GARDENING, p.1

WHY GARDEN?

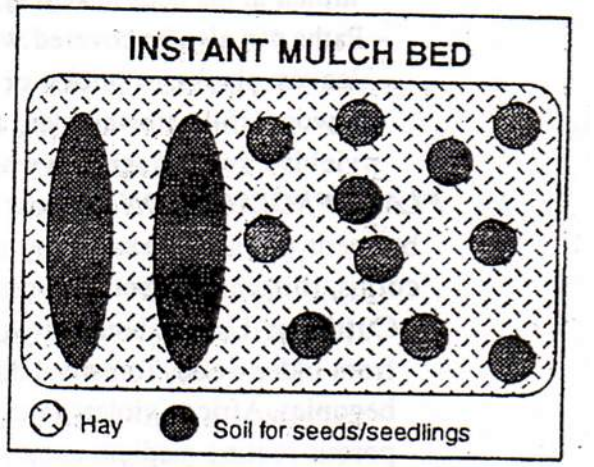
- Health - freshness, avoid agricultural chemicals, more nutrients in organic produce (see chart)
- Economics - less wage labor needed to purchase food
- Ecological - reduce transportation costs of commercially produced food, pesticides, vast acreage used for commercial farming freed up for returning to a balanced ecosystem, cleanses grey water
- Spiritual - physically experiencing our Oneness with Earth, our kinship with plants

GARDEN LAYOUT (Aims: to establish quickly & maintain easily)

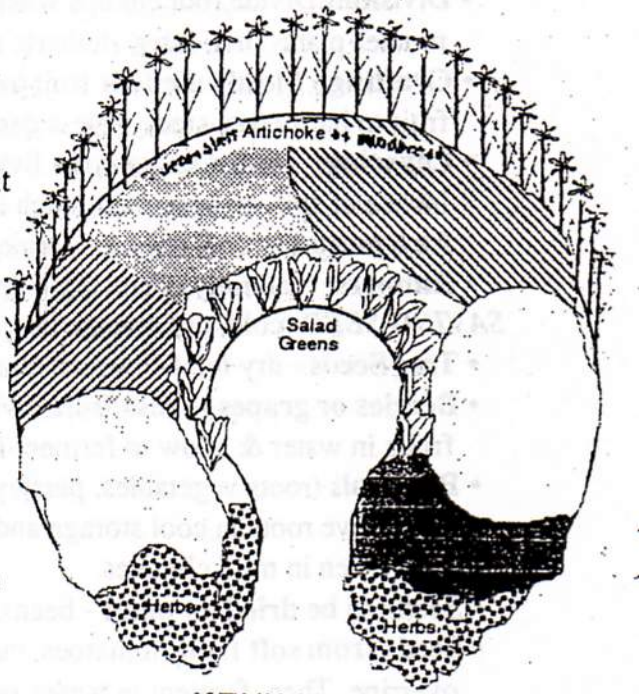
- Alfalfa sprouts, mushrooms - in kitchen, basement
- Culinary herbs (rosemary, sage, marjoram, basil, thymes, etc.) just outside kitchen door, in herb spiral (see diagram)
- Clipping beds (chives, lettuce, parsley, arugula, nasturtium, spinach, etc.) along edges of beds
- Long-bearing, plucking beds (Brussels sprouts, chard, peppers, celery, bunching onions, etc.) just behind clipping beds
- Plants which grow vertically or have high light requirement (tomatoes, beans, summer squash, okra, carrots, peas, beets, asparagus, etc.) in narrow beds
- Long maturation, single harvest veggies (corn, melons, onions, turnips, potatoes, cabbages, grains, etc.) in broad beds, closely spaced for self-mulching
- Fences & trellises - peas, chayote, jicama, kiwis, beans,cucumbers, NZ spinach, grapes, etc.

CREATING GARDEN BEDS

- **Instant mulch bed:**
  - Spread hay 8-10" thick directly over ground.
  - Pull hay back from small areas to be planted (see diagram), and fill with good soil.
  - Plant seedlings or seeds.
  - Water well.
  - *Slightly-less-instant Option:* Scrape up the turf and topsoil from a wide path around the bed and heap it onto the bed site; continue as above.

