Fertilizers

- What they are
- Why we need them
- How to use them

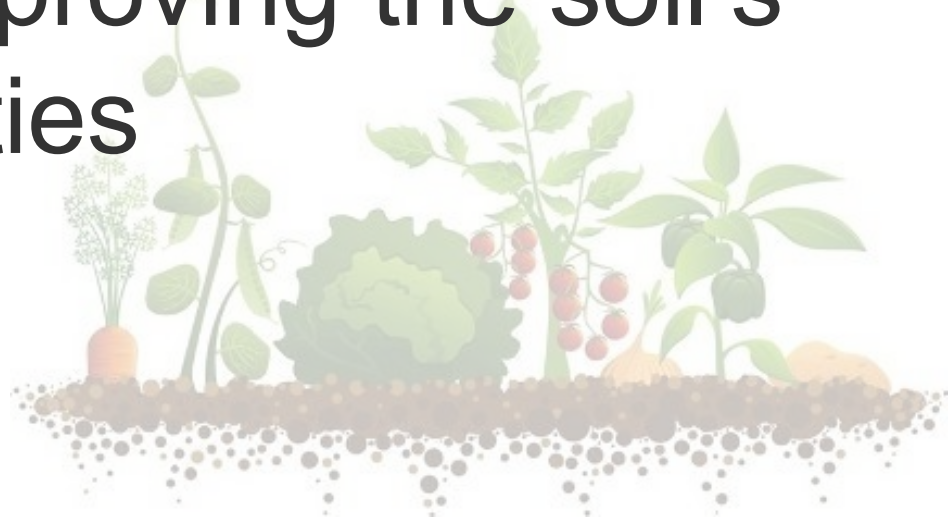
Fertilizer Defined:

- Any material of natural or synthetic origin that is applied to soil or to plant tissues to supply one or more of the plant nutrients essential to the growth of plants

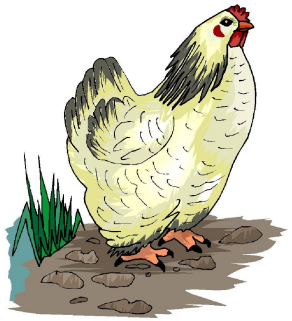
Wikipedia

Fertilizer or Amendment?

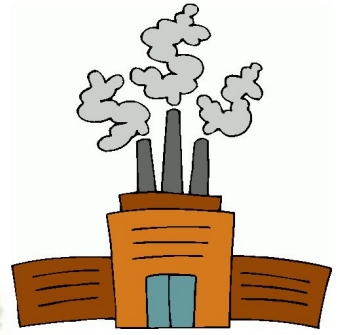
- Fertilizers affect plant growth directly by improving the supply of available nutrients in the soil
- Amendments, on the other hand, influence plant growth indirectly by improving the soil's physical or chemical properties



Organic vs. Inorganic



- Organic fertilizers are usually plant or animal derived matter
- Inorganic fertilizers are sometimes called synthetic because chemical treatments are required for their manufacture
- How do you tell if it's organic?



Which is better?

- It depends …
- Inorganic fertilizers feed the plants quickly and directly
- Organic materials slowly feed and improve the soil that feeds your vegies
- Current research says … **go organic**

