Houseplant Problems

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PLANTS GROWN INDOORS serve a number of functions. They provide points of interest and beauty in the home. They give hours of pleasure and entertainment for those who care for and watch them grow — a product of one's labor and attention. And, they help cleanse the air and add humidity, especially during the winter months. Consequently, when something goes wrong with house plants, it becomes a matter of concern to the grower.

Many houseplant problems are man-made and occur because we do not understand the growth and environmental requirements of the plant. Others are the result of microorganisms which cause diseases, or the problem may be injury by insects or mites (see Extension Bulletin E-973).

If we pay attention to plants, they will usually indicate to us, by various growth responses — changes in size, shape, color and/or growth habit — that something is not right. The chart on page 2 gives a number of symptoms which may occur in a plant and the possible factors causing these symptoms. A discussion of each factor and ways in which the plant disorder may be remedied are also presented.

An attempt has been made to make the chart as complete as possible; however, two or more factors often cause the problem. When this occurs, symptoms may overlap, or unusual symptoms may be expressed which are not described in this publication.

WATER (1 and 2)[1]

An adequate, uniform quantity of water is necessary for all plant functions. This amount varies with the type of plant and the environmental conditions in which the plant lives.

1. OVERWATERING

Overwatering limits the soil oxygen that roots need in order to breathe. All symptoms caused by overwatering are due to root malfunction and subsequent root rot.

CONTROL

Unpot. Healthy roots and root tips will be white or cream colored. If roots are not firm and whitish, they have been injured or killed. Repot the plant in new, porous soil. Water thoroughly; then allow soil to dry somewhat between waterings.

Two methods may be used to check moisture levels:

(1) **"The cake test"** — poke a wooden toothpick into the soil; if it comes out wet (soil adhering), the soil is moist; if it comes out dry or dusty, the soil is dry and you should apply water.

(2) **"The dirty finger"** — if you must dig down into the pot ¾" to 1" to reach moist soil, the moisture level is low enough so that water can be added.

2. UNDERWATERING

Plants not given enough water will wilt. Chronic underwatering will cause the lower leaves to yellow gradually and die as the plant adapts to the reduced water supply by restricting its growth. Chronic underwatering also stunts plant growth.

CONTROL

Increase the amount of water **or** the frequency of watering — but *not both*. When watering, apply enough water to wet the soil thoroughly and allow some drainage. If not enough water is applied, the bottom part of the pot will receive too little water for normal root development.

FERTILIZER (3 and 4)

Fertilizer contains the nutrients that are essential for the growth and development of plants. The nutrients are used to build the plant, aid its growth processes and regulate the pH (acid or alkaline reaction) of cell sap.

CAUTIONS

Do not fertilize newly purchased plants for several weeks. Most plants have enough fertilizer applied in the greenhouse to last a month or more after purchase; also, they may contain slow-release fertilizer in the potting soil. When purchased, plants occasionally have excess fertilizer in the soil. See No. 3 below for further discussion and treatment.

[1] *Numbers refer to the specific causal factors in the chart.*

CAUSAL FACTORS	SYMPTOMS															
	Wilting	Lower leaves turn yellow	Uniform yellowing or top leaves yellow	Root Rot	Leaves too small	Browning leaf tips and/or margins	Black or brown leaf spots	Leaf/petiole rot	Little or no new growth	Bud and/or flower drop	Leaf Drop	Pale leaves, spindly growth	Loss of varigation or leaf split	Blackening of new growth	Purple discoloration of leaves or stem	Leaves deformed, curled, or distorted
1. Overwatering	✓	a→ ✓	✓	✓		✓	✓	✓	✓	✓	→b ✓					✓
2. Underwatering	✓	✓				✓			✓							
3. Overfertilization	✓			* ✓		✓	✓				✓					
4. Underfertilization		✓	✓		✓				✓		✓	✓			✓	
5. Compacted soil (pot bound)	✓	✓							✓		✓					
6. Insect infestation		✓	✓			✓	† ✓			✓	✓					✓
7. Insufficient light		c→ ✓			✓				✓	✓	→d ✓	✓	✓			
8. Excess light			✓		✓		✓		✓			✓				
9. Low humidity		✓				✓				✓	✓					
10. Disease	✓					✓	✓	✓								✓
11. Excess salts (especially softened water)	✓			* ✓		✓		✓	✓					✓		
12. Too low temperature						✓			✓		✓			Frozen		
13. Too high temperature	✓					✓	x ✓		✓	✓	✓					
14. Drastic temperature change		e→ ✓				✓	✓			✓	→f ✓					
15. Gas fumes		✓				✓			✓		✓					✓
16. Iron deficiency			✓			✓									✓	

