VARIATION IN SOIL BIOFEEDBACKS ASSOCIATED WITH MICROSTEGIUM VIMINEUM.

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A wide range of biotic and abiotic factors have been shown to impact the structure and dynamics of plant communities. However, much of this research has focused on the importance of abiotic factors, particularly light and soil nutrients, and has ignored the biotic component of soils. Despite this focus on abiotic constraints, accumulating evidence has identified soil biota as having a potentially important role on invasion biology and plant populations. Soil biofeedbacks are generated by a diversity of organisms and the resulting soil community can serve as a form of density-dependant regulation and may play an important role in maintaining the diversity of terrestrial plant communities. The mechanisms involved in the biofeedback of a particular site, comprising the indirect effects, are established and assist in regulating community assemblages and dynamics along with invasions, and successional trajectories.

With particular interest in the soil-feedback effects on interspecific competition, we are hypothesizing that *Microstegium vimineum*, an exotic C4 grass, has created a negative feedback through the soil community on the understory forest flora within the Buell Small Succession Study (BSS), effecting population dynamics and community structure of the system.

To address the research question, we conducted a greenhouse soil inoculum experiment utilizing an associated understory species in order to determine whether the mechanism responsible for the impacts observed by the *Microstegium* invasion within the BSS is related it*'s* ability to alter the soil community. Our sample design allows us to observe local variation among individual soil communities that are replicated in 10 adjacent fields comprising the entire site. We also took soil samples from an adjacent old growth forest that borders the BSS to determine variability in soil biofeedbacks. At the end of the growing period, plants were harvested and total above ground biomass was determined.

We found no overall effects of *Microstegium* on plant performance and only a status effect (live vs. autoclaved soil). However, the comparison of individual fields yielded variation within the site where some fields experienced a status effect, a *Microstegium* effect or an interaction between status and *Microstegium.* Reproductive success was found to be most strongly correlated with biomass, and therefore, plants that performed better had the highest probability of flowering.

In most soil biofeedback studies, samples are pooled over the entire site leading to a sample that may be unrepresentative of local, spatially explicit soil communities that can play an integral role in plant community assemblages. The most important aspect yielded by this experiment is when considering soil feedback studies, variation can exist in systems that cover the same landscape and can vary significantly from overall site effects. We argue that variation can be easily over-looked when the spatial aspect of a system is not considered or ignored and should be included in further soil feedback studies

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