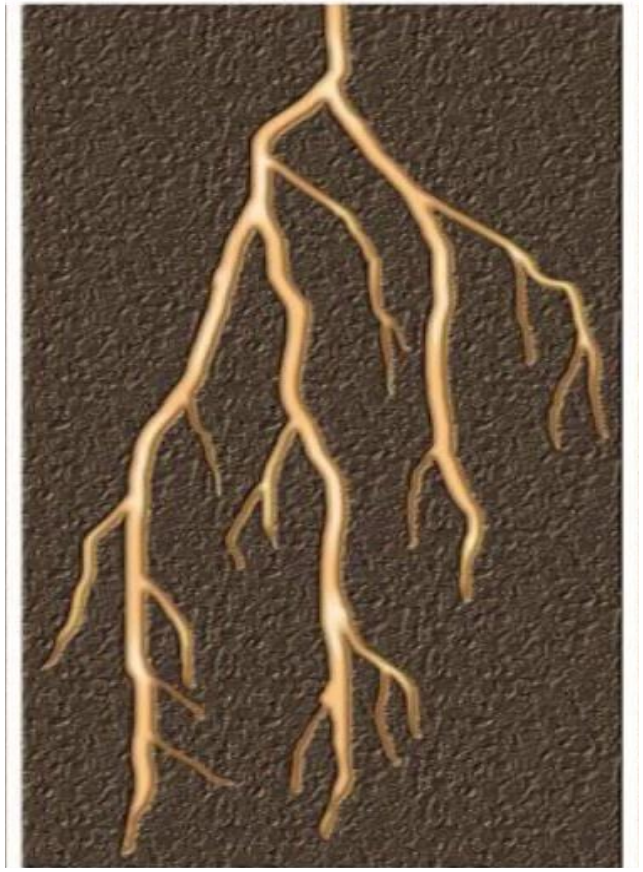
Transition to Organic

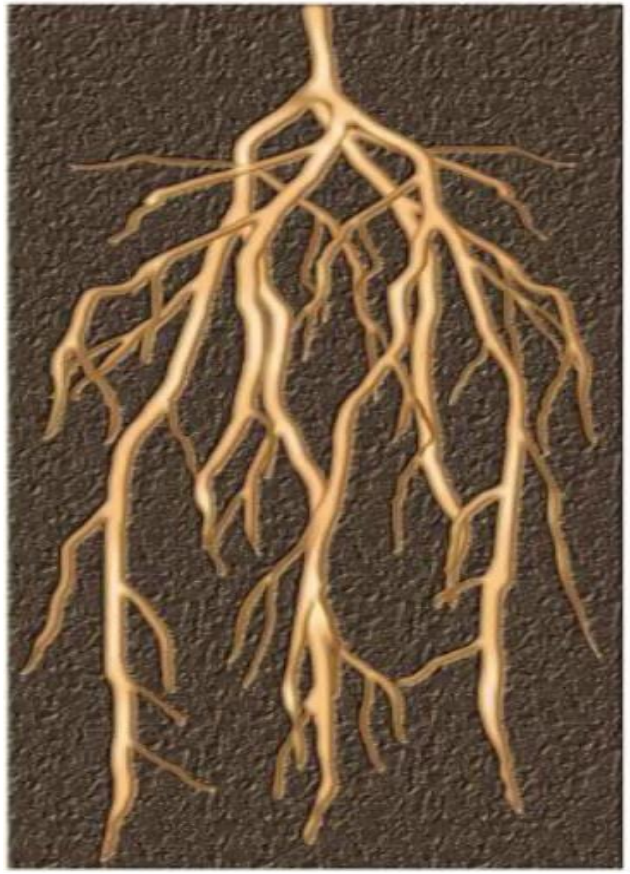
- Gradually replace synthetics over several years
- Practice other good organic practices
  - Minimize digging and no tilling
  - Add organic matter
  - Practice crop rotation
  - Don’t leave the soil bare

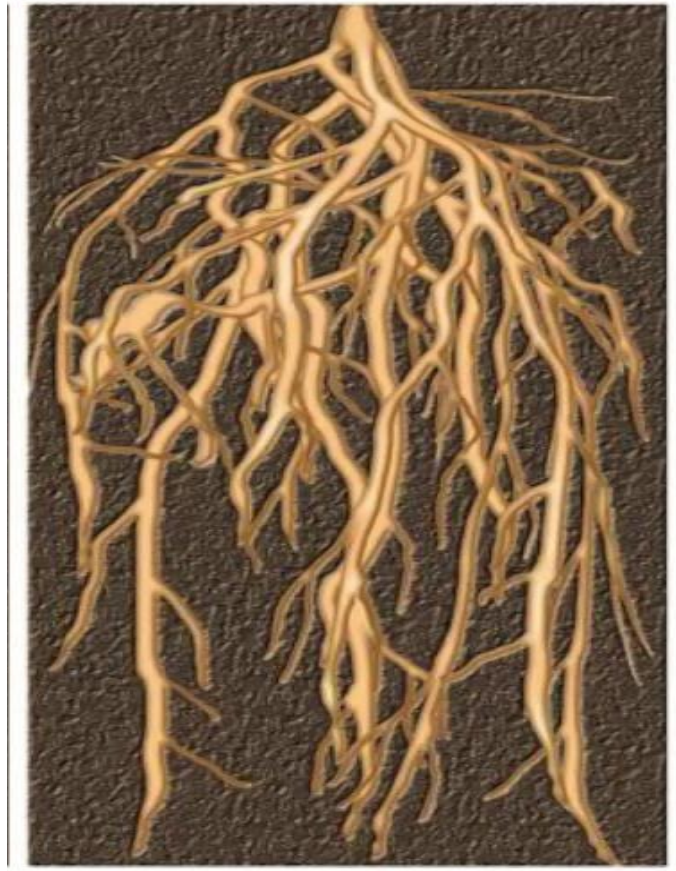
Cover Crops/ Green "Manure"

