

Water-wise Veggie Gardening

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Gardens on the Go

Growing Veggies



Growing veggies can use less water than you would usually use on your lawn if you do it right.

Save Water and Save Money!



Not only will you use less water by converting some of your lawn into vegetable garden, the area that you turn into garden can produce hundreds of dollars worth of vegetables, fruits and nuts

Organic Vegetable USD Value/SF

- * Cilantro\$ 21.20
- * Arugula-Roquette\$ 20.92
- * Green Salad Mix\$ 17.55
- * Chives\$ 16.40
- * Dill\$ 16.40
- * Lettuce\$ 16.20
- * Tomato, Cherry, small & medium\$ 15.57
- * Turnip\$ 9.90
- * Tomato, large\$ 9.50
- * Squash, Winter\$ 8.40
- * Cucumber\$ 7.74
- * Basil\$ 6.63
- * Radish, Red\$ 6.22
- * Pumpkin\$ 6.20
- * Chard, Swiss\$ 6.14
- * Celery\$ 6.00
- * Squash, Summer\$ 5.96
- * Choi\$ 5.70
- * Peas, Snow\$ 4.50
- * Pepper, Jalapeño\$ 4.50
- * Squash, Summer, Zucchini\$ 4.17
- * Onion, Bunching\$ 4.14
- * Pepper \$ 3.60
- * Brussels Sprouts\$ 3.59
- * Carrots\$ 3.56
- * Rhubarb\$ 3.25
- * Squash, Winter, Butternut\$ 3.20
- * Kale\$ 3.07
- * Peas, English\$ 3.00
- * Onion, Bulb\$ 2.63
- * Radish, White\$ 2.60
- * Bean, Bush\$ 2.51
- * Peas, Edible Pod\$ 2.50
- * Spinach, Spring/Fall\$ 1.75
- * Potatoes\$ 1.50

Where to Begin??



- * Starting a garden has never been easier, using the latest methods.
- * You may have heard of lasagna beds, or sheet mulching.
- * Both of these methods make turning any area in your lawn into a lush garden that uses very little water.

How to help hold water in your soil right from the start

Building a Water-wise Garden Bed

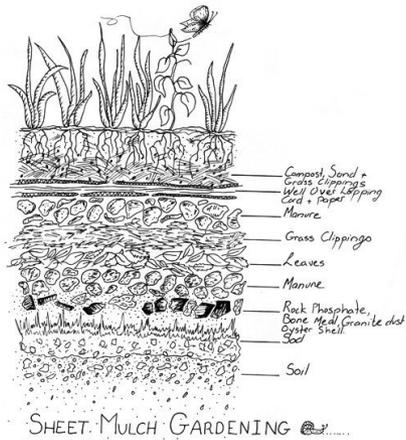
Lasagna Garden Bed (Sheet Mulching)

There are huge advantages to building a no-dig sheet mulched bed!



1. Adds organic matter where you most need it.
2. Keeps soil moist even during dry spells, thereby reducing water use.
3. It leaves the microbes and the worms protected and undisturbed, in addition to being well fed and hydrated.
4. It keeps down weeds
5. You will get better harvests.
6. It is dead easy!!!

Lasagna Beds



Final Layer:
Compost or Manure

Repeat layers 2-5 until Garden is 2-feet deep

Layer 5:
"Greens"

Layer 4:
"Browns"

Layer 3:
Organic "Greens"- ex: vegetable scraps, garden trimmings, and grass clippings.

