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I International Conference on Research for Sustainable Development in Mountain Regions

Book of Abstracts

INSTITUTO POLITÉCNICO DE BRAGANÇA
Centro de Investigação de Montanha
Embrapa
United Nations Educational, Scientific and Cultural Organization · UNESCO Chair in Sustainable Mountain Development
University of the Highlands and Islands Oilthigh na Gàidhealtachd agus nan Eilean
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Fertilizing value of a five years pasture ley in comparison with maize monoculture

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Crop rotation is one of the basic pillars of agroecology and sustainability of the production systems. Monoculture is only possible in areas without significant ecological constraints (soil fertility, available water, ...). In general, the more severe the ecological limitation for plant growth the longer should be the crop rotation and vice versa. Long-course rotations usually permit the introduction of a pasture ley phase which could lead to a more consistent and fast increase in soil fertility. In this work the fertilizing effect of a ley phase of 5 years was compared with a maize monoculture maintained for an equal period of time. The pasture ley increased the pool of organic matter. In 5 years, the 0-20 cm soil layer of the pasture phase sequestered 17.4 Mg ha^{-1} of total organic carbon and accumulated 403 kg N ha^{-1} more than the same layer of soil under maize monoculture. A maize crop grown after plough the 5 years pasture ley and after the 5 years of maize cultivation as a monoculture produced, respectively, 15.3 and 8.7 Mg dry matter per hectare and recovered 175.4 and 68.0 kg N ha^{-1}, being this difference the result of the nutrient release from the extra pool of organic matter that was built during the ley phase. The residual effect of the organic pool persisted in the second year of maize growth. Dry matter yield and N recovered were 10.0 and 8.4 Mg ha^{-1} and 78.3 and 50.3 kg ha^{-1}, respectively in the previous pasture ley and maize monoculture