



Deutscher Tropentag, October 9-11, 2002, Witzenhausen
“Challenges to Organic Farming and Sustainable Land Use
in the Tropics and Subtropics”

**Root Growth of Eight Different Varieties of the Grain Tef
(*Eragrostis tef* (Zucc.) Trotter) from Ethiopia**

ANDREA KLEEBOERG, CHRISTIAN RICHTER

University of Kassel, Institute for Crop Science, Germany

Abstract

Tef (*Eragrostis tef* (ZUCCAGNI) TROTTER) is a grain, mainly grown in Ethiopia. Soils in Ethiopia are often low in phosphorus. The cultivation of phosphorus efficient varieties is a way to use these soils more efficiently. The tef varieties DZ-Cr-37, DZ-01-1445, Local Brown, DZ-01-787, Local Yellow, DZ-01-354, Ambo Black and Ambo White from Ethiopia were examined in their early growth stage on the root criteria length of root hairs, length of main root, number of lateral and adventitious roots and root/shoot ratio. An extended and dense root system, long root hairs and a high root/shoot ratio are reasons for the phosphorus efficiency of a plant. With extension of the root system varietal differences for the length of main root criteria and number of lateral and adventitious roots increased: Local Brown showed significant differences compared to the varieties DZ-01-1445, DZ-01-787, Ambo Black and Ambo White in two experiments (temperate and tropical climatic conditions, respectively). The mean values for length of root hairs varied between 0.86 mm (DZ-Cr-37) and 1.06 mm (Ambo White) but showed no significant varietal differences. Rank lists based on the mean values of the varieties for all examined criteria showed that Local Brown achieved the best results followed by Local Yellow, DZ-Cr-37, Ambo Black, DZ-01-787, Ambo White, DZ-01-1445, DZ-01-354 under tropical climatic conditions and by Local Yellow/DZ-01-354, DZ-Cr-37, Ambo Black, DZ-01-787, Ambo White, DZ-01-1445 under temperate climatic conditions. With the exception of DZ-01-354 the order of both rank lists was the same. The results from the early growth stage show that differences between tef varieties exist in developing characteristic features which are important for phosphorus efficiency. Varietal differences may be confirmed in long-term studies for later growth stages. The identification of more phosphorus efficient varieties is necessary to be able to recommend suitable varieties for low phosphorus soils.

Keywords: Phosphorus efficiency, tef