

## 91. Can functional complementarity of plant strategies enhance drought resilience in associations of Mediterranean grasses?

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Grasslands are very important agro-ecosystems worldwide but the sustainability of their numerous ecosystem services is threatened under climate change especially in Mediterranean areas. As biodiversity is increasingly recognized to enhance and stabilize processes within plant communities, we aimed to test whether the associations of forage species with contrasting above- and belowground functional strategies improve the use of soil water and the resilience of biomass productivity under increasing summer aridity. Monocultures and bi- or tri-specific mixtures of perennial grasses (native species or cultivars) were compared in a 3-years field experiment under either an average or an extreme summer drought scenario in southern France. From the measured leaf and root traits, both the functional identity (mean traits of associated species) and the functional diversity (trait differences between associated species) were calculated for each mixture. Overyielding and resilience (post-stress vs. pre-stress productivity) were assessed from seasonal aboveground biomass (AGB). Total transpirable soil water (TTSW) and evapotranspiration in summer (ETsum) were derived from monthly soil water content monitoring. Overall, response patterns were similar between native species and cultivars. Across all treatments and drought scenarii, AGB productivity and resilience were highly correlated with TTSW, ETsum and rooting depth. The functional identity of mixtures better explained overyielding and resilience responses than the functional diversity. However, the effects associated with functional complementarity between root traits may have greater impacts on mixture drought resilience on a longer term. These results showing the role of root traits and water-use on the resilience of perennial mixtures provide sound agro-ecological rules to design suitable associations of species for drought-prone areas.