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How to Recognize and Control Oedema In Ornamental Plants

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In the winter months, environmental conditions in Michigan greenhouses are apt to be cool and humid with low light levels. These conditions cause the greenhouse soil to remain moist for an extended time and rarely dry out. This situation can lead to a water imbalance in many plants, causing a physiological disorder called oedema.

Certain plants such as ivy geranium (*Pelargonium peltatum* L.) can have oedema year-round, but the December through February period is the primary time of the year when oedema is a problem for the energy-conscious greenhouse operator. Oedema can be particularly troublesome in double plastic houses which reduce light and air infiltration rates. Overwatering can lead to similar problems in the home environment, even under low humidity conditions.

In addition to ivy geranium, oedema can also occur on other ornamentals, fruit trees and vegetables when soil moisture and relative humidity are high and air temperature and light conditions are low.

Symptoms

Symptoms are as varied as the plant species they affect. In general, tiny water-soaked blisters or bumps (**Fig. 1**) first appear on the lower or older leaves. The plant tissue surrounding the bumps or blisters may turn red or purple as in *Balfour aralia* (*Aralia*



1) Grape Ivy



2) Peperomia



3) Ivy Geranium



4) Periwinkle

Balfouriana) or black as in peperomia (*Peperomia obtusifolia* (L.)) (**Fig. 2**). The water soaking may be followed by the formation of tan colored, corky scar tissue as found in ivy geranium (*Pelargonium peltatum* (L.)) (**Fig. 3**). Leaves severely affected by oedema turn yellow and fall off. Occasionally, the disorder will produce a marginal blackening as in periwinkle (*Vinca minor* L.) (**Fig. 4**). Periodically, this disorder is seen in the summer in fields of susceptible vegetables such as cabbage. For all the variation in final symptoms, oedema initially

causes a water-soaked appearance and develops on oldest leaves first.

Cause

Oedema is a non-parasitic condition induced when soil moisture is high, and the air surrounding the leaves is cool and/or very humid. The roots absorb soil moisture faster than it can be lost through transpiration from the leaves. Water begins to accumulate in the leaf cells, causing them to swell and then burst (water soaking), forming crater-like patterns or ridges of

wound created by the ruptured cells. Low nutritional levels and environmental factors such as light intensity may also influence the susceptibility of plants to oedema. However, the plant-water relationship has been found to be the main factor causing oedema.

Control recommendations for the greenhouse

Use well-drained potting media and keep glass or plastic clean for maximum light transmission. Keep oedema sensitive plants on the "dry side" during periods of cloudy, cool weather. To prevent high humidity conditions, regulate ventilation to lower the moisture content of the air and avoid overcrowding of oedema sensitive plants. Use horizontal air flow fans to hasten air movement and maximize transpiration.

Control recommendations for the homeowner

Water less frequently in winter. Increase the amount of light the plant is receiving. Move oedema sensitive plants to a warmer area.

The following plants are known to be oedema sensitive:	
Scientific name	Common name
<i>Acer spp</i>	Maple
<i>Anthurium olneydianum</i>	Anthurium
<i>Aralia Balfouriana</i>	Balfour aralia
<i>Brassica actinophylla</i>	Schefflera
<i>Brassaia oleracea L.</i>	Cabbage
<i>Cissus rhombifolia</i>	Grape ivy
<i>Clivia miniata Regel</i>	Clivia
<i>Crassula argentea Thunb.</i>	Jade
<i>Euonymus spp</i>	Euonymus
<i>Fatsia japonica (Thunb.)</i>	Fatsia
<i>Ficus elastica 'Decora'</i>	Rubber plant
<i>Ficus lyrata Warb.</i>	Fiddle leaf fig
<i>Hedera Helix L.</i>	English ivy
<i>Hibiscus Rosa-sinensis L.</i>	Hibiscus
<i>Pelargonium peltatum (L.)</i>	Ivy geranium
<i>Peperomia obtusifolia (L.)</i>	Peperomia
<i>Vinca minor L.</i>	Periwinkle
<i>Yucca spp</i>	Yucca
Several species in the Cactaceae family are also sensitive.	

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