



BUILDING HEALTHY SOIL

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AGENDA

Welcome and introductions!!

Benefits of Building Healthy Soil?

Soil Assessment

- **Soil Types**
- **Nitty Gritty**

Soil Nutrition Building Blocks

How is it done?

- **Compost**
- **Mulches**
- **Sheet mulching**
- **Green Manures**

Other soil how-to (tips):

Q&A

THE MANY BENEFITS OF BUILDING YOUR SOIL

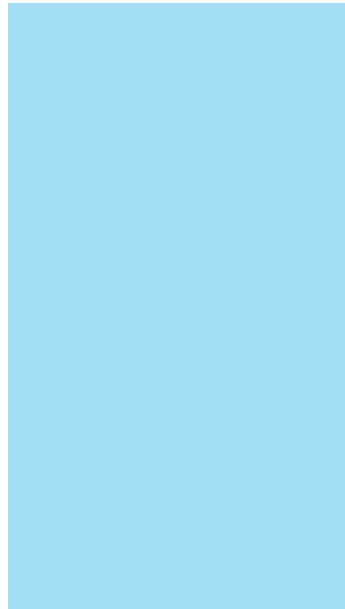
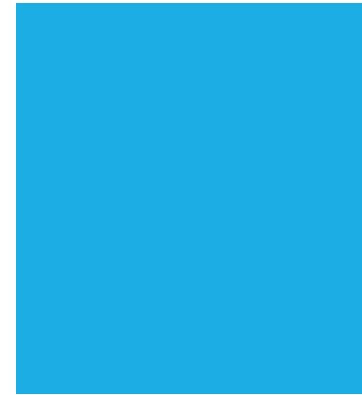
- Retains water in the soil longer, reduces the need to water more often
- Reduces plant stress from fluctuating water and temperature levels
- Releases nutrients slowly to feed your plants longer
- Helps to aerate clay soils and clump together sandy soils
- Balances the pH of your soil
- Improves yields for flowers and fruit
- Fixes nitrogen



LET'S TALK SOIL

Soil types

- Do you know what kind of soil type you have?
 - Clay or sand? Or both?
 - **Clay:** retains water with an iron fist, hard for roots to penetrate
 - **Sand:** drains water and nutrition quickly
- Nitty gritty test
- If you know what you are working with, the easier things will be



SOIL NUTRITION BUILDING BLOCKS

N-P-K

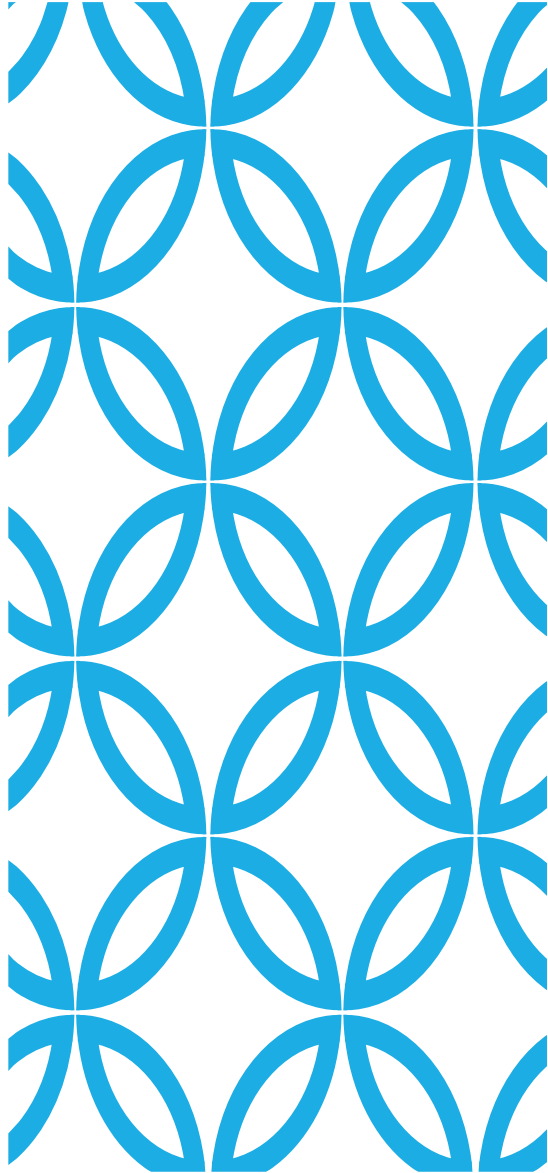
- **Nitrogen (N):** for stem and leaf development
- **Phosphorus (P):** for flower and fruit development
- **Potassium (K):** metabolism and overall health, photosynthesis

