

Containers & Raised Beds



A Great Way to Garden

Master Gardener
Workshop Series

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UNH Cooperative Extension
www.extension.unh.edu



What we will review today

- 🍅 Planning Your Garden,
- 🍅 Container Gardening,
- 🍅 What to Plant,
- 🍅 Soil, Food and Water,
- 🍅 Raised Bed Gardening,
- 🍅 Growing Things Upward,
- 🍅 Purchasing Plants and Seeds.



Growing Things is in our Genes

- 🍅 Humans have been farming since at least 7000 BC,
- 🍅 Most of us can trace our ancestors back to some form of agriculture,
- 🍅 A hundred years ago even city folk had a small patch of flowers, vegetables or herbs,



Everyone has a
Green Thumb!



Planning your garden...

What do you want?

One flower!



A small garden!

Two tomato plants!



Define your **goals** but know your **limits** (physical, mental, time).

Check with your homeowners association.



Planning Your Garden:

Define Your Environment



- Sun,
- Wind,
- Slope,
- Structures,
- Micro climate,
- Water flow,
- East, west, north, south.



Planning Your Garden:

Draw up a Plan

The more you plan the easier your effort will be and the more success you will have.

- 🍅 Define your growing space,
- 🍅 Locate a water source,
- 🍅 Create a work area,
- 🍅 Create a waste area,
- 🍅 Develop a maintenance schedule.



Planning Your Garden:

Do Some Research

Go on the Net or to the library and find out:

- 🍅 What your plants need (soil, sun, food, water),
- 🍅 What kind of bugs like to munch on your plants,
- 🍅 What diseases can weaken or kill your plants,

Even if you are growing just one flower, find out all you can.



Planning Your Garden:

Time for some Fun



Make a list of what you need:

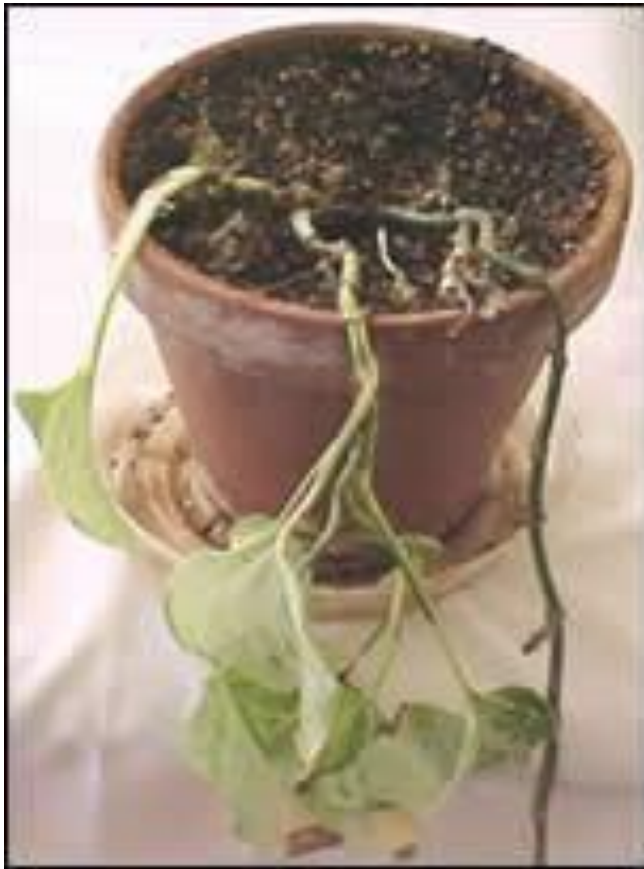
- 🍅 Containers, potting soil, plant food, seeds or plants, and tools,
- 🍅 Purchase your items,
- 🍅 Get to work (but take your time).



Container gardening is the process of growing plants in containers above ground and has been practiced for thousands of years.



Container gardening is different than growing plants in the ground.



The environment is more harsh for plants in containers:

- 🍅 Greater heat and cold fluctuation,
- 🍅 Less water holding capacity,
- 🍅 Limited root space,

So container gardening is less forgiving of mistakes!



Advantages of Container Gardening:

- 🍅 You get to control the environment,
- 🍅 Fit into smaller spaces,
- 🍅 Easier for those with physical limitations,
- 🍅 No digging or hoeing and little weeding,
- 🍅 You can extend your growing season,
- 🍅 Animals are less likely to get to your plants,
- 🍅 Locate your garden close to your home.



Almost Anything Can Be A Container



Containers



- 🍅 All containers need drainage,
- 🍅 Dark containers and metal containers heat up and dry out faster,
- 🍅 Match container to mature plant size and root depth,
- 🍅 Any pot made of clay or earthen material will dry out more quickly,
- 🍅 Container needs to hold one days worth of water.



What to Plant?

You can plant just about anything if you have a big or deep enough container.