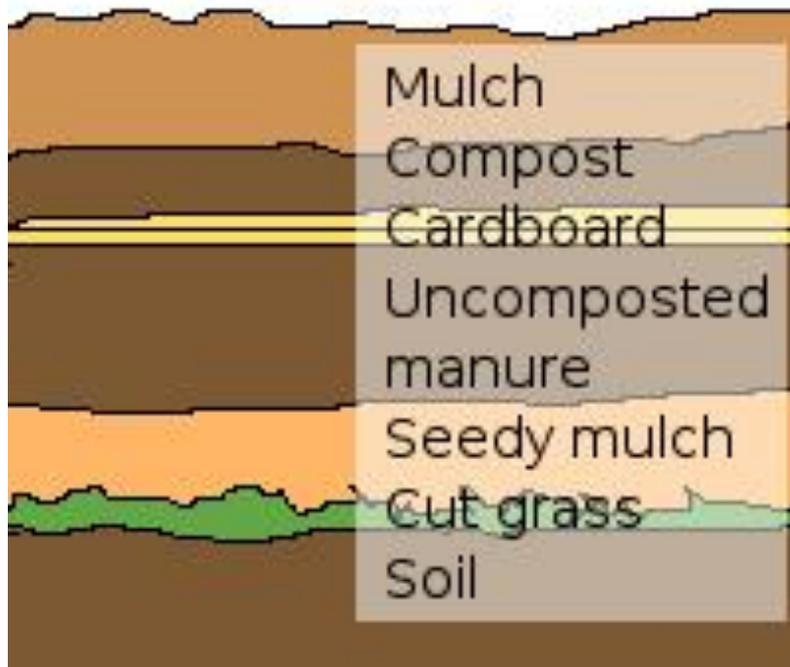
Layer 2:
Organic "Browns" - ex: Fall leaves, shredded newspaper, peat, and pine needles.

Layer 1:
Corrugated Cardboard or Newspaper

KISS BED

Keep it simple!!

Sheet Mulch:



1. Cut grass or weeds down
2. Add a layer of unfinished compost, partly composted manure
3. Lay down a layer of cardboard or 6 sheets thick newspaper, making sure they overlap well
4. Add a 3 inch minimum layer of soil mixed with compost or straight compost
5. Mulch with chopped leaves, wood chips, or seaweed.

Can be done on existing beds or new shrub and tree beds

- * Plant trees and shrubs or work around ones already planted
- * Repeat the layers as on the last slide, laying down unfinished compost, cardboard, finished compost and mulch



Seedling Beds



- * When planting young seedlings use newspaper instead of cardboard so the roots can more easily penetrate the material
- * Plant the seedlings right into the compost mix on top, and then mulch with leaves, chopped leaves, straw, or partly decomposed wood chips.

Direct Seeding in a Lasagna Bed



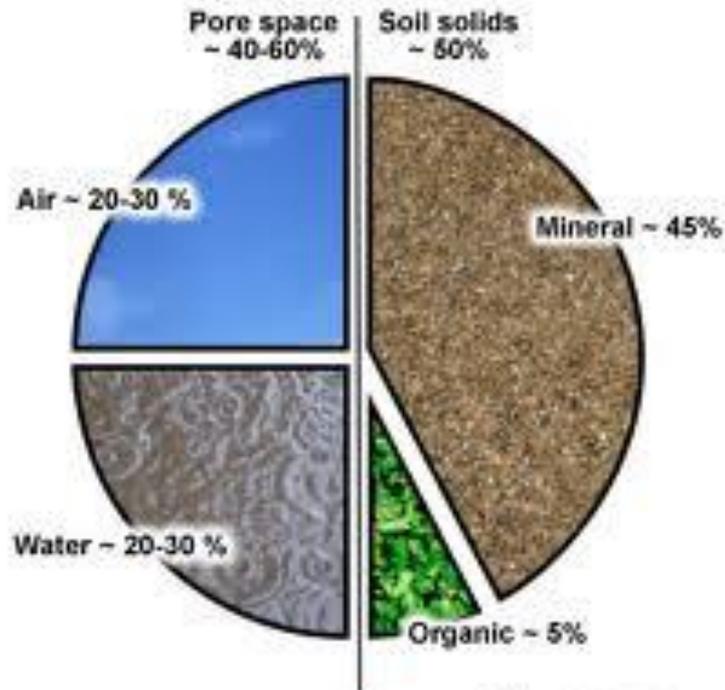
- * You can also seed directly into the lasagna bed if you use newspaper instead of cardboard.
- * Roots will easily penetrate moist newspaper

