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Themenschwerpunkt: Waldschadensmanagement – Forstschutz und Kalamitätsbewältigung

Evaluation of changes in chemical soil properties and assessment of silvicultural site use after a forest fire

Warmer, drier summers increase the risk of forest fires in Germany. Despite this challenge, there is a lack of expertise for dealing with this risk in the forestry and hazard control community. The research collaboration ErWiN (Enhancement of the ecological, silvicultural and technical expertise concerning forest fires) aims to produce an important foundation for a knowledge-based handling of forest fires in the areas of silviculture and firefighting. The work package presented here has the goal of analyzing changes in chemical soil characteristics. The results are the basis to identify the altered water and nutrient supply for the regenerating forest stands.

The first research site in Treuenbrietzen (large forest fire in 2018) was set up along the burn severity gradient starting from the unharmed forest stand (control) and ending at the most severely burnt area. The second research site in Groß Eichholz (very small fire in May 2022) was set up similarly. At regular intervals, soil and soil solution samples are collected from each research plot along the gradient in order to quantify the changing chemical soil properties. In addition, data monitoring includes the soil temperature, soil moisture and meteorology. The statistical analysis consisted of a t-Test/ANOVA or the non-parametrical equivalent.

The consequences of a lack of vegetation after a forest fire are soil erosion and a redistribution of nutrients on site. It is expected that nutrients will accumulate in the original planting rows and thus decrease on the mounds between the planting rows. The ash layer can diminish water infiltration and can therefore cause or intensify the hydrophobicity of the soil. These modified site conditions will influence the choice of suitable tree species for regeneration of the forest stand.