Tap rooted crops (carrot, parsnip, etc.) may be a problem.

Corn needs lots of space and lots of stalks for pollination.



Plant Root Depth Determines Container Size

Shallow Rooted Vegetables – 12" x12" Container

Arugula	12-18"	Mache	3-6"
Bok Choy	12-36"	Mustard greens	12-18"
Cabbage	12-18"	New Zealand spinach	10-24"
Fennel	12-18"	Onion	8-12"
Garlic	12-18"	Radish	5-8"
Jerusalem Artichoke*	12-18"	Spinach	12-18"
Kale	12-18"	Strawberry	12-18"
Kohlrabi	12-18"	Summer Squash	12-18+"
Lettuce	12-18"		

*Can be invasive.



Plant Root Depth Determines Container Size

Medium Rooted Vegetables – 18" x 24" Container

Broccoli	18-36"	Beans	24-36"
Brussels sprouts	18-36"	Beets	18-36"
Cauliflower	18-36"	Chard	18-24"
Celery	18-36"	Chiles	18-48"
Collards	18-24"	Cucumber	12-24+"
Corn	18-36"	Potato	18-24"
Leek	18-36"	Rutabaga	24-36"
Napa cabbage	18-36"	Turnip	18-24"
Peas	24-48"	Winter Squash	12-24+"
Peppers	24-48"		



Plant Root Depth Determines Container Size

Deep Rooted Vegetables – 24" x 36" Container

Carrots	36-48"+
Eggplant	36-48"
Fava Bean	36-48"
Artichoke	48"+
Asparagus	6-8'
Parsnip	48"+
Rhubarb	36-48"+
Tomato	18-48"+



Plant Root Depth Determines Container Size

Most Herbs fit in a 12" x12" Container

Basil	S	8-12"	Annual	
Chive*	S	3-6"	Perennial	Divide every 3 yrs.
Cilantro	S	8-18"	Annual	
Mint*	S	12-18"	Perennial	Plant in a pot
Oregano*	S	6-18"	Perennial	
Parsley	S	8-12"	Biennial/annual	
Rosemary	S/M	12-24"	Perennial	
Sage	M	24-36"	Perennial	
Sum. Savory	S	8-12"	Annual	
Tarragon	S	6-10"	Perennial	Divide every 3 yrs.
Thyme	S	6-10"	Perennial	

*Can be invasive.



Soil for Containers

Containers require a soilless mix. Regular garden soil will compact in a container.



Soilless potting mixes are:

- Lightweight and hold water and oxygen much better than garden soil,
- Free of weeds and diseases,
- May even contain slow-release fertilizer.



Food and Water

You need to remember that:

- 🍅 Plant roots can't grow deep or spread out in containers,
- 🍅 Nutrients get washed out with frequent watering,
- 🍅 Water evaporates more quickly from above ground containers,

So, you will need to regularly feed and water your plants.



Food and Water



Food for your plants

- 🍅 Water soluble fertilizer,
- 🍅 Every two weeks or as directed,
- 🍅 Fish emulsion is a great choice (it may be stinky),
- 🍅 Scorched leaves may be a sign of too much fertilizer.



Food and Water



Watering your plants:

- 🍅 Check plants daily,
- 🍅 Water when top two inches are dry,
- 🍅 Water slowly until water comes out of bottom,
- 🍅 Try not to wet leaves,
- 🍅 Water early in the day,
- 🍅 Be aware of chlorine in your water,
- 🍅 Group pots together.



Raised Beds Are Just...



...Really Big Containers



The Benefits of Raised Beds

Higher yields and less area to weed – Can increase yields as much as five-fold over the traditional row-path-row garden layout.

Reduced soil compaction – Established walkways to keep foot traffic off planting area.

Earlier planting – Facilitates better runoff and drainage, allowing soil to warm faster in the spring. Beds can be covered with plastic during spring rains, allowing for early planting even in rainy years.

Frost protection – Easier to cover for spring and fall frost protection. They can also be shaded in the hot summer.



The Benefits of Raised Beds

Soil improvement – Presents a clearly defined area where you can concentrate on soil improvement techniques. In situations where the soil is poor or shallow, good planting soil may be added to the box.

Architectural interest – Raised beds become an architectural feature of the landscape design.

Accessible Gardening – Raised beds are ideal for enabling persons with limited mobility to garden.

Reduced soil erosion – Keeps soil in the bed and from washing away.



Raised Beds



Raised Mounds



Constructing a Raised Bed

A bed can be any width, just remember you (or your spouse/partner) need to be able to reach across with ease – this generally means no wider than 4 feet (3 feet is better).

Beds can be any length that fits your area.

Pathways must have room for a wheel barrel or cart to maneuver and pivot (at least 24 inches).

Bed height is dependent upon soil conditions – you want at least 12 to 16 inches of quality soil to grow in. The deeper the bed the better your plants will do.

