GETTING DOWN TO THE BASICS:
GARDENING
&
PLANT CARE

Plants as Living Elements

Many common mistakes in gardening and plant care are the result of a failure to fully comprehend the nature of plants as living, changing organisms, and a failure to differentiate between plant and animal biology.

This is a recurring theme in any discussion of gardening and plant care.

Plant Selection and Planting

Factors influencing plant selection:

- Mature form (size and shape);
- Hardiness and heat resistance;
- Site and soil tolerance;
- Natural characteristic and maintenance considerations;
- Aesthetics.

Importance of Existing Conditions

- Match existing conditions with cultural requirements of desired plants.
- Beginning gardeners should start “easy”.
- Birmingham: USDA 7b hardiness, AHS 8 heat index.
- Microclimate: climate on a small scale.
- Soil improvement and bed preparation cannot overcome improper plant siting.

Bed Preparation & Proper Planting

- Dig a wide hole, not a deep hole; 5x wider than the root mass.
- Do not add organic to the backfill of individual planting holes
- Container plants must have their roots teased out from the pot.
- Plant 'em high, they won't die; plant 'em low, they're sure to go.
- Planting time is the best time in the plant's life to influence its future health and vigor.
- Vigorous, healthy plants are more able to resist insect pests and diseases, and physiological problems.
- Many physiological problems can be traced to poor planting.

Why Plant in Beds?

- Beds function as design elements:
  - ✓ visually and physically define space, create screens and barriers, separate uses, etc;
  - ✓ compositions using different plants provide endless aesthetic possibilities (blend and contrast plant form, texture, color and growth or bloom sequence.
- Aid in optimal culture:
  - ✓ concentrate maintenance activities based on proximity;
  - ✓ group according to affinity for similar cultural requirements (moisture, sun, soil type, pH, pruning, pesticides, fertilization);
  - ✓ protect from human damage (maintenance equipment and/or personnel).
  - ✓ If soil improvement is needed the whole bed can be adjusted

Benefits of Proper Bed Preparation:

- increased soil oxygen levels;
- increased soil organic matter;
- better moisture retention;
- improved soil porosity and drainage;
- more “air” in the soil.

Many new “development” homes are characterized by soils that are highly altered. Bed preparation is especially important here and machine power may be needed.

Problems from Recent Changes

Problems with established plants can be the result of recent environmental changes:

- altered sun or shade patterns;
- altered drainage patterns;
- change in wind exposure or air movement;
- roots cut as a result of utility trenching;
- roots cut, or covered up as a result of grading;
- soil compacted by people, vehicles and/or equipment.

Mulching

- Hold in soil moisture* (by blocking solar radiation and reducing evaporation);
- inhibit erosion* (by providing a physical barrier against rainfall and runoff);
- break down to increase soil organic matter (some faster than others);
- help keep weeds down (mostly by blocking sunlight needed for germination) *;
- prevent rapid changes in soil temperature (by acting as insulation);
- are aesthetically pleasing (at least visually neutral and/or uniform) *;
- help prevent human-caused damage (mower or weedeater) *.

* True for inorganic mulches

Organic Mulch

“Wood chips”

Inorganic Mulches

Applying Mulch

Piling Up Mulch on Stems & Trunks:

- leads to unwanted adventitious roots (can potentially girdle stems);
- promotes fungal growth and a type of decay known as butt rot (no kidding);
- makes perfect shelter for voles (which like to eat roots and bark);
- prevents gas exchange between soil and air (remembering roots need oxygen for cellular respiration).

Roots on top of fabric in mulch

Mulch was continually added on top of landscape fabric and roots grew mostly in the mulch layer

Follow Nature

- In nature, plants in a forest provide their own mulch.
- A healthy forest drops about one ton of debris per acre per year (about 2-3" total is enough)
- Partially decomposed and shredded leaves arguably are the best mulch.

Soil Invertebrates & Fungi

- Many soil organisms stir and aerate soil, and recycle nutrients.
- Fungi play important roles (not just decomposition).
- Mycorrhizae: symbiotic fungi; many species-specific.
- May dramatically increase root surface area.
- Secrete enzymes for nutrient breakdown.
- Cannot survive under strict chemical regimes or excess fertilization.

Integrated Pest Management

1. **Selection & Culture:**
   a. choose pest-resistant species and cultivars;
   b. plant for diversity, avoiding monoculture;
   c. site and install plants properly;
   d. maintain good health and vigor through cultural manipulations.
2. **Monitor Regularly:**
   a. establish a realistic threshold level for damage based on plant health, not aesthetics;
   b. concentrate on observing at likely times for activity;
   c. look for all species (pests, beneficials and neutrals).
3. **Obtain Positive Identification of Pest Species:**
   a. research life cycle;
   b. determine population levels;
   c. treat only when threshold level is exceeded.
4. **Apply Treatment:**
   a. treat only the identified pest species;
   b. use least toxic methods first (including cultural manipulation).

Integrated Pest Management

- Continue monitoring…

  if pest persists, consider:

  ✓raising your threshold level;

  ✓replacing the plant with a pest-resistant variety;

  ✓undertake additional cultural manipulation;

  ✓apply a stronger (more toxic) treatment.

Monitoring

The most important aspect of post-planting care is observing plants.

Careful, thoughtful and studious monitoring will tell when something is amiss and might require closer diagnosis and correction. Regular observation will allow you to correct small problems in small ways, before they become large problems. Monitoring is the first step, most important step in an integrated pest management program.

Controlling Weeds

- Cultural Control
- Pre-Emergent Herbicides
- Contact Herbicides
- Soil Sterilants

Fertilizers

Utilization of N, P and K:

- ✓ Potassium is part of the chlorophyll molecule and also plays a role in bio-electrical reactions.
- ✓ Nitrogen is part of the plant cell and encourages the production of vegetative growth.
- ✓ Phosphorous encourages root growth; high phosphorus fertilizers are recommended for new plantings to stimulate initial root growth and rapid plant establishment: strong roots make healthy and vigorous plants. Check levels in soil before adding.

Fertilizers

- Liquid Fertilizers
- Granular Fertilizers
- Plant Food?

Watering

- New installations will require more.
- Weaning plants off supplemental watering should be a goal.
- Because our soil seldom, if ever freezes, plants use and require water here on a 12-month basis.
- Supplemental watering should be done infrequently and deeply (as opposed to often and quickly).
  - ✓ Deep watering saturates the root zone and encourages deeper rooting.
  - ✓ As water is used by plants (or evaporates), water moves upward through the soil profile through capillary action and adhesion.
  - ✓ Deeply watered plants stay watered longer.

Watering

- Automatic irrigation systems can be very effective.
  - ✓Design must allow flexibility.
  - ✓Such systems also require calibration.
- Always push the mulch aside and see if the soil is really wet – more, or less, may be needed.
- Another way: irrigate to a one-half inch depth, and follow up later the same day with another one-half inch.

Watering

- Large plants are best watered individually with a slow drip.
  - ✓ Let run for several hours – assuming it is not running off.
- Slow-drip bags are commercially available for watering in this manner.
- Drip irrigation is the most water-conserving irrigation method (for ornamentals) because the water is placed at the root zone: none is lost to overspray, and little is lost through evaporation.
  - ✓ Above ground "spaghetti" tubing and bell-shaped emitters are good for containers.
  - ✓ Various types of soaker hoses or specialized subsurface water-emitting pipes can be laid throughout beds.

- **Liming**
- **Staking and Guying**
- **Tree Wrap**
- **Pruning Paint and Other Plant Poultices**