

Super Soil for Organic Gardening



George Bushell

“Feed your soil,
not your plants”
(Thomas Jefferson)

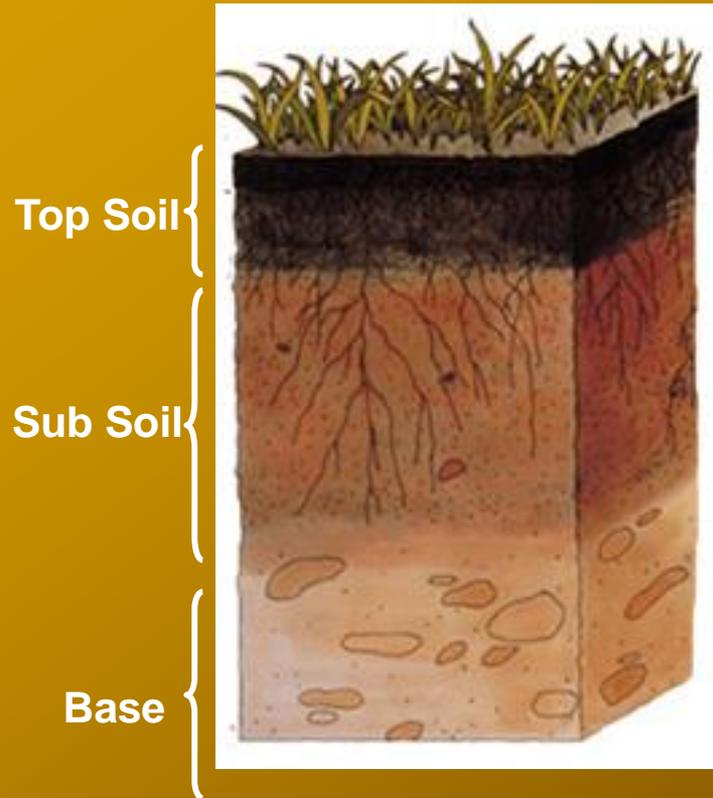
What Makes A Healthy Soil

- *Soil Type*
- *Correct pH Range*
- *Proper Nutrients*
- *Good Drainage*
- *Lots of Organic Matter*
- *Appropriate Moisture Levels*
- *Sufficient Sunlight*



Basic Soil Structure And Types

Structure



3 Basic Types

Silty Soil



Squeezed wet soil forms partial ball

Sandy Soil



Squeezed wet soil forms no ball

Clayey Soil



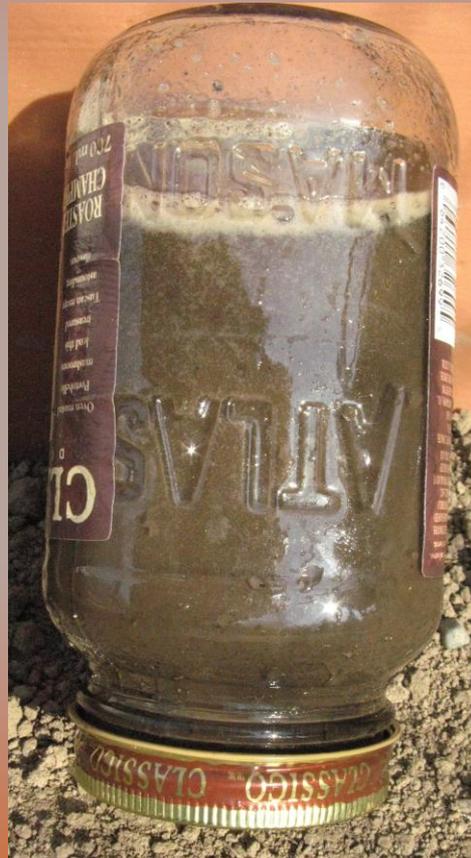
Squeezed wet soil sticks together while dry soil cracks

Analyzing Soil Composition

1 - Place a couple of handfuls of test soil in a glass jar



2 - Fill jar with water



3 - Shake soil / water mixture and let sit for 12 hours

4 - Observe soil composition

No raw organic matter on surface

2% clay

18% silt

80% sand



Typical Soil Sold in Ottawa

Soil Type

Best Soil – Silt: 50%
Sand 25%
Clay: 25

Add Compost to All Soil Types –
improves organic matter,
drainage, nutrients, workability



