1. Vegetables for health
   • Eat a variety of colors
   • Vary preparation methods
   • Vitamins, minerals, fiber, phytochemicals

2. Success in the Vegetable Garden
   • Follow local/regional advice
   • Choose a sunny location
   • Provide moisture and drainage
   • Build healthy soil
   • Use compost, cover crops, mulch
   • Plant in the proper season
   • Control weeds, pests and disease
   • Harvest at peak for best quality

3. Regional Advice
   • Books
     o Texas Fruit and Vegetable Gardening by Greg Grant
     o The Southern Kitchen Garden by William D. Adams and Tom LeRoy
     o The Vegetable Book by Sam Cotner
     o Vegetable Gardening in the Southwest by Trisha Shirey
     o Month by Month Gardening by Skip Richter
   • Aggie website http://aggie-horticulture.tamu
   • Blog: www.masterofhort.com

4. Garden Location/Layout
   • 6-8 hours of sun
   • Rows, Raised Beds, SFG, SBG

5. Utilize containers
   • 5 gallons or larger is best
   • Use lightweight potting mix
   • Water frequently

6. Moisture & Drainage
   • Locate garden near a source of water
   • Water deeply, 1-1½” water per week
   • Drip or soaker hoses
   • Monitor your equipment regularly
   • Capture rain water

7. Soil Preparation
   • 8-12” loose soil, pH of 6.0-7.5
   • Perform a soil test
   • Incorporate 1-2” compost each season
   • Build soil with cover crops and mulch
   • General fertilizer recommendation:
     o ½-1 cup fertilizer (15-5-10) per 20’ row
     o Or 1 tablespoon/plant
     o Double amount if using organic (8-2-4)
     o Sidedress every 4-6 weeks

   • Encourage beneficial insects
   • Identify and target destructive pests
   • Limit use of pesticides, use least toxic
   • Build soil over time (compost, cover crops)
   • Biodiversity – ‘mix it up’

9. Make your own Compost
   • Layers of green and brown with a shovelful of soil/compost
     o Green = nitrogen
       ▪ Grass clippings, kitchen waste, coffee grounds, manure
     o Brown = carbon
       ▪ Leaves, newspaper, straw
   • Make it big – 3’ x 3’

10. Kitchen compost
    • Do use vegetable scraps, coffee grounds, tea bags, cooking liquid
    • Do not use meat, fat, bones

11. Cover Crops
    • Fall: Elbon rye, vetch, clover
    • Spring: buckwheat, cowpeas

12. Mulch Planting Beds
    • Controls weeds
    • Helps retain moisture
    • Moderates soil temperature
    • Adds organic matter over time
    • Use compost, leaves, pine needles, grass clippings, newspaper, straw
13. Seeds
- Heirlooms:
  - OP, been around 50+ years
  - Variable maturity rate, yield
  - Self-pollinators are easiest to save: tomatoes, beans, peppers, okra
- Hybrids:
  - Cross between two parents
  - Uniform genetics – same plant every time, hybrid vigor, consistent yield
  - Improved disease resistance

14. Direct Seed vs. Transplants
- Better to direct seed:
  - Beans, peas, beets, carrots, radishes, turnips, spinach, Swiss chard, lettuce, collards, kale, cucumber, squash
- Better to transplant:
  - Broccoli, cabbage, cauliflower, eggplant, onions, pepper, tomatoes

15. The Right Plant…at the Right Time
- Recommended Varieties
- Vegetable Planting Calendar
  - Average First Freeze: late November
  - Average Last Freeze: early March

16. Seasons in the Vegetable Garden
- Cold season: Jan-Feb
- Warm season: March-April
- Transition warm to hot: May
- Hot season: June-Aug
- Transition hot to warm: Sept-Oct
- Cool season: Nov-Dec

**Cold Season: Jan-Feb**
Tolerate frost, protect when temperature <28°F
Optimum temp for growth is 55-65°F
Frost tolerant once established

