

# NATURALLY HEALTHY GARDENS

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Gardens on the Go

Bringing  
Gaia College's  
Organic Master Gardener Program  
to YOU!!

## EVERY GARDENER WANTS A BEAUTIFUL, HEALTHY GARDEN



## FLOWERS



## ROSES



## VEGETABLES



## LAWNS





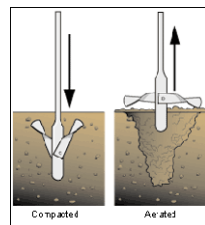
## FOUR STEPS TO A HEALTHY ORGANIC GARDEN

1. Compost
2. Mulch
3. Adopt smart watering practices
4. Protect soil microbes

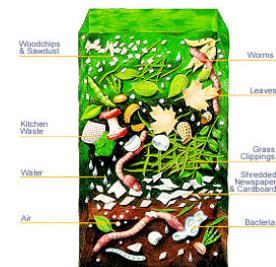
## 1) COMPOST



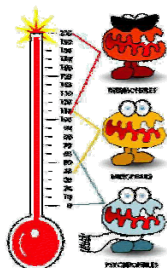
## COMPOSTING



## LAYERING COMPOST



## COMPOSTING MICROBES



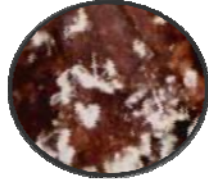
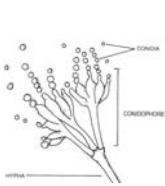
## FUNGI



Reproductive

Vegetative

## OTHER DECOMPOSING ALLIES



ACTINOMYCETES

MOLDS

## BIGGER COMPOST FRIENDS



WORMS

SOWBUGS

## MORE COMPOSTING FRIENDS



CENTIPEDES

MILLIPEDES



### 2) MULCH

1. Conserves water
2. Eliminates weeding
3. Provides food for microbes
4. Provides shelter for microbes
5. Adds organic matter which the microbes turn into food for your plants



### MULCHING MATERIALS

Newspaper  
Seaweed  
Compost  
Straw  
Composted Wood Chips  
Leaves



### MULCHING

Can be done after plants are in the ground





### MULCHING

Can be done in vegetable or ornamental beds



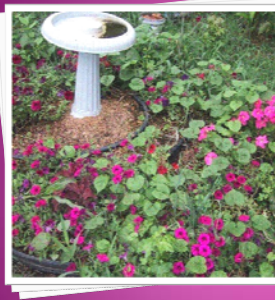
### MULCHING

Should be done to establish beds instead of tilling



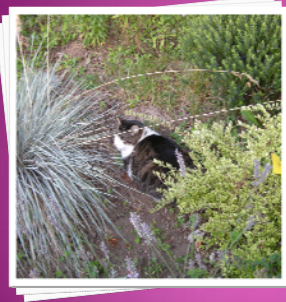
### LASAGNA BED

Best way to establish a garden bed



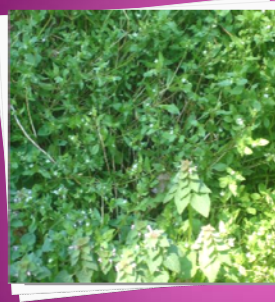
### FLOWERS LIKE LASAGNA TOO

These 2 petunia plants were grown on top of a 6-12" layer of newspaper, and slightly undone compost, with regular watering with aerobic compost tea. This photo was taken 2 months after planting.



### MULCHING: LEAVE THE LEAVES

By spring the leaves are gone, devoured by soil microorganisms



### WEEDS AS MULCH

Local weeds are used in no-till garden beds as either cover crops or companion plants, then I smother them under 6 layers of newspaper and a handful of straw, leaves, or compost.

<http://www.captaincompostalabama.com>

## ADAPTING SMART WATERING PRACTICES



## WATER IS ESSENTIAL TO LIFE

Remember that not only do your plants need water, all the soil microbes need water as well. Our job is to use this water wisely and slow the movement of the water through our gardens by use of mulches and organic matter.



## ORGANIC MATTER IS LIKE A SPONGE

Organic Matter acts like a sponge in the soil, holding both water and air in the correct proportions. This slows down the loss of water from your landscape as while keeping the correct amount of air.

## MICROMISTER



These 180 degree micro jets are ideal for watering borders and against fences and walls. The jets produce a ½ circle spray pattern. Spray radius 2.3 metres.

## MICROMISTER



A rotating, full circle sprinkler with adjustable flow. Designed for installation into the main tube and the micro feeding tube, or on fitted rigid risers.

## IRRIGATION RULES



- Water just before dawn if you can
- Do not water at night
- Do not water in hot sun or wind
- Apply only as much water as you need
- Do not set irrigation and walk away
- Make sure any automatic irrigation is set correctly

## BUY A RAIN GAUGE



## RAIN GAUGES



SIMPLE



DIGITAL

## WATERING YOUR LAWN



- Many lawn problems are created by excessive watering
- To keep a lawn green it only takes 1 inch of water a week
- To keep a lawn alive it only needs  $\frac{1}{2}$  an inch of water a week

## MORE WATERING TIPS



- It is better to water the lawn twice a week with half the amount needed each time.
- Do not water every other day, just because you can.

