



Vegetable Gardening

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Slides: <http://bit.ly/autaugaveg>



Principles (Dani Carroll)

- n Work with nature, not against it
- n Better to have a small, well-tended garden than a large neglected one



Five Factors to Consider in Selecting a Garden Site

- n # 1: Sunlight—6-8 hours per day
- n # 2: Convenient water source
- n One inch per week (60 gallons per 100 sq feet)
- n Avoid overhead watering
- n Water less often and more deeply
- n Water directly to the roots
- n You'll hear more about irrigation later



Five Factors to Consider in Selecting a Garden Site

- n # 3: Well-drained soil (fill 1-ft hole with water, should drain within 30 minutes)
- n Organic matter can help
- n If soil drainage is poor, consider raised beds
- n Raised beds also help with limited space, sloping terrain, weed encroachment, saving your back, etc.
- n Warm faster in spring, but dry out faster



Five Factors to Consider in Selecting a Garden Site

- n #4: Site near your home
- n Need to check daily (insects, disease, fruit, leaky irrigation, weeds)
- n #5: Air drainage
- n Avoid low spots (trap cold air)



Fertility - Healthy Soil is Key

- n Get a soil test
- n Soil pH
 - n Most vegetables prefer 6.2-6.8
 - n Specific vegetables listed in your chapter
 - n If acid, add lime
 - n Dolomitic lime adds calcium and magnesium
 - n If alkaline, add pine sawdust
- n Nutrient analysis: Phosphorus, potassium, magnesium, calcium
- n Organic matter

Fertility - Healthy Soil is Key

- n Soil Test Report will recommend lime and fertilizer
- n Apply fertilizer as recommended
- n Fertilizer bag numbers: N-P-K
- n Compost is also a source of nutrients
- n Cover crops: legumes (peas, beans, clover, Sunn hemp) fix nitrogen
- n Beware of applying N too early
 - n Apply $\frac{1}{2}$ 1-2 weeks before planting
 - n Add the other $\frac{1}{2}$ in 2-3 week increments (side-dressing)
- n 3-4 inches from plant stem

Fertility - Healthy Soil is Key

- n Long season and short season crops
- n Long season crops (tomatoes, peppers, okra, sweet potatoes, and cabbage) need more fertilizer
- n Short season crops (squash, lettuce) need less fertilizer

Two Ways to Plant

- n Direct Seeding
- n Transplants

Direct Seeding

- n Plant into moist but not saturated soil
- n Follow seed packet directions re spacing
- n Lightly firm soil over seed after planting
- n Keep soil moist until seed germinates
- n You can plant more closely and then thin

How deep?

- n Smaller seeds—no more than $\frac{1}{4}$ " deep
- n Larger seeds— $\frac{3}{4}$ to $1\frac{1}{2}$ " deep

Advantages of Transplants

- n Jump start on growth
- n Avoid having rain wash away seeds
- n Some types of plants don't germinate well if direct seeded



Disadvantages of Transplants

- n Can't find desired variety in store
- n Plants not in store at the right time
- n Start your own seeds at home



When to Plant?

- n "The Alabama Vegetable Gardener" (ANR-0479)
- n "Planting Guide for Home Gardening in Alabama" (ANR-0063)
- n Your chapter also has planting dates



What Varieties?

- n "The Alabama Vegetable Gardener"
- n Seed catalogs
- n Choose disease-resistant varieties



Containers for Starting Seed

- n Seeding flats
- n Peat pellets
- n Cell packs
- n Soil blocks



Seed Starting Medium

- n Must be sterile
- n Soil-less, peat-based mix
- n Pro-mix or Faford
- n Or make your own



Making Your Own Starting Medium

- n 1 bushel shredded sphagnum peat moss (pre-moistened)
- n 1 bushel horticultural vermiculite
- n 10 oz. 4-16-8 fertilizer
- n 3 oz. ground dolomitic limestone
- n Mix with water in 5 gallon bucket



Germination

- n Most seeds need consistent 75-80°
- n ANR-1061 offers specifics per vegetable
- n Provide heat under the tray (seed mat)
- n Cover with clear dome
- n Some seeds don't need light to germinate
- n But they all need it once they're up



Germination

- n Remove dome when you see green
- n Keep light 2 inches from plants so they won't get leggy
- n Don't water from top
- n Into the tray underneath the plants
- n When soil feels dry, replenish tray
- n It's easy to overwater seedlings!