17. Crop Rotation by Family – Cool Season
- Cabbage/Brassica – arugula, broccoli, Brussels sprouts, cabbage, cauliflower, collards, kale, mustard, radish, turnip
- Goosefoot – beets, chard, spinach
- Umbel – carrots, cilantro, parsley
- Onion – onion, garlic, leeks
- Composite – lettuce, artichoke
- Legume – peas

18. Cabbage Family/Brassicas
- Prefer full sun, can tolerate light shade
- Cold tolerant – can take a freeze
- Watch for caterpillars

19. Arugula
- Easy to grow, plant seed 4-6” apart
- Plant small section every 2 weeks

20. Broccoli, Cauliflower, Cabbage, BS
- Stagger plantings
- Space 15-24” apart
- Feed every 2-4 weeks (2-4 tbsp/plant)
- Broccoli - one head plus side shoots
- Cauliflower produces one head
- BS – fall planting (takes 4+ months)
- Grow heading vegetables fast and strong (bigger plant = bigger head)

21. Collards/Kale
- Seed or transplants
- Space 12-18” apart
- Better flavor after frost

22. Kohlrabi
- Space 6-12” apart
- Harvest when young and tender
- Consume raw or cooked

23. Radishes
- Space 4-6” apart, thin 4-6” apart
- Harvest in 30-50 days

24. Turnips/Mustard
- Space 6-12” apart
- Harvest turnips when small and tender
- Use young leaves for salads, larger leaves for greens

25. Asian Greens (Kitazawa Seeds)
- Bok choy, pak choi, tatsoi
  - Mei Qing Choi, Joi Choi, Toy Choy
- Mizuna mustard
- Komatsuna (spinach-mustard)

26. Beets/Swiss Chard
- Thin beets 4-6” apart
- Space chard 12-15” apart
- Give chard afternoon shade in summer
- Bright Lights, Rhubarb Red, Pink Lipstick

27. Spinach
- Seed or transplants, 6” apart or broadcast
- Prefers cool weather, cool soil, short days

28. Carrots
- Lightly cover seed, keep moist
- Space 2-4” apart, thin early
- Stress will cause bitter taste
29. Lettuce
- Seeds or transplants, space 6-12” apart
- Barely cover seed
- Prefers cooler soil/temps

30. Garlic
- Softneck varieties perform better in Texas
- Plant in Oct, 6” apart, 1” deep
- Harvest in June when leaves yellow

31. Onions
- Grow from transplants in Jan/Feb
- Pencil size or smaller, 6” apart
- Use short day varieties
- Don’t forget to water through winter
- Harvest when tops fall over (May-June)
- Cure and trim before storing
- Green onions – plant spring and fall

32. Peas – Sugar-snap, English, Snow Peas
- Space 4-6” apart
- Plant in Sept and Jan/Feb
- Susceptible to powdery mildew
- Super Sugar Snap, Amish – vining types

33. Asparagus
- Perennial, requires good soil preparation
- Plant crowns in Jan, 18-24” apart
- Don’t harvest till 3rd year
- Remove foliage in late fall/winter
- Mulch well in winter and summer

34. Potatoes
- Plant mid-late February
- 2-3 oz pieces, certified seed potatoes
- Plant 4-6” deep, 12-18” apart
- Pull soil up around stems when 6-8” high
- Dig in 90-100 days
- Sources: Potato Garden, Wood Prairie

35. Crop Rotation – Warm Season
(rotate crop families every 3 years to break disease and pest cycles)
- Cucurbit - cucumber, melon, squash
- Grass - corn
- Legume – beans
- Mallow - okra
- Morning glory - sweet potato
- Nightshade - tomato, potato, peppers, e/p

36. Beans, Bush and Pole
- Plant spring and fall
- 50-65 days to harvest
- Bush beans mature faster than pole
- Pole beans produce over longer period
- Pole Varieties: Fortex, Emerite, Kwintus, KY Wonder, Rattlesnake, Purple Pod

37. Butter Beans (Limas)
- Plant spring and fall
- 65-90 days to harvest
- Harvest when seeds are fully developed
- King of the Garden, Christmas Pole, Dixie Speckled Butterpea

