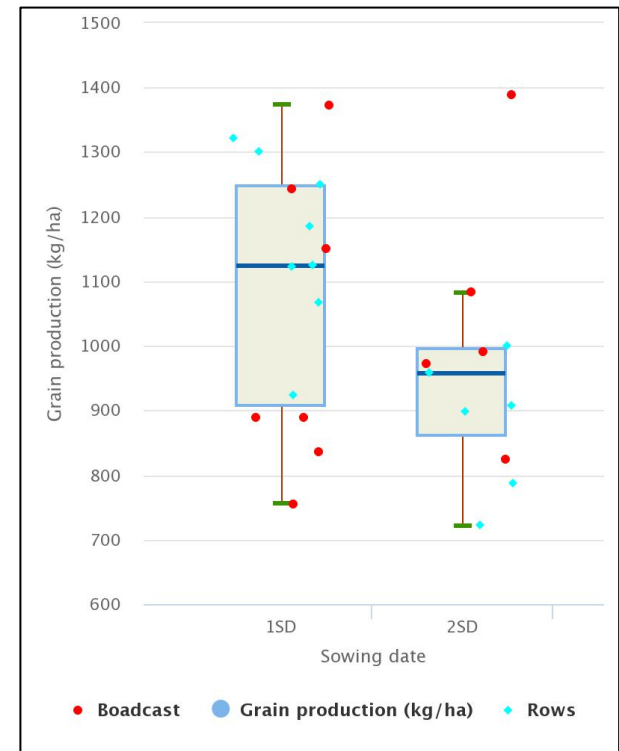
No tilling > Minimal tilling

Sowing strategy



No significant differences

Sowing date



1st sowing date > 2nd sowing date

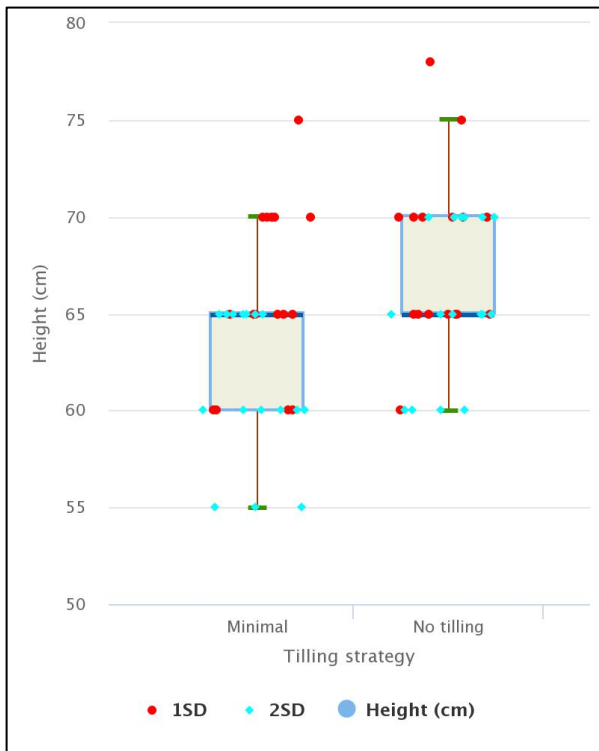
Task 2.2. Camelina sowing strategies for the locally adapted 4CE-MED systems



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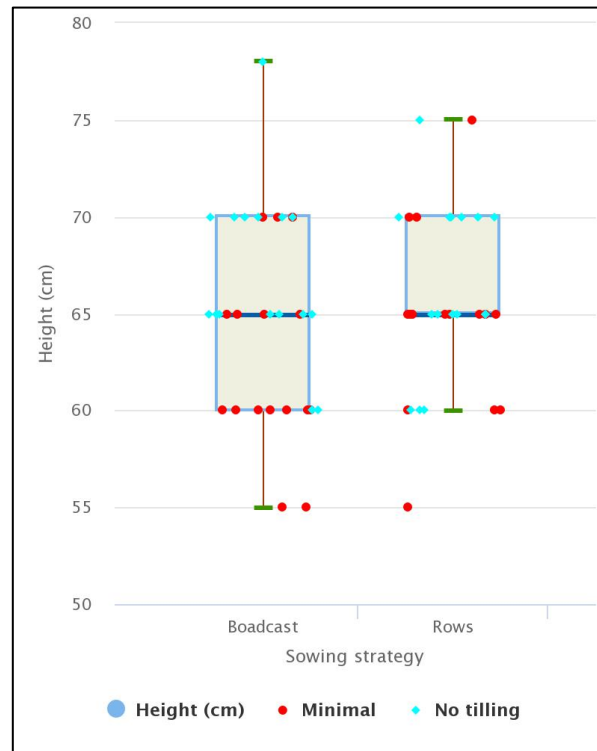
Trials in Spain: Height