Stepping Up

- n Transfer small seedlings to larger containers
- n Keep light on them



Hardening Off

- n Introduce natural light gradually
- n When plants are 5-6 inches tall
- n Dappled shade is a good transition tool



Planting Transplants

- n At container level, except tomatoes
- n Or a little deeper than root ball
- n Water to settle roots
- n Space plants according to guidelines
- n Too close: humidity and poor air circulation increases disease risk
- n Too far apart: reduced yields, wasted space, more weeds



Caring for Plants - Mulch

- n Leave no bare soil
- n Conserve soil moisture
- n Moderate soil temperature
- n Suppress weeds
- n Prevent soil crusting
- n Reduce erosion



Caring for Plants – Mulch Materials

- n Newspaper
- n Decomposed leaves
- n Straw or hay
- n Grass clippings
- n WeedGuard
- n Black plastic



Succession Planting

- n Plant every three weeks
- n Tomatoes, beans, corn
- n Maximizes yield
- n Helps with determinate crops (so you won't have all your corn at one time)



Weed Control

- n Preventative, mechanical, and mulch
- n Mulch 6-8 inches thick
- n Newspaper: 8 sheets thick



Cover Crops

- n Weed suppression
- n Biomass
- n Control erosion
- n Nitrogen fixing (legumes)
- n Breaking up hard soil (forage radish)
- n Production of mulch



Integrated Pest Management (IPM)

- n Cluster of cultural, physical, and chemical techniques to limit pest damage
- n Cultural
 - n Resistant varieties
 - n Crop rotation by families (no repeat for 3-4 years)
 - n Soil conditioning
 - n Disease-free transplants
 - n Proper watering
 - n Sanitation
 - n Companion planting
 - n Avoid monoculture



Integrated Pest Management (IPM)

- n Physical
 - n Row cover (exclude insects)
 - n Trap cropping
 - n Solarization
 - n Scouting for plant diseases
 - n Weed control (habitat for pests)
 - n Insect control to prevent spread of disease



Integrated Pest Management (IPM)

- n Chemical - last resort if the first two fail
 1. Diagnose the pathogen or causal agent correctly
 2. Begin spray program at the right time, as a preventative
 3. Follow directions on pesticide label
 4. Avoid using pesticides above 90 degrees or if windy



Know Your Vegetable Families (ANR-1254)

- n Onion (*Alliaceae*) - onion, garlic, leeks, shallots, chives
- n Carrot (*Apiaceae*) - carrot, parsnip, parsley, celery
- n Sunflower (*Asteaceae*) - sunflower, lettuce, endive, salsify, Jerusalem artichoke
- n Goosefoot (*Chenopodiaceae*) - Beet, Swiss chard, spinach



Know Your Vegetable Families

- n Mustard (*Brassicaceae*) - mustard, cabbage, broccoli, cauliflower, kale, collards, Brussels sprouts, rutabaga, kohlrabi, radish, turnips
- n Mallow (*Malvaceae*) – okra
- n Nightshade (*Solanaceae*) - tomato, pepper, eggplant, Irish potato



Know Your Vegetable Families

- n Grass (*Poaceae*) – corn
- n Pea (*Fabaceae*) - peas, beans, soybeans
- n Bindweed (*Convolvulaceae*) – sweet potatoes
- n Gourd (*Cucurbitaceae*) – muskmelon, watermelon, summer squash, winter squash, pumpkin, honeydew melon, gourd



Vegetables By Season

- n Cool Season (Fall into Spring)
- n Warm Season (Late Spring, Summer, and early Fall)
- n Book & ANR-0063 list varieties that work well in our area
- n First we'll look at Cool Season



Asparagus

- n Perennial, thrives for 15+ years
- n Plant in March
- n Dig v-shaped furrow 12" deep
- n 1-2" compost, then crowns, then 2-3" inches of soil
- n When the plant pokes through, fill remainder of furrow with soil



Harvesting Asparagus

- n Year 1 - no harvest
- n Year 2 – 2 weeks and then stop
- n Year 3 – 4 weeks and then stop
- n Year 4 and all subsequent – 6 weeks and stop
- n Stop when spears are smaller than a pencil
- n When ferns turn brown, cut them back



Asparagus – Early Spring Dressing

- n Broadcast lime if needed
- n Add compost and fertilizer
- n Gently rake into soil 1-2" deep



Brassicas

- n Plant in the Fall
- n They'll bolt in the Spring when it warms up
- n Transplants generally better than direct seeding
- n If you start seed, allow 5-6 weeks from seeding to transplants
- n Plant spacing varies – check ANRs



Broccoli

- n Harvest center head when flower shows slight yellow



Cauliflower

- n When curd develops, tie leaves together to block out sunlight
- n Cut heads while still tight



Brussels Sprouts

- n Sprouts form on the stalk
- n When lower leaves yellow, cut them off and remove sprouts that are 1" in diameter
- n I've had success cutting tops off plants



Cabbage

- Harvest when head is firm



Collards and Kale

- Harvest lower leaves
- Plant will continue growing new leaves



Mustard and Turnips

- Magnesium deficiency common, so use dolomitic limestone
- Harvest lower leaves until weather gets too hot
- Harvest turnip roots when 2 -2½" in diameter



Rutabaga

- Can direct seed in July or plant transplants in the Fall
- Both leaves and roots are edible
- Harvest roots when 3-5" in diameter



Lettuce

- Better to start with transplants
- If direct seeding, make sure water is available until plants are established
- I've had good results with transplants if I wait until it's really Fall (not just September 21!)