- Adds organic material below the surface without digging & can add Nitrogen to the soil
- Plant in Fall or between growing crops
- Cut down when it is in half bloom
- DON'T remove the roots
- Clip into small pieces and leave on the soil

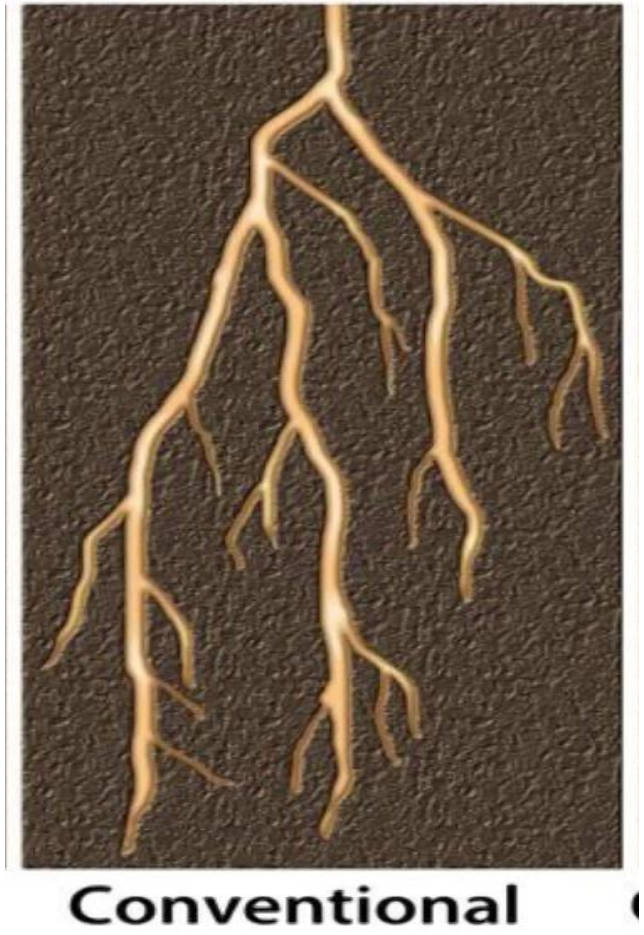
Root Growth in Three Different Soil Environments