North/south orientation captures more sun.



Construction Materials

A simple way to construct a raised bed garden is to use construction lumber (2 by 4s, 2 by 6s, 2 by 8s and 2 by 10s).

Untreated lumber may last for several years, except in high salt areas or wet sites.

Various untreated landscaping timbers may also be used.

Do not use CCA pressure treated lumber (removed from the market several years ago due to arsenic concerns) or railroad ties (creosote - cancer concerns).

Brick or other building materials may be used.



Wood Planks

Advantages of Planks:

- 🍅 Relatively inexpensive,
- 🍅 Easy to handle,

Disadvantages of planks:

- 🍅 Require support at corners and every 4 feet,
- 🍅 Will rot within five years (if not sooner).



Wood Timbers

Advantages of timbers (and logs):

- 🍅 Longer lasting than planks,
- 🍅 Larger timbers hold back soil even if partly rotted,
- 🍅 Larger timbers don't need support,
- 🍅 Provide a place to sit while working,



Disadvantages:

- 🍅 Smaller sizes require support at corners,
- 🍅 Expensive,
- 🍅 Will eventually rot.



Timber Construction

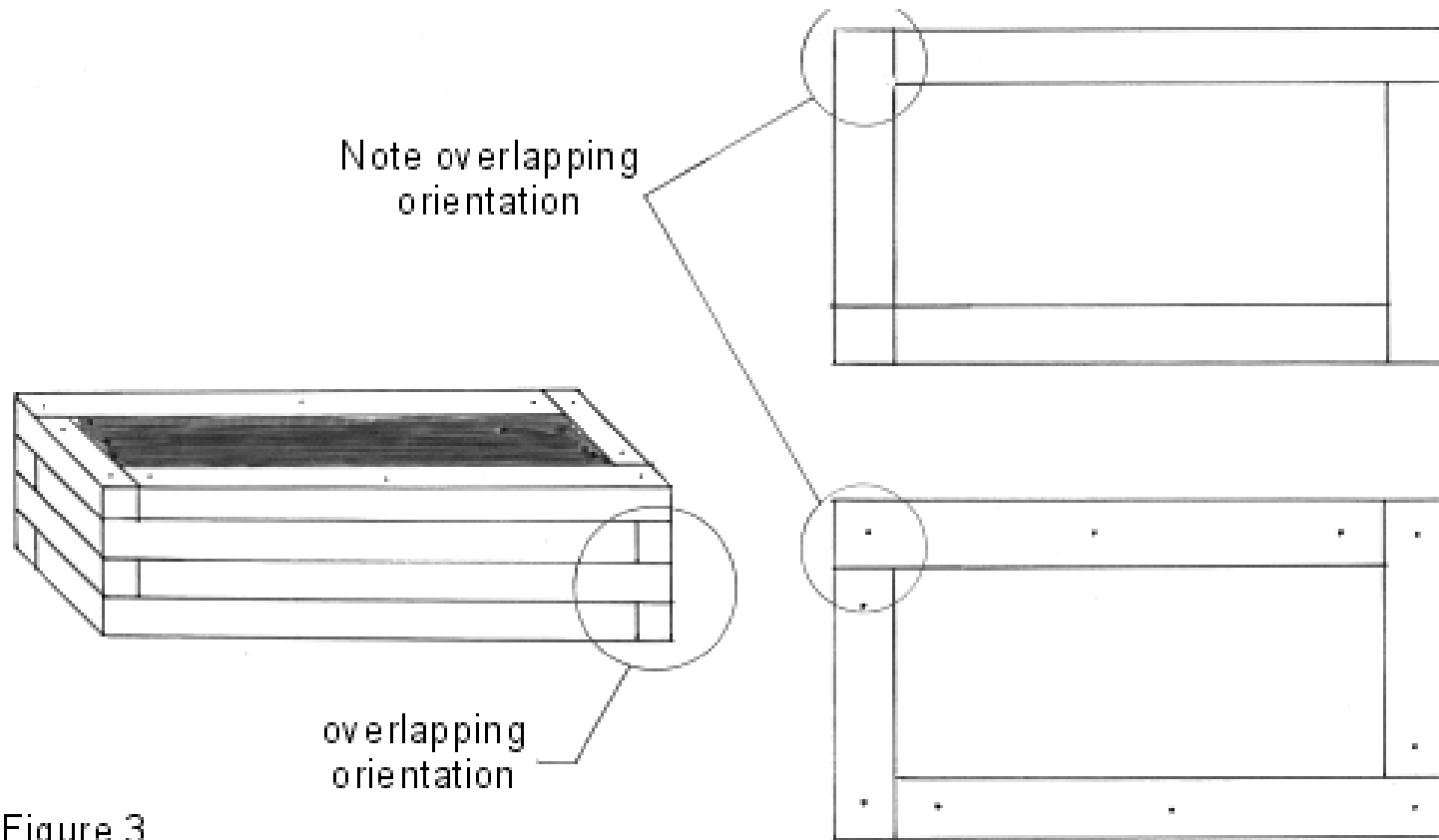


Figure 3.