a→ →b Leaf yellowing and leaf drop may occur independently or in sequence as a response to overwatering.
* Root burn followed by root rot.
† Dark or black growth on leaves (sooty mold).
c→ →d Leaf yellowing followed by leaf drop.
e→ → f Leaves may yellow first, then drop or may drop without yellowing.
x High temperatures may or may not accompany high light intensity, see No. 8 for discussion.

Reduce fertilizer application in winter (by about 50 percent) when short day length and cloudy conditions normally slow plant growth.

The finer the root system, the more dilute the fertilizer should be in order to prevent root burning. (Bulbous plants are coarse-rooted; African violet has a fine root system.)

Be sure the soil is thoroughly moist before applying a concentrated fertilizer, or water plants with a diluted fertilizer solution. As a rule, underfertilization is less damaging to plants than overfertilization.

3. OVERFERTILIZATION

Too much fertilizer injures plants in three ways:

Fertilizer salts[2] burn the roots and cause most of the same symptoms as overwatering.

Fertilizer salts accumulate at the soil surface and along the pot rim, causing death or injury to stems, petioles and leaves.

Excess soluble salts can be translocated through the plant, causing dead spots on the leaves and leaf margins.

[2] *See 11. Excess salts.*

CONTROL

Fertilizer salts are water-soluble, so place the plant under a dripping faucet for several hours to wash (leach) the salts through the soil and out the bottom of the pot or other container.

Fertilize less often or decrease strength of fertilizer used by 50 percent.

Repot the plant in a new soil mix.

4. UNDERFERTILIZATION

Too little fertilizer results in poor growth, pale color and the appearance of nutrient deficiency symptoms, nitrogen deficiency being the most common.

CONTROL

Use a commercial fertilizer according to directions on the label. Measure accurately. Newest growth should look greener in 24 hours. (Once older leaves show deficiency symptoms, they seldom recover.) If new growth still looks yellowish, do *not* fertilize again right away. Try an application of iron chelate. (This form is identified by name on the label.) Iron is essential to healthy green leaves, but often becomes unavailable to roots, even if present in the soil, due to soil alkalinity (high pH) or low soil temperature. Chelated iron is a form readily available to the plant roots.

5. COMPACTED SOIL (POT BOUND)

Pot-bound plants have too many roots in proportion to the pot size and the amount of soil in the pot. Plants depend on the soil to hold moisture and nutrients until needed. Too many roots for a given volume of soil cause the plant to show symptoms of water and/or nutrient stress, or the plant may stop growing altogether.

CONTROL

Repot into the next larger size pot with fresh potting soil.

6. INSECT INFESTATION

See MSU Extension Bulletin E-973.

LIGHT (7 and 8)

Light intensity, duration and quality are all important for proper plant development. The chloroplasts (food production units) in the leaves use the energy in light to make food for plant growth and function. The leaves are the first indicators of improper light conditions.

7. NOT ENOUGH LIGHT

Without enough light, the chloroplasts are not able to manufacture enough food to allow the plant to maintain its normal growth processes; hence leaves turn yellow, and new growth is small and weak. Low light conditions and short days (usual during Michigan winters) also cause the stomata (leaf pores) to be open less in winter even though the house atmosphere is warm and dry.

CONTROL

Move plants to a brighter location.

Keep window glass clean.

Place white or reflective surfaces near or around the plants to insure maximum use of available light.

8. TOO MUCH LIGHT

Too high light intensity may destroy chlorophyll (green) pigments in the chloroplasts, causing leaf burn. Too much light also tends to inhibit growth; hence plants become short and stocky, they may become pale green, and leaves may be much reduced in size, especially those of shade-loving plants.

CONTROL

Move plants to a more shaded location.

Shade the window so plants receive indirect light only.

HUMIDITY (9)

High relative humidity with adequate light causes less water stress and allows a higher rate of photosynthesis (food production) due to better gas exchange through the open stomata. Optimum humidity levels for plant growth is 50 percent. Normal winter house humidity in Michigan is from 5 to 20 percent.

