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Some Causes of Cultural Problems of Plants

Plant problems arising from causes other than insect and mite infestation and disease organism infection

SOIL PROBLEMS CONTRIBUTING TO ROOT DAMAGE AND THE ASSOCIATED ABOVE GROUND SYMPTOMS

I. Soil Chemistry Problems

A. Improper pH and associated problems.
1. Soil nutrients either rendered unavailable to plants or too available, and therefore toxic (iron deficiency, aluminum toxicity).
2. Unfavorable pH may be toxic to plants.
3. Growth of soil microorganisms may be poor (suppression of nitrogen cycle bacteria at low pHs).

B. Lack of sufficient organic matter for holding soil nutrients and water, as in a very sandy soil or lack of oxygen circulation in clay soil.

C. Soluble salts problems.
1. Too much or too little fertilizer applied.
2. High salt content from or in poor fill (dredged fill).
3. High salt content from salt water flooding or from "salty" irrigation water (hurricane tides, high soluble mineral content well water).
4. Salt used on icy walkways and roadways in winter.

D. Chemical application problems.
1. Chemicals washed to roots from sites of application (residual weed control materials, lime from new foundations).
2. Improper application of chemicals directly on the soil around plants, (soil drenches, fuel oil overflow, driveway sealants, bleach used to wash cement or siding, pool chemicals; nearly any chemical, if spilled in quantity).

II. Soil Physical Problems

A. Soil too well or too poorly drained.
B. Poor soil aeration due to unfavorable soil texture (heavy clays), soil compaction, impervious surface layers of material (extensive areas of paving, soggy mulches or wet leaf accumulations).
C. Poor soil aggregation (binding of particles) due to lack of organic matter, heavy traffic, working wet soils, etc.
D. Changes in the grade of the soil occurring when fill or cultivation soil is added around established plants, or when soil is removed by erosion. Too deep or too shallow planting.
E. Insufficient soil volume, as in a narrow curb strip, shallow topsoil over hardpan, undersized plant container, or with a high water table.
F. Presence of builders' rubbish in soil (chunks of cement, lumber).

NON-SOIL PROBLEMS CAUSING POOR PERFORMANCE

I. Plant Characteristics As Possible Cultural Problems

A. Plants requiring special growing conditions; the acid soil requiring plants, plants requiring full sun or shade, plants intolerant of moist soils, drought damage.
B. Plants with special dormancy or germination requirements; plants needing a certain number of hours below 40°F. to break dormancy, seeds needing stratification.

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C. Plants with special pollination requirements or peculiarities; need for cross pollination.
D. Plants with certain undesirable characteristics such as unwanted fruit, thorns, leaves in the fall, Ginkgo fruit, Honey Locust thorns.
E. Many other peculiarities could fit into this section, such as plants with certain grafting incompatibilities, those with overly aggressive rootstocks and those slow in coming into flowering.

II. Chemical Damage

A. Overdosage (The myth: "If a little is good, then a lot must be better").
B. Misapplication, direct spray of material toxic to a plant, drift or spray droplets or vapor of a volatile material, toxic residual left in a sprayer, etc: 2,4-D and other spray materials misapplied.
C. Unintentional application of chemicals, air pollution, dog excrement or automobile exhaust.

III. Mechanical Damage

A. Damage from tools, machinery: lawn mower, weedwacker, hoe, automobile or trenching operations.
B. Damage from improper transplanting: severe root injury, too deep or too shallow planting, girdling roots, girdling support wires, crowding by improper spacing, shading, poor soil preparation or poor care after transplanting.
C. Damage from improper pruning: poor cuts, damage to branch collar, too severe pruning or wrong season.
D. Damage from extreme exposure: wind, sun, ice, snow, hail or storms of all sorts.
E. Damage from pipeline breaks: gas, water, steam or sewer.
F. Damage from animals: rabbits, mice, deer or sapsuckers.
G. Damage from vandalism: breakage, bark stripping or lit cigarette butts.
H. Damage from lightning strikes or fires.
I. Damage from parasitic plants or dodder.

IV. Hardiness-Climate Centered Problems

A. **Drought damage** - some plants are more susceptible than others due to heredity and cultural practices: also, accompanying changes in level of water table may be damaging.
B. **High temperature damage** - roots of certain Northern evergreens in a warmer climate, unmulcheD roots of certain shallow - rooted plants. (Rhododendron)
C. **Low temperature damage**
   1. Chilling injury - low temperature damage to plants at temperatures above freezing, cold water damage to the leaves of certain plants.
   2. Freezing injury - damage due directly or indirectly to sub-freezing temperatures (early, late, or during the normally expected season).

      a. Winter sun-scorch of evergreen leaves.
      b. Complete kill of non-hardy plants, killing of roots and crowns so no plant regrowth is possible.
      c. Damage to shoots, stems, trunks: sunscald, bark-splitting, killing of all or part of the cambium, killing back of shoot growth.
      d. Damage to flower buds and/or flowers.

         aa. Low temperature killing of flower buds, as sometimes occurs with peach, forsythia and flowering quince.
         bb. Late spring frost damage to flowers of early flowering species, as sometimes occurs with some of the magnolias and fruit trees.

The extent of freezing injury is dependent on the low temperature reached, the length of time at the low temperature, and the rate of freezing and thawing.