ORGANIC VEGETABLE GARDENING

Kim Martin & Laurie Bostic
Barking Cat Farm

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BARKING CAT FARM

- Small specialty farm founded 2004
- Two locations: Heath & West Tawakoni
- Organic vegetables, cut flowers, herbs & fruits
- Intensively growing using sustainable, low till methods
- Grow over 200 varieties, many heirlooms
- CSA & restaurants

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BARKING CAT FARM

- Grow all of our own transplants
- Licensed Texas Nursery
  - Required for plant sales
  - And for cut flowers
- Vegetable gardener for 25 years

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WHY GROW YOUR OWN?

- Concerned about food safety?
- Organic food not available?
- Better taste?
- Save money?
- For the joy?

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WHAT IS ORGANIC?

- WAS the “conventional” method prior to WWII!
- Today’s “conventional” methods use synthetic fertilizers & pesticides
- “Organic” is a regulated standard
- Is the standard enough?

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AGENDA

- Soil
- Site Selection
- Growing Systems
- What to Grow
- Watering
- Fertilizing
- Pests

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WHAT IS SOIL?

- Soil is alive! Dirt is dead soil
- Minerals from weathered rock
- Organic matter
- Air
- Water
- Vast amount of biology - Soil Food Web

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SOIL FOOD WEB

- Community of organisms living all or part of their life in the soil
  - Bacteria
  - Fungi
  - Protozoa
  - Nematodes
  - Arthropods
  - Earthworms

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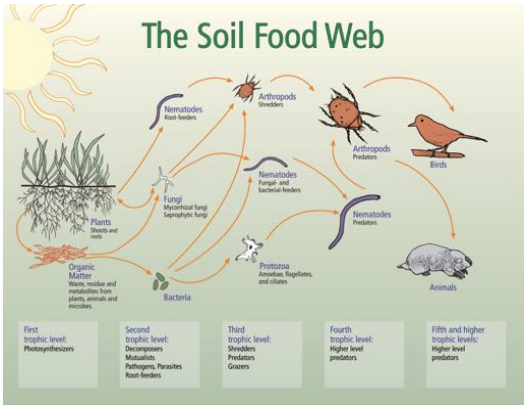

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SOIL ORGANISMS

- Rhizosphere
- Decompose organic matter
- Sequester nutrients in the soil near roots
- Release N as waste when eating each other
- Convert soil chemicals into forms that the plant needs
  - in exchange for root exudates (sugars, amino acids)

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HOW'S YOUR SOIL?

- Go dig down into your soil with a hand spade, look for biological activity:
  - Good, earthy smell
  - "Sticky", aggregating soil
  - Earthworms, small insects

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BUYING SOIL

- Small scale - buy bagged soil, but it needs biology
- Better solution - buy pickup load from local supplier
- Add biology!
  - Vermicompost (worm castings)
  - Good compost

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SOIL TESTS

- Necessary part of growing good food
- Use same lab year after year
- Easy to take samples
- "Hands on Agronomy" by Neil Kinsey

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CARING FOR SOIL

- Build organic matter continuously
  - Add compost, use different sources
  - Cover crop
  - Rotate your crop families

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SITE SELECTION

- "Full sun" generally means 6-8 hours
  - National garden experts don't know Texas!
  - Observe sunlight patterns
  - Shade is good in July/August
- Orientation
  - Trees, fences, buildings, other obstacles

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SITE SELECTION

- Drought requires using more shade:
  - Grow taller crops on Western/Southern side
  - Reduce sun exposure in summer to 6 hours
  - Consider using shade cloth, shade tunnels

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SITE SELECTION

- Also take into account:
  - Drainage
  - Wind
  - Where's your water?
  - How far from your house?
  - How big? Will you need new tools?

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IN GROUND GROWING

- What was the previous use?
- Sod removal
- Tilling
- Amendments to improve tilth
- Slopes, contours

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RAISED BEDS

- Quickest solution
- Easy to construct
- Limit width to 4' or less
- Can be made accessible
- Easily add low tunnels with row cover, shade cloth

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CONTAINERS

- Still need "full sun"
- Watering requires more care
- Crop rotation or soil replacement important!
- Best book: See handout!

