increase infiltration, then achieved water storage and sediment reduction. Vegetation reduced the velocity of slope flow by increasing the slope roughness, affected the hydraulic parameters of slope shallow open channel flows, and effectively increased slope resistance coefficient and soil anti-scourability. At the same time, vegetation had a significant role in enhancing soil shear strength. Under different conditions, soil cohesion had a significant negative correlation with runoff and sediment yield. The change characteristics of soil cohesion and internal friction angle were affected by both cover conditions and water content of vegetation slope. Based on this, vegetation had a good role in soil and water conservation. The research results would help us to quantitatively evaluate the effects of water storage and erosion reduction of vegetation and deepen the understanding of soil erosion mechanics process.

Do Norway spruce, Douglas fir and European larch stands differ in litter decomposition and belowground carbon storage?

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An increase in droughts and insect infestations threatens Norway spruce (*Picea abies*) stands across European forests. With a higher drought tolerance, Douglas fir (*Pseudotsuga menziesii*) and European larch (*Larix decidua*) became a suitable non-native and a native silvicultural alternative to Norway spruce. How tree species selection affects litter decomposition and belowground carbon (C) storage is, however, still not fully understood. Here, we want to 1) answer if Norway spruce, Douglas fir and European larch differ with regard to litter mass loss partitioning into leaching of dissolved organic C (DOC) and CO_2 efflux during decomposition, 2) to link mass loss partitioning to litter biochemical properties and 3) to relate mass loss partitioning to belowground C stocks. It is hypothesized that tree species with a higher partitioning into leaching of DOC have higher belowground C stocks. The study took place in Austria and measurements were conducted over the course of one year. Litter CO_2 efflux and leaching of dissolved organic C was measured *in situ* by means of respiration chambers and lysimeters. Litter bags were used to study mass loss and biochemical litter processes/properties. The results of this study will help to improve our understanding of tree species effects on the forest belowground C cycle. In order to lower the uncertainties of C sequestration estimates for the forestry sector, this information is very important. Furthermore, new insights into the complex process of litter break down will be provided. First results of the study will be presented at the conference.

Use of arbuscular mycorrhizal fungi (AMF) in ecological restoration projects for the Atlantic Forest */Uso de fungos micorrízicos arbusculares (FMA) em projetos de restauração ecológica da Mata Atlântica*

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A maioria das plantas superiores associa-se a fungos micorrízicos arbusculares (FMA). A simbiose promove efeitos positivos para a nutrição e sobrevivência das plantas. A pesquisa está inserida no P&D da ANEEL realizado pela AES-Tietê e IPEF. O experimento de campo está na Estação Experimental de Genética de Anhumas, ESALQ/USP, em Piracicaba, SP. As espécies avaliadas foram: *Mabea fistulifera, Lafoensia pacari, Psidium myrtoides, Esenbeckia leiocarpa, Gallesia integrifolia* e *Machura tinctoria*. Os FMA foram: *Glomus intraradices* e *G. etunicatum*. Delineamento experimental de blocos ao acaso, com cinco tratamentos: 1) Mudas não inoculadas em viveiro (MNIV), recebendo fertilizantes na quantidade recomendada por análise de solo (FR); 2) Mudas inoculadas em viveiro (MIV) e FR; 3) MIV, com fertilização recomendada para N e K e redução de P para 1/3 do indicado (P1/3); 4) MNIV e FR, com adição de FMA na cova (MIC); 5) MIV, P1/3 e MIC. Aos 24 meses foi realizado inventário com medição das plantas. *E. leiocarpa* apresentou alta mortalidade em todas as situações; *M. fistulifera* apresentou maior sobrevivência nos tratamentos com FMA; *L. pacari, P. myrtoides, G. integrifolia* e *M. tinctoria* apresentaram alta sobrevivência em todos os tratamentos. A redução de P em plantas com FMA não afetou o crescimento, exceto *G. integrifolia* que apresentou altura significativamente superior quando inoculado com FMA no viveiro ou no campo e recebendo fertilização da quantidade recomendada. O efeito da adição de FMA variou conforme a espécie mas, de uma maneira geral, pode ser considerado vantajoso na restauração ecológica da Mata Atlântica.

Plant responses to belowground variations along elevational gradients in temperate and tropical climates

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Soil is a hyper-heterogeneous environment, and how plants respond to changes in belowground variations in soil properties and microclimate is poorly understood. Environmental gradients are useful for examining how root traits mediate plant responses to soil heterogeneity. We measured soil/air temperature, soil water potential and physical/chemical properties in 30 plots along elevational gradients located in France and Mexico, both above- and below the treeline. High elevations were colder than lower elevations at both sites, but in Mexico, precipitation decreased at high elevations, whereas in France, higher elevations were wetter than lower altitudes. Soil properties were more idiosyncratic along both gradients. We selected 11 (France) and 14 (Mexico) woody and herbaceous species based on their abundance along the gradients. A range of root and leaf functional traits were measured. Data showed that trends in root traits along gradients were often masked by the hyper-heterogeneous belowground environment, whereas patterns in leaf traits were more evident. Results will be discussed with regard to the effect of elevation as an environmental filter on plant traits.