Cinder Blocks

Advantages of cement blocks:

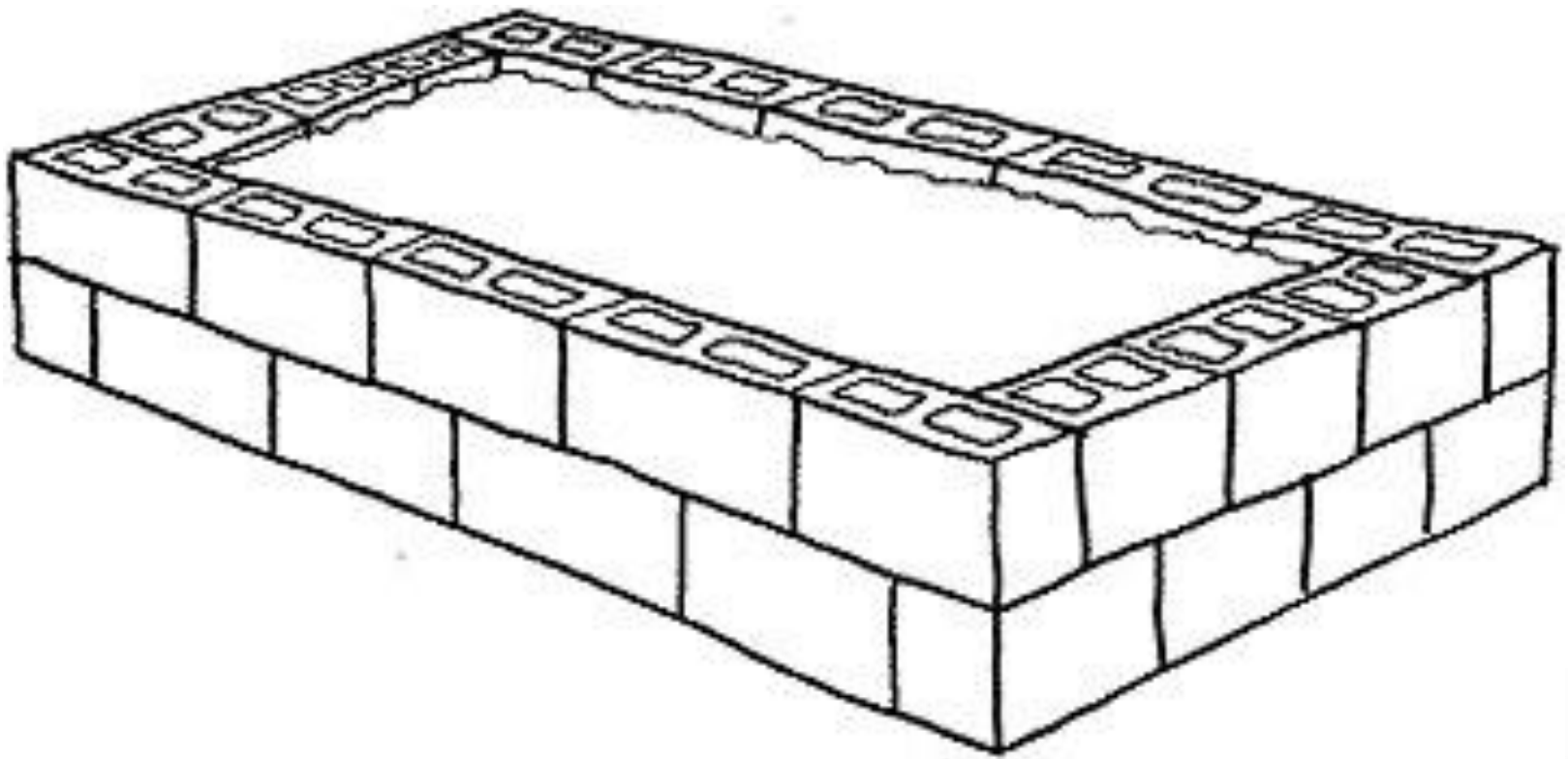
- May not require support if leveled properly,
- Will not rot,
- Retain heat (may warm soil earlier in spring extend season in the fall),

Disadvantages:

- Most expensive option in the short term,
- Can be unattractive (paint them green?),
- Not comfortable to sit on,



Concrete Block Construction



Bed Preparation



Soil Horizons (Layers)