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GROWING SYSTEMS

- Row cropping
  - Traditional
  - Often watered by row flooding
- Intensive
  - Also traditional
  - More efficient use of water
  - Perhaps more friendly to soil biology

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GMO

- GMO = Genetically Modified Organism
- Commodity Crops
  - Corn
  - Sugar Beets
  - Soybeans
  - Work has been done on other vegetables
- GMO contamination
  - Drift
- Safe Seed Pledge

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HYBRID VS OPEN-POLLINATED

- Hybrids
  - Produced by crossing two open pollinated plants
  - Seed saving not generally recommended
  - Improved disease resistance, production
- Open-pollinated
  - Heirlooms
  - Seeds produce similar plants

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ANNUAL, BIENNIAL, PERENNIAL

- Annuals
  - Last one year
  - Form fruit, set seed, die
  - Plants may reseed themselves
- Biennial
  - 2 year cycle
  - Onions
  - Vegetative 1st year, seed 2nd year
- Perennials
  - Return year after year ex: asparagus

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WHAT TO GROW

- What do you like to eat?
- Do you want to freeze or can?
- Do you want to start your own transplants?
- Do you have enough space?

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VARIETY SELECTION

- Big box stores don't necessarily know what works here...
- And neither do some local nurseries!
- Tested varieties can be found from TAMU (see handout)
  - However, can be out of date
  - Mainly hybrids
- Not all heirlooms work here

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TIMING IS EVERYTHING!

- Check vegetable planting dates for your area
- Our average last frost: 3/15
- Our average first frost: 11/15
- What does it mean?

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CROP FAMILIES & ROTATION

- Crop rotation is about "Family"
- 3 years in between planting
  - be careful, some popular vegetables are in same family!
  - Tomato, potato, pepper, eggplant - all Solanaceae
- Why
  - avoids depletion of nutrients
  - avoids build up of soil borne diseases
  - avoids build up of pests

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CROP FAMILIES & ROTATION

- Make a plan
  - Doesn't have to be complicated
  - Think about when crops planted, when done
  - Can get 2-3 crops, maybe more per season
  - Keep records of what you plant where & when
  - Don't plant crops from the same family in that area again for 3 years
  - Incorporate cover crops

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COOL WEATHER CROPS

- Plant so they will mature in cooler weather
  - These crops do better in the Fall here, but possible in Spring:
    - Fava Beans, Beets, Broccoli, Cabbage, Carrots, Cauliflower, Chard, Cilantro, Collards, Kale, Kohlrabi, Lettuce, Mustard, Parsley, Snow Peas, Sugar Snap Peas, Green Shelling Peas, Radishes, Spinach, Turnips
- Onion plants – February
- Brussels Sprouts – Fall only, need cold weather to sweeten sprouts

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WARM WEATHER CROPS

- Plant in warm weather!
  - Seed will rot in ground, frosts will kill
  - Beans, Corn, Cucumber, Eggplant, Melons, Okra, Southern Peas, Peppers, Pumpkins, Squash (Summer & Winter), Tomatoes
- Pepper & Tomato plants set out in March
  - Must start 8-10 weeks before
- Eggplants plants set out in April
  - Grow all season
  - Do best in Fall

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SUMMER

- Grow hot weather loving crops in the summer
  - Okra
  - Cucumbers – irrigation required
  - Melons – irrigation required
  - Southern Peas
  - Squash – irrigation required
  - Beans - irrigation required
  - Peppers, cherry tomatoes & eggplants from Spring can grow all year
  - Basil
  - Amaranth, Malabar spinach, buckwheat

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SUCCESSION PLANTING

- Not same as rotation
- Plant same crop several times instead of once
- Common with
  - Beans
  - Squash
  - Corn

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WHAT DO SEEDS NEED?

- Water
- Light
- Oxygen
- Heat

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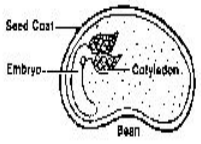
GERMINATION BASICS

- Seed coat
- Embryo
- Cotyledons
  - [kot-l-eed-n]
- Endosperm



http://gardening.wsu.edu/library/vege004/vege004.htm

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HOW SHOULD THIS SEED BE STARTED?

