



Horticulture Notes: Got Plant Problems?

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“To diagnose” means to analyze a problem and the situation in which it is found. In horticulture, there are two causes of plant problems: biotic and abiotic.

Biotic problems are caused by living agents like viral infections, parasites, animals and insects. Characteristics include: 1. They affect all plants in the specie; so all the impatiens of a specific specie will droop and die in your garden. 2. Each plant will demonstrate localized damage as when the red lily beetle eats holes in the leaves but they do not affect the stem or flower. 3. Random damage occurs as when snails move from plant to plant and damage only some of the Hosta plants.

Abiotic problems stem from non-living agents such as extreme heat or drought, cold, moisture, or something the gardener has done, her cultural practices. They are characterized by: 1. All plants are affected regardless of specie. With fall’s first heavy frost, all the plants in your vegetable garden are killed. 2. All parts of these plants are affected as when your garden is under water due to exceptional rainfall or flooding. 3. There is a regular pattern to destruction where low lying plants are killed by frost but those on higher elevations are not [micro-climates]. 4. The problem has a sudden onset.

Most gardeners use a simple non-technical process to diagnose problems like the process of elimination. For example, what is not the cause? Then they ask a series of questions such as when did this occur? What was the weather like? Has this problem embraced other plants in the garden? Do my neighbors have a similar problem?

Step 1: Identify the plant

Identify as much information about the plant as you can: name, annual or perennial, hardiness, sun/shade preference, etc. Use scientific (Latin) names to target specific problems since many insects and diseases are host specific and to avoid confusion. For example, whorled loosestrife [*Lysimachia punctata*] is an old fashioned perennial, not the invasive plant that invades wetlands called purple loosestrife [*Lythrum salicaria*].



Whorled loosestrife
[*Lysimachia punctata*]



Purple loosestrife
[*Lythrum salicaria*]

If you don’t know the name, use a process of elimination to guide you. Is the plant an annual? What is its hardiness? How much sun does it require? How much water does it need? What color are its flowers? How are the leaves spaced along the stem? Include all the information you know as you observe this plant over the growing season. Check out The American Horticulture Society’s tome, “A-Z Encyclopedia of Garden Plants” [which is available cheaply on [Amazon](#)] or “Peron’s Pests and Diseases of Woody Perennials”. Both are organized by species.



Step 2: Compare sick plant with a healthy one in the species. Are all the needles on a conifer brown or only some? Are there spots on the underside of all the ferns? Is there mold on the underside of all sycamore leaves? If every conifer has only brown needles, then the trees are all dead. But, if all ferns have spots on the underside, they are all fertile.

Step 3: Look for patterns

Within a planting:

1. Is the same species affected throughout the garden or are a variety of species affected? If the problem affects only plants in the same specie, the agent is usually biotic due to host specificity. Related species may have a common pest. But a mixture of different species being affected suggests an abiotic cause.
2. Is there [non-species related] uniform or localized distribution of the problem? With a uniform problem pattern, an abiotic cause is often the result of environmental factors like wind, frost, and drought. Localized problems, also, are symptomatic of abiotic damage like along the side of a pathway where the mower sheared off the stems of plants aligning it.
3. Are all plants in the area affected? Insect and parasitic damage does not happen overnight; it is gradual. Rarely does disease affect 100% of plants in a grouping; less than 10% is average. So the cause of sudden, widespread damage is more likely abiotic.

Within a single plant:

1. Regular patterns of damage are due to abiotic causes.
2. Random occurrences are biotic.



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Additional information is available through a case history:

1. Timing of the damage: Was it noticed after the snow melted? Did you fertilize late the previous autumn? Could be Fairy Mold.

2. Site characteristics: Often we buy plants that we love and are beautiful to us without considering if they will do well in our gardens.

- Soil: What is the pH? Does it have too much or too little moisture retentiveness for that plant? Is there enough organic matter? Are there high salt levels due to synthetic fertilization?

- Exposure: How much sun, shade, and wind protection does the plant receive?

- Moisture: How much is needed? What is too much, too little? Can the soil retain moisture?

3. Cultural practices:

- Planting methods: Have we dug the hole deep enough? Did we leave the upper rim of peat pots exposed? Did we remove the burlap from around the root ball?

- Chemical applications: Do we use pesticides rather than hand digging a weed? Do we over or under fertilize? Do we use synthetics that accumulate salts in the soil causing plants to wilt and pests to flourish? Did we apply winter horticultural oil at the correct temperature?

- Cultivation practices: Did we have a soil test performed? Do we know what amendments the soil needs? Did we aerate the lawn to avoid compaction? Do we plant

plants with similar needs near each other like rhododendrons, azaleas, and blueberries?

4. Age of the plant: Different problems occur when a plant is young than when it is old.

Step 4: Determine primary symptoms

Think about what this plant is telling you:

1. Underdevelopment suggests decreased amounts of chlorophyll, fewer blossoms, or stunted growth.

2. Over-development of plant parts [especially in woody ornamentals] may produce galls, extensive flowering, and exuberant flush of lush foliage.

3. Necrosis or death of plant parts result in loss of plant parts, root end spot, stippling.

Step 5: Check for signs

There could be structures produced by casual agents such as ruffles in a normally smooth leaf. Or pathogens such as fruiting bodies or mycelia. Look for pests on under and upper sides of the leaf. Telltale signs include honeydew or droppings.

Step 6: Still uncertain, contact experts

Collect samples of healthy parts and the injured parts.

Place in separate plastic bags. Take to your local nursery or arborist