O Horizon: loose and partly decayed organic matter

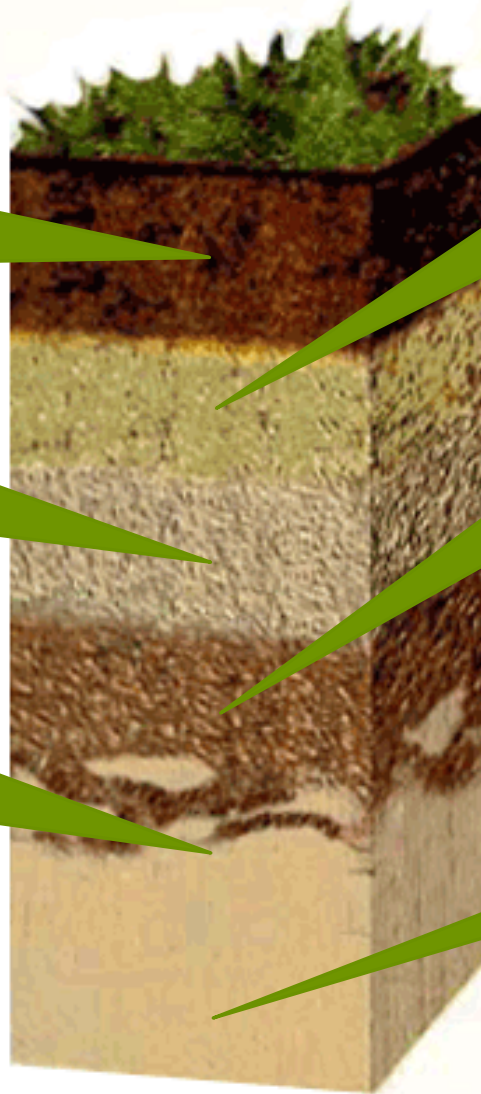
E Horizon: light colored zone of leaching

C Horizon: Partially altered parent material

A Horizon: mineral matter with some humus

B Horizon: accumulation of clay from above

Unweathered parent material



Courtesy UVM.EDU

Drainage Test for Soil

Dig a hole two feet deep.

Fill the hole with water.

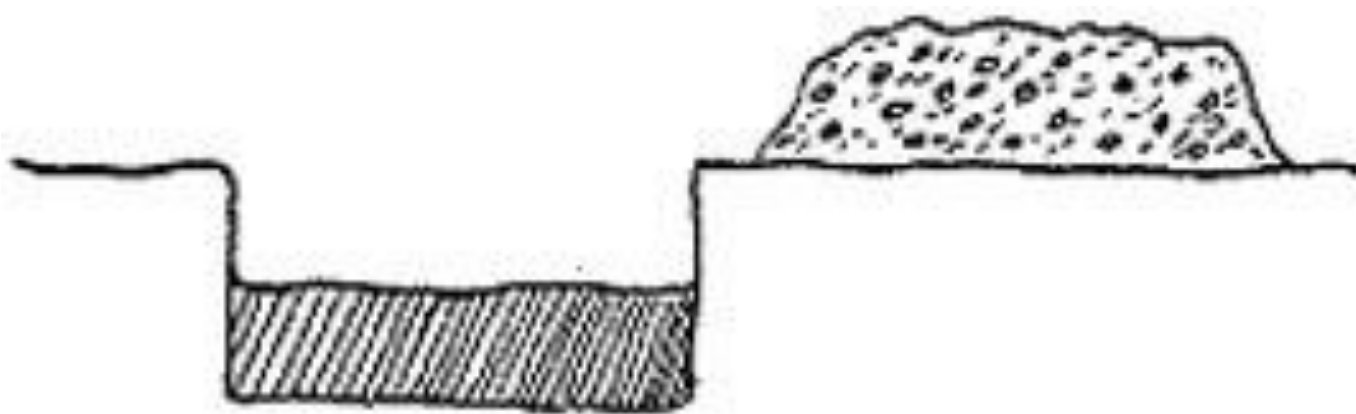
Let it drain. Then fill it again.

It should drain in a few hours.

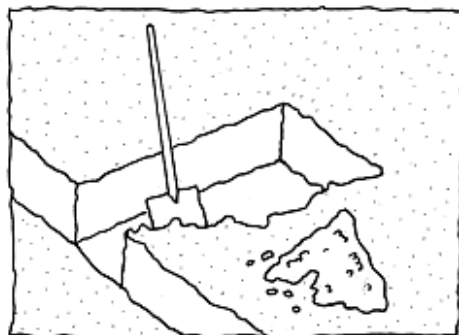


Double Digging

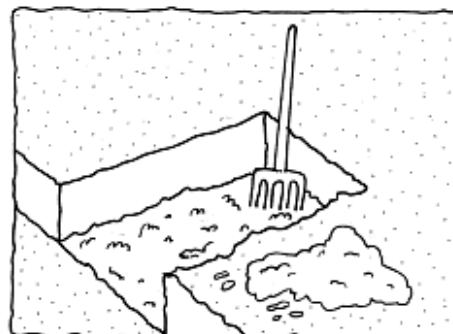
- 🍅 Also known as "French intensive" or "deep bed" method,
- 🍅 Performed only one time,
- 🍅 Loosens soil to depth of about 2 feet,
- 🍅 Requires shovel, garden fork and a lot of muscle.