## BE SMARTER THAN YOUR SPRINKLER SYSTEM

- 1) Use a rain gauge, or use a ruler and any flat-bottomed container. A tuna can works well.
- 2) Put your rain gauge in the middle of the sprinkler spray area. If there is more than one kind of spray head, test the kind that you have the most of that waters lawn.
- 3) Write down the time and start the sprinkler.
- 4) Check the water depth in the rain gauge or container every ten minutes or so until the sprinkler has watered  $\frac{1}{2}$  inch of water.
- 5) Write down the ending time. Figure out how many minutes you should water.
- 6) If you have an automatic timer on your sprinkler, set the timer for that many minutes.
- 7) If you have an automatic timer with more than one zone, do this test for each zone.

## HOW TO USE A RAIN GAUGE IN THE FLOWER OR VEGETABLE GARDEN





## CALIBRATING YOUR GARDEN SPRINKLER

- Water your garden for 10 minutes
- Stop the water and dig a hole to see how deep the water has penetrated
- Start the sprinkler again and repeat until the water has penetrated about one foot deep.
- Check your rain gauge to see how much water it holds
- You can then set your sprinkler to run until your gauge is at that same level, or you can also run it the same amount of time.

## PENETRATION OF VERY DRY SOILS



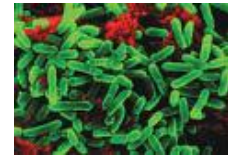
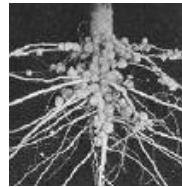
- If your soil has dried out to the extreme you may want to cycle your irrigation
- Cycling involves running the sprinkler for 15 minutes, allowing the water to soak in, then repeating.
- Cohesive forces will draw the water into the soil, and there will be less run-off



## PROTECT SOIL MICROBES

In one handful of soil there could be as many soil microbes as people on this earth.

## WHAT DO SOIL MICROBES DO?



Nitrogen Fixers provide nitrogen

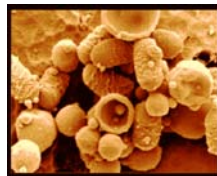
Decomposers make all nutrients available from organic matter

## MYCORRHIZAE FUNGI



- Make nutrients like Phosphorous available to the plant
- Extend the plant roots, providing more nutrients and water from a larger area
- Defend the plant roots from disease
- Share nutrients and water from plant to plant
- Help bind the soil together

## LACTOBACILLUS



- Lactobacillus in soil help make nutrients available to plants
- Lactobacillus in plants also plays a role in defending plants from root diseases

## WHAT DO SOIL MICROBES NEED?

- ◉ Moisture - Rain, irrigation, and organic matter
- ◉ Protection - Mulch with organic matter, freedom from toxic fertilizers and pesticides, and tilling
- ◉ Air - Present in organic matter
- ◉ Food - Organic matter



### NO TILL GARDEN

After only 6 months of constant composting and aerated compost tea soil applications, the native hard acidic clay soil turns into this pretty loamy stuff!

## WHERE DO SOIL MICROBES COME FROM?

- ◉ There are thousands upon thousands of beneficial soil microbes in healthy soil
- ◉ Soil microbes can easily be destroyed by the use of chemical fertilizers and pesticides
- ◉ You purchase EM or Effective Micro-organisms from various suppliers to re-innoculate your soil.



## MICROBES IN COMPOST



- ◉ Compost contains many beneficial microbes
- ◉ You may be able to spread the beneficial organisms around by making aerated compost tea.



### COMPOST TEA

Although you can extract some nutrients from compost by merely hanging a bag of compost in a bucket of water, however, it is far preferable to aerate the tea, so that you are also getting beneficial aerobic bacteria



### SIMPLE COMPOST TEA BREWER SYSTEM

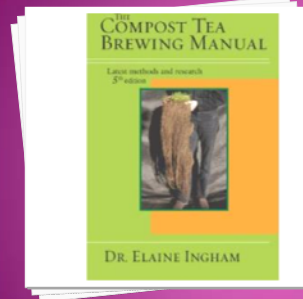
Simple systems are available to brew up a nice blend of compost tea full of beneficial microbes





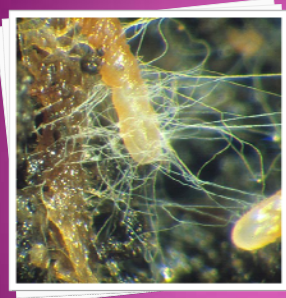
### COMPOST TEA

A simple compost tea brewer can be made with an aquarium pump



### COMPOST TEA BREWING MANUAL

Illustrates how compost tea enriches soil, protects plants from disease, and how you can make compost tea either as a home gardener, or as a business



### MYCORRIZAE

Mycorrhizae fungus wraps around plant roots to help them absorb food and water, as well as protect them from root diseases. You can inoculate roots with mycorrhizae, and the roots will continue to feed it in exchange for its services.

### PLANTS HAVE NATURAL DEFENCES

- Plants have mobilized their natural defenses to protect themselves since the beginning of time
- Some defenses are internal, others are the result of their relationships with microbes
- Our plants can resist both insects and diseases if they are well fed with a balanced diet.
- Only organic matter in conjunction with healthy microbiology of the soil can provide this perfect nutrition.



PESTICIDES AND CHEMICAL FERTILIZERS KILL THE ORGANISMS THAT CAN PROTECT OUR PLANTS FROM INSECTS AND DISEASES



HELP KEEP OUR WORLD SAFE FOR ALL IT'S CREATURES, LARGE AND SMALL

REMEMBER



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THANK YOU

Enjoy the rest of your day!