Beets, Carrots and Radishes

- Need well-drained loam soil high in organic matter (like every other vegetable!)
- Harvest at proper root sizes
 - Beet: golf ball
 - Carrot: 1" or less in diameter at crown
 - Radish: ¾-1¼ inch



Chives

- n Direct seed or transplant in spring
- n Harvest leaves as desired during growing season
- n Cut back to ground after freeze
- n They'll come back in the spring
- n After 3-4 years they form separate plants
- n You can divide them



Onions

- n You can plant short day transplants in the Fall if you can find them
- n Roots develop better if you plant in Fall (after it turns cool)
- n You can plant in the Spring, but you'll get tiny little onions



Garlic

- n Plant in October or November
- n Harvest in early Summer when half the leaves have turned brown
- n No water for at least a week before harvest



English ("Garden") Peas

- n Include both shelling and sugar snap varieties
- n Seeds germinate best in 40° soil
- n For us, that's February
- n They need a trellis



Now We Shift to Warm Season

- n Plant after average last freeze (for us, March 31)



Southern Peas (Cowpea)

- n Germinate best in 60° soil
- n Vining types need a trellis
- n Drought resistant, but irrigation improves yields
- n Can plant purple hull peas as late as July and still get a crop



Potatoes

- n Best grown in late winter or early spring
- n February is recommended
- n Edible plant part is the tuber
- n Choose early/early mid-season varieties that do not require a long growing season
- n Too hot in Alabama for long-season types, like Russet



Potatoes

- n 3-4 days before planting, cut into egg-sized pieces
- n Place in well-ventilated area so cut can heal
- n Plant pieces 2-3" deep about 1' apart in rows 3' apart
- n Protect growing tubers from sunlight by covering with thick mulch when plants are 8-10" tall
- n Harvest when vines die and turn yellow
- n Allow potatoes to cure 2 weeks prior to consumption



Corn

- n Plant on or within a few days of last killing frost
- n For us, that's mid March through April
- n Corn needs to mature before it gets really hot
- n Early planting also helps with insects
- n Plant in blocks, not long rows (helps with pollination and ear fill)



Tomatoes

- n Most popular home-grown vegetable
- n Not the easiest!
- n Susceptible to disease and insects
- n Choose resistant and heat-tolerant varieties
- n Plant in April
- n Start transplants indoors, step up until they are 6" x 6"



Tomatoes

- n Space 2-3 feet apart
- n I prefer 3 feet for air circulation
- n Plant deep
- n Pinch off lower leaves
- n Dig a trench
- n Plant root ball and most of stem in the soil, cover and water all along the planted area



Tomatoes

- n Trellis, stake, or cage
- n Companion planting important (basil, marigolds, herbs to attract braconid wasps)
- n Keep watering level consistent to avoid blossom end-rot
- n Prune suckers (lateral branches) in early mornings when small (2-4")
- n Harvest when tomato is full-sized and has reached "breaker stage" (color just beginning to show)



Tomatoes

- n Store out of sunlight 44-60°
- n Greener tomatoes need higher temps



Two Types of Tomatoes

- n Indeterminate
 - n Vining plant
 - n Keeps producing as long as environment is favorable
- n Determinate
 - n Limited height (3-4 feet)
 - n Bears most fruit within 4-6 weeks
 - n Not much after that



Peppers and Eggplant

- n Nightshades like tomatoes
- n Less cold tolerant
- n Handle heat better
- n Germinate more slowly than tomatoes
- n May need staking as the season progresses
- n Eggplant susceptible to flea beetles but can bear through them
- n Plants can get large, so space accordingly



Cucurbits

- n Cucumbers, cantaloupes, watermelons, squash, and pumpkins
- n Vine crops – need lots of space
- n Often planted in hills, usually 5-7 seeds per hill
- n Thin to 1-2 seedlings per hill at 2-4 leaf stage
- n Spacing varies from 1' (cukes) to 5' (watermelon, vining pumpkins)



Cucumbers

- n Cucumbers can be trellised to save space
- n Select bitter-free cucumber varieties
- n Keep soil fertile
- n Water consistently
- n Keep pH from getting too low
- n Keep well-picked



Cantaloupes

- n Place small squares of wood underneath fruit to prevent rotting of bottom
- n Harvest when fruit separates easily from stem



Watermelons

- n Harvest when ground spot turns yellow
- n Fruit looks more dull
- n Dead tendril attached to vine
- n Fruit sounds dull when thumped



Squash and Pumpkin

- n Vine borers and squash bugs are major pests
- n You'll probably get at least one free year
- n Plant resistant varieties
- n *C. mochata* and *C. argyrosperma* (*C. mixta*) have good resistance to vine borers
- n Not included: yellow squash and zucchini!



