

Setting Drip Irrigation Line, Planting and Mulching

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1. Place two drip lines on each one meter (39 inch) wide planting bed; turning the drip holes upward.



2. Hold drip lines in place with forked sticks or wire staples.



3. Make a bucket stand for the water container. If each bed is watered with a 20 liter (five gallon) bucket, make the stand so that the bottom of the bucket is one meter (39 inches) above the top of the raised bed. If a larger water container is used to water multiple planting beds, the stand should be slightly higher.



4. Cover the top of the water container with a piece of cloth to serve as a coarse filter before filling the container with water.



5. Connect the drip lines to the water container. The technique for connecting the lines will vary depending on the type of drip line you use. Follow the directions given by the manufacturer of the drip lines.



6. Fill the container with water and as wet spots form at the drip holes, plant the plants at those spots.



Drip lines usually have drip holes every 12 inches but are also available with 6 and 24 inch spacings; it is not recommended that you poke additional holes in the drip line. If you need to space plants wider apart, holes can be sealed by heating or wrapping with electrical tape.

7. Using your hand, a stick, or a small trowel, make a hole for planting transplants. Plant the transplants at the same depth they

were growing. If the plants are tall and spindly, plant them deeper than they were growing. For example, spindly tomato plants can be inserted into the planting hole up to almost the first leaf.



Depending on the mature size you expect the plants to be, you may consider planting seeds between the two rows of plants or along the edge of the planting bed.



9. Next, mulch the raised beds with dried plant material (grass cuttings, straw, etc.).



8. After transplanting is complete, if more water is available, additional watering with a sprinkler can or by running more water through the drip lines will help reduce transplant shock and increase plant survival rate.



10. A typical 15 meter (50 foot) raised bed with 100 plants requires 20 liters (five gallons) of water morning and evening. During the dry season, this one raised bed will produce enough vegetables to feed a family of five to seven.



11. After two or three years of production, the raised beds can easily be rejuvenated by moving them ½ meter to the left or right. The foot path becomes the new compost trench and the old compost trench becomes the new foot path.



Fruits of your hard work!



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Where people use the techniques we teach for dry season farming, it is like an oasis in the desert. After attending a village workshop, Timothy said, “What you have taught me is more valuable than money. It will not only impact me but also my children and my grandchildren. May God bless you. Come again and again to teach us more.”

One billion people go to bed hungry every night. Every six seconds a child somewhere in the world dies of hunger. Malnutrition contributes to more than half of all childhood deaths. We can make a difference! God can use our hearts, hands, talents, and resources to transform the lives of hungry people. We challenge you to join our “Hunger Fighting Team”.

Your donation will help us impact families who need our help:

\$15 will buy a drip irrigation kit for feeding a family

\$300 will buy drip kits to feed 150 people

\$1,000 will fund a village food sustainability workshop

\$5,000 will establish a learning center with a demonstration farm

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Healing Hands International Survival Gardening Fact Sheet

... Director of Agriculture Carl Burkybile , cburkybile@hhi.org

Composting

... using available materials to add organic matter and nutrients

1. Foundation layer
... 15 to 20 cm (6 to 8") layer of coarse material such as maize stalks or cobs, or small branches
2. Veneer layer
... a layer of banana leaves, cabbage leaves, or newspapers that will keep fine material from blocking the air inlet in the foundation layer
3. Carbon source
... add 25 cm (10") of green vegetation such as plant residue, dried grass, leaves, or Anything that grows and then water it
4. Nitrogen source
... add 5 cm (2") layer of animal manure or legume plants to fuel the bacterial action for the decomposition process
5. Soil or termite mound
... add 5 cm (2") layer of soil or termite mound to provide weight and pressure and a source of microorganisms
6. Kitchen scraps, ashes, and/or eggshells
... these items help add bacterial action; do not use animal parts, blood, or animal fat as they will attract rodents
7. Water each layer
... moisture helps the decomposition of the compost to occur
8. Continue alternating layers of carbon and nitrogen sources until the compost heap is the desired height
9. Finish by mulching the top and add water