9. TOO LOW RELATIVE HUMIDITY

Low humidity causes less-efficient photosynthesis (reduced food production), collapse and death of leaf tips, and creates a predisposition to mite infestation (mites are favored by dry conditions).

CONTROL

Group plants together and/or on trays of moist pebbles. This practice has the effect of increasing the humidity and keeping it in the immediate environment. Misting plants also increases humidity for a short time. When misting, use distilled or rain water to avoid the build-up of salt residues on leaves (from minerals in water).

Caution: Do not mist African violets, purple velvet plants or plants with extremely hairy leaves. This may cause molding of the leaves.

Giving plants a cool shower occasionally is good, as this washes dust from the leaves and provides extra moisture and humidity. If used, a shower should replace a normal watering rather than be an added treatment.

10. DISEASES

See MSU Extension Bulletin E-973.

11. EXCESS FERTILIZER SALTS

Excess salts come from three sources — hard water, overfertilization and softened water.

"HARD" WATER

Hard water is due mainly to salts of calcium, magnesium and iron. Plants use these salts in very small quantities; however, in large amounts the salts can become toxic to the plant. They are the white, crusty, crystalline material which develops on pot and soil surfaces and burn or irritate plant stems and leaves. Over a period of time, salts can change the soil pH, which in turn has an adverse effect on plant growth and nutrient availability.

CONTROL

When you water, use distilled or rain water, or melted snow. Add extra water, so some runs through the pot and out. This treatment will allow some soil leaching and slow the build up of salts.

Periodically, remove the crusty surface layer of soil and replace with new soil.

Repot the plant into fresh soil periodically as salts build up and plant growth responses necessitate.

OVERFERTILIZATION

See No. 3 above.

ION EXCHANGE SOFTENED WATER

(Culligan type softeners)

Softened water is less favorable for plants than hard water because the softening process exchanges the calcium, magnesium and iron salts (some of which the plant uses) for sodium salts, which make the water soft but are of no use to the plant at all. Furthermore, the plant absorbs the sodium and transports it just as it would a useful mineral. In time, the sodium accumulates in the tissues and may cause root damage and leaf burn, especially along the margins.

CONTROL

See controls under "hard water" above.

TEMPERATURE (12 and 13)

Temperature influences all plant reactions, either directly or indirectly. Ideally, seedlings need warmest temperatures (75-80°F) and mature plants need cooler temperatures (65-70°F). Most house plants do nicely at 72°F day temperature and a cooler (65°) night temperature.

12. TOO LOW TEMPERATURE

At low temperatures, roots will not take up water even if it is available. Low temperatures can destroy the green chlorophyll pigments, giving a reddish or a whitish appearance to the leaves. Low temperatures also adversely affect the uptake of certain plant nutrients.

CONTROL

Move plant to area of warmer temperatures.

13. TOO HIGH TEMPERATURE

At constant high temperatures (85° F+) photosynthesis is inhibited while respiration (food utilization) continues. Hence, in time the reserves are used up and plant injury occurs. High temperatures along with adequate light can cause excessive water loss, resulting in wilt and/or poor growth.

CONTROL

Lower the temperature and/or improve air circulation.

Move plant to a cooler location.

14. DRASTIC TEMPERATURE CHANGE

Injury caused by rapid temperature change usually occurs when plants are purchased in the winter and improperly packaged (wrapped) for transport to the buyer's home or when plants in the house are exposed to drafts when exterior doors are opened.

CONTROL

When buying a plant in late fall or winter, make sure it is adequately insulated for the trip from store to home.

In the home, be aware of cold drafts and arrange plants to avoid such situations.

15. GAS FUMES

Gas escaping from a faulty valve or connection or the incomplete burning of gas due to improper jet or air supply adjustment in a furnace can injure house plants. Plants are very sensitive to gases and will show symptoms before the gas concentration is at a level where people react. Therefore, if your plants are showing leaf thickening, curling, epinasty,[3] leaf and flower drop, leaf yellowing or browning which can not be explained by other factors mentioned in this bulletin, gas fumes may be at fault and you should have your furnace checked.

16. IRON DEFICIENCY

See No. 4 above.

[3] *A physiological condition in which the leaf folds back against the petiole or stem.*

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