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Recognizing Herbicide Phytotoxicity

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Weeds are a nuisance in most landscapes and sometimes the herbicides we use to control the weeds end up injuring some of our ornamental plants. Herbicide injury is usually the result of the person making the application. Let's face it we are not following the directions on the label as carefully as we should! We are sometimes using herbicides on weeds that are growing in too close proximity to our sensitive ornamental plants. We are using more herbicide than the label instructs. Or we can be careless and spray during windy conditions or wave the wand around so that the spray drifts onto non-target plants.

Normal foliage of London Plane on left. Twisting and cupping of leaves caused by (2,4-D, a broadleaf weed

The term for plant damage is "phytotoxicity" and it can be caused by pesticides, nutrients, or physical and environmental damage (wind, sun, hail, etc.). Often the identity of the herbicide can be determined by the injury symptoms on the plants. Symptoms can be divided into 5 main categories: leaf and shoot malformations, root and shoot stunting, leaf spotting, leaf chlorosis (yellowing), and leaf necrosis (death).

Postemergence herbicides: In the home landscape there are several herbicides applied to actively growing weeds that are commonly used: glyphosate (Roundup) and the broadleaf weed herbicides (2,4-D, dicamba, triclopyr, etc.). Even though all these herbicides cause leaves and shoots to be malformed, they belong in different chemical families and so the symptoms that they cause in plants are distinctly different.

Glyphosate prevents certain amino acids from forming within the plant and amino acids are necessary for plants to grow properly. When a full label rate is sprayed on succulent weeds they usually die. When a lesser amount drifts onto succulent ornamentals the new foliage will often be yellow. The aerial drift of glyphosate may cause delayed leafing in spring, shortened internodes, small leaves, leaf distortion and chlorosis.

Glyphosate spray applied for winter weed control may be absorbed through the thin or green bark of dormant woody ornamental plants such as roses, shrubs or trees. The injury becomes apparent the

ornamentals from late fall-winter applications of glyphosate.

Leaf chlorosis on escallonia caused by spring application of glyphosate.

following spring. New growth is so distorted and shoot internodes are so short that leaves are barely recognizable and more closely resemble clumps of moss along the stem. Symptoms may persist in the plants for a year until the herbicide is metabolized away. In spring and summer non-target plants sprayed with glyphosate will have the exposed leaves showing leaf chlorosis and some distortion.

Many broadleaf herbicides are in the same chemical family. When they drift onto non-target plants they move systemically within the plant causing new growth over the entire plant to be distorted. These "hormonelike" symptoms include leaf cupping, stem twisting, downward bending, elongation, and contorted and stunted leaves. However leaves and shoots are not miniaturized.

Preemergence herbicides: Most preemergence herbicides cause stunting and distortion of young roots and shoots. Injured main roots are stunted, thickened and swollen at the tips and lateral roots fail to develop. In seedlings the stem may swell at or just above the soil line. Injured plants may appear normal, but wilt more readily as the stunted root system fails to take up enough water to sustain the plant.

Established ornamental plants with well developed root systems can typically tolerate even high rates of preemergence herbicides. Injury may occur to seedlings or to young transplants, when the herbicide is applied too deeply in the soil.

Remedies: Like other chemicals, herbicides vary greatly in persistence. All are degraded in the environment by chemical and microbial processes. Most postemergence herbicides break down in a few weeks, however since damaged leaves cannot be repaired by plants, it appears that the herbicide is still present in the environment.

Preemergence herbicides often remain in the soil for several months because that is their intended purpose, and a few may last for more than a year. Incorporating organic matter, such as compost or manure helps adsorb the herbicides into the organic matter rendering it unavailable or inactive.

Improve the vigor of herbicide injured plants by taking good care of them. Do not over-irrigate or over-fertilize them, but instead let the herbicide naturally degrade.

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