Adding organic matter the easy way

Cover Cropping

Importance of Organic Matter

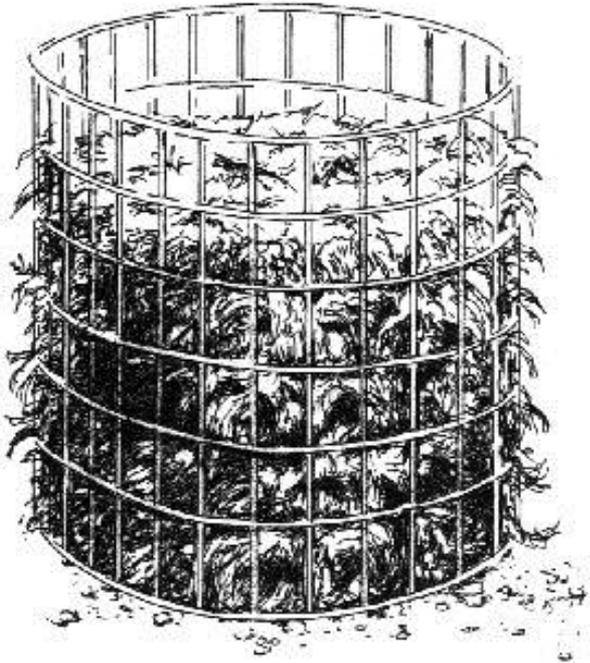
Soil Components with Overall Averages



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- * Remember nature adds organic matter from the top
- * Soils that have 5% organic matter can hold 5 times the amount of water as soils that have 1% organic matter, meaning they will not dry out as quickly
- * Soils high in organic matter also hold lots of air even though they hold lots of water.

Ways to Add Organic Matter



compost bin

- * Top dress with Compost
- * Mulch
- * Cover Crop

Organic Matter: grow your own!!

Non Leguminous

- * Rye
- * Oats
- * Wheat
- * Forage turnips
- * Buckwheat (at right)

