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ZEOLITIZED TUFFS IN PEDOTECHNIQUE FOR QUARRY RESTORATION: EVALUATION OF PHYTONUTRITIONAL EFFICIENCY IN ^AUP MODEL HORIZONS

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A study was started aiming at assessing the suitability of zeolitized tuff as optimal mineral Human Transported Materials (HTMs) in pedotechnologies for quarry restoration. Different models of pedotechnosystems have been carried out by co-utilising (i) zeolitized tuff as natural K-rich zeolite-bearing rock with a huge cation exchange capacity and NH₄⁺ selectivity, (ii) commercial peat-amendment as source of exogenous organic matter, and (iii) a mixture of phosphorite and poultry as low-cost source of mineral P and organic nitrogen, respectively. The experimental pedotechnosystems were assembled as substrates for settlement and growth of pasture-grass. From the taxonomic point of view, they represent anthropogenic horizons designed “^Aup” according to the latest Keys to Soil Taxonomy, where the “caret” symbol (^) indicates just mineral or organic layers formed by Human Transported Materials (HTMs). In a previous research, data related to agronomic efficiency and organic matter evolution of such pedotechnosystems confirmed the relevant suitability and efficiency of zeolitized tuff as pedogenic substrates in quarry restoration. In the present paper our attention was focused on the estimation of present and potential phytonutritional efficiency through the assessment of both agronomic performance as well as residual fertility. In order to weight the key-components of the pedotechnosystems, and the possible interactions among them, conventional as well as special experimental indices were proposed. All investigated pedotechnosystems showed a huge crop production. The comparison among the experimental indices suggests that soil-plant relationships very well performed, especially for the less expensive pedotechnosystem, i.e. that fertilized with phosphorite and poultry manure without organic amendment.