

## Food Production in Northern Climates



Dr. Steve Brown, Mat-Su/Copper River District Agriculture Agent

## Why a home garden?

- Saves money!
- Encourages people to eat more healthily
- It's a pleasant hobby
- Something the whole family can do
- Food security



## Plan your garden

- You wouldn't build a house without a plan...don't garden without one either!

- saves time
- saves money



Went without a plan well planned time

## Plan your garden

- A 10x30 m garden will supply a family of four
- Plan for the veggies you like best
- Plant enough to supply you through the year
- Plan some for others too!
- Keep notes for next year!



## Planning your garden

- Make a scale drawing
- Run rows north and south
- Tall plants towards north
- Short plants towards south



## Microclimate - Light

- Southern exposure
  - Full sun – best for most crops
  - N-S row orientation captures the most sun
- Avoid tree lines, buildings
  - Extended morning or afternoon shade will reduce yields
  - Tree roots compete for water



## Microclimate - Wind

- ❑ Sandblasting can injure plants
- ❑ Water stress
  - dry midsummer winds can draw water out of leaves faster than roots can replace it
    - ❑ Even on irrigated crops!
- ❑ Protection from prevailing winds
  - Shelter belts, hills, buildings
  - Avoid shading or use shade-tolerant plants

## Select vegetables/varieties

- ❑ Choose wisely
- ❑ Not all vegetables do well up North (duh!)
- ❑ Recommended Variety List for South Central Alaska—HGA-00031



## Some like it hot!



- ❑ Warm weather crops generally need to be grown in hoop houses, high tunnels, greenhouses
- ❑ Cucumber, corn, beans, tomatoes, peppers, etc.



## Some not!

- Cool weather crops do well up North
- Leafy crops like it cool, but not too bright
- Spinach and other greens will bolt with too much sun



## Windbreaks

- ❑ Windbreaks are critical in Alaska
- ❑ Should be upslope
- ❑ Law of 10' s
  - *Every meter of vertical windbreak protects 10 meters of ground*



## Cold Frames and Hot Beds

- ❑ Similar structures
  - Hot beds have a heating source
  - Cold frames rely on sunlight
- ❑ Function like “mini-greenhouses”
  - Ventilation very important on sunny days
- ❑ Small, low cost
  - Used to extend the growing season, grow and harden-off transplants, over-winter tender plants, and for propagation

### Cold Frames & Hot Beds



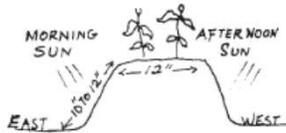
### Raised beds

- Raised beds should be 33 cm high and no more than 1 meter across
- Old tires are great
- Treated lumber can be covered with plastic



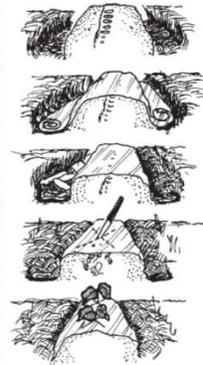
### Raise the soil temperature

- Anything that warms the soil will increase growing success
- Mounding and raised beds are good for this



### Mounding

- Form mound and plant seeds
- Cover in clear plastic
- When seedlings emerge, slit plastic
- Weeds can usually be ignored



### Test the Soil

- How much fuel is in your tank?



this



**THIS!**

### How to take a soil sample

- Best done in fall before freeze up
- Collect multiple samples 15 cm deep from entire site and mix in bucket
- Place about ¼ liter soil in sample bag



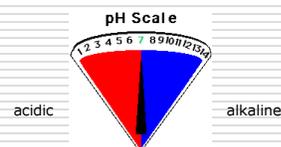
## What does a soil test indicate?

- pH and lime recommendations
  - *Don't ignore pH!!!!!!*
- Nutrients
  - (N) nitrogen
  - (P) phosphorus
  - (K) potassium



## Potential of hydrogen (pH)

- Most plants prefer 6.5-7.0 range
- Potatoes like 5.5-6.5
- TAKES TIME TO ALTER Ph!



## Liming

- Most Northern soils are too acidic
- Ground limestone "sweetens" acidic soil (don't use hydrated lime)
- Wood ashes work well too!
- Another reason for a soil test



## Organic Matter

- What the soil lives on
- Breaking down of leaves, dead bugs, etc releases nutrients
- Microbial activity
- Helps hold nutrients and water



## CHEMISTRY CLASS!!!!

- Macro Nutrients    N    P    K
  - Nitrogen (N)-Lush leaves
    - Too much just as bad as too little
    - Excess dark green but few fruits
  - Phosphorus (P)-Roots and Fruits
    - Encourages fibrous root growth
    - Strong sturdy stems, helps crops mature
  - Potassium (K)-Vigorous growth
    - Develop strong root system
    - Disease resistance

## CHEMISTRY Continued!!!!

- Secondary & Micronutrients    Ca    Su  
Mg
  - Calcium, Sulfur, Magnesium
    - Next most important for healthy growth
  - Iron, Manganese, Zinc, Copper, Boron, Molybdenum, Chlorine, Sodium, Cobalt, Nickel
    - Still needed, but in much smaller amounts

### Getting a nutrient recommendation

- Contact your friendly local University of Alaska Cooperative Extension Service agriculture/horticulture agent:

- Mat-Su/Copper River, Steve Brown- 907-745-3360



### FERTILIZING

- (N) nitrogen is always the 1st number
- (P) phosphorus is always the 2nd number
- (K) potassium is always the 3rd number

- The number represent the % in weight of each nutrient in the bag

8-32-16

### Fertilize

- What were the results of your soil test....?
- Broadcast 1½ pounds of 10-20-10 (or similar) fertilizer per 100 square feet and till into top 2 inches of soil
- Broadcast another 1½ pounds per 100 square feet mid-season



### Cultivate the soil

- Loosening the soil is important for root growth and getting air in soil
- Test the soil to make sure it isn't too wet
- Crumbly = good
- Sticky = bad



### Amend soil with compost

- Compost improves soil structure
- Introduces beneficial microbes/fungi
- Decreases nutrient loss
- Very important for man-made Alaskan "topsoil"



### Starter Solutions

- "Kickstart" for the seedlings
- Plants need phosphorus for growth
- Starter solution of 10-52-17 is best
- Alternately, use dung tea
  - Place fresh dung in large container with water...age for 1 week



### Hardening off

- ❑ Plants kept/started indoors (or in the greenhouse or coldframe) must be prepared for the shock of being outside

- Cold
- Wind
- Bright sunlight



### Irrigation

- ❑ Water regularly
- ❑ Crops grown through plastic will need less water
- ❑ Consider drip irrigation underneath plastic



### Control insects: Cutworms

- ❑ Feed at night
- ❑ Clip plant off at soil level
- ❑ Use collars or screens



### Control insects: Root maggots

- ❑ Attacks all crucifers (cabbages)
- ❑ Rotate garden yearly
- ❑ Use collars or screens



### Slugs!



### Control insects: slugs

- ❑ Use beer cup traps...maybe
- ❑ Sand paper or other rough surfaces
- ❑ Good sanitation



Need help?

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