Tilling strategy



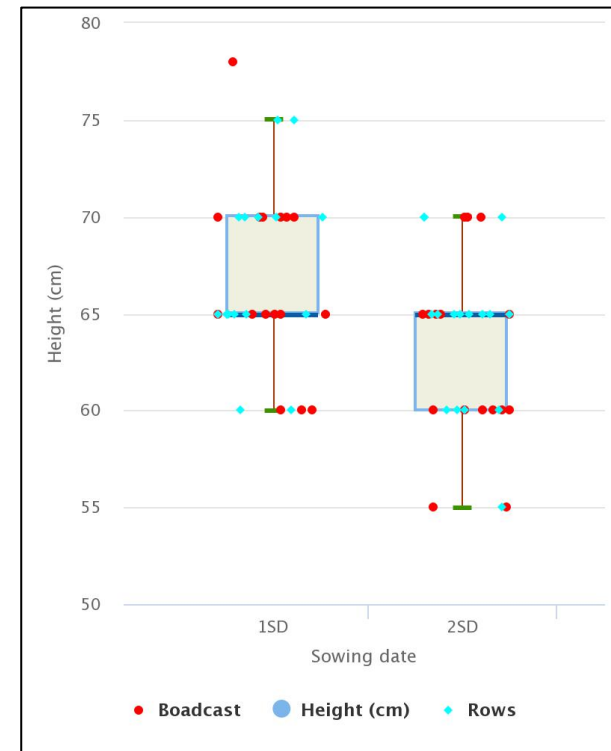
No tilling > Minimal tilling

Sowing strategy



No significant differences

Sowing date



*1st sowing date > 2nd sowing date
(BBCH: 105-109)*

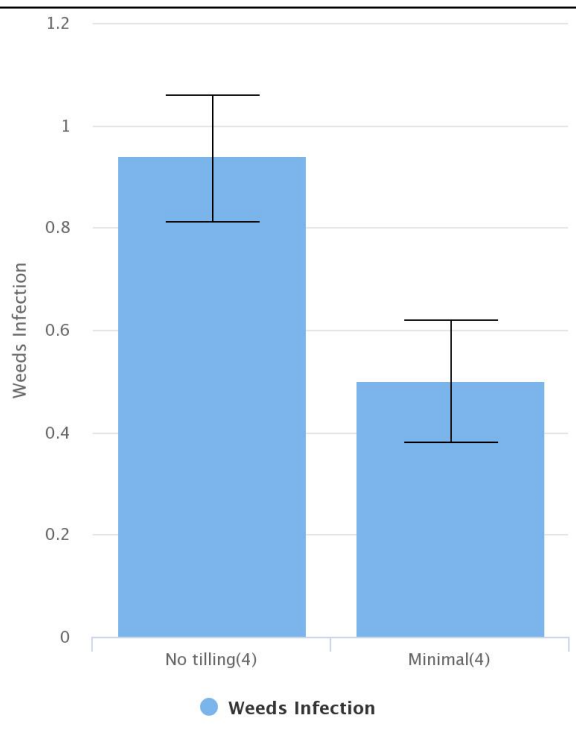
Task 2.2. Camelina sowing strategies for the locally adapted 4CE-MED systems



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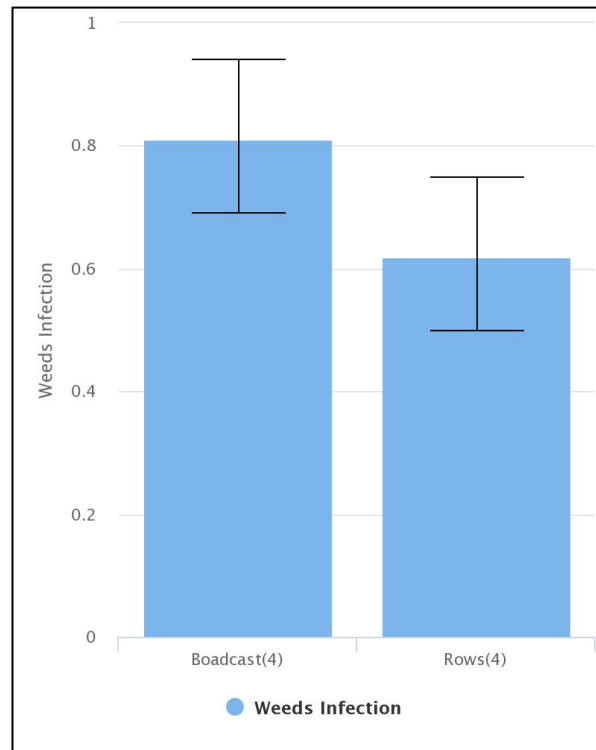
Trials in Spain: Weeds infection

