

Intumescences (Edema) on Greenhouse Tomatoes

Intumescences is an abiotic disorder that can affect greenhouse tomatoes. It is a physiological disorder and not an infectious disease nor an insect gall. It is also known as edema (oedema).

Symptoms

Blisters develop on the lower surface of the leaves, starting out as small, clear watery blisters or whitish-green bumps especially near the leaf veins. Lesions then turn brown as they dry. On the upper leaf surface, brown necrotic spots can be seen that are surrounded by chlorosis (yellowing). Leaf curling, distortion and leaf drop can also occur. Stems and petioles can also become infected. Older leaves are more likely to be damaged than younger leaves. Tomato cultivars vary in their responsiveness to this abiotic disorder.



Figure 1 & 2: Intumescences symptoms on greenhouse tomato leaves. Photos by L. Pundt

Causes

This abiotic disorder may be caused by environmental conditions such as improper water balance in the plant and the quality of light. Excess moisture in the growing media combined with high humidity levels in the greenhouse leads to low transpiration rates. This causes a buildup of excess moisture in the cells, so the cells enlarge and erupt. Blisters develop due to this increased cell pressure.

Light quality may also be a factor. Recent research has shown that ultraviolet B light, which is mainly provided by the sun, helps prevent the formation of intumescences in tomato. In a Michigan State University study, researchers reported less intumescence in tomato plants, when supplemental light was in the 50:50 Blue: Red ratio compared to 100% red light.

Management

Keep records of which cultivars you grow that are more susceptible, so you can select cultivars that are less problem-prone. Avoid overwatering plants especially during cool, cloudy overcast growing conditions. Reduce humidity levels in the greenhouse by heating and venting and the use of HAF fans.

Give plants plenty of space to increase light levels. Use white plastic mulch on greenhouse floors instead of black plastic mulch, to increase light levels. If using supplemental light to combat low light in the winter months, choose LED lights that provide a combination of blue and far-red wavelengths. Metal halide fixtures also provide more ultraviolet and blue light compared to high-pressure sodium fixtures.

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References

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