

Effect of selected herbicides in vitro and in soil on growth and development of soil fungi from oil palm plantation

ABSTRACT

Herbicides are commonly used in integrated weed management programs in oil palm plantation. Their usage not only controls the weed populations but also affects microbial populations especially fungi in soil, and hence modify soil biochemical and biological processes critical for ecosystem functioning. The response of fungal population from oil palm soil exposed to paraquat, glyphosate, glufosinate-ammonium and metsulfuron-methyl at 0.5, 1 and 2 times their recommended field application rates, in vitro and in soil environment was assessed in present studies. Herbicides both in vitro and in incubated soil caused significant inhibition of fungal growth. Inhibition of fungal growth increased with increased herbicide rates. The degree of growth inhibition by the herbicides tested in vitro was in order of paraquat and glufosinate-ammonium > glyphosate > metsulfuron-methyl. Species-specific inhibition and influence of exposure periods were also evaluated and found to vary for fungal species, herbicides and their rates of application.

Keyword: Glufosinate-ammonium; Glyphosate; In vitro; Metsulfuron-methyl; Paraquat; Soil fungus; Soil microcosm