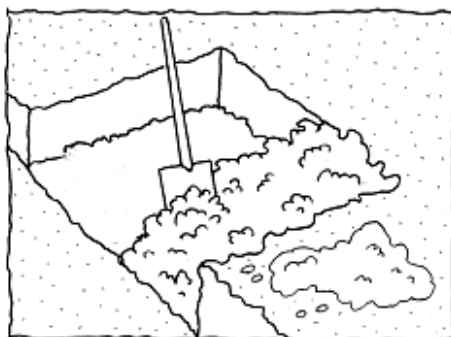
Double Dig Method



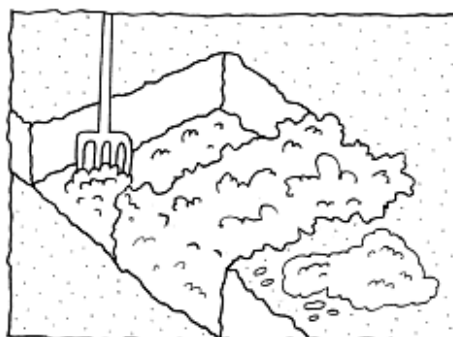
A. DIG FIRST TRENCH; PILE SOIL ALONGSIDE TRENCH OR INTO WHEELBARROW



B. BREAK UP BOTTOM OF TRENCH WITH FORK AND WORK IN SOME COMPOST



C. DIG SECOND TRENCH; PLACING SOIL INTO FIRST TRENCH



D. CONTINUE IN THIS MANNER; FILL LAST TRENCH WITH SOIL FROM FIRST TRENCH

Diagram 2



Single Dig Method

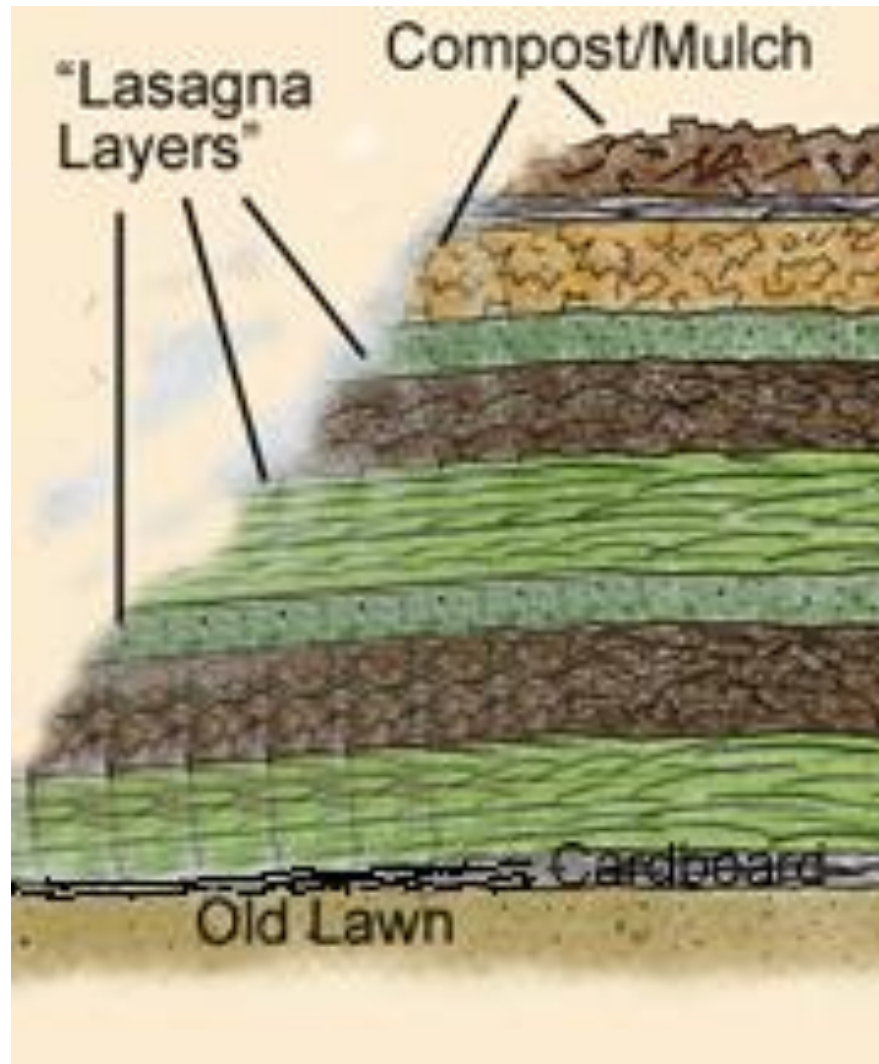
An easier method:

- 🍅 Ideal for soil that is naturally loose, well drained, or previously cultivated,
- 🍅 Requires garden shovel.
- 🍅 Follow processes for double-digging except omit disturbing the subsoil.

