

Impact of Nematode Invasion on Physiological Processes in Plants

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Abstract—*Under a diseased condition, the plants tend to lose their energy mainly due to the interference in physiological activities. Growth, yield and development are resultant attributes of physiological processes like photosynthesis, respiration, transpiration etc. taking place in the plants. Photosynthesis is an anabolic process that involves capturing the sunlight with the help of chlorophyll and utilizing water and carbon dioxide to yield carbohydrates and oxygen. There are several factors governing the process of photosynthesis. The driving force for water movement through a plant is the difference in water potential from the soil to the atmosphere. Nematode infected plants exhibit symptoms of water stress. Nematode feeding on roots and intraroot migration damages the epidermis, cortex and stellar elements. Affected vascular system leads to interruption of transpiration. Reduced root growth directly affects the water movement inside plant. Stomatal aperture directly regulates water flux through a plant, decreasing conductance of water flow in the roots reducing transpiration. Water stress as induced by nematode parasitism leads to stomatal closure. As a result, the rate of CO₂ entering inwards and water vapours diffusing outwards through stomata are lowered and hence, the declined stomatal conductance. Nematode invasion of host root systems results in reduced leaf water potential, stomatal conductance, transpiration and root conductivity. Leaf temperature is one such attribute that depends on the rate of transpiration. Water diffuses out as vapours from the above ground parts of plant providing cooling effect to the transpiring organs (leaf thermo-regulation). Thus, reduced transpiration rate due to nematode parasitism leads to increased leaf temperature. That indirectly relates to nematode induced stress in plant system.*

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