Tilling strategy



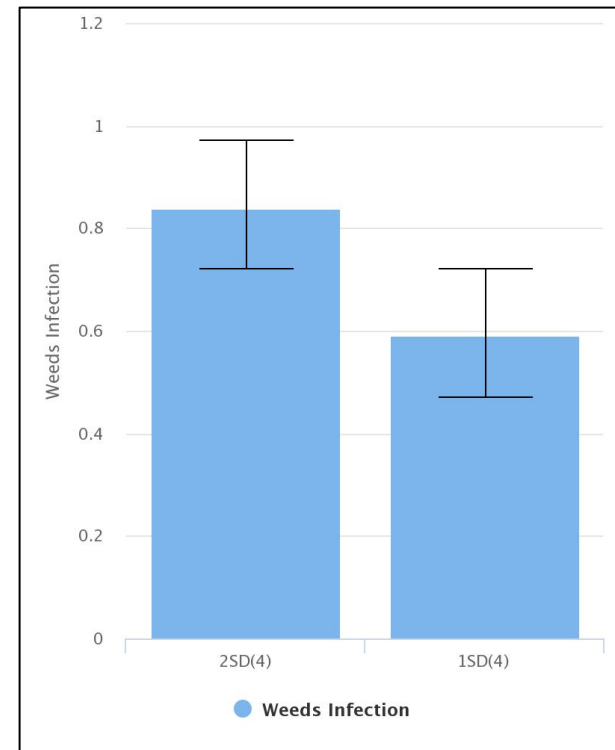
No tilling > Minimal tilling

Sowing strategy



Broadcast > Rows

Sowing date



2nd sowing date > 1st sowing date

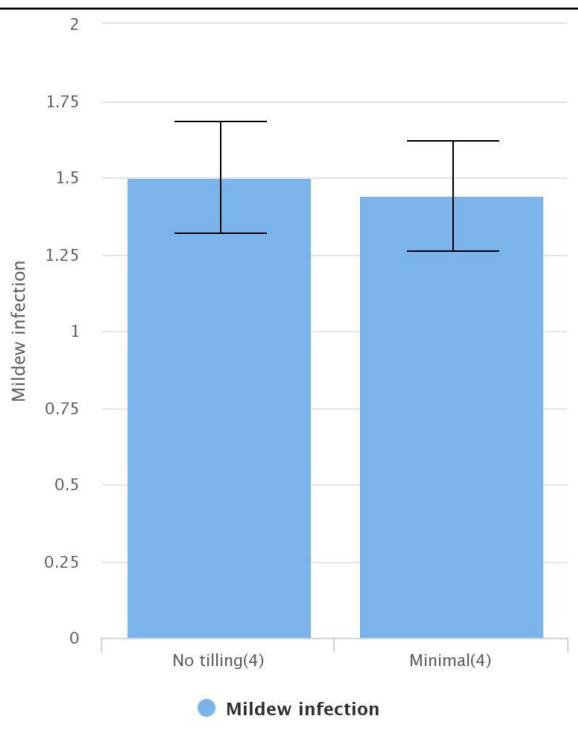
Task 2.2. Camelina sowing strategies for the locally adapted 4CE-MED systems



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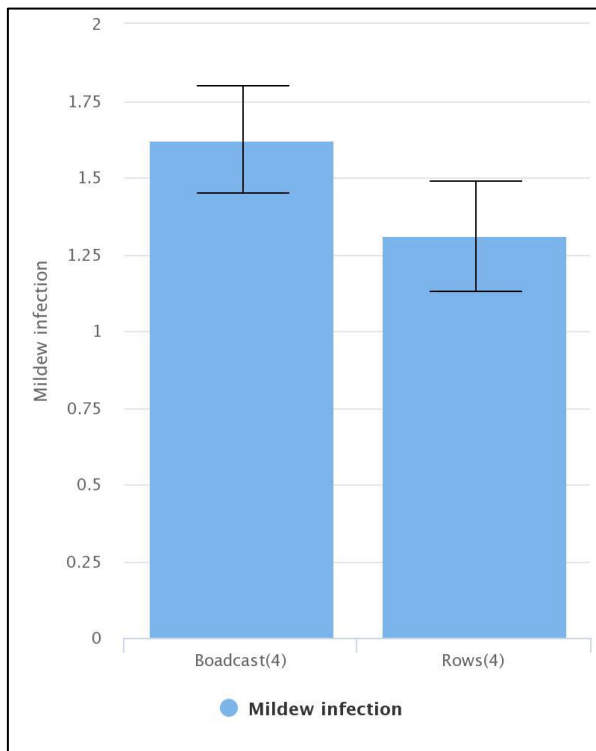
Trials in Spain: Mildew infection