Squash and Pumpkin

- n Row cover will help deter borers; keeps out moth that lays eggs.
- n Remove barrier when blossoms appear
- n Borer damage—entire plant wilts
- n One remedy is to cut open stem, remove borer, replant and water well



Dealing with Squash Bugs

- n Consistent scouting essential
- n Eggs laid in leaf margins on both tops and undersides of leaves
- n Hand removal works unless there is an infestation
- n Mulch can be a problem as the bugs can hide under there
- n Put down small squares of wood
- n Wait for the bugs to gather under there
- n Lift the board and kill them



Okra

- n Direct seed in warm soil
- n Can cut back to 6-8" from ground in late summer for second crop
- n Keep well picked



Sweet Potato

- n Plant transplants in April-June (they like it warm)
- n Well-drained, coarse-textured soil that is relatively low in N; can be trellised
- n Exposure to sunlight will cause fruit to turn green, so protruding potatoes should be harvested
- n Crop is ready for harvest when the greatest number of 8-10 ounce potatoes are found under each plant



Sweet Potato

- n Cure 7-10 days at 80-85 degrees and 70-90% humidity
- n Store at 55 degrees, 85 % humidity



Beans

- n Direct seed in well-drained soil in April-May
- n Bush beans mature faster than pole beans, which will require trellis
- n Maintain adequate water supply, especially at bloom and pod-setting time



Fall Vegetable Gardening

- n Better time to work outside in Alabama!
- n Plants are hardy and frost-tolerant, varying in degree of cold tolerance



Fall Season Crops

- n Germinate in cooler temps
- n Shallower root systems
- n Smaller plant sizes



Plants That Frost Will Kill

- n Nightshades
- n Cucurbits (yes, that includes winter squash)
- n Okra
- n Corn
- n Sweet potatoes
- n Beans
- n Melons
- n Southern Peas (not spring peas)



Plants That Will Survive Frost

- n Broccoli and cabbage
- n Cauliflower
- n Chard
- n Lettuce
- n Mustard
- n Onion, radish, and turnip
- n Frost blanket gives us 6° or so protection



Cold Weather Champs

- n Beets
- n Brussels sprouts
- n Carrots
- n Collards and kale
- n Parsley
- n Spinach



Organic Insecticides

- n When all else fails
- n Amanda's disclosure
- n Follow label directions!



Bacillus Thuringiensis (Bt)

- n Stomach poison that paralyzes insect's gut; targets specific pests and doesn't harm beneficials
- n Kills insect in 10-14 days
- n Apply early in season
- n Target at small stage; larger insects harder to control
- n Apply to lower leaf surface



Beauveria Bassianais

- n Living insecticides w/ fungal spores
- n Effective against aphids, whiteflies, caterpillars, etc.
- n Don't mix with fungicides—will kill spores
- n Penetrates the exoskeleton of target insects and enters bloodstream, poisoning the host



Neem Oil

- n Physical poison effective on small and soft-bodied insects
- n Repeat application to keep some insects (e.g. aphids) in check



Spinosad

- n Effective against caterpillars, flea beetles, thrips
- n Can be highly toxic to pollinators
- n Apply only during evening hours when bees aren't around



Pyrethrum

- n Contact poison
- n Needs to be applied several times throughout season
- n Kills small insects; larger insects may recover



Garlic Extract

- n Repels insects
- n Rarely kills them
- n Mobile insects will recolonize plant after product wears off



Paraffinic Oil Products

- n Not fatal to target pest (e.g., aphids, mites, whiteflies)
- n Affects ability to feed and transmit diseases
- n Apply at first detection and reapply weekly
- n Cucurbits-apply right after germination
- n Avoid using above 90° or when plants are drought-stressed



Sulfur

- n Effective against thrips, scales, spider mites
- n Some products can cause leaf burn on hot days



Insecticidal Soap Products

- n Potassium salts of fatty acids specifically for use on crops
- n Dishwashing detergents can damage crop or leave off taste
- n Do not apply above 85°
- n Repeat applications and thorough coverage of plant necessary to keep soft-bodied insects in check



Kaolin Clay

- n Natural, white mineral produced in the earth by weathering of rocks rich in aluminum silicate
- n May not kill insects but repel and confuse them due to unfamiliar coating on plant/fruit surface
- n Thorough coverage is essential, along with repeat spraying after rainfall



Drip Irrigation

- We haven't yet found a wrong way to do it
- We bury our trunk lines and feeder lines
- So we can mow over them
- Drip tape lies on the surface or just below it
- Controller is up in the barn out of the weather



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