Sandy Soil

- Dries out quickly
- Low nutrient levels
- Drains well (if not underlain by clay)

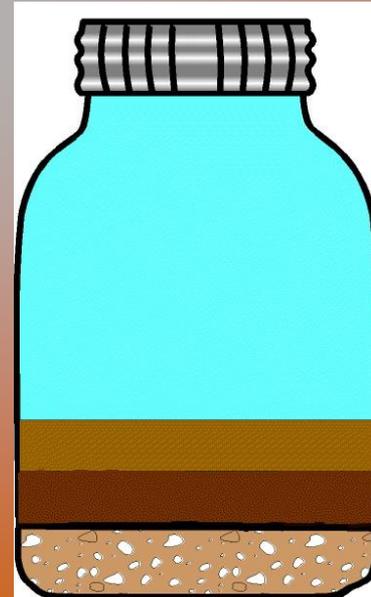
- 0 to 10% Clay +
- 0 to 10% Silt +
- 80 to 100% Sand +++



Clay Soil

- Sticky when wet
- Hard when dry
- Difficult to work
- High mineral content
- Drains poorly

- 50-100% Clay +++
- 0 to 49% Silt +
- 0 to 49% Sand +



Silty/Loam Soil

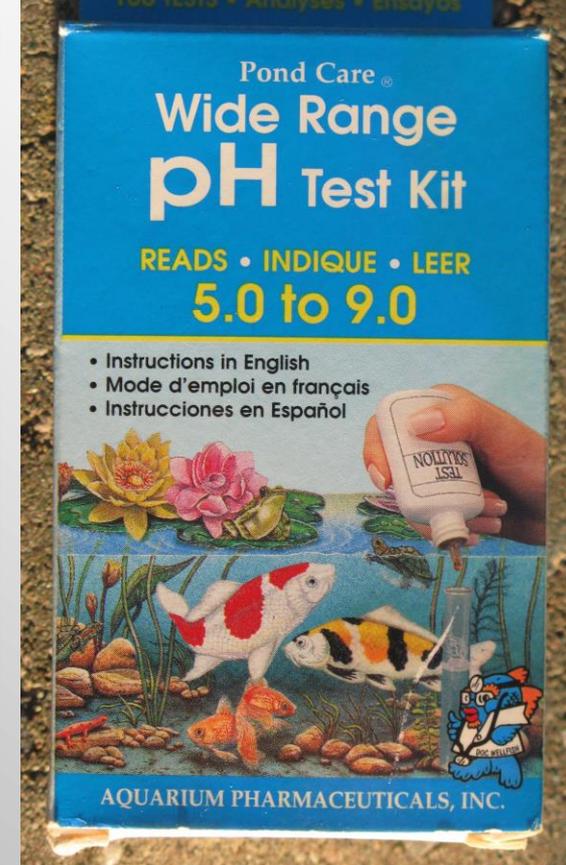
- Good when wet
- Good when dry
- Easy to work
- High nutrient content
- Drains well

- 10 to 30% Clay +
- 30 to 50% Silt ++
- 25 to 50% Sand +++

Soil pH (measure of acidity/alkalinity)

e.g., Ritchies Feed & Seed

- 7.0 indicates a neutral soil
- a change of one (e.g. 7.0 to 6.0) indicates a 10 fold increase in acidity
- >7.0 indicates an alkaline soil
- <7.0 indicates an acidic soil
- the majority of plants prefer a reading of 6.0 to 6.5
- potatoes & strawberries prefer a more acidic soil (5.5 – 6.0)
- brassicas prefer less acidity (alkaline soil) (near 7.0)



pH Measuring Kits
Are Inexpensive

- **Wood ashes & limestone decrease acidity - increase alkalinity**
- **Sulphur powder decreases alkalinity - increases acidity**

