Efficacy of the Wheel Track Roller® to reduce runoff and erosion from in potato fields

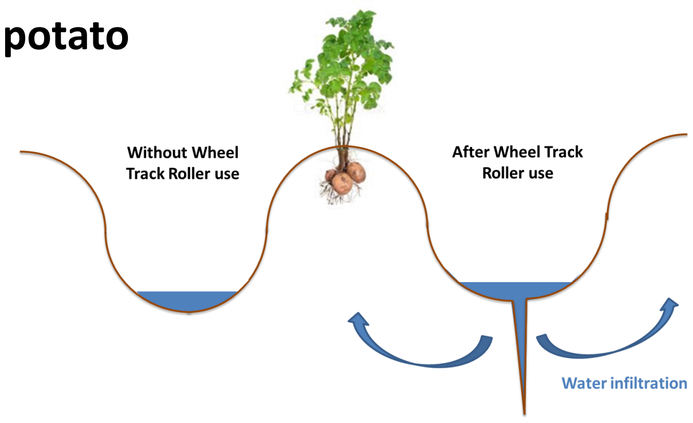
1. Introduction

The Wheel Track Roller® (WTR®) was invented by an English farmer interested in reducing soil erosion due to water runoff and increase water efficiency. This project investigated the WTR® in two potato fields characterised by different soil characteristics in order to establish its efficacy in terms of erosion mitigation and water use efficiency.

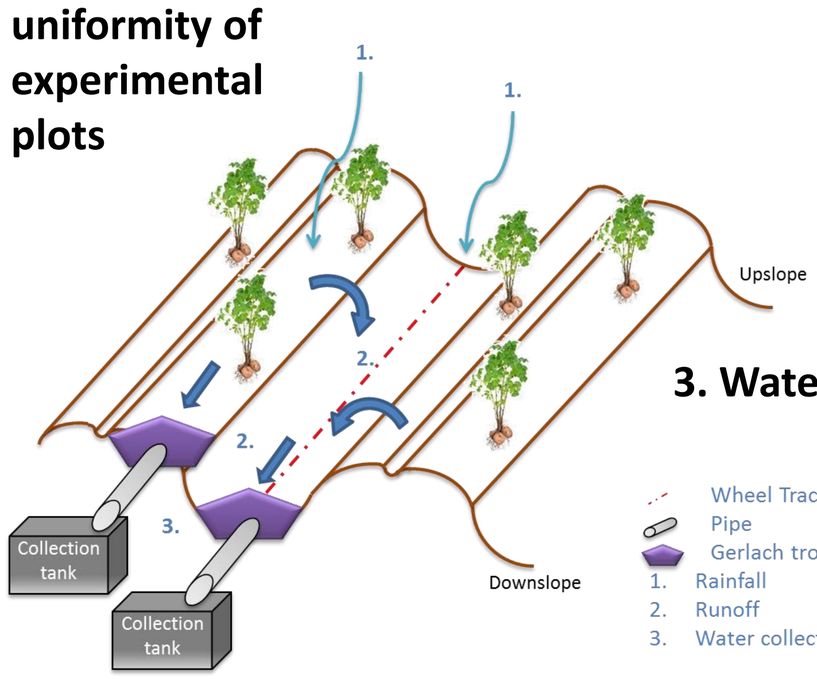
WTR® with two leading tines in background and the roller in foreground

2. Material and Method

1. Use of the WTR® in potato production



2. Soil sampling and analysis to check the uniformity of experimental plots



3. Water sampling and analysis

Wheel Track Roller line
Pipe
Gerlach trough
1. Rainfall
2. Runoff
3. Water collection

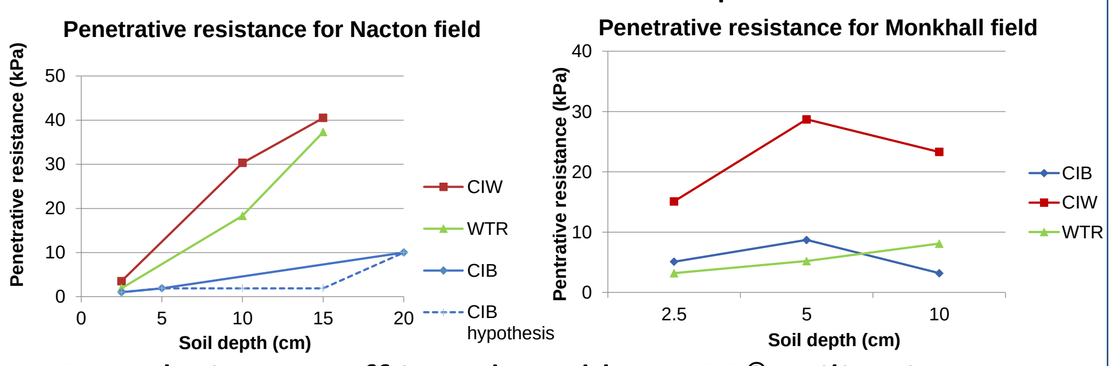
- Cumulative runoff
- Total sediment
- N and P in runoff
- Volumetric soil moisture

4. Weather data collection

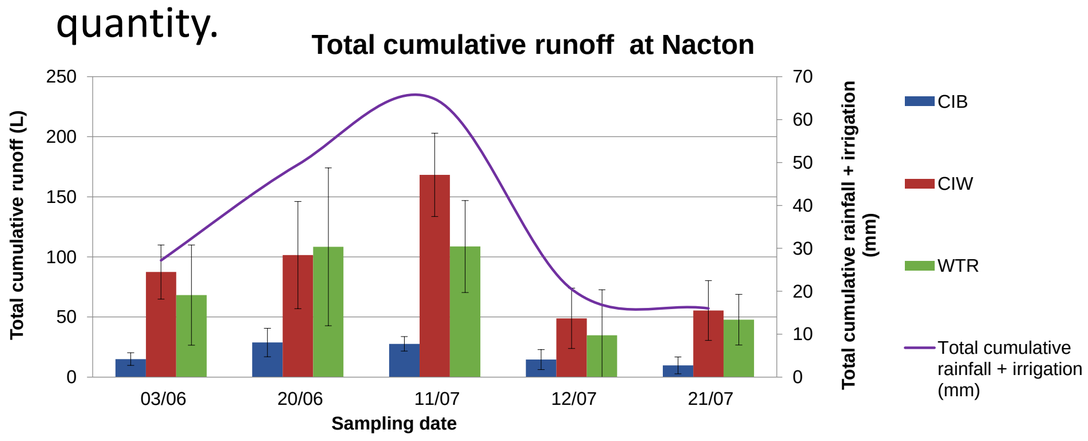
- Rainfall quantity
- Runoff quantity and starting time

3. Results

- Wheel Track Roller reduces soil compaction.



- Cumulative runoff is reduced by WTR® utilisation.
- WTR® significantly reduces total sediment loss.
- The effect of the WTR® is increased by higher rainfall quantity.



CIW for Control in wheeling, CIB for Control in bed, WTR for Wheel Track Roller®

4. Discussion and conclusion

The WTR® significantly reduced soil compaction in wheelings which resulted in 20% and 25% reductions in cumulative runoff volume and total sediment loss respectively as compared with the untreated wheelings for the whole time period of the study at Nacton.

- No significant change in sediment concentration in runoff was observed but due to the reduction in total runoff volume, total sediment loss was reduced at both trial sites.
- Increase of WTR effect by the augmentation of runoff quantity ➔Substantial effect considering the total volume from the whole period of potato farming (10 to 15 weeks)

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