

This presentation premiered at WaterSmart Innovations

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Bottle Irrigation using Saline Water

Research Title: *Optimizing Soil Moisture for Higher Yield using Solar Evaporation with minimum Water*



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Problem Identified



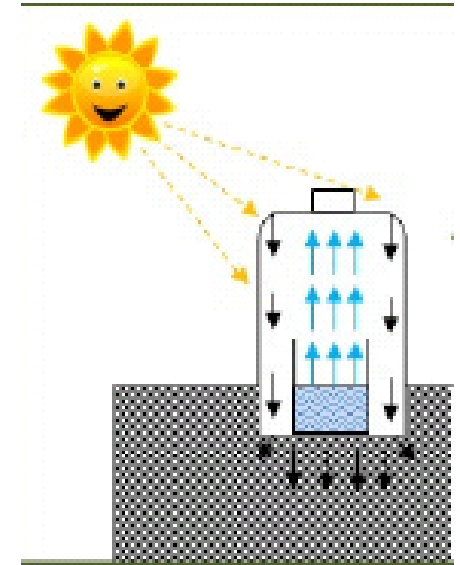
Convectional Irrigation Techniques

- Irrigation Methods commonly used today require water in large amounts to achieve the moisture level desired at the root zone.
- Proper Management of Soil moisture is neglected.
- Improved Soil Moisture management is essential for sustainable improvement of food production and water supply.
- Quality water is required for irrigation (Saline water cannot be used).

Hypothesis



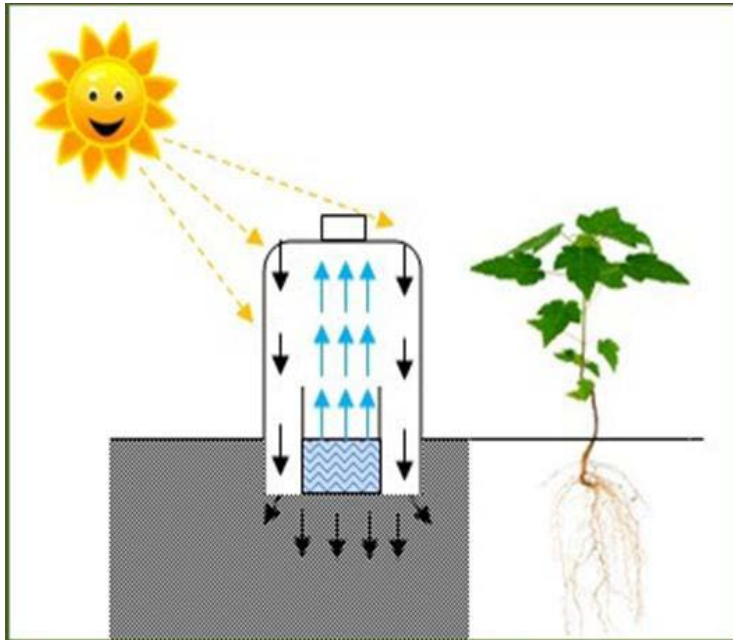
Usage of Water



Evaporation using Sunlight

- ❖ Water Usage for Irrigation.
- ❖ Water Evaporation using sunlight.