Constructing Raised Planting Beds

... aid in soil improvement and improve production using less land area

1. Lay out a 1 meter (39") wide planting bed area and a ½ meter (18") foot path between beds using stakes and strings
2. Double dig the planting bed area 20 to 30 cm (8 to 14") deep
3. Dig a center trench in the planting bed 50 cm wide and 20 cm (8") deep
4. Line the trench with banana leaves, cabbage leaves, or other large pieces of vegetation
5. Add 20 cm (8") of vegetation to the trench and then water it
6. Add 5 cm (2") of animal manure on top of the vegetation and water
7. Cover the center trench with soil and pull extra soil from the foot path leaving a raised bed elevated 35 to 40 cm (14 to 16") above the foot path
8. Level the top of the raised bed with a rake, a board, or by hand

Setting Drip Lines

... making every drop of water count

1. Place two drip lines on each one meter (39") wide planting bed turning the drip holes up
2. Secure drip lines in place every meter or two with forked sticks or wire staples
3. Construct a bucket stand for the water container one meter (39") above the top of the raised bed
4. Cover the top of the water container with a piece of cloth to serve as a coarse filter
5. Connect the drip lines to the water container following the manufacturer's instructions
6. Fill the container with water and plant when the wet spots form

Planting Suggestions

... start with quality seed or plants

1. Some vegetables are best planted with seed while others are commonly grown from seedling transplants. Moist soil is important in either case for establishment of the plant.
2. Transplanting is best done in the late afternoon, on a cloudy day, or early in the morning
3. Remove seedling very carefully by lifting them with a trowel or stick bringing some soil with the roots.
4. Keep seedling that are dug up covered and out of the sun until they are planted.
5. Be careful not to damage the stem by pinching it; lift holding the leaf of the plant.
6. Plant the same depth that the plant was growing; if the plant is tall and weak the plant deeper that it was.
7. water at planting time is a key to plant survival and establishment

Manure Tea

... giving growing plants a boost

1. Place 1 to 2 liters of manure in a porous cloth (like a maize sack), add a large stone for weight, and then tie the sack ("tea bag") with a string or rope
2. Lower the sack into a 20 liter bucket of water for 1 to 3 days
3. Remove the sack and spread the solids on your garden to add organic matter
4. Dilute the nutrient solution that remains 4 to 1 with water
5. Use a sprinkler can to water the nutrient solution for leaf crops once a week
6. Water fruit crops with the nutrient solution every 2 weeks
7. Water root crops with the nutrient solution once per growing season

Healing Hands International

... first the bread ... then the bread of life

... join our hunger fighting team at www.hhi.org

Two 4x50 Wooden Box Raised Beds

Materials

- Roll of string
- 16 1x2 18" or 2' string stakes
- 60 1x4 12' box stakes
- 20 2x8 10' treated for garden bed boxes
- 18 2x4 or 2x6 12' for seats
- 6 2x4 8' treated for bucket stand
- 16 pre-drilled splice plates (truss plates)
- 4 joist hangers for bucket stand
- 8 corner brackets
- 32 angle brackets (90°) for fastening seats on planting beds
- One box of 1 ½ inch star wood screws
- One box of 2 ½ inch star wood screws
- Two pickup loads of vegetation (green plant material, grass clipping, straw, green or dried leaves)
...optional materials- small branches with leaves, corn stalks, tomato vines, etc.

- Two pickup loads of animal manure
- Two pickup loads of topsoil or garden mix (soil with compost included)
...check with city recycle center
- Seeds and/or transplants
...select what you like to eat

Drip Irrigation Materials

- 2 five or ten gallons buckets
- Water source for filling buckets
- 2 or 3 drip irrigation bucket kits (depending on whether 2 or 3 drips/bed)

Foot Path Materials

- 3 rolls of landscape fabric (3 x 50')
- 2 boxes of landscape staples or roll of wire to fasten drip lines and landscape fabric in place
- One pickup truck loads of bark mulch

Companion Plantings... don't compete but complement each other

Carrots Love Tomatoes

... By Louise Rotte

Beans grow well with carrots, cauliflower, and beets. Marigolds in bean rows help repel the Mexican bean beetle.

Cabbage family plants are good companions to onions and potatoes. Do not plant with tomatoes, pole beans, or strawberries.