pH Preference *(7.0 is neutral)*

Acid Loving Plants

<i>Vegetable</i>	<i>pH</i>	<i>Vegetable</i>	<i>pH</i>
Cabbage	~7.0	Beans	6.0-6.5
Broccoli	~7.0	Carrots	6.0-6.5
Cauliflower	~7.0	Eggplant	6.0-6.5
Beets	~7.0	Parsnips	6.0-6.5
Turnip	~7.0	Peas	6.0-6.5
Cucumber	6.5-7.0	Peppers	6.0-6.5
Lettuce	6.5-7.0	Pumpkin	6.0-6.5
Melons	6.5-7.0	Squash	6.0-6.5
Onions	6.5-7.0	Tomatoes	6.0-6.5
Spinach	6.5-7.0	Potatoes	4.5-6.0
Celery	6.5-7.0	Radish	4.5-6.0
Corn	6.5-7.0	Watermelon	4.5-6.0

- Sulphur powder increases acidity – decreases alkalinity

Three Main Vegetable Nutrients



Nitrogen (N)

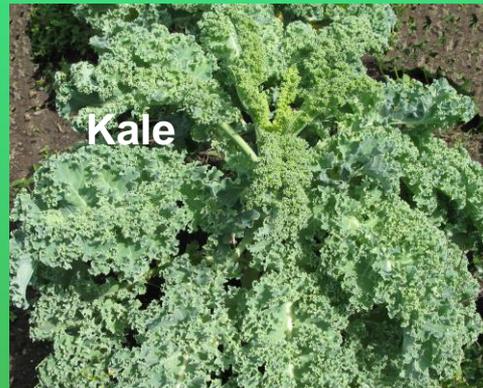
Phosphorus (P)

Potassium (K)

**Plus Many
Minor Nutrients**

Nitrogen (N) - enhances green, leafy growth

Preferred by: leafy green vegetables, such as lettuce, spinach, chard, cabbages, broccoli, cauliflower, corn



Source: compost, plowed down green plants (e.g. rye, oats, buckwheat), fish emulsion



Phosphorous (P) - hastens ripening & improves flavour

Preferred by: *Fruiting vegetables such as tomatoes, peppers, eggplant, beans, melons, squash*