38. Corn
- Plant standard varieties when soil is > 50°
- Supersweet varieties when soil is > 60°
- Most varieties 65-95 days to harvest
- Plant in wide rows or blocks
- Isolate su and se varieties from sh2
- Thin to 1 foot spacing
- Corn earworm: apply Bt to silks
- Tight husk varieties: Silver Queen, Bodacious, Merit, Country Gentleman, Golden Bantam

39. Cucumbers
- Harvest in 55-65 days
- Pick frequently, before they turn yellow
- Grow upright on a trellis or a cage
- Poona Kheera, Suyo Long

40. Eggplant
- Grow from transplants
- Does well in warm weather
- Harvest 60-80 days from transplanting
- Harvest when skin is shiny and fruit is firm
- Sidedress every 3-4 weeks
- Harvest using knife or clippers
- Produce best in fall weather

41. Melons
- Plant in warm weather
- 80-110 days to harvest
- Plant seeds in groups or hills
- Fertilize lightly and mulch well before plants begin to run
- Harvest when fruit separates from vine

42. Peppers
- Plant after last freeze in spring
- Grow from transplants
- Harvest 70-90 days from transplanting
- Sidedress every 3-4 weeks
- Harvest using knife or clippers
- Produce best in fall weather
43. Heat Index – Scoville Units
- Poblano = 500-2500 (Scoville Units)
- Jalapeno = 3500-8000
- Serrano = 8000-22,000
- Tabasco = 30,000-50,000
- Habanero = 100,000-350,000
- Bhut jolokia >1,000,000
- Trinidad Scorpion > 2,000,000

44. Summer Squash
- Sow seed in March, harvest in 50-60 days
- Space 2 feet apart
- Squash vine borer
- Use row cover until blooms appear
- Spray or dust stems with Bt
- Tatume and butternut – resistant to borer?
- Tromboncino/Trombetta squash

45. Winter Squash and Pumpkins
- Plant March-June, store for winter use
- Plant pumpkin in June for Halloween
- Reaches maturity in 90-120 days
- Give space to vine (3-4”) or grow vertical
- Harvest when rind is hard
- Sunshine, Cha Cha, Orange Cushaw
- Small spaces: Honey Bear, Small Wonder

46. Powdery Mildew
- Causes:
  o Warm days, cool nights
  o Poor air circulation
- Treatment
  o Air circulation/spacing
  o Remove infected leaves
  o Neem oil, serenade, K bicarbonate

47. Tomatoes
- Always use transplants
- Plant in early spring with protection
- Carry thru summer or replant late July/Aug
- Look for resistant varieties – VFNT
- Pollination ceases when nighttime temperatures reach upper 70s

48. Tomato Types
- Determinate:
  Bush type, 60-75 days to harvest, most fruit matures all at once
  (Solar Fire, Sunmaster, BHN 444, Patio)
- Indeterminate:
  Vining plants, 75-80+ days to harvest, produces fruit over a longer period

49. Transplanting and Growing Tips
- Plant sideways in shallow trench
- Water in with half-strength fertilizer
- Spray weekly with fish emulsion/seaweed
- Work in 2-3 Tbsp fertilizer at fruit set
- Wrap cages with row cover
  o gives 2-4˚ degrees of frost protection
  o protects plants from wind, insects

50. Some Tomato Favorites
- Standard Slicer
  Big Beef, Celebrity, Champion, Early Girl, First Prize, Fourth of July, Tycoon
- Grape/Cherry
  BHN 968, Black Cherry, Black Plum, Juliet, Sweet 100, Sun Gold
- Heirloom
  Brandywine, Cherokee Purple, JD’s Special C-Tex, Juane Flamme
- Paste:
  Amish Paste, Big Mama, Viva Italia

51. Blossom End Rot
- Causes:
  o Calcium deficiency
  o Usually caused by water fluctuations
- Treatment
  o Water consistently
  o Mulch to conserve moisture
  o Remove infected fruit

52. Early Blight
- Causes:
  o Alternaria fungus
  o Found in soil
- Treatment
  o Mulch soil
  o Crop rotation
  o Good air circulation
  o Remove infected leaves
  o Tolerant varieties (A)
    Big Beef, Celebrity, Iron Lady, Jasper, Mountain Magic
  o Fungicide
**Transition to Hot: May**
Okra, Southern peas, sweet potatoes, greens
- Plant April/May/June