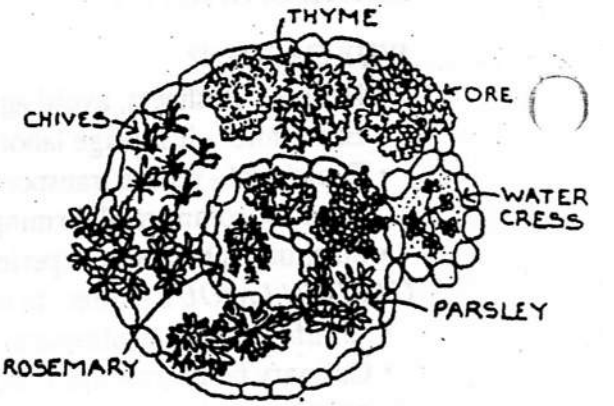


- **Double-dug bed:**
  - Mark the area to be dug with a line.
  - Beginning at one end, take off the turf and topsoil (a spade's depth) from a foot-wide section and remove to the other end of bed.
  - Loosen a second spade's depth of soil, and cover it with the turf and then topsoil of the next foot-wide section.
  - Continue down the bed, loosening subsoil and covering with the next section's turf and topsoil.
  - Cover the last section with the turf and topsoil from the first section.
- Keyhole beds: (see diagram) improve access in small areas with minimum space; create microclimate
  - Plants frequently accessed in center rows, single-harvest & tall vegetables to rear.
  - Compost can be fed into keyhole (or you can place a large slab of rock or wood, or mulch, in the keyhole and create a place for quiet communion with your plants)



KEYHOLE BED

- **General tips for all types of beds**
  - *Don't monocrop! Every living thing functions better with a little variety in its life.*
  - Make beds no wider than double your reach, so that it is never necessary to walk on them.
  - Dig a little gutter along the edges of your beds; this will allow water to run off in heavy rains, and will allow water to quickly penetrate to root areas during light rainfall. It also is a collector for the rich soil/mulch mixture which accumulates during heavy rains.
  - Edge your beds with whatever is handy - rocks, logs, boards, bricks
- **Paths**
  - I like to cover mine with hay, and then use the broken-down hay with its accumulated soil as mulch in the beds next year.
  - Paths can also be covered with ground bark, leaves, planks, or bricks, or mowed. Chamomile is a wonderful pathway plant as it is durable and yields a sweet fragrance when walked on.



HERB SPIRAL

PLANT PROPAGATION - almost all flowering and cone-bearing plants can be propagated sexually by seeds and also asexually by cuttings, division, grafting, or layering; as well as from bulbs, corms, rhizomes, offsets and runners

- **Cuttings:** Use for both softwood cuttings made from current year's growth & hardwood cuttings from older wood. Tomatoes do very well this way. Also can use leaf cuttings (succulents, begonias, African violets) and root cuttings (quackgrass is notorious). Need high humidity & porous rooting medium (sand, peat moss, vermiculite, sphagnum moss, perlite or combination)
- **Division:** Divide root clumps when they push up new small crowns around the base of the mother plant. (iris, aster, rhubarb, aloe)
- **Grafting:** Mostly used for fruit trees, to attach a branch (or entire tree) which produces desired fruit to hardy root stock of less desirable fruit
- **Layering:** Bend a section of a living shoot or branch into the ground, covering with several inches of soil, or wrap the branch in moist sphagnum moss covered tightly with plastic wrap. Leave for 6 months or until roots are formed
- **Runners:** (naturally occurring layering) - strawberries, vinca, spider plants

SAVING SEED (cold, dry storage best - in refrigerator in sealed packages)

- **Tree Seeds** - dry for 1-3 weeks on screen or canvas; for cones, dry for 2-12 weeks
- **Berries or grapes** - crush fruits (with rolling pin or in blender), wash off residue, dry. Or place fruits in water & allow to ferment for 2-3 days, then separate seed & dry.
- **Biennials** (roots vegetables, parsley, cabbage, Brussels sprouts) won't produce seed until second year. Save roots in cool storage and plant out the second year to get seed, or just leave a plant in the garden in mild climates.
- **Seeds to be dried on plant** - beans, peas, corn, root vegetables, spinach
- **Seeds from soft fruit** (tomatoes, cucumbers, eggplant, squash) - leave on plant until fruit is overripe. Then, ferment in water, remove residue, dry (like berries; see above)

IPM (INTEGRATED PEST MANAGEMENT)