Peppers



Watermelon



Watermelon



Cantaloupe



Squash



Cantaloupe

Source: bone meal,
rock phosphate



Rock Phosphate



Potassium (K) – encourages root growth

Preferred by: *carrots, radish, parsnips, turnips, rutabagas, potatoes*



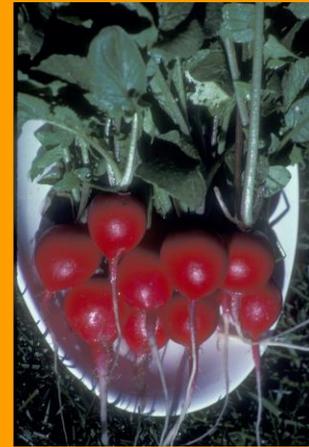
Beets



Carrots



Rhutabagas



Radishes



Parsnips

Source:
wood ashes,
sea weed



Liquefied Sea Weed



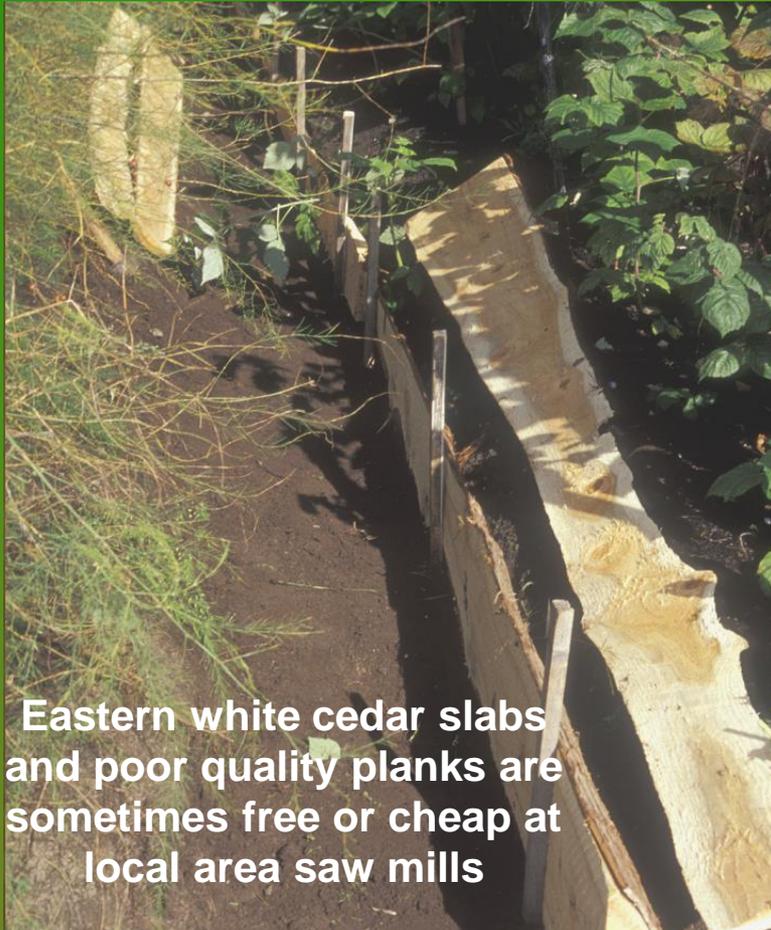
Wood Ashes

Plants Need Good Drainage

- Raised beds improve drainage where needed*
- Soil warms faster in spring*
- Should provide raised edge to prevent water run-off when watering*



Building Wooden-Sided Raised Beds



Eastern white cedar slabs
and poor quality planks are
sometimes free or cheap at
local area saw mills



Use metal rebar or any old metal
stake – wooden stakes rot



Angle sides
inward slightly
to prevent
winter collapse

Building Wooden-Sided Raised Beds



Plank Side Raised Beds



Connect side slabs with metal strips and short screw nails



Connect side planks with metal strips and short screw nails



Connect end slabs to sides with metal strips & short screw nails



Connect end planks to sides with long screw nails or nails

Other Types Of Raised Beds



Cement Block Raised Bed



Cold Frame / Raised Bed



Untreated Cedar Planks



**Up-scale
Raised Beds**



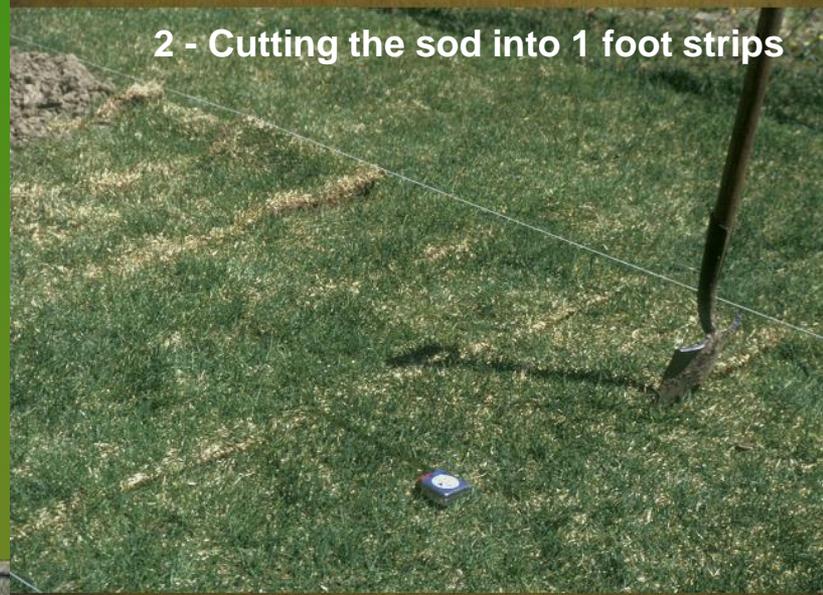
Stone Sided Raised Bed

Building Grass-Sided Raised Beds - #1

**1 - Laying out the beds
(about 5' wide)**



2 - Cutting the sod into 1 foot strips



3 - Rolling up the sod



4 - Excess sods placed upside-down in bottom of bed



5 - Starting to place topsoil in bed



Building Grass-Sided Raised Beds - #2



6 – Propping up sod sides with soil (place at an angle)



