



Technologies for Small-Scale Irrigation for Horticulture

Irrigation technology summaries from the Innovations in Dry Season Horticulture Project in Uganda

Raised Furrow-Basins

Irrigation for waterlogged areas

Raised furrow-basins enable targeting irrigation and effective drainage in waterlogged areas. These are flat beds surrounded by bunds, with drainage canals around the edges. Inside each basin, raised beds and furrows are made for vegetables. These beds can be flattened into basins during rainy seasons for rice production. Raising the beds between canals allows a deeper root area in case of rain, but efficient use of water during irrigation. This system can be used with many kinds of vegetable crops, and with various water supplies.



Benefits include:

- Adequate drainage in waterlogged areas for a number of vegetable crops, including onion, cabbage, carrot, and cowpea
- Lower cost than pressurized systems
- Ease of irrigating compared to flooding and watering cans
- Allows use of waterlogged areas throughout the year

Conditions for using raised furrow-basins

Crops

Most vegetables



However, solanaceous crops such as tomato, eggplant, and potato are susceptible to disease in seasonally waterlogged areas

Seasons

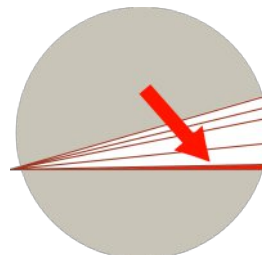
Rainy and dry



Appropriate for year-round production; can be used for drainage and water management during rainy periods

Slope

Mild (less than 2%)



Steeper slopes can result in greater erosion rates, especially in sandy soils, requiring additional labor for maintaining furrows

Water Supply

Various



Especially stream diversions, natural and protected springs, and pumped water

The Horticulture Irrigation Project

The Horticulture Irrigation Project (HIP) engages in participatory research and development with smallholder farmers in Uganda to improve irrigation systems, working within the local context and with a focus on gender issues. Find out more at www.hortirrigation.org.

The Horticulture Irrigation Project (HIP) is supported by the Horticulture Innovation Lab and the Global Center for Food Systems Innovation with funding from the U.S. Agency for International Development, as part of the U.S. government's global hunger and food security initiative Feed the Future.

Building and using raised furrow-basins

Dig drainage canals across the slope. Spacing between canals should be no greater than 10 meters.

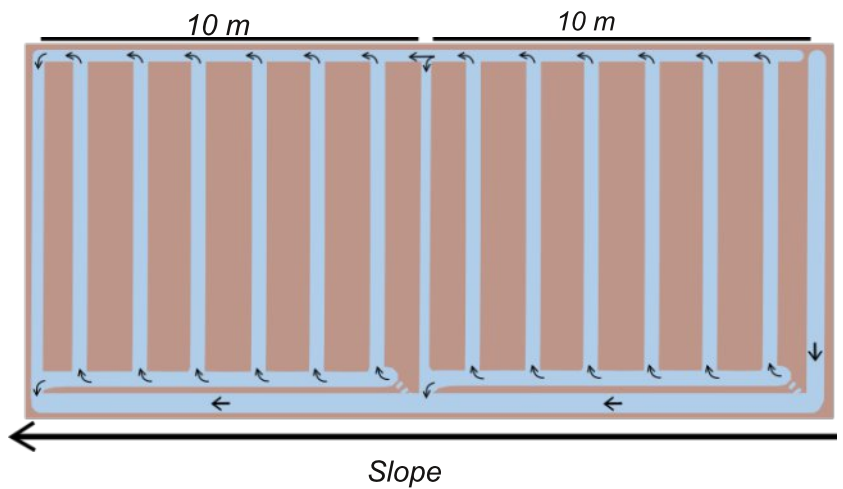
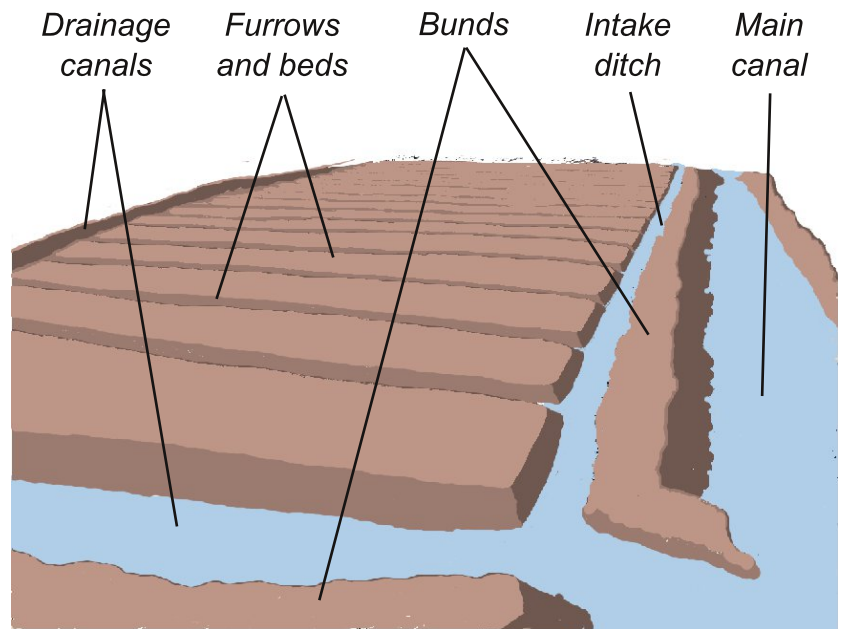
Dig two larger canals down the slope, on both ends of the cross-slope canals. These are the main canal and a third drainage canal. The raised area between the four canals is the raised basin.

Level the raised basin first by eye, then allow water to enter. Uneven portions of the surface will be exposed by the water. To finish leveling, move soil from the raised portions to the lower portions.

Dig furrows starting from the main canal towards the opposite drainage canal, to a depth of one hoe and width of 1 to 1.5 meters. Flatten the tops of the beds between furrows.

Make an intake ditch inside and parallel to the main canal, connecting to each furrow.

Irrigate by blocking the main canal, and allowing water into the intake ditch. Open each furrow by blocking the intake ditch, or open all by blocking at the bottom corner of the basin.



Cross-section view of plot



Cross-section view of drainage canals



Cross-section view of raised basins



Cross-section view of finished system with drainage canals, basins with furrows, and planted beds

Limitations and Challenges

- System requires higher up-front costs in labor than other irrigation systems
- Furrows must be unblocked during rain to avoid the risk of flooding the plot
- Rain and irrigation water may erode furrows and beds, especially in sandy and other loose soils; system requires consistent labor in re-shaping beds and clearing furrows