Corn does well with potatoes, peas, beans, cucumbers, pumpkin, and squash.

Cucumbers are offensive to raccoons, so they are good to plant with corn. Cucumbers also like beans, peas, and radishes. A few radishes help protect cucumbers from cucumber beetles. Cucumbers dislike potatoes.

Lettuce grows well with onions, cucumbers, carrots, and radishes. Onions help repel rabbits and insects.

Okra grows well with melons and cucumbers. Peppers and eggplant can be grown nearby.

Onions like cabbage, beets, tomatoes, and lettuce. Onions do not like peas and beans.

Peas grow well with carrots, turnips, radishes, cucumbers, corn, beans, and potatoes.

Peppers grow well with okra and tomatoes.

Radishes sown with cucumbers, squash, and melons repel the striped cucumber beetle.

Squash with two or three radishes planted in each hill will have fewer insect problems.

Tomatoes are compatible with peppers, carrots, onions, garlic, and marigolds. Tomatoes should not be planted with cabbage and potatoes.

Watermelons are good to interplant with potatoes. Do not plant watermelon near tall growing plants because they need plenty of sunshine. Seedless watermelon varieties should be planted with good pollinator such as "Sugar Baby".

Resources Pages

Books and Handouts

Making a Compost Pile

... By Carl Burkybile (download from HHI website)

Raised Planting Beds

... By Carl Burkybile (download from HHI website)

Setting Drip Irrigation Line, Planting, and Mulching

... By Carl Burkybile (download from HHI website)

Agriculture Blog Stories and Hunger Fighting Team Information

... By Carl Burkybile (view on HHI website)

The New Square Foot Gardening: Grow More in Less Space

... By Mel Bartholomew

Let It Rot! The Gardener's Guide to Composting

... By Stu Campbell

The Sustainable Vegetable Garden: A Backyard Guide to
Healthy Soil and Higher Yields

... By John Jeavons and Carol Cox

How to Grow More Vegetables

... By John Jeavons

The Vegetable Gardener's Bible

... Edward C. Smith

Gaia's Garden: A Guide to Home-Scale Permaculture

... By Toby Hemenway

Farming God's Way Trainer's Reference Guide
... By Grant Dryden

Farming God's Way Field Guide
... By Grant Dryden

What's Wrong With My Vegetable Garden?: 100% Organic
Solutions for All Your Vegetables, from Artichokes to
Zucchini
... By David Deardorff & Kathryn Wadsworth

What's Wrong With My Plant? (And How Do I Fix It?)
... A Visual Guide to Easy Diagnosis and organic Remedies
... By David Deardorff & Kathryn Wadsworth

Carrots Love Tomatoes: Secrets of Companion Planting for
Successful Gardening
... By Louise Riotte

Food For The Future, Now: A Survival Garden Plan
... By Damon P. Miller II, MD, Carol Cox, and Robin Mankey

An Experimental 33-Bed Grow Biointensive Mini-Farm:
Growing Complete Fertility, Nutrition, and Income
... By John Jeavons

Rainwater Harvesting: System Planning
... By AgriLife Extension Texas A & M

Vegetable Gardening in Africa
...By Elizabeth D. Adam (may be out of print)

Websites

Healing Hands International www.hhi.org

... see HHI and SAWBO Scientific Animations

... available as computer or cell phone videos in several languages

Educational Concerns for Hunger Organization (ECHO)

www.echonet.org

Bountiful Gardens, a project of Ecology Action

www.bountifulgardens.org

United States Department of Agriculture

www.usda.gov (food and nutrition)

State and Country Cooperative Extension

www.csrees.usda.gov (pick the state where you live)

Master Gardeners Organization

www.ahs.org/ (pick the state where you live)

Chapin Living Waters phone 315-788-0891

www.chapinlivingwaters.org

DVDs

Farming God's Way www.farming-gods-way.org

... Disc 1 Biblical Keys

... Disc 2 Technology

... Disc 3 Management

... By Grant Dryden (available through the ECHO website)

Grow Bio Intensive: A Beginner's Guide in 8 Easy Sessions

... By Ecology in Action (see Bountiful Garden website)