7 – Completely fill the raised bed with topsoil



8 – Smooth the top of the bed (leave an edge for efficient watering)



9 – The finished product

Good Drainage (Cont'd)

*Raised Beds Improve
Drainage*

But Hilled Beds:

- difficult to water efficiently*
- must use considerable
compost to prevent run-off*



Compost Adds Organic Matter (N), Conserves Moisture , Improves Drainage & Adds Fibre (easier to work)



**Add as much
compost as
possible**



**Add compost as mulch in June
and dig into the soil in the fall**

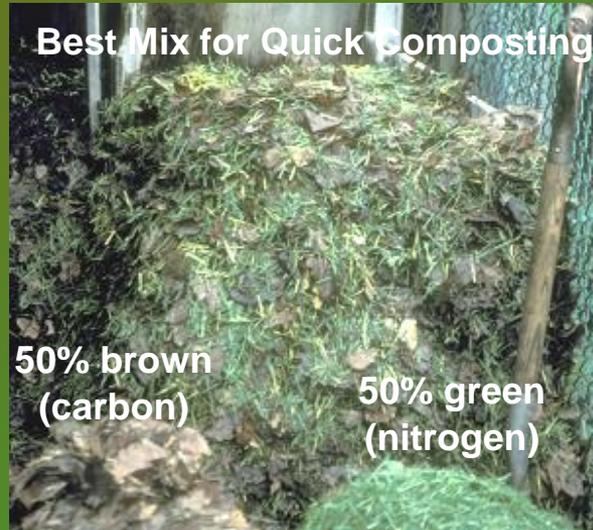
Make Your Compost

Save:

- fruit & vegetable scraps
- all yard trimmings, etc
- eggshells & hair
- tea bags, coffee grounds

Do Not Compost:

