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THIRD AFRICA CONGRESS ON
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5-8 June 2023 | Rabat, Morocco



المعهد الوطني للبحث الزراعي
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Institut National de la Recherche Agronomique

Sustainable Weed Management in No-Till Chickpea and Lentil Farming under Morocco's Semi-Arid Regions

By: Hirich El Hocine, EL gherass
Oussama, Idrissi Omar, Bamouh Ahmed ,
Cicek Harun,

Theme:

Building a Resilient Future in Africa
through Conservation Agriculture and Sustainable
Mechanization



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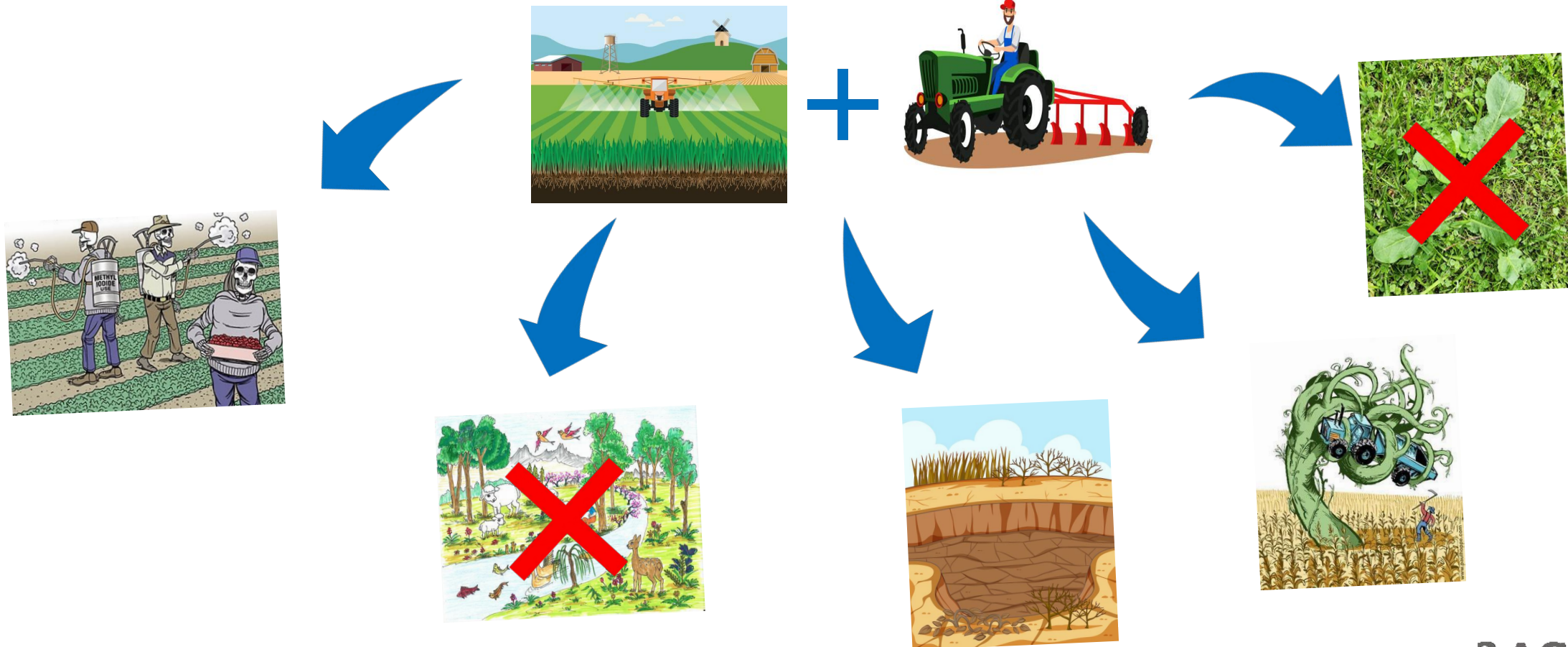


Bronze Sponsor



Introduction

Conventional agriculture



Introduction

Conservation Agriculture

Conservation Agriculture (CA) is a farming system that can prevent losses of arable land while regenerating degraded lands (FAO, 2016)



Introduction

Conservation Agriculture (CA) Adoption in Morocco

- The New Generation Green 2020-2030 strategy is a visionary initiative by the Moroccan government to promote sustainable agricultural practices and ensure food security (MAMP, 2021).
- One key aspect of this strategy is the adoption of no-till farming on a massive scale (1 million hectares of agricultural land) (MAMP, 2021).
- INRA has examined crop rotation systems of cereals, legumes, and forage crops under CA across INRA's research sites and farmers' fields in Morocco over a long and productive partnership (INRA, 2021).