- **Some facts about pesticides/herbicides:**
  - 400,000 people die annually from pesticide use/abuse
  - Average person consumes 1.5 kg pesticides thru eating, drinking, breathing or skin contact
  - Pesticide resistance:
    - At 1st application of pesticide 90% of target insects are killed, 10% survive; of these survivors, 50% are killed and 50% survive with the 2nd application
    - The survivors produce more eggs, and have longer adult (eating) cycles
    - Poisons also affect pest predators (95% of insects); they're either killed by spray or starve.
    - When new pest outbreak occurs, there are no predators
- **Preventing/Reducing insects**
  - Active gardening techniques
    - Abundance - plant a little extra; normal crop loss is around 7%
    - Diversity - confuse the insects, make them work harder to find food
    - Keeping plants healthy (spacing, well-watered, good seeds [open-pollinated, local, resistant varieties])
    - Keeping soil healthy (avoid excess Nitrogen, control pH, slash rather than pull weeds, water early in the day)
    - Timely sowing & harvesting - develop a bearing calendar and know when to protect from bugs & when to harvest.
  - Passive techniques
    - Supporting wildlife with brushy areas, rock piles, bird perches
    - Companion planting
      1. parasitic wasp habitat - sunflower, cosmos, Q. Anne's lace, dandelion
      2. physical repellant - marigold, crotatia
      3. alternative host plants for pests - cabbage & hawthorn, mustard/turnip for cabbage, dill for tomatoes
      4. physical interference - windbreak, shade, insect block
      5. aromatic herbs to disguise smell of food for pests - pennyroyal for mosquitoes, garlic oil spray, wormwood, nasturtium
  - Mechanical techniques
    - hand picking
    - chicken predation
    - barriers - collars, Tanglefoot, mulch
    - canteloupe halves for slugs
    - buried beer containers for slugs, sowbugs
    - bug juice (spread specific virus diseases) - put pest insects in blender with water, blend, strain, and spray on affected crops
    - plant juice - same as bug juice, except using leaves from plants that are not being attacked by insects
  - Biological control - ladybug, praying mantis, assassin bugs, tachinid flies, lacewings, trichogramma
  - Specific deterrents
    - sucking insects: desiccants (salt, flour, soap), vacuum off plants
    - chewing insects: hand pick, use irritants (sand, diatomaceous earth)
    - nematodes: increase organic matter in soil, which encourages nematode-trapping fungi
    - cutworms: sulfur (matchstick head down by each seedling)
    - whitefly: sage, mothballs

- **Minimizing damage by mammals**
  - Human scent in the garden is the best deterrent - *live* in your garden (and urinate around the edges
  - Avoidance: Cover food scraps well, plant sacrifice crops outside garden area
  - Barriers: fences, nets, covers, urine, hedges
  - Disruption & confusion: Noise, water, irritants (urine, pepper, woodash, soap), prickly plants, thorns, scarecrows, traps
  - Specific deterrents
    - Rabbits - Epsom salts solution (2 T/liter H_20), Kerosene, mint, rubber tires
    - Cats - rue
    - Deer - urine, high fences, *Irish Spring* soap hung in fruit trees
    - All mammals - mix 10 parts mutton fat with 1 part kerosene, reduce over flame, cool, spread on trees; smells Foul!

COMPANION PLANTING (See chart for some examples)

- Antagonists - used in weed suppression, border control (walnuts, marigolds)
- Beneficial insect attractors (buckwheat, clover, fennel, coriander)
- Soil improvers - green manures (comfrey, legumes)
- Compatible growth & life cycles - relies on the efficient & noncompetitive use of space & time & resources (alfalfa & wheat, bean & corn, peas & sorghum, root crops & leafy greens)
- Physical protection from wind, sun, insects, other pest animals (trees, artichoke, sunflower

NUTRITION

- **Planning a year-round food supply**
  - Limiting factors to 12 mo. harvest - soil & air temperature
    - Winter strategies:
      1. Suntrap planting - create parabolic shelters of hedges/shrubs, facing south, and plant inside curve
      2. Raised beds warm soil sooner
      3. Wind protection - stack hay bales to north side of beds
      4. Thermal mass - plant on the south side of stone wall or water storage tanks
      5. Microclimate devices: row covers, cloches, cold frames, hot beds, greenhouses
      6. Plant winter hardy veggies - fava beans, kale, Brussels sprouts, spinach, arugula . . .
      7. MULCH!
    - Summer strategies:
      1. Avoid west sun! Plant tall crops (corn, sunflower) to southwest to shelter beds
      2. Shade houses, shadecloths
      3. Use transplants of heat-sensitive plants to avoid bolting (lettuce, spinach, etc)
      4. Choose heat tolerant veggies - NZ & Malabar spinach, arugula, collards
      5. Plant seeds more deeply
      6. MULCH!
      7. *Patricia's summer-proof tomatoes*: Dig a hole as deep as you can, put manure and partially composted soil in bottom, cover with good soil, plant tomato seedling so that top of plant is just at ground level. As plant grows, fill in around stem with soil/mulch.
- **Food preservation**
  - Drying - the inside of a car with rolled-up windows makes a great solar dehydrator
  - Cold room/root cellar (be sure to store apples separately from other fruits or veggies)
  - Preserving/pickling - jams, jellies, pickles, relishes, herbed oils & vinegars, fermenting
  - Freezing - Seasonal strategy: bake in cold weather, stockpile in freezer for use in warm weather
  - Outside storage: store potatoes in ground, lined with pine needles; store root crops in above-ground clamps