Abstract

In this study, the arbuscular mycorrhizal indigenous colonization of two genotypes of maize (Negro and V-23) and two genotypes of wheat (Berros and San Cayetano), characterized previously as less efficient and more efficient in nitrogen and phosphorus use (N and P), respectively, were evaluated. These genotypes were cultivated in an Andisol during the spring-summer cycle of 1998 and with four doses of nitrophosphated (N+P) fertilizer in order to achieve the mineral mycorrhizal fertilization effect related to the N and P use efficiency of each genotype. Three root samples were collected from each treatment starting when the fertilizer was applied and finishing with the flowering stage of the plants. These samples were stained using the Phillips and Hayman (1970) method and the percentage of the arbuscular mycorrhizal colonization was determined using the intersection method. For both species we found that the genotypes with low nutrimental efficiency showed major arbuscular mycorrhizal colonization, with 75% for maize and 71% for wheat, while the percentage was significantly less for the most efficient genotypes with 64% and 55%, respectively. The colonization percentage diminished significantly in both species, when the supply of N+P was increased responding to the application of phosphorus; however, while in maize the colonization percentage diminished when the age of the plant increased, (less mycorrhization in the anthesis), in wheat the opposite was observed. The results suggest that the MA colonization is related to nutrient availability, mainly phosphorus content and possibly with the metabolic route (C3 or C4). As a consequence these parameters should be considered as an alternative in the selection of efficient genotypes under field conditions and in the reduction in the use of mineral fertilizers.

Keywords

Sustainable agriculture, cereals, plant nutrition, acid soils.