

IN-FIELD RAINWATER HARVESTING: A CLIMATE-SMART SUSTAINABLE PRODUCTION PRACTICE

In-field rainwater harvesting

With in-field rainwater harvesting (IRWH) rainfall runoff is promoted on a 2 m wide strip between alternate crop rows and stored in basins. Water collected in the basins infiltrates deep into the soil beyond the surface evaporation zone. After the basins have been constructed no-till is applied and a crust forms on the runoff strip which enhances runoff. Mulch can be placed in the basins to further reduce water losses through evaporation from the soil surface (Es) and to create a cooler cropping environment. The stored rainwater is used productively to grow a variety of grain and vegetable crops for household consumption.

The IRWH technique is thus a sustainable technique that contributes to climate change adaptation through increased plant available water, buffering during dry spells, increased yields and better rainwater productivity enabling food production.

Why is IRWH a climate-smart practice?

- Conserves limited rainfall for longer periods which allows farmers to grow crops in semi-arid areas with low and erratic rainfall
- Reduces Es, thus conserves rainwater
- Avoids risk of crop failure linked to erratic and declining rainfall
- Stops runoff (R) and therefore soil erosion
- Increases rainwater productivity (RWP)
- Conserves 9% more carbon than conventional tillage methods

IRWH in South Africa

The majority of South Africa is regarded as semi-arid where rainfed agriculture has to cope with unreliable rainfall, high evaporative demand, marginal soils and recurrent droughts with subsequent production failures. In addition to this, RWP is low because of high water losses through R and Es. To improve RWP and crop yields these losses need to be minimized. The IRWH technique was developed to counteract these unproductive losses and to contribute to food security.

Impacts

More than 1 400 households in 42, 8 and 19 rural communities respectively, in the Free State, Eastern Cape and Limpopo Provinces, where the majority of community members live below the poverty line, have implemented and applied the IRWH crop production technique to improve their household food security status. The IRWH technique is a sustainable production technique that increases agronomic productivity, decreases production risk, conserves the natural resources, is economic viable and socio acceptable.

Triggers

- Establishment of community based water harvesting interest groups
- Support services by provincial departments of Agriculture and ARC

Benefits

- Empowers people in rural communities to fight food insecurity and poverty
- Increases yields by 30 – 110 %
- Decrease risk of crop failure by 43 – 63 %
- 48 – 54% higher probability to break even
- Socially acceptable (Increases income, promotes education, improves social well-being, improves health status, reduces crime, increases crop diversity)
- Easy to implement with low maintenance cost
- Simple duplicatable technique

Constraints

- Farmers lack skills and knowledge on how to effectively utilize the IRWH production technique
- Lack of finances to buy inputs
- Low support from Government to out-scale

Prepared for Agriculture Rural Development Day Learning Event on How can rainwater management help support food production and smallholder farmers' ability to adapt to climate variability and change?