FARM AFRICA
Technical Guide to Dry Season Homestead Drip Irrigation.

Advice for extension staff introducing the technique to new areas.

Contents

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Notes for Extension Agents

1. Three farm-families should be selected whenever the technique is introduced to a new operational area.
2. Start with farmers in Alek, in good growing areas where there are serious farmers relying on farming for their livelihoods.
3. Ask the local chief to call the farm-families together.
4. Explain the purpose of the new technology (homestead drip).
5. Ask the farm-families to select 3 homesteads to test the system (peer group selection).
6. They should be selected according to the a willingness to volunteer and site selection criteria.
7. Ideally, the chosen homesteads should be visited daily at the establishment of the beds and then twice a week until the system is fully functional.
8. **Field visits,** preferably one at establishment stage, one mid-season and one at harvest. should be held at the beds so that the technique can be introduced to other farm-families,
9. A post-harvest discussion workshop should be held with all the farm-families involved to discuss any problems or improvements to the technique.
10. When visiting farm-families critical points to check for are:
    - Site is protected
    - Drip system is level, connections are not leaking;
    - Water is filtered through a cotton cloth.
    - Plants are not under/over watered; wilting or waterlogged.
    - Plants are correctly spaced.
    - Nets are available to protect beds against birds/insects.

1. The Idea.

One way of increasing food security in Warrap State is to extend the growing season through irrigation.
A simple Drip System will enable households, close to a source of water such as a shallow well or stream/river, to grow vegetables and cash crops for as long as the water supply lasts using water very efficiently for a very low cost.
Water from a bucket placed on a wooden post 1.5m high, can be slowly siphoned throughout the day using plastic tubes, on to beds of vegetables and cash crops, to provide the daily water requirement the plants need.
It will also present an opportunity to improve vegetable bed management, e.g. no walking on beds, weeding, spacing, protection from birds and mulching.

2. Site Selection

- Near a dry-season water-source that can provide up to three buckets of water a day for one mature bed 15m long and 2 m wide.
- A securely fenced area or existing garden to prevent damage to plants by animals and the theft of the produce.
- Level land with loamy soil which you can improve with compost and animal dung.

3. The Equipment

The most important elements of this system are;

- Cheap, local (Kenya or Sudan) materials,
- No moving parts, not even taps,
- No unusual movements just have to fill up a bucket from the river/source.

The contents of one set are as follows;

- 20 litre bucket made of durable, polyethylene is placed at c.1.5m above ground on a wooden post with a suitable small platform attached.
- 1m long, polyethylene siphon tube of 9mm/6.5mm:outer/inner diameters,

with a filter cloth attached is placed in the bucket.

- 1m long polyethylene connecting tube of similar diameter is connected to the siphon tube by a 50mm metal/plastic sleeve joint 12.0/9.0mm.
- 16m long delivery tube (18.0mm/15.5mm) receives the distal end of the connecting tube.
- 300mm polyethylene runners/drippers 1mm internal diameter; 3mm external diameter, are placed at 200mm intervals on alternate sides of the delivery tube (75 per delivery tube).

4. The Method.

- Fill the bucket with water from the shallow well, *toic* or river by **pouring through a cotton cloth to filter out** all soil and other particles.
- The delivery tube is placed along one of the two vegetable beds, placed side-by-side, 15m long and c.1-2 m wide separated by a path of 300-400mm.
- The connecting tube is pushed into the delivery tube and sealed.
- Water is siphoned out of the bucket by placing the siphon tube in the water with a cotton cloth tied tightly across the opening of the upper end; allow the tube to fill with water; lift the lower end out of the bucket and allow it to drop below the height of the bucket before releasing the water in the tube to start the siphoning.
- Make sure the upper end remains at the bottom of the bucket by tying a stone to the end with the cotton cloth filter.
- Once the water is flowing, the sleeve connector is slid over both tubes to join the siphon tube to the connecting tube.
- Water enters and flows through the delivery tube of which the far end is folded and clipped shut.
- Using an old vet. needle or a thin nail, make a series of 3 mm holes in the delivery tube at 200 mm spaces on alternate sides of the tube.
- Push the runners/drippers into holes in the delivery tube so that 250 mm of the 300mm is inside the tube.
- Water seeps out of the holes on to the soil through the narrow polyethylene runners.
- After irrigated the first bed, the bucket is filled and the delivery tube moved across to the second bed.
- The process is carried out as frequently as necessary; once/twice-a-day per day when plants are young; increasing to up to three times a day when plants are mature.
- If the water is salty, ensure that the delivery points do not dry-up.

5. Vegetable Growing

Sowing

- Sow your vegetable seeds in a seed box or nursery.
- Do not sow the seeds deeper than 4x the thickness of the seed.
- Shade the nursery to begin with, then reduce the shade to full-light before transplanting to the beds.

Transplanting.

- Plant in evenly spaced rows.
- Plant in the evening.
- Use recommended spacing for each vegetable type chosen.
- Give each plant a cup of water and early next morning, surround the plant with dry soil to reduce evaporation.

Weeding.

- Weed as necessary to keep completely weed free.
- Weed gently with a light sharp *maloda*.. Do not walk on the beds.

Irrigating.

- Establish the system on the first day.
- Check all runners each day to ensure they are not blocked.
- Watch the water use carefully so that supply matches requirement.
- Water requirement will increase as the plants grow and then reduce a week or two before harvest.