Trace minerals

- Magnesium
- Calcium
- Iron

Table of the Elements

| | | | | | | | | | | | | | | | |
|-----------------------------|--|--|--|--|--|--|--|--|--|-------------------------------------|--|---|------------------------------------|-----------------------------------|----------------------------------|
| 1 H Hydrogen 1.008 | | | | | | | | | | | 13 Al Aluminium 26.9815385 | | | | |
| | | | | | | | | | | 5 B Boron 10.81 | | | | | |
| | | | | | | | | | | 8 VIII B Fe Iron 55.845 | 9 VIII B Co Cobalt 58.933194 | 10 VIII B Ni Nickel 58.6934 | 11 IB Cu Copper 63.546 | 12 IIB Zn Zinc 65.38 | |
| | | | | | | | | | | 44 Ru Ruthenium 101.07 | 45 Rh Rhodium 102.90550 | 46 Pd Palladium 106.42 | 47 Ag Silver 107.8682 | 48 Cd Cadmium 112.414 | 49 In Indium 114.818 |
| | | | | | | | | | | 76 Os Osmium 190.23 | 77 Ir Iridium 192.217 | 78 Pt Platinum 195.084 | 79 Au Gold 196.966569 | 80 Hg Mercury 200.592 | 81 Tl Thallium 204.38 |
| | | | | | | | | | | 108 Hs Hassium (269) | 109 Mt Meitnerium (278) | 110 Ds Darmstadtium (281) | 111 Rg Roentgenium (282) | 112 Cn Copernicium (285) | 113 Nh Nihonium (286) |
| | | | | | | | | | | 62 Sm Samarium 150.36 | 63 Eu Europium 151.964 | 64 Gd Gadolinium 157.25 | 65 Tb Terbium 158.92535 | 66 Dy Dysprosium 162.500 | 67 Ho Holmium 164.93033 |
| | | | | | | | | | | 94 Pu Plutonium (244) | 95 Am Americium (243) | 96 Cm Curium (247) | 97 Bk Berkelium (247) | 98 Cf Californium (251) | 99 Es Einsteinium (252) |



TOOLS FOR BUILDING SOIL

COMPOST, COMPOST, COMPOST !!!

- **NPK: 1-1-1**
- Top dress beds with 1-2 inches seasonally for clay soils, quarterly for sandy soils
- Increases water holding
- Regulates temps and moisture levels for plant health





COVER CROPS: LEGUMES

- **Fava**
 - Annual
 - Sow in spring or summer, chop down in summer or fall
 - Tolerates poor growing conditions
- **Vetch**
 - Biennial
 - Sow in spring or fall, chop down the following fall or spring
- **Alfalfa**
 - Roots can reach from 5-9 feet down
 - Perennial
 - Best nitrogen fixer, but must grow a full yr
 - Plant in spring or late summer, turn under the following spring or fall



COVER CROPS: FAVA BEANS

They fix nitrogen and store in the root of the plant

Leave the roots in the soil to keep the nitrogen where it belongs

These roots create channels in the soil and eventually decompose



COVER CROPS: GRASSES

Buckwheat

- Annual
 - Tolerates poor and acidic soils
 - Fast growing, can be turned under in 5-6 weeks
 - Sow anytime after last spring frost until midsummer, turn under when first flowers show
 - Excellent for smothering weeds



COVER CROPS: GRASSES

Winter Rye

Annual

Has a fibrous root system to help stabilize soils

Adds organic matter in the soil

Plant in late summer/early fall

Chop when it starts flowering

OTHER SOIL AMENDMENTS

- Bone Meal (P): 3-15-0
- Alfalfa Meal (N): 3-1-3
- Kelp Meal (K): 1-0-3
- Fish Emulsion (N): 9-7-2
- Vegan Mix (N): 3-2-2
- Citrus Mix (N): 6-3-3
 - Also contains iron
- Rock Phosphate (P): 0-3-0
- Coffee grounds (N):
 - Adds organic material as well as acidity to the soil



OTHER SOIL AMENDMENTS





PLANT PERENNIALS!!

Their roots enable soil structure improvement

Able to reach nutrients and water at deeper depths than annuals

- Especially Mg & Fe that lay further down in the soil

Draw moisture up for the benefit of annuals and help keep the soil from drying out

The soil remains mostly undisturbed for the life of the plant

PLANT PERENNIALS





SHEET MULCHING SUPPLIES

FOR PERENNIAL BEDS:

- **Cardboard**
- **Compost**
- **Mulch**





SHEET MULCHING SUPPLIES

FOR ANNUAL BEDS:

- Newspaper
- Compost
- Straw or leaves



KEEPING YOUR SOIL INTACT AND HEALTHY

Don't walk or garden on wet soils

Avoid rototilling

- You want your soil **CHUNKY**
- Tilling can cause compaction as the soil gets “smoothed out” (*mashed potato analogy*)
- Breaks up the fungal network that connects the plants together
- Tilling also exposes dormant seeds in the soil
- Releases stored carbon into the atmosphere

Consider double digging as a 1-time project



KEEPING YOUR SOIL INTACT AND HEALTHY

Avoid toxic chemicals in your garden

- Pesticides kill good bugs as well as bad ones
- Fertilizers cause quick lush growth which can be harmful to the plant, disrupt natural growth
- Kills the biodiversity in the soil
- Weakens the soils' ability to filter, may contribute to harming waterways
- Plants are more easily attacked by diseases or pests

KEEPING YOUR SOIL INTACT AND HEALTHY

Good garden sanitation

Throw diseased plants in your organics cart, not your compost bin

Clean tools that have been used on diseased plants

- Soap and water
- Diluted bleach
- Run metal tools under a flame

QUESTIONS?

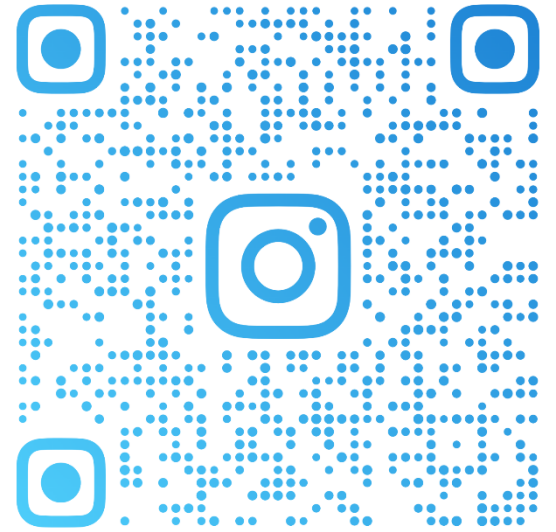


THANK YOU!

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