Chile Pepper Disorders Caused by Environmental Stress

Guide H-249

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FLOWER DROP

Flower drop occurs when buds, flowers and immature pods drop (abort) from the plant. The problem can be caused by a number of different stress conditions. Any factor that inhibits pollination can cause flower drop. The most common stress factors associated with this disorder are high temperature stress, insufficient water, strong wind, high relative humidity, insect damage and nutrient deficiency, toxicity or imbalances. The best management practice is to ensure proper water and fertilization during flowering. Some cultivars appear to be less susceptible to flower drop than others.

SUNSCALD

Sunscald occurs on pepper fruit exposed directly to intense sunlight. This damage often occurs when shaded fruit is suddenly exposed to the sun. Sunscald may occur on foliage when intense sunlight is combined with high temperatures. Defoliation or prolonged wilting caused by other diseases, such as powdery mildew, bacterial leaf spot, Phytophthora root rot, Verticillium wilt and root-knot nematodes, can contribute to problems with sunscald.

Symptoms appear on the part of the fruit that is directly exposed to the sun. The affected area is light-colored, sunken, soft and wrinkled. The damaged tissue eventually turns whitish tan in color and papery in texture. Sunburned skin may subsequently be attacked by secondary fungi and bacteria, which contribute to further fruit decay. Symptoms may be confused with those caused by blossom-end rot, however sunscald will only occur on the side of the fruit exposed to the sun. Blossom-end rot may form on exposed or unexposed areas and is always found near the blossom end of the fruit.

SALT INJURY

Excessive salt concentration in the soil or irrigation water can result in significant crop losses. Peppers are relatively sensitive to salt. In peppers, yield loss begins when the electrical conductivity (EC) is greater than 1.5 dS/m. Data in New Mexico indicates a 50 percent yield loss at EC 5.8 dS/m, and an additional 12.6 percent reduction in yield for every additional unit increase in EC. Plants of all ages are susceptible to salt injury. However, damage to seedlings is generally more severe and can result in extreme stunting or death. In direct-seeded peppers, salt injury combined with other seedling diseases or wind damage, can result in long skips and stand losses of more than 50 percent. Mature plants exhibit symptoms of burned root tips, marginal leaf necrosis, wilt and defoliation.

Injury often develops after light rains or light irrigations that wash salts into the root zone. Although eliminating the problem completely is not possible, damage may be minimized by cultural practices that move salt away from the plants and roots. For example, furrow-irrigated plants should be planted on one side of the bed, as this irrigation method tends to concentrate salts in the bed's center. Conversely, drip-irrigated plants should be planted in the center of the bed, because this method tends to push salts to the sides of the row. Regardless of the irrigation method, enough water should be applied to help leach salts down into the soil. Seedling damage may be reduced by planting into preirrigated beds and capping the row. When the cap is removed, salt is dispersed in the furrow or on the sides of the beds. Pepper cultivars possess varying degrees of salt tolerance.

WIND INJURY

Strong winds can damage pepper plants in several ways. Damage can result from rapid desiccation of the foliage or hypocotyl. When this occurs on young seedlings, the plants will fall over and die. On older plants, desiccated foliage may wilt beyond recovery. Wind injury also may result in physical damage to the foliage or in broken stems or branches. Physical damage to seedlings occurs from wind whipping the plants back and forth. These plants typically snap off where callus tissue forms at the soil line following injury. Wind damage is intensified by blowing sand, causing necrotic spots to form on the foliage.

Seedlings may be protected from strong winds when planted into the stubble of small grains. Additionally, windbreaks planted around the edges of the field may protect plants growing in high wind areas.

COLD SOILS

Establishing good direct-seeded chile stands is key to producing a high-quality, high-yielding crop. Unfortunately, there are many factors that can directly reduce seed germination and seedling survival: cool soil and air temperature in spring, high winds, soil crusting, high soil salinity, insects, weeds and diseases. These challenges often make it difficult to establish a strong chile stand.

Uniform gemination of chile seed requires warm temperatures. Studies have shown that chile seed germinates best when the temperature is greater than 65ºF. Chile seed requires approximately 11 days to germinate (>80 percent germination) at 73ºF, approximately 22 days at 59ºF, and more than 28 days at 55ºF. In cool temperatures, chile seeds germinate sporadically, resulting in an uneven, weak stand. Rapid and uniform germination results in strong seedlings that are less susceptible to soilborne diseases and insects, less likely to be desiccated or injured by strong wind and less likely to be damaged by soil crusting.

HAIL INJURY

Severe hail can result in tattered foliage and pock-marked fruit. The damaged tissue may become chlorotic or necrotic in response to the injury. Wounds created by hail often are invaded by fungi and bacteria, resulting in fruit decay.

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