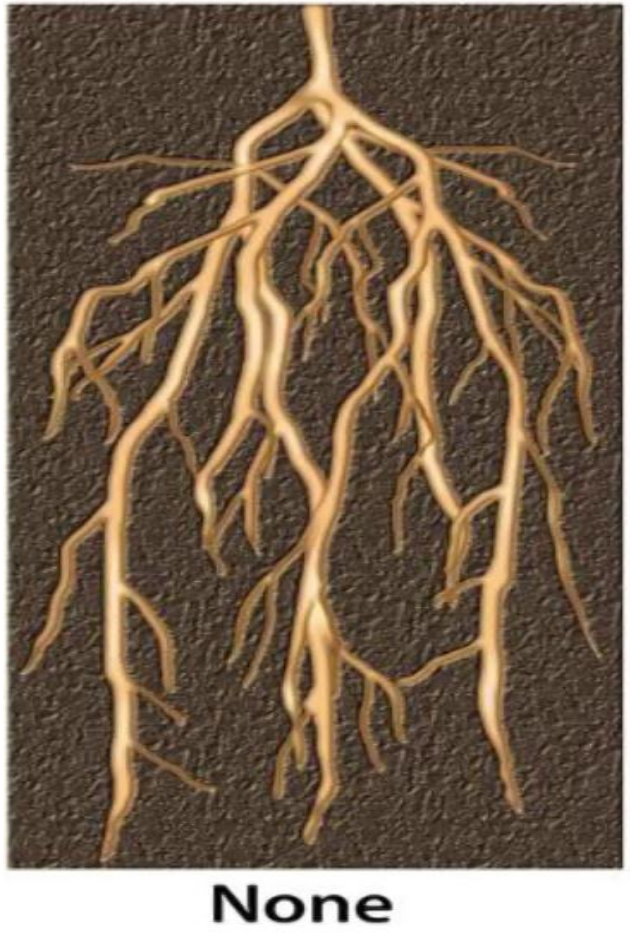




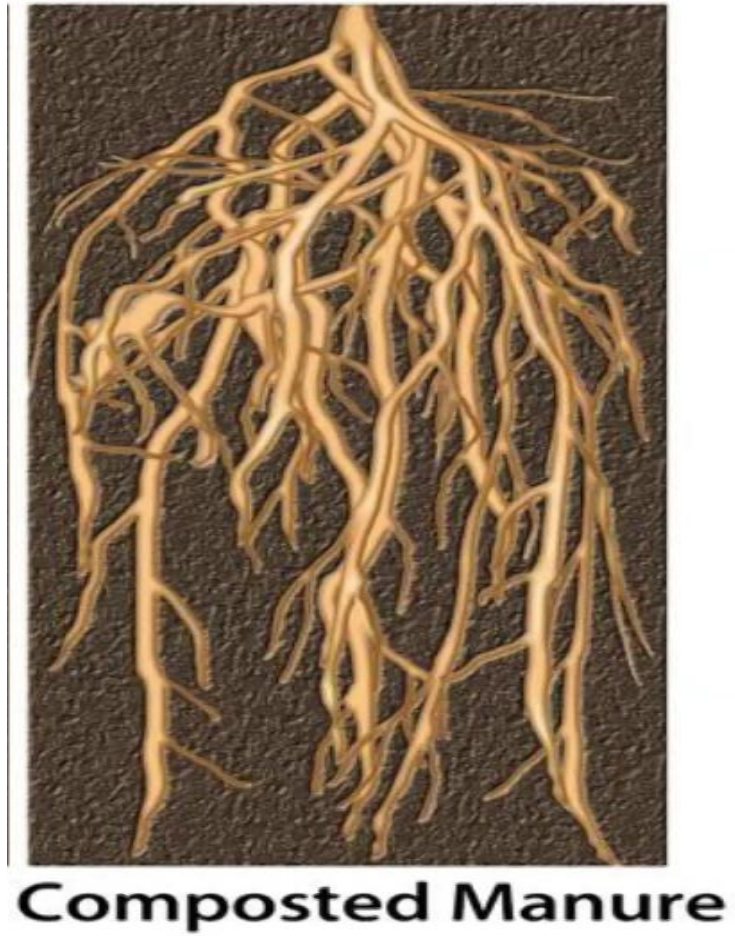
Effect of Fertilizer vs. Nature vs. Organic Amendment



with Fertilizer



Natural State



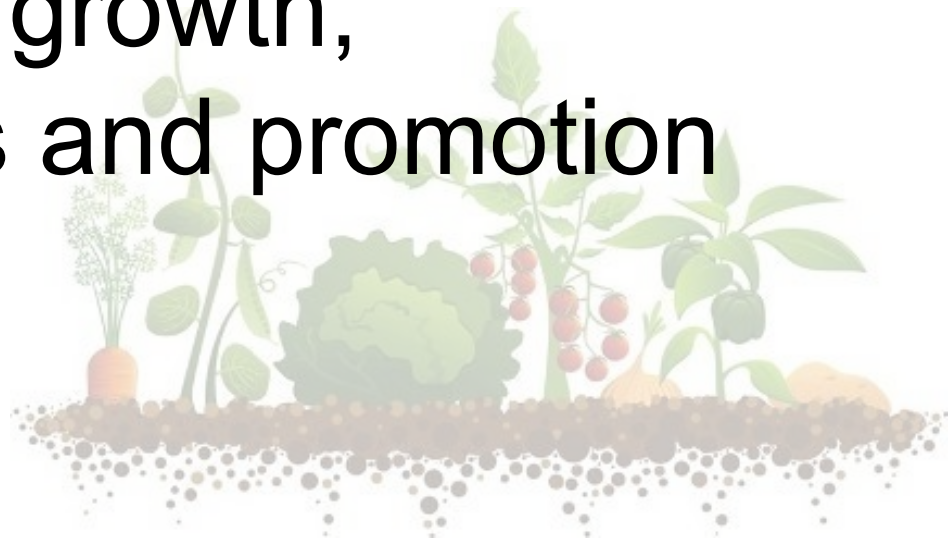
Added organic matter

Yikes ~ What to buy?