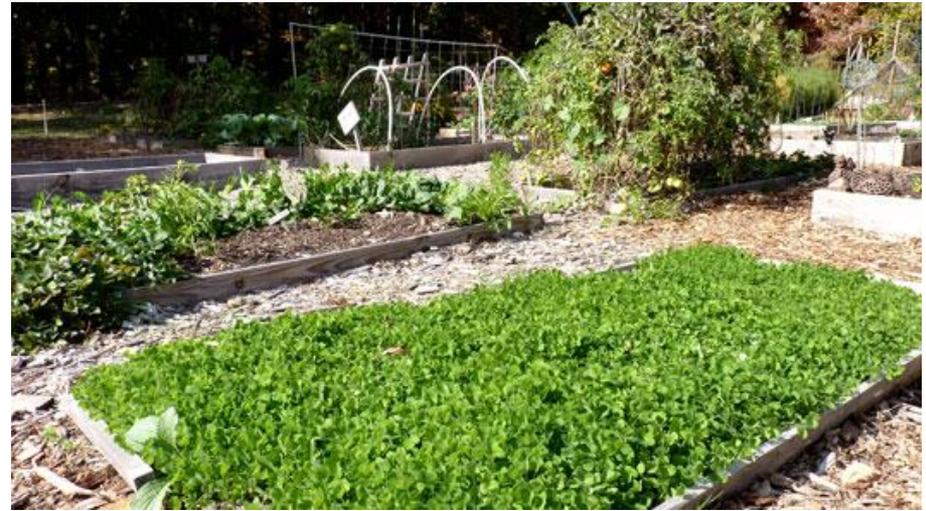
Leguminous adds Nitrogen

- * Clovers
- * Hairy Vetch
- * Field peas
- * Alfalfa

Benefits of Cover Crops

- * Adds organic matter and, in some cases, Nitrogen.
- * Attract earthworms
- * Increase beneficial microorganisms in the soil
- * Attract pollinating insects
- * Help aerate the soil
- * Provide weed control
- * Protect against soil and nutrient loss
- * Some cover crop plants will excrete substances that kill off soil diseases or discourage soil borne pest insects
- * Provide more soil nutrition than manure
- * **Improve soil water retention**

Cover Cropping



Cover Cropping Lasagna Beds (no digging required)

1. Plant cover crops in the early spring or fall
2. 6 weeks before you want to plant your vegies chop the crop down
3. Lay some unfinished compost on top of the chopped down crop.
4. Cover with newspaper (spring) or cardboard (fall)
5. Weight newspaper down, wait at least 6 weeks
6. Add a layer of compost/compost soil mix
7. In spring you can now plant the bed. In fall mulch heavily with leaves. Keep mulch wet until the rains begin.

How to water your garden when it does need it

Common Sense Irrigation



Setting up Irrigation

- * One important part of saving water is setting up your irrigation properly.
- * Whether you have a fancy system or a simple overhead sprinkler you want to make sure you are not applying more water than is needed.



Micro-misting



- * Micro misting applies a low volume of water over a wide area of soil, often below the plant canopy.
- * The trick to saving water with this or any irrigation system is to set it up right.

Equipment Needed

- * Micro-misting kit
- * Timer
- * Rain Gauge
- * Watch
- * Trowel
- * Index Finger



Common Sense Irrigation Set Up

- * Set up system using guidelines in instructions on how far to put misting heads.
- * Attach timer to hose bib and attach system to timer.
- * Place rain gauge where it will receive an average amount of water
- * Run water for 5 minutes on dry soil
- * Stop and insert finger into the soil. If still dry at finger depth, run 5 minutes more.
- * Dig a hole with trowel. Soil should be moist down to at least a foot. Keep running irrigation for 5 minutes at a time until this is true.
- * Set irrigation system to run this amount of time.
- * See how much water is in rain gauge so you can water only to the amount needed after a rain.