Theory



Water Evaporates due to Sunlight

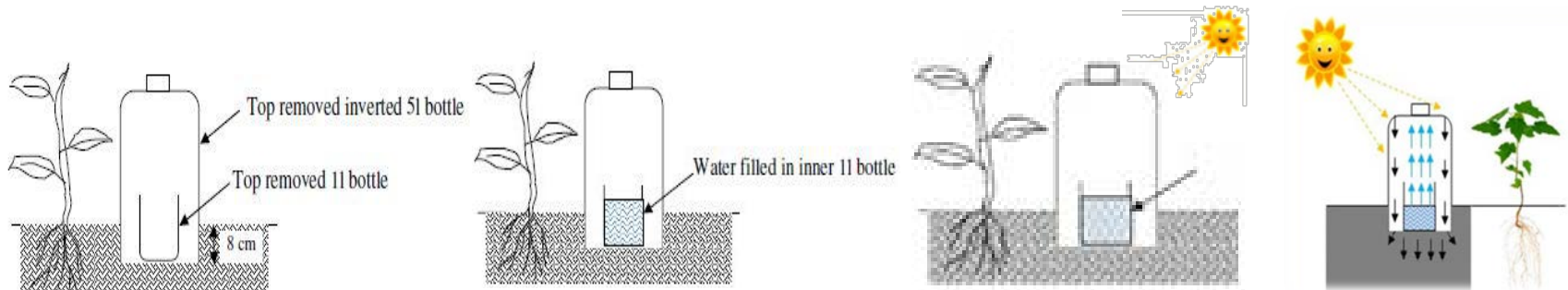


Individual Unit

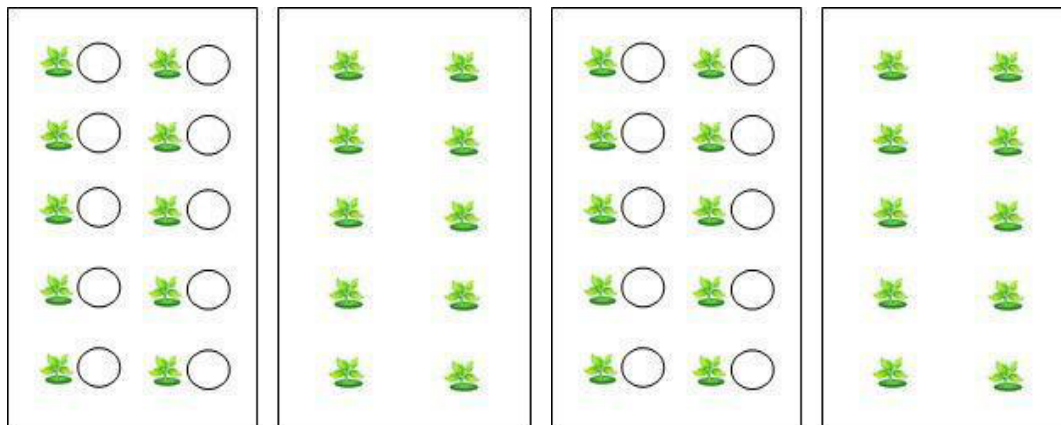
Once the Sun light falls, water evaporates and condense on the outer bottle wall which then flows down to the root zone of the plant through the channel system.

Experiment

Stage 01: Preparation of the water feeding System.



Stage 01: Preparation Chili Plots. [Experimental Plots]



Plot A

Plot B

Plot C

Plot D

Plot A : Plants with bottle watering system using normal water.

Plot B : Plants with normal watering system using normal water.

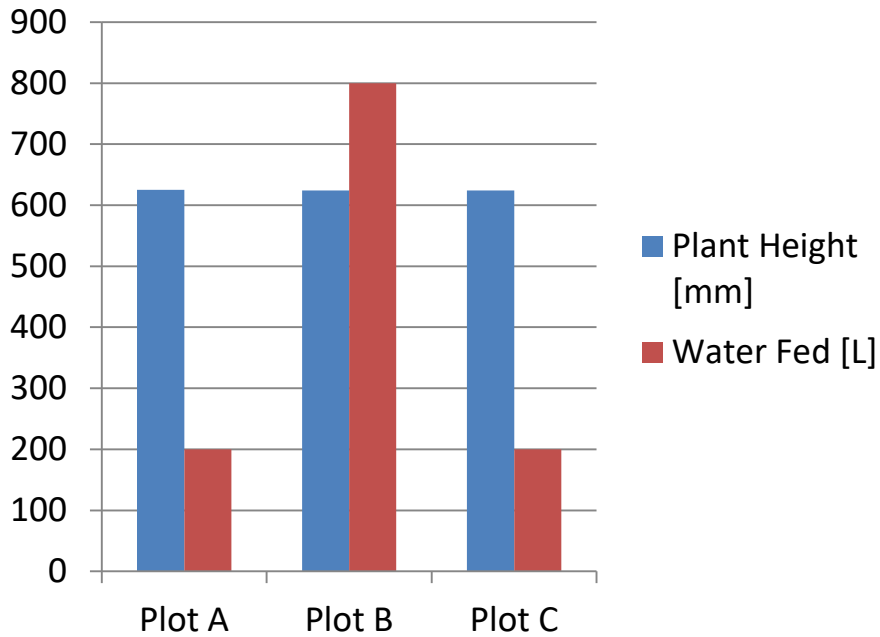
Plot C : Plants with bottle watering system using high saline water.