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Introduction

Weed Management in conservation agriculture

Reduces weed seed bank

Diversifies control strategies

Reduces seed germination and viability

Alters growing conditions

Breaks weed life cycles

Promotes competitive crops

Improves soil health

Introduction

Weed Challenges in Moroccan Pulse Production

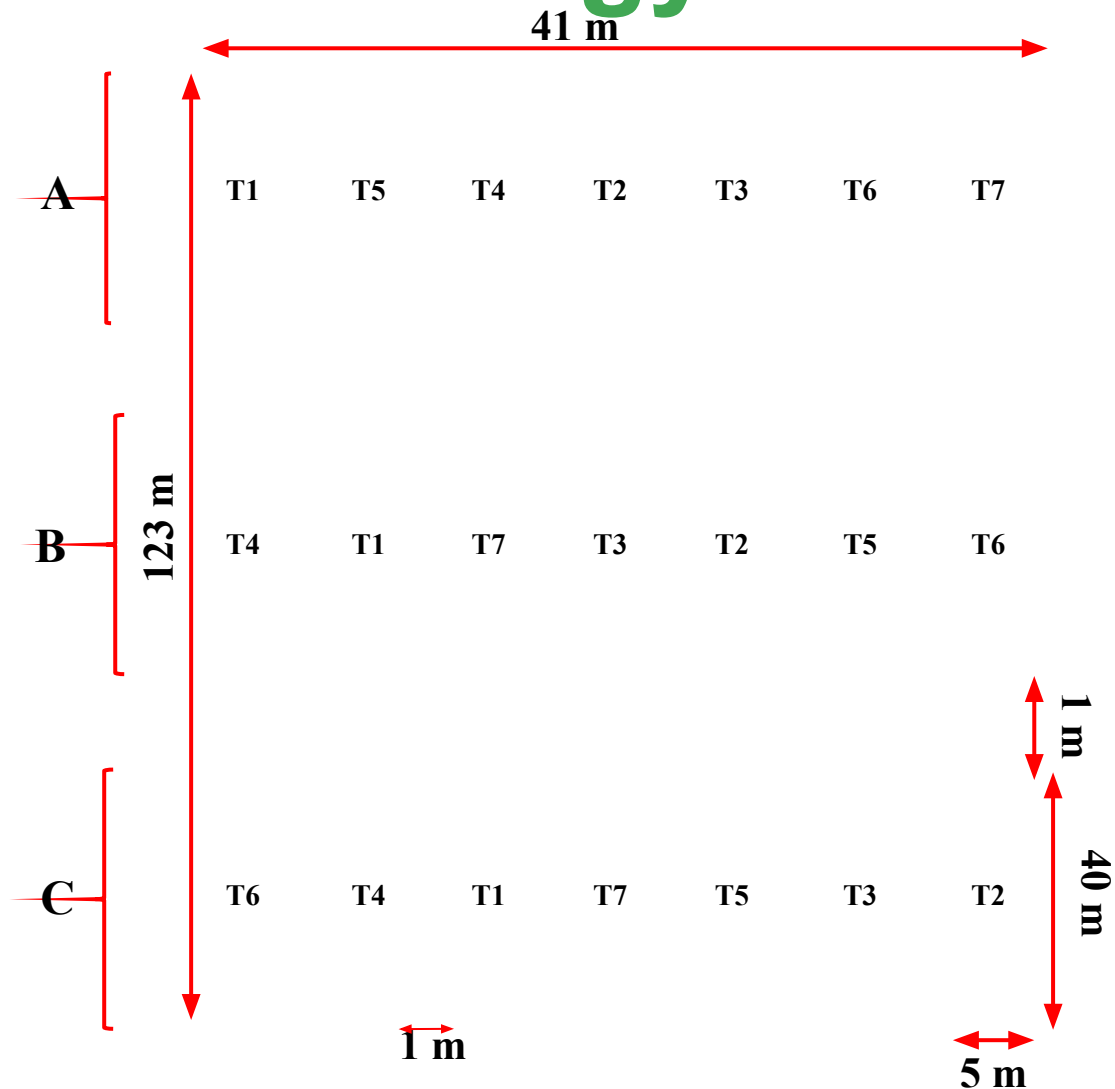
- Weeds are a major problem in Moroccan pulse crops, competing for resources and significantly reducing yield and quality
- The limited workforce and its high cost
- The lack of registered herbicides
- Limited weed management options
- Herbicide resistance