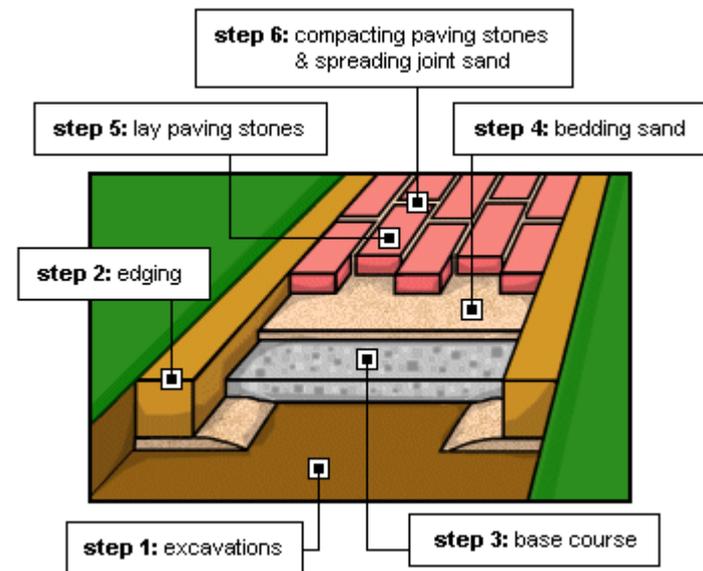
Rainwater Collection



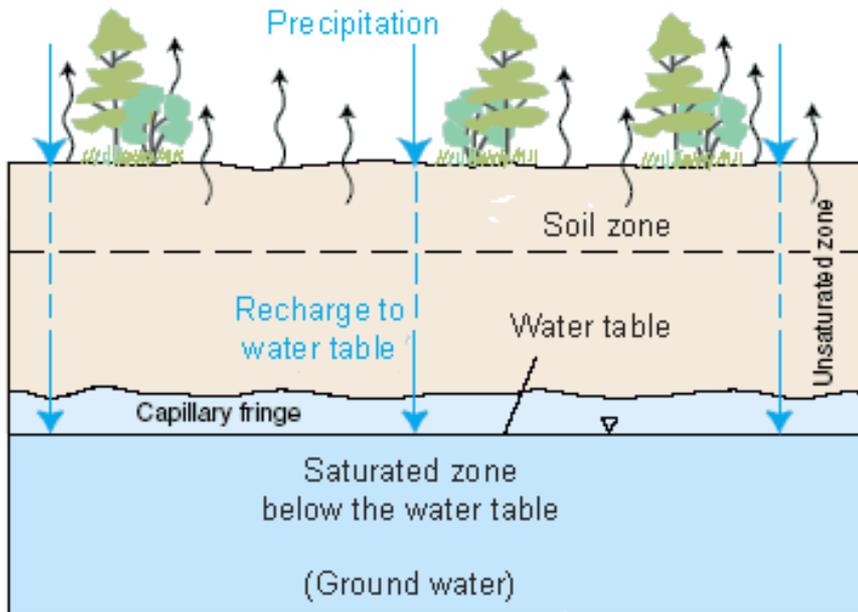
Tips and tricks to hold on to the water you do apply

More Water Saving Tricks in the Garden

Limit Hard Surfaces in Your Garden



Water Infiltration



- * Water either infiltrates or runs off.
- * Hard surfaces cause it to run off more quickly
- * Water that runs off is lost, water that infiltrates is available for plants for a longer period of time

Limit Hard Surfaces in Your Garden

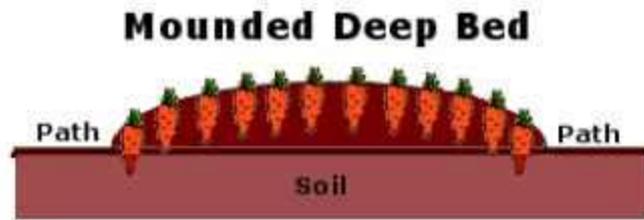
- * Use gravel or wood chip mulch on paths
- * These materials provide water infiltration into the soil below so that the landscape holds more water.
- * Gravel and wood have multi faceted surfaces that water can cling to and then release water vapor which the plants can also use



Avoid Raised Beds for Summer Gardens



Mounded beds



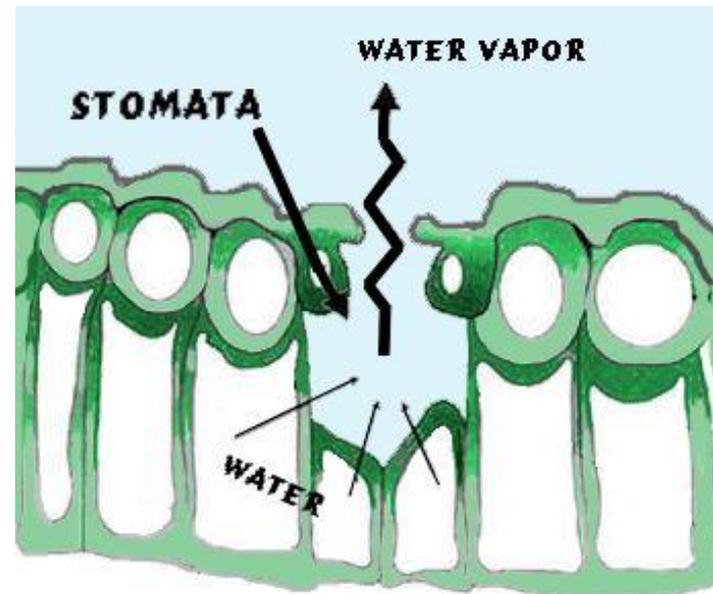
- * A mounded bed will actually loose less water and still provide nice growing space for roots.
- * Another advantage of a mounded bed is that plants can be planted right down to the path level, thereby shading soil

