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“Solidarity in a competing world —
fair use of resources”

Occurrence of Arbuscular Mycorrhizal Fungi (AMF) and Dark Septate endophytes (DSE) Associated with *Eragrostis Tef*

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Abstract

Teff (*Eragrostis tef* (Zucc.) Trotter) is a tropical and sub-tropical crop and is a staple food for Ethiopia and an alternative source of forage, malt making and biogas. It grows under a wide range of agro-ecological conditions from lowland to highlands under water stress to the water logged areas. But, there is a knowledge gap in how the associations of arbuscular mycorrhizal fungi (AMF) and dark septate endophyte (DSE) with *Eragrostis tef* is affected by fertilisation and by inoculation with spores from the AM divers' forest soil. A pot experiment was set up to test the effect of fertilisation and arbuscular mycorrhizal inoculation with forest soil on the occurrence of AMF and DSE on the roots of *Eragrostis tef*, AMF spores occurrence in the soil. The top soils of agricultural fields and natural forest were collected from Tara Gedam, Gelawdiwos and Injibara in the western Amhara region, Ethiopia and quncho teff was sown in each pot. *Eragrostis tef* fine roots were stained by using 5 % ink- acetic acid solution and counted with a 200x, 400x and 1000x magnifications. AMF spores were extracted from the soil and counted with 230x magnifications. The results showed that, AMF colonisation was higher with the use of forest inoculum but lowered by the use of full recommended fertilisers and the DSE colonisation were higher with the use of forest inoculum but not changed by the use of fertilisers. The use of forest inoculum increased the spore density, but the use of fertilisers reduced the spore density as compared from the control treatment. Additionally, the mycorrhizal host plant, *Eragrostis tef* increased the spore density due sporulation. The most abundant spores were *Glomus*, *Gigaspora* and *Entrophospora* genera. Keywords: AMF, DSE, *Eragrostis tef*, Forest inoculum and N-P fertiliser.

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