Study Objective



The evaluation of the efficacy of various weed management methods in no-till lentil and chickpea crops under arid and semi-arid conditions of Morocco.

Methodology



T1 : Manual weeding

T2 : Mechanical weeding (2x the hoe)

T3 : Chemical weeding (Pre-emergence : Acifluorfen)

T4 : Mechanical weeding (1x the hoe)

T5 : Control

T6 : Chemical weeding (Pre-emergence : Pendimethalin)

**T7 : Chemical weeding (Post-emergence : pyridate +
Haloxifop-R Methyl Ester)**

Results

Weed identification

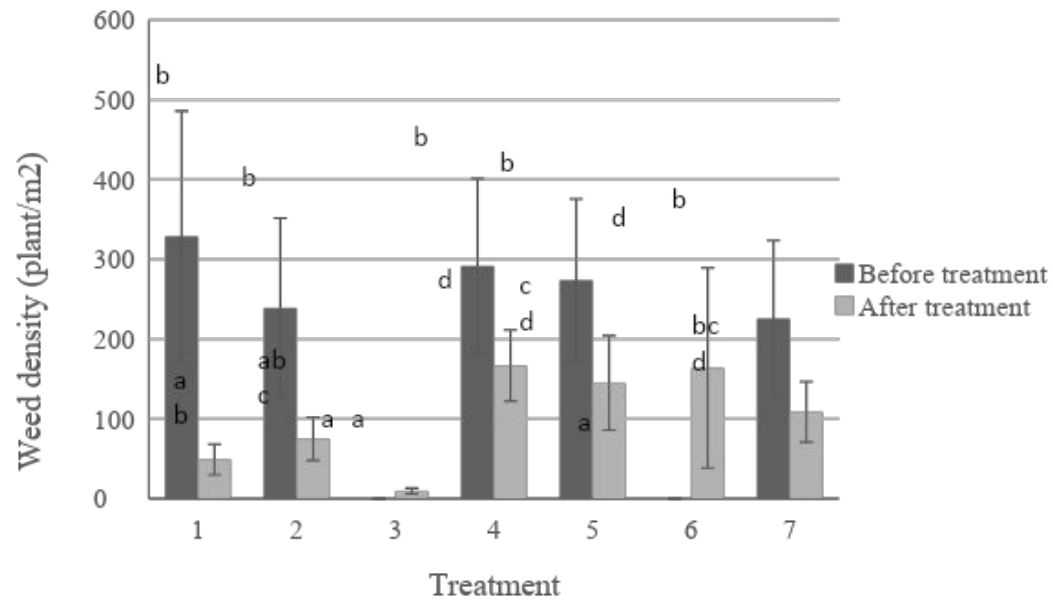
- Weeds from both crops were relatively diverse, with a total of 32 species belonging to 18 botanical families.
- six families contributed two-thirds of the overall species number : Asteraceae (26%), Poaceae (13%), Brassicaceae (10%), Papaveraceae (6%), Apiaceae (6%) and Chenopodiaceae (6%).
- In both lentil and chickpea crops, there was a severe infestation of several weed species, namely *Centaurea diluta*, *Diploaxis catholica*, *Lolium rigidum*, *Beta macrocarpa*, *Sinapsis alba*, and *Papaver rhoeas*