Provide Wind Protection



- * Fences or hedges provide wind protection for gardens that will prevent excessive water transpiration from plants

Leaf Stomata



Plant Intensively

1. Group plants that have shallow roots and deep roots together.
2. Remember plants can share water by keeping water vapor under the canopy
3. The shade created by the leaves also slows evaporation from the soil



Garden in Winter

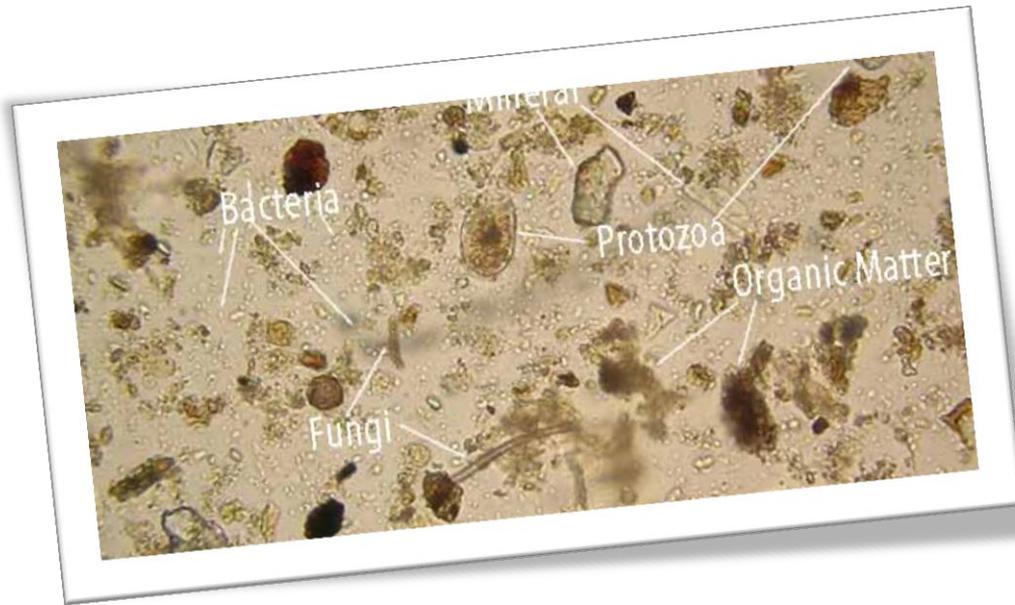


- * Here on the coast you can garden year round.
- * Vegetables are often more expensive in the winter
- * No water is required for plants in late fall and early spring.



