

Fusarium Wilt of Tomato: Plant Growth, Physiology and Biological Disease Management

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Abstract : Current research work was carried out to check influence of farmyard manure (FYM) in *Lycopersicon esculentum* L. against *Fusarium oxysporum* f. sp. *lycopersici* (FO) in copper polluted soil. Silt-loam soil naturally enriched with 70 ppm of Cu was inoculated with 1×10^6 spore suspensions of FO and incorporated with 0%, 1%, 1.5% or 2% FYM. The multilateral interaction of host-pathogen-metal-organic amendment was assessed in terms of morphology, growth, yield, physiology, biochemistry and metal uptake in tomato plant after 30 and 60 days of sowing. When soil was inoculated with FO, plant growth and biomass were significantly increased during vegetative stage, while declining during flowering stage with substantial increase in productivity over control. Infected plants exhibited late wilting and disease severity was found on 26-50% of plant during reproductive stage. Incorporation of up to 1% FYM suppressed disease severity, improved plant growth and biomass, while it decreased yield. Rest of manure doses was found ineffective in suppressing disease. Content of total chlorophyll, sugar and protein were significantly declined in FO inoculated plants and incorporation of FYM caused significant reduction or no influence on sugar and chlorophyll content, and no pronounced difference among different FYM doses were observed. On the other hand, proline, peroxidase, catalase and nitrate reductase activity were found to be increased in infected plants and incorporation of 1-2% FYM further enhanced the activity of these enzymes. Tomato plant uptake of 30-40% of copper naturally present in the soil and incorporation of 1-2% FYM markedly decreased plant uptake of metal by 15-30%, while increased Cu retention in soil. Present study concludes that lower dose (1%) of FYM could be used to manage disease, increase growth and biomass, while being ineffective for yield and productivity in Cu-polluted soil. Altered physiology/biochemistry of plant in response to any treatment could be served as basis for resistant against pathogen and metal homeostasis in plants.

Keywords : *Lycopersicon esculentum*, copper, Fusarium wilt, farm yard manure

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