Tilling strategy



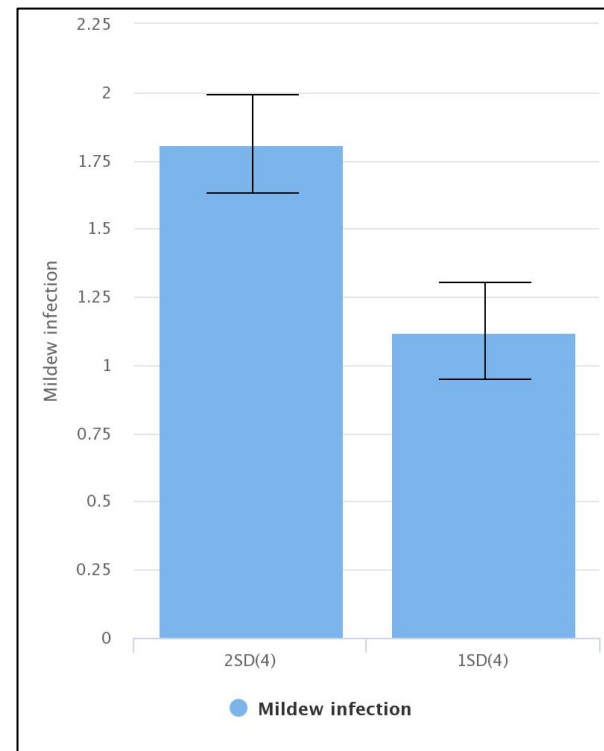
No significant differences

Sowing strategy



Broadcast > Rows

Sowing date



2nd sowing date > 1st sowing date

T2.3 Identification of the optimal harvesting methods for the demo-field trials

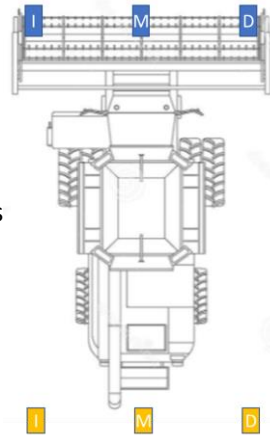
1.1 Procedure

Measuring losses at the cutter bar

- No reel rpm adjustment option : 1 treatment
- Reel position at 40 cm from the ground
- 3 repetitions with 3 trays each = 9 measurements

Measuring losses at the rear of the combine

- 3 air rpm settings: 800, 950 and 1100 (3 treatments)
- 3 replicates with 3 trays each in each treatment.



1.2 Characteristics of the plot

Harvest date: 21 July 2021

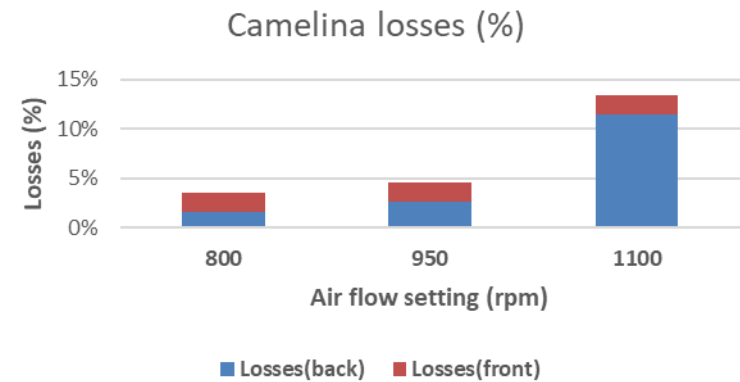
Location: Finca El Encín (Alcalá de Henares)

Variety: CCE32

Area : 0.64 ha

Yield : 1.4 T/ha

1.3 Preliminary results



This study has corroborated the importance of the air flow setting during the harvest.

Thank you for your attention





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4CE MED

WATER AND SOIL CONSERVATION

4CE-MED PARTNERS