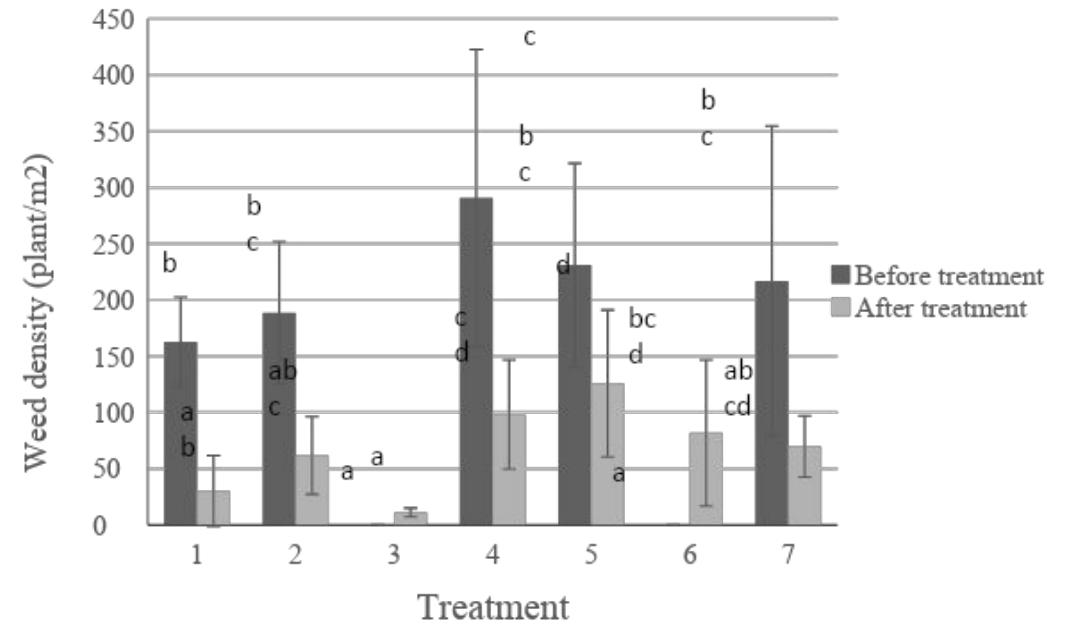
Results

Weed Density

Lentil



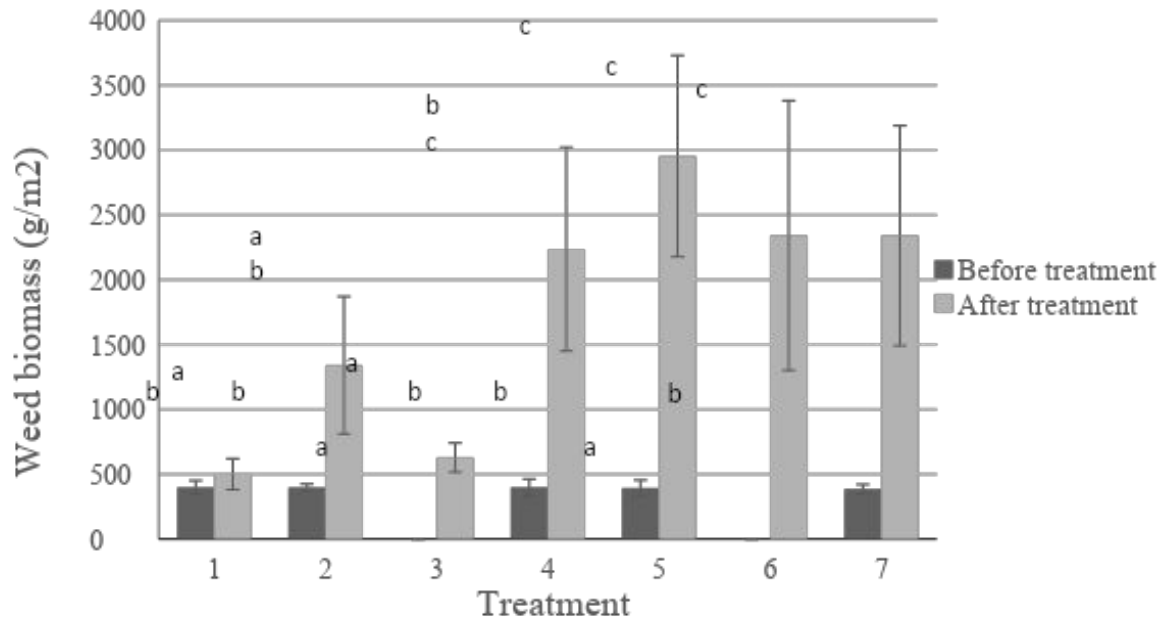
Chickpea



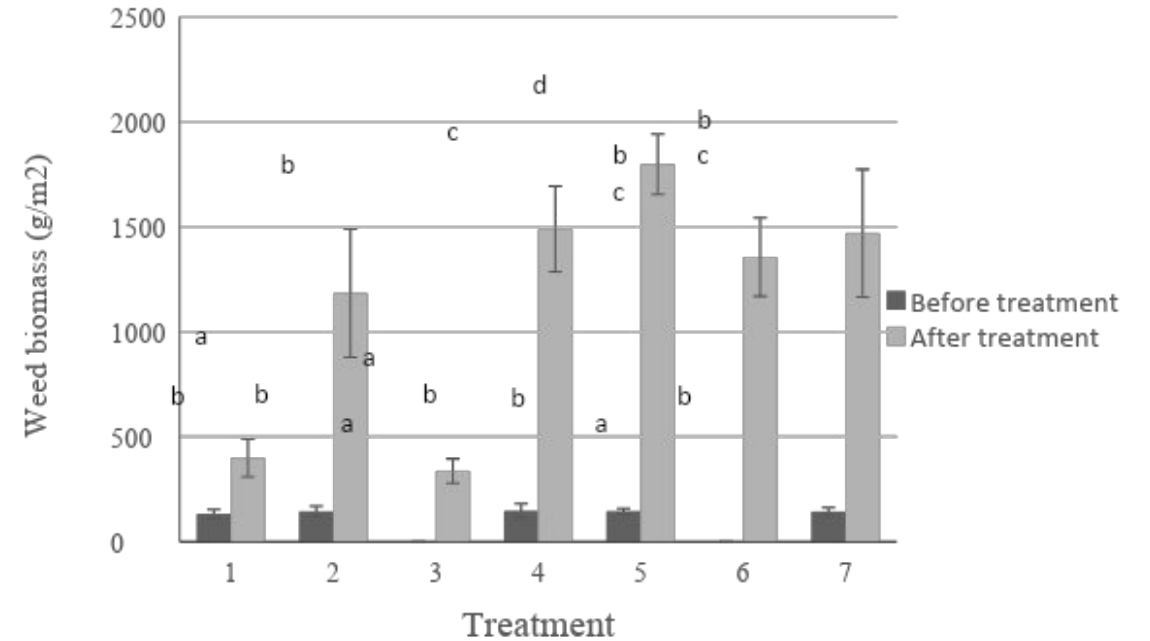
Results

Weed Biomass

Lentil



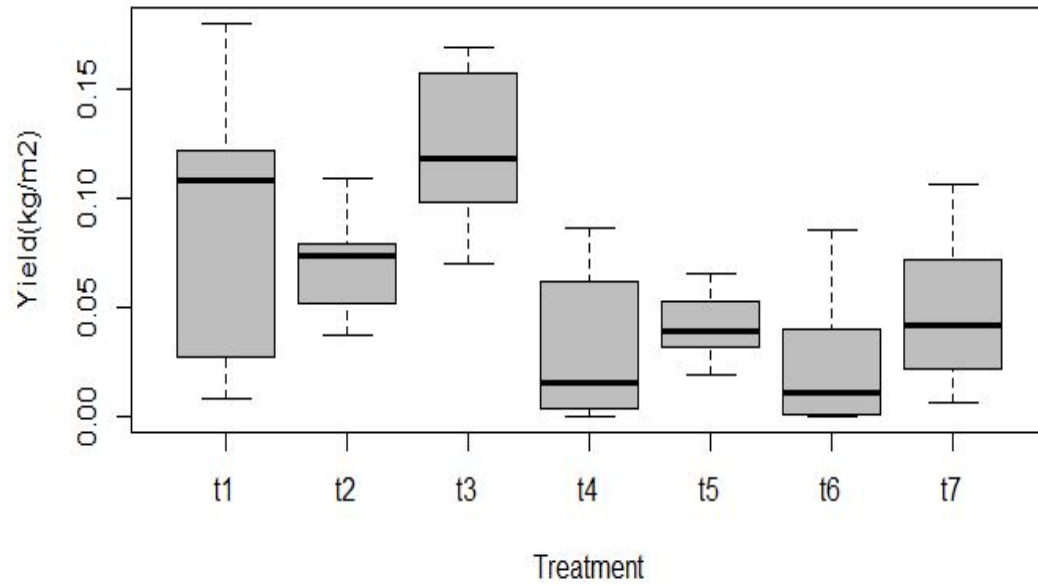
Chickpea



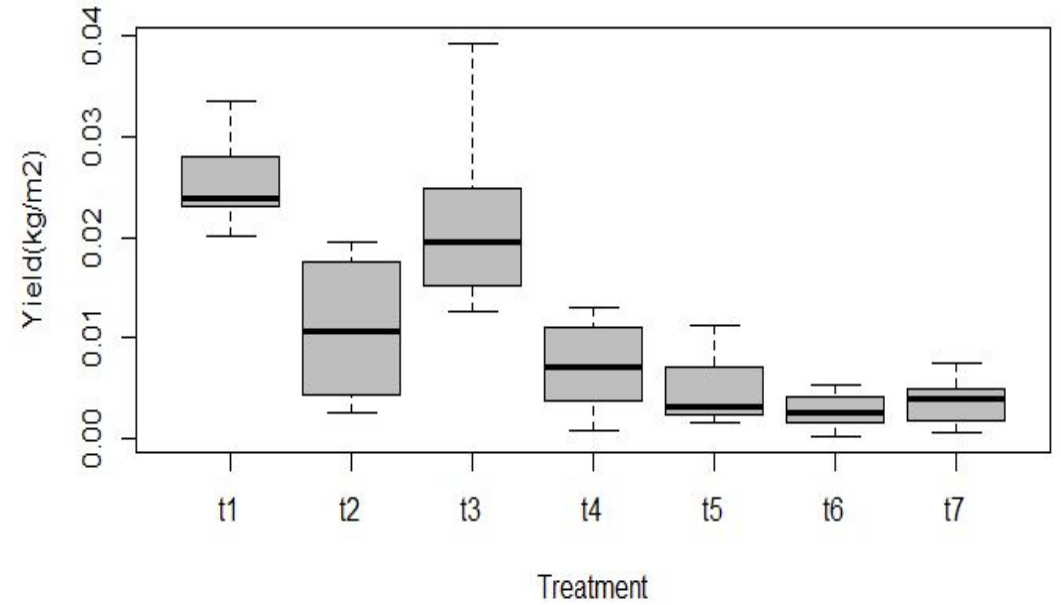
Results

Crops Yield

Lentil



Chickpea



Results



Conclusion

- 1** The lentil and chickpea crops are infested with various weed species, including *Centaurea diluta*, *Diploaxis catholica*, *Lolium rigidum*, Big-fruited Bette, *Sinapsis alba*, and *Papaver rhoeas*. These weeds pose a significant challenge to the growth and productivity of both crops.
- 2** The pre-emergence herbicide containing aclonifine showed the highest efficacy in weed control, comparable to hand weeding.
- 3** The herbicide containing aclonifine could be applied after germination until the stage of two true leaves, offering flexibility in timing the treatment. While a brief recovery period for the plants was observed after herbicide application

Acknowledgments and References

Acknowledgments

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3ACCA Secretariat
African Conservation Tillage Network
P.O Box 10375, 00100 Nairobi, Kenya.
KALRO - KABETE, Waiyaki Way.
Website: <https://africacacongress.org>
Email: cacongress@act-africa.org

