

AGRICULTURAL LAND-USE LEGACIES AND NON-NATIVE INVASIVE PLANTS IN A SOUTHERN APPALACHIAN FOREST 100 YEARS POST-ABANDONMENT

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Historic land use plays a profound role in shaping contemporary landscapes and ecological communities. The southern Appalachians have a rich land-use history, including late 18th century European settlement that resulted in the clearing of forests for cultivation. Widespread agricultural abandonment occurred in the late 19th and early 20th century, with subsequent regrowth of the forests that characterize the region today. In this study, we considered the role of agricultural land-use history in shaping current patterns of non-native plant invasion in the forest understory of a southern Appalachian watershed 100 years after abandonment. We addressed three overarching questions: **(1) Does agricultural land-use history affect the presence and abundance of invasive plants in the forest understory? (2) If so, what characteristics of these formerly cultivated areas are associated with their invasibility? (3) What other factors (related to topography or landscape context) influence invasibility?** The study was conducted at the Bent Creek Experimental Forest in western North Carolina. Areas that were previously in cultivation and then abandoned between 1900 and 1910 were compared with nearby reference sites that were not formerly cultivated. Biotic and abiotic characteristics were measured in the formerly cultivated sites and reference sites to determine which factors most influenced invasibility. The most common invasive plant species encountered were Oriental bittersweet (*Celastrus orbiculatus*), Nepalese browntop (*Microstegium vimineum*), and Japanese honeysuckle (*Lonicera japonica*). Land-use history played a major role in determining patterns of invasion at Bent Creek, with a higher frequency of presence and higher abundance of invasive plants in the formerly cultivated sites. Exchangeable cations and pH were positively correlated with presence and abundance of invasive plants and were an important explanatory variable. The concentration of exchangeable cations also was strongly correlated with the overstory community composition, particularly the abundance of *Liriodendron tulipifera* and other early-successional species. We suggest that the agricultural land-use history at Bent Creek may be affecting invasibility indirectly, by causing elevated soil nutrient levels (especially exchangeable cations) as a result of nutrient cycling by early-successional tree species.

Keywords: land-use history, old field, *Liriodendron tulipifera*, exchangeable cations