This method can also be used for raised beds.



Raised Bed Lasagna Method



Raised Bed Lasagna Method

There are several advantages to sheet composting:

- 🍅 An easy and uncomplicated method of composting,
- 🍅 Can be done a little at a time as materials are available,
- 🍅 Can be done on a large or small scale,
- 🍅 Used to improve soil or add to existing beds and borders,

This is an easy way to expand a garden with a minimum amount of equipment, material and time.



Preparing the Soil Under Your Raised Bed

Mark your bed.

Cut any grass as low as possible.

Dig a twelve inch wide trench the length of the bed.

Add amendments (based on soil test) and several inches of compost.

Using a pitchfork (or broadfork), loosen and push the soil towards the trench.

Put bed frame in place.

Cover bed with several layers of wet newspapers and fill with high quality topsoil.



Raised Beds Without Sides



Raised Beds Without Sides

Raised beds may also be made without sides.

Organic matter is mixed in at the same time the garden is tilled.

Walkways are dug down with the soil thrown up on the bed.

Beds are wider at the base than at the top.

You will need to cover the bed with an organic mulch to prevent soil erosion and reduce compaction from rain and sprinkler irrigation.

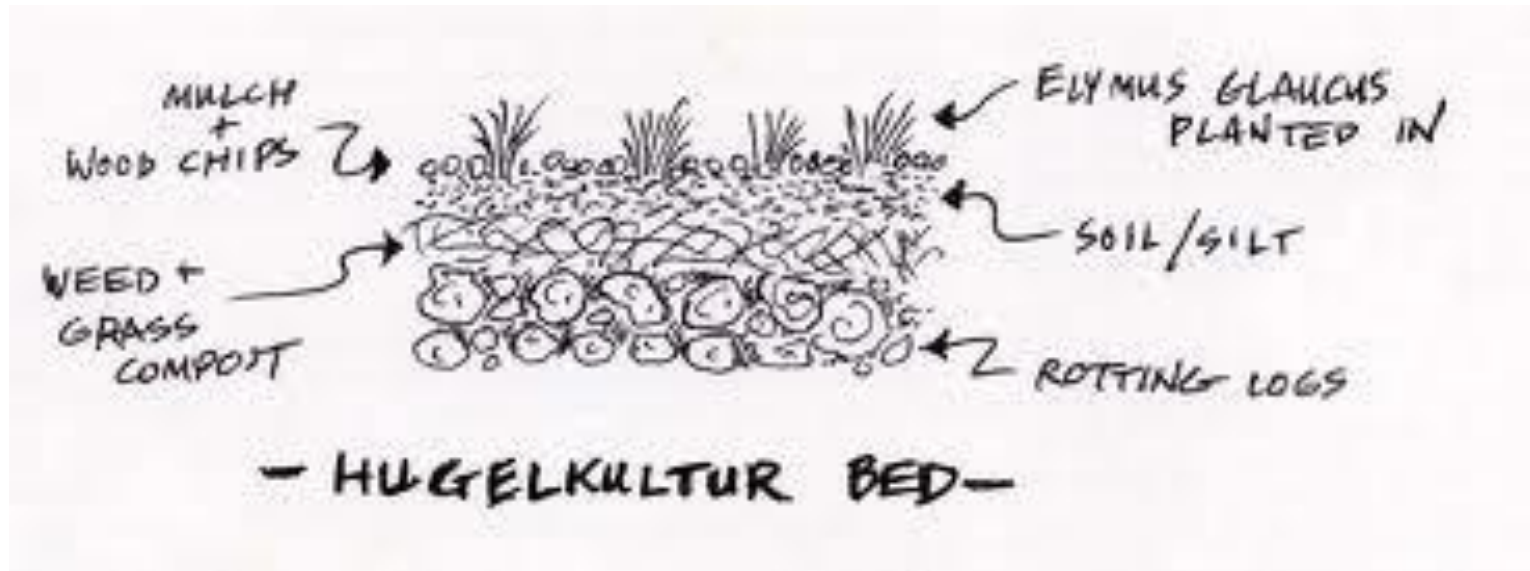
Wood chips can be used to fill the pathways.



Hugelkultur



Hugelkultur



Start by digging a deep trench or pit and then filling it with woody stuff, adding some nitrogen-rich compost materials like grass clippings or manure , piling the soil back on top, mulching, and leaving it to break down.



Hugelkultur

The decomposing wood attracts earthworms deep into your subsoil, extends your growing season by adding warmth, creates air pockets for your plants' roots to enter, and encourages mycelia to join the party.