- Plant these outside, don't transplant:
  - Root crops (carrots, radishes, turnips)
  - Beans & peas
  - Fast growing crops: cucumbers, melons, zinnias, sunflowers
- Read the seed packet or catalogue
- Search on-line; try Google with: site:*.edu

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WHERE DID THIS SEED COME FROM

- Federal Seed Act - Germination percentage
  - http://www.ams.usda.gov/ - search for “seed act”
- Good packaging
- Safe seed pledge
  - http://www.gene-watch.org/programs/safeseed/sourcebook.html

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STORED PROPERLY

- My garage….
- My closet….
- Retail rack
- Direct shipped from seed company
- Refrigerator
- Freezer

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WATERING

- Drip irrigation
- Soaker hoses
- Sprinkler
- Hand water

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WATERING

- Drip irrigation
  - Best approach
  - Water efficient
  - Less evaporation
  - Prevents foliar disease
  - May be allowed during watering restrictions, check with your water

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WATERING

- Soaker hoses
  - Replace annually
  - Uneven pressure
- Sprinkler
  - Lose water to evaporation
  - Foliar disease
  - Watering restrictions
- Hand water

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FERTILIZER

- N-P-K
  - Percentages of Nitrogen, Phosphorus & Potassium
  - Soil test recommends amounts
  - N most mobile in soil
  - P & K can build up

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N - NITROGEN

- Key for growth
- Deficient plants are
  - Spindly
  - Light green to yellowing leaves
  - Older leaves yellow first
- All forms of N applied must be mineralized
  - Requires soil biology!

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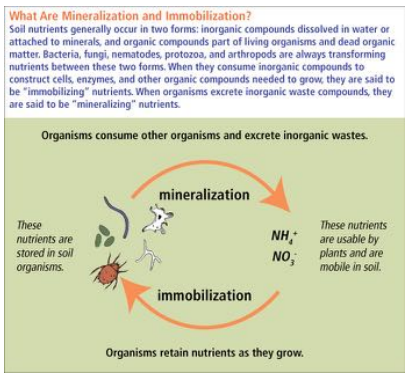

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N - NITROGEN

- Used by plants in two forms:
  - Nitrate NO_3
  - Ammonia NH_4+
- Nitrate needed early in season for leaf
- Ammonia needed for fruit & seed production
- Switch forms back & forth in soil

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N - NITROGEN

- Bacteria & fungi contain N
  - When eaten, some N released as plant available ammonium
  - Can convert to nitrate in soils dominated by bacteria
  - Fungally dominated soils - N in ammonium form
- Sources: compost, manures, meals, fish

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P - PHOSPHORUS

- Needed for
  - Photosynthesis
  - Energy storage & transfer
  - Cell division
- Deficient plants are
  - Spindly
  - Dull green
  - Purpling of stems, undersides of leaves

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P - PHOSPHORUS

- Not mobile in soil
  - Put it where you need it but not too deep
  - Roots have to come in contact
- Uptake affected by
  - Temperature
  - Aeration & moisture
- Sources: soft rock phosphate, manure, compost

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K - POTASSIUM

- Potash or K_2O
  - Photosynthesis
  - Transport & storage of carbohydrates
  - Hardiness, cell wall construction
  - Water use efficiency
  - Increases yields, quality, reduces disease

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K - POTASSIUM

- Deficient plants are
  - Yellow to brown edges on older leaves
  - Light green between leave veins
  - Older leaves affected first
- Sources
  - Compost, manures, soil microbial action, naturally mined potassium sulfate

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HOWEVER

- When you add fertilizer, especially N
  - You are doing the job of some soil biology
  - Junk food for the soil
  - Use low rates, focus on biology

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WHAT TO USE

- Good compost
  - May be your own
  - Duffing
- Use low N amendments
- Use Fish & Kelp
- Use Molasses sparingly
- Consider avoiding blended fertilizer

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PESTS & DISEASE

- Indicator
  - Biology is not working
  - Brix levels are low
  - Look at your soil!

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farm@barkingcatfarm.com
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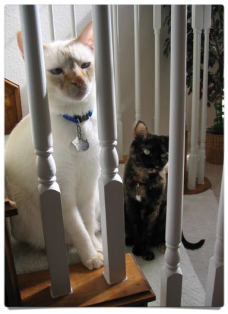

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