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Poster

SHIFTS IN RHIZOSPHERE FUNGI AND BACTERIA RESPONDING TO COPPER APPLICATION

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ABSTRACT

It is generally known that heavy metals such as copper (Cu), cadmium (Cd) and zinc (Zn) can affect growth and activities of microorganisms in soil. Farmers apply copper containing fungicides to soil borne pathogens. A pot experiment was carried out to assess the effect of copper application on soil microorganisms. Lettuce was grown in pots and copper was applied at the rate of 0, 8 and 16 m.mol / kg of soil. Soil and plant samples were taken on 4, 9 and 36 days of post application of copper. Total and copper resistant fungi and bacteria, available phosphorus and pH in soil were measured. Lettuce roots were assessed for mycorrhizal infection. The total population of fungi declined initially with copper application but recovered after about one month. The proportion of Cu-resistant fungi increased up to 9th day of copper application (26 -52%) and at 36 days, it reached the level similar to that of the control (10%). Bacteria were more affected by copper application than fungi. Total bacteria counts of copper amended soils remained 10% of the control (5.7 X 10^6 CFU). Unlike fungi, copper resistant bacteria showed much higher population even at the end of the experiment. Similar to fungi, mycorrhizae were also affected initially by copper application, but recovered substantially with time. Mycorrhizae infection declines with increase in phosphorous (r^2= 0.078, P=0.05) and increases with plant dry weight (r^2= 0.65, P=0.05). These result indicate that shift in fungal and bacterial population due to application of copper at 8 and 16 mmol/kg of soil is reversible. Results of this study are important in determining intervals of application of copper containing fungicides to soil.