- 🍅 Grow a garden with little irrigation or fertilization.
- 🍅 Works anywhere there is wood.
- 🍅 Use burned or rotting wood, twigs, branches, even whole trees.
- 🍅 Built into the ground or as a raised bed.



Season Extension

Anything that allows a crop to be cultivated beyond its normal outdoor growing season.



Season Extension

Raised bed allow you to attach row covers and high tunnels.



Soil and Compost for Your Beds



Purchasing Topsoil or Loam

New Hampshire has no legal definition of topsoil and no regulations governing its sale, so buyer beware.

Know your supplier and ask about the source of the topsoil he or she is selling.

If it's an amended product, ask the vendor for the 'recipe.'

If you are buying soil from a garden or landscape supply center, ask the vendor for the product's test data.

If the topsoil hasn't been tested, ask for a small sample and have it tested yourself.



Purchasing Topsoil or Loam

A topsoil with a pH between 5.5 and 7.5 is acceptable.

As far as texture goes, a classification of *loam* or *sandy loam* is best.

Ask if the loam has been screened.

Don't buy a product that has a chemical or other off-odor.

Occasionally, topsoil stripped off farmland may contain herbicide residues that could hinder crop germination. Take a sample home, plant a few seeds in it and see if they germinate okay.



Buying Compost

Ask about their compost process and source of material.

Check out composting facility if possible (stay away from big piles – create anaerobic conditions).

Ask to see a lab compost test.

Examine contents (sand, wood, glass, plastic, caps).



Growing things upward



Trellises and supports:

- 🍅 Provide more sunlight and air flow,
- 🍅 Save space,
- 🍅 Allow for cleaner fruit,
- 🍅 May reduce disease.



Trellis and Supports



Plants

Buy them!



Start them from seed!



Buying Plants

- 🍅 Check the roots (should be white – not grey brown or black),
- 🍅 Shop on Fridays,
- 🍅 Dig for the good stuff,
- 🍅 As wide as tall,
- 🍅 Buy it now,
- 🍅 Buy a little more than you need,
- 🍅 Read plant tags carefully,
- 🍅 Nip the bloom in the bud (no flowers).



Growing plants from seed



Growing plants from seed gives you a head start on the growing season and may be the only way to obtain plants of a new or special cultivar.



Growing Plants From Seed



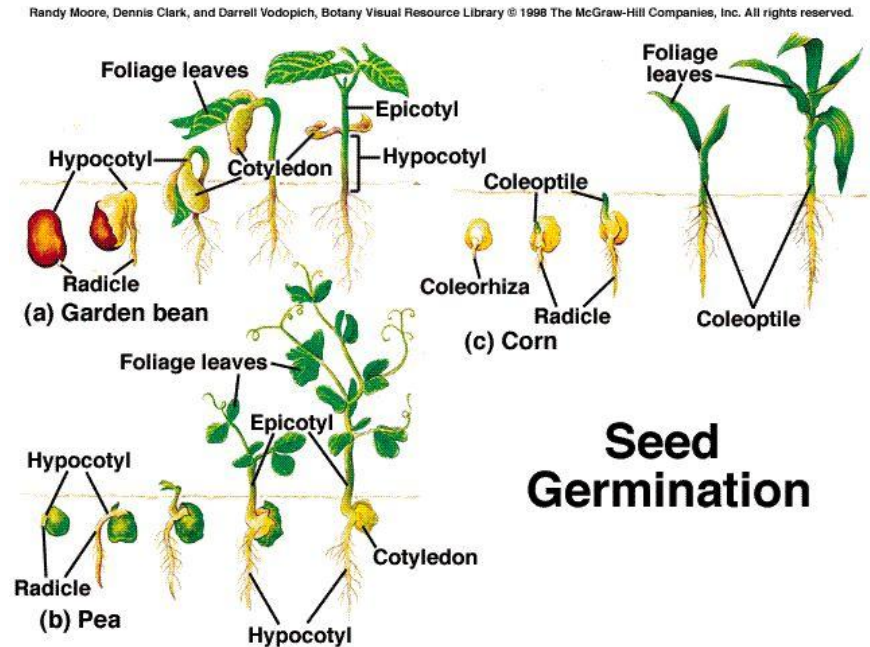
Seeds need the right amount of:

- Moisture,
- Warmth,
- Light or darkness to germinate.



Growing Plants From Seed

- Start with high-quality seed from a reliable source,
- Buy only enough seed for one year's use,
- Select cultivars which provide the plant size, color (flower, foliage, or fruit), and growth habit you want,
- Choose cultivars adapted to your area,



Growing Plants From Seed



- Store them in a cool, dry place,
- Follow the directions on the package,
- Do not sow seeds too early,
- Keep moist but not wet.





Thank You



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