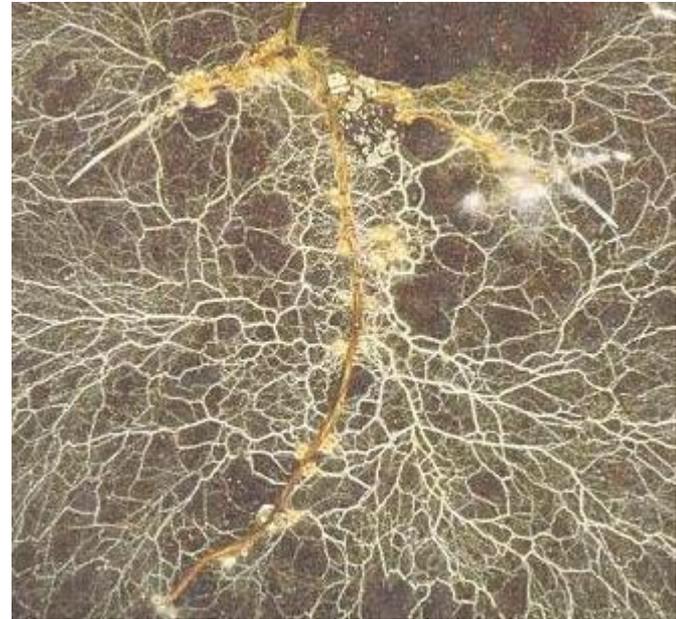
Build Your Soil

Good Soil is a Sponge



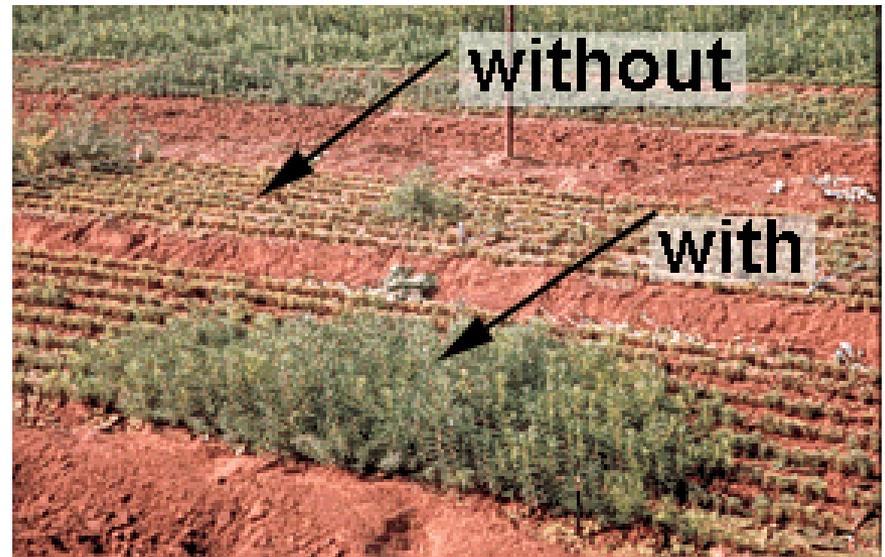
- * Healthy soil is full of microbes that store both air and water in equal portions.
- * Adding organic matter feeds the microbes so that they can grow and multiply
- * Microbes also need protection from drying so it is wise to provide a mulch

Inoculate with Mycorrhizae



Benefits of Mycorrhizae

- * Attach to the root and reach out into the environment to scavenge up water and nutrients
- * Deliver these nutrients and water to the plants roots
- * Protect the plant from soil borne diseases
- * Provide drought protection for plants



Use Mulch



- * Straw
- * Grass Clippings
- * Shredded Paper
- * Leaves
- * Wood Chips
- * Seaweed
- * Garden Residues
- * Comfrey Leaves

Benefits of Mulch

- * Mulches conserve moisture by reducing the amount of soil water lost through evaporation.
- * Mulches help maintain a uniform soil temperature. They act as insulators, keeping the soil warmer during cool weather and cooler during the warm months of the year.
- * Mulches minimize soil erosion and compaction from heavy rains and aid in water penetration.
- * Mulches help with weed problems. Organic mulches feed the soil microbes, which then feed your plants.
- * Organic mulches add organic matter, thereby increasing the water holding capacity of the soil, which means less water will need to be applied.

Conclusion

Vegetable gardens can be made extremely water wise by using the following techniques

- * Build it right, right from the start. Sheet mulching instead of digging helps preserve soil structure
- * Increase your organic matter
- * Cover crop to add organic matter which helps hold water in your soil
- * Irrigate wisely
- * Limit hard surfaces
- * Avoid raised beds
- * Provide wind protection
- * Plant intensively
- * Grow winter veggies
- * Inoculate with Mychorrhizae
- * Use Organic Mulch

Enjoy your Garden!!