- meat or dairy products
- pet waste



Turn Over Your Compost Once Per Year



Keep 3 bins



Each spring, remove bins from compost



Turn over compost



Place back in bins



Use compost in 3rd year

7: Hide Your Composters

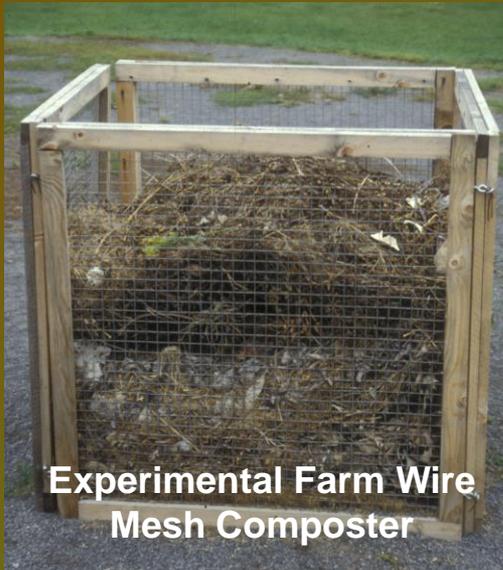


Or hide a single composter behind a rose / clematis / etc trellis

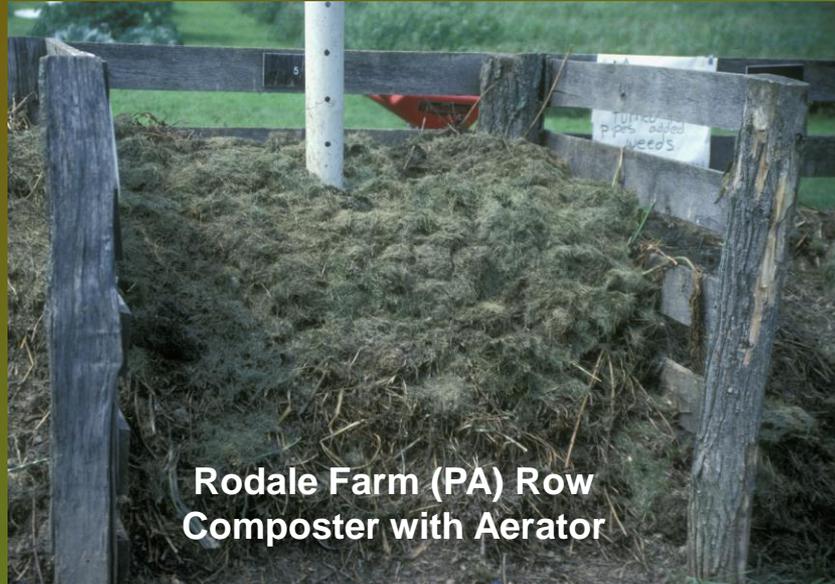


Build a Divider to hide Composters in the back corner of your yard

8: Other Composters



Experimental Farm Wire Mesh Composter



Rodale Farm (PA) Row Composter with Aerator

Worm Composting



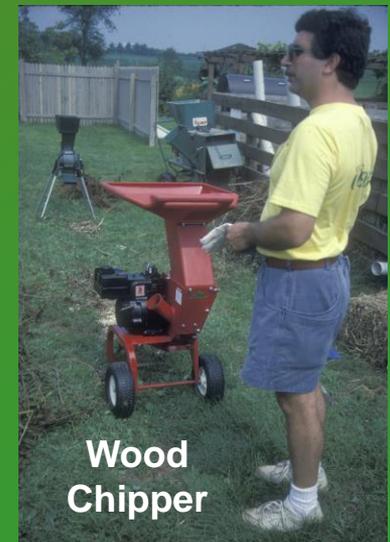
Rotating Quick Composter



Two Bin Composter

Year 1

Year 2



Wood Chipper

Providing The Right Amount of Moisture

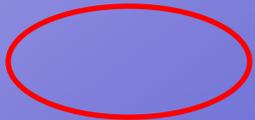
- If warm, transplants require daily watering during 1st week

- Established plants need about one inch of water each week - mulch & only water if not enough rain



If using a sprinkler, water in the morning or evening to minimize evaporation & conserve water – a soaker hose & mulch saves water

- Create soil ridges around hills and beds to reduce runoff & increase seepage to root areas



Install A Rain Barrel



Rain water filter

Converted whiskey barrel →



Rain water filter & Catch basin

Fancier Rain Barrel →



Simpler Rain Barrel →



Sunlight Requirements



- Most vegetables need a minimum of six hours of sunlight each day

- Some leafy green veggies can survive in partial shade



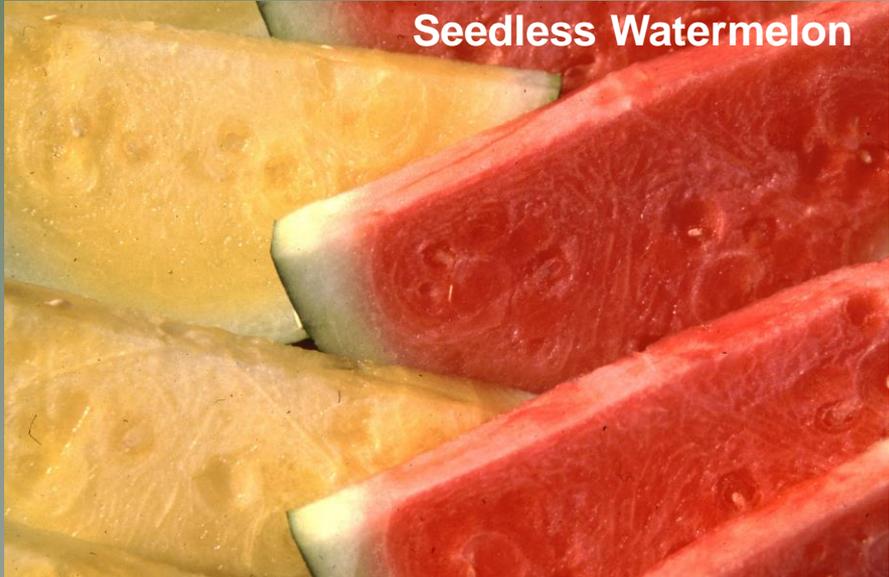
Start With Good Soil - Finish With Great Veggies



Peppers



Squash



Seedless Watermelon



Sweet Corn



Parsnips



Brocoverde Cauliflower