Plot D : Plants with normal watering system using high saline water

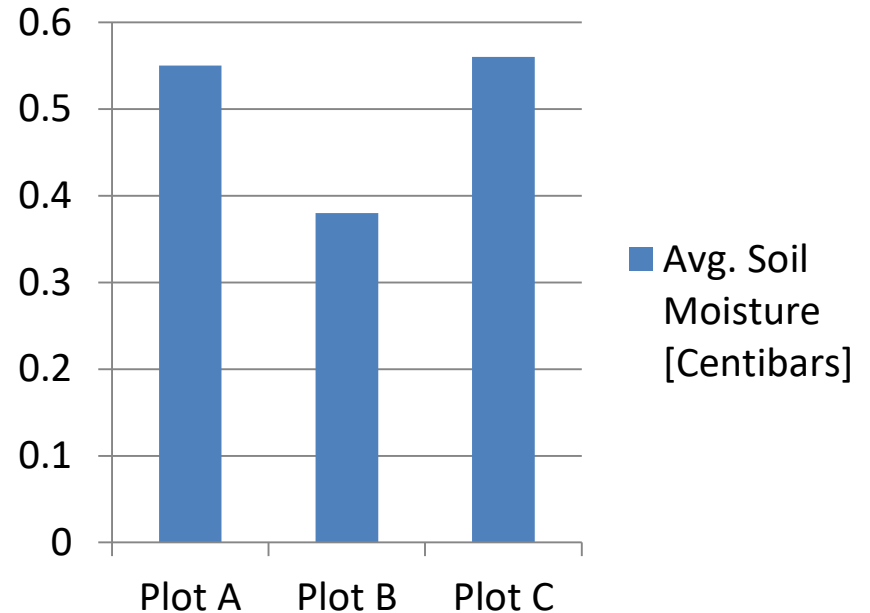
From the Experimental Plots



Results



□ *Plant height and water fed for 12 weeks duration in three Plots*



□ *Average soil moisture at 8 cm depth in three Plots*

**Note: Plants in Plot D died after two weeks thus it has not been watered.*

Conclusions

- Application of bottle system device to a farming plot to increase moisture level of the root soil could successfully prevent the water waste by feeding the water to the topsoil layer by using any watering techniques.
- By Supplying only the required amount of water at the roots with this controlling device, significant amount of water can be saved during the period in which heavy quantity of water is used in any cultivation.
- This device could save nearly 50% of water per acre of chili or similar plantation compared to normal watering methods.
- Using this methodology, salt water (Sea Water) can be used for watering system.
- This efficient and novel device could achieve the following environmental and social benefits:
 - Improvement of Productivity of Farmers due to less involvement of watering plants in regular intervals.
 - Prevention of Soil Erosion.
 - Reduced Water Pollution due to not allowing water to flow to the environment.
 - Increase of yield due to prevention of flushing off the fertilizers from plants.

Suggestions

- ❑ As this research was done on test scale in small plots, it is suggested to repeat the research in a real size farm fields to experience real life conditions.
- ❑ Try the System for different type of crops.
- ❑ An alarm system which is connected to the inner saline bottle should be modify to a mobile SMS or alert app system as nowadays all farmers uses mobile phones.



- ❑ Further improvements to increase the efficiency and effectiveness of the proposed device



Thank you for your Patronage



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