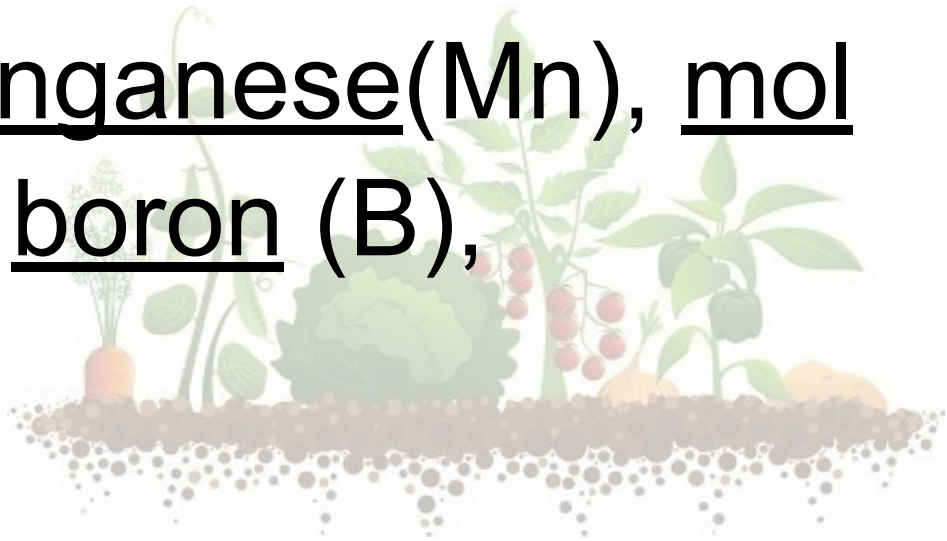
Fertilizer's 3 Numbers

They represent the three main macronutrients

- Nitrogen (N): leaf growth
- Phosphorus (P): Development of roots, flowers, seeds, fruit
- Potassium (K): Strong stem growth, movement of water in plants and promotion of flowering and fruiting

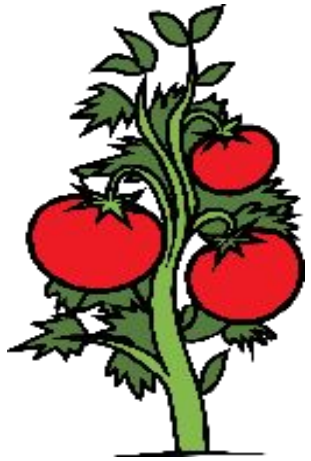


- There are three **secondary macronutrients**:
  - calcium (Ca), magnesium (Mg), and sulfur (S)
- Plus **additional micronutrients**:
  - copper(Cu), iron(Fe), manganese(Mn), molybdenum(Mo), zinc (Zn), boron (B), chlorine (Cl) & nickel (Ni)

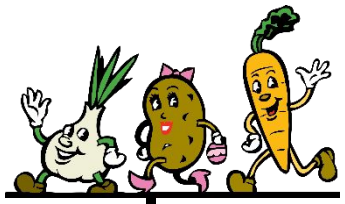


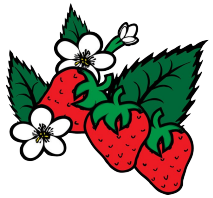
What should you use ?

- Look at the 3 numbers and think about the result you are trying to achieve
  - Leafy greens needs Nitrogen
  - “Fruit” production needs Potassium & Phosphorus



- Broccoli is a flower and legumes are seeds
- Root crops need more Phosphorus



-  For berries use a balanced formula
- Fruit trees like compost

Next Step ~ Application

- When planting place near or under seeds or transplants
- Side dressing during growth
- Watering in
- COMPOST

Summary

- What we covered
- Resources
  - Napa Master Gardeners Website
- Next ~ what to do in your garden now

My resources:

- https://johnkempf.com/water-and-nutrition-supply-are-biologically-driven/
- Backyard Carbon Sequestration: What Does Synthetic Fertilizer Have to Do with It? https://www.ecologicalgardening.net/2015/10/backyard-carbon-sequestration-what-does.html
- The Rodale white paper, "Regenerative Agriculture and Climate Change: A Down-to-Earth Solution"
- Healthy Garden Tips “Mulches, Soil Amendments and Fertilizers”
- Raw Animal Manure vs Pasteurized or Aged: Napa MG Blog https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=45694
- Grow A Cover Crop http://mgsantaclara.ucanr.edu/?search=yes&q=cover%20crop#gsc.tab=0&gsc.q=cover%20crop&gsc.page=1
- UC California Garden Web > Vegetables https://ucanr.edu/sites/gardenweb/Vegetables/?uid=26&ds=462
- UC IPM “Fertilizing Your Vegetables”