53. Okra
- Harvest when 4-6” long
- Harvest frequently
- Wear gloves and long sleeves to harvest
- *Stewart’s Zeebest* - Baker Creek, SESE

54. Southern Peas
- www.heavenlyseed.net
- Harvest in 60-75 days for fresh eating (pods should be plump and pale in color)
- Or allow to dry on vine for winter storage
- Adequate moisture during bloom, pod set
- Excess fertilizer = more vine, fewer pods
- Yard long beans: *Red Noodle, Liana*

55. Sweet Potatoes
- Plant slips April-June
- Space 12-18” apart
- Spreading growth habit
- Harvest before first frost (Sept/Oct)
- Handle carefully to avoid bruising
- Cure one week in a warm, humid spot before storing or eating

56. Warm Season Greens
- Malabar, molokhia, vegetable amaranth
- Harvest leaves for fresh eating or cooking

**Cool Season: Nov-Dec**
- Dormant season – take a break!
- Plan and prepare for spring planting
- Enjoy winter greens and summer bounty

59. Extending the Season
- Row cover
  - Protection from cold, wind, insects
  - Gives 2-4º frost protection
  - Allows 85-90% light penetration
- Shade cloth
  - Protection from intense sun and heat
  - Helps moderate extreme temperatures
- Succession planting – spread the harvest by staggering plantings every 1-2 weeks (works well with broccoli, cauliflower, bush beans, lettuce, root crops)

60. Increase Production
- Control weeds – they compete for water, nutrients and sunlight
- Build soil – compost, mulch, cover crops
- Intensive planting, interplanting
- Wide rows- eliminate single rows
- Thin early to proper spacing

61. Grow Vertically
- Beans, peas, cucumbers, some squash, Malabar spinach, small melons

62. Tips for Controlling Pests and Disease
- Row cover
- Diverse plantings
- Resistant varieties
- Rotate crop families
- Plant in the right season
- Proper watering techniques
- Tolerate some insect damage
- Proper spacing and air circulation
- Sanitation- remove diseased plant material

63. Low toxicity insect and disease controls
- Read the label (and follow it)
- *Bt* – caterpillars
- *Insecticidal Soap* – aphids, spider mites
- *Spinosad* – caterpillars, borers
- *Neem oil* – aphids, beetles, squash bugs, powdery mildew, caterpillars
- *Serenade*® – downy mildew, powdery mildew, early blight
- *Potassium bicarbonate* – early blight, powdery mildew
- *Copper Soap fungicide* – downy mildew, powdery mildew, early blight

57. Benefits of Fall Gardening
- More rain
- Fewer insects
- Cooler temperatures
- Milder weather = better flavor

58. Tips for Seeding/Transplanting Success
- Water soil before planting
- Acclimate seedlings before transplanting
- Provide shade during establishment
64. Harvesat the right time
- Harvest in the morning
- Harvest at peak size for best flavor
- Rinse and wrap loosely in plastic
- Pick frequently to encourage more blooms
- Read pesticide label for ‘Days to Harvest’

65. Maturity Rate
Quick Growing (30-60 days)
Beets, bush beans, lettuce, mustard, radish, spinach, summer squash, turnips
Moderate (60-80 days)
Broccoli, carrots, cucumber, green onion, kohlrabi, lima beans, pole beans, okra, peppers, tomatoes
Slow (80+ days)
Asparagus, cabbage, cauliflower, eggplant, garlic, Irish potatoes, melons, onions, pumpkins, sweet potatoes, winter squash

66. More Tips
- Start small
- Plan ahead
  o Will you be super busy or on vacation at harvest time?
  o Will you be around to water?
- Be realistic
  o Expect phenomenal success and dismal failure
- Keep records, make notes
  o Favorite and high-yielding varieties
  o Planting and harvest dates
  o Insect or disease tolerance
  o Insect or disease susceptibility

THANK YOU AND GOOD LUCK!