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Influence of composition ratio of herbage and shrub on roadside vegetation characteristics along Bi-Tong Highway

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Key word Slope protection, vegetation restoration, shrub and herbage mixture, community diversity

Introduction Highway plays important role in promoting the development of Chinese economy (Forman R, 2002). With the increase of Highway in China, great attentions have been paid on the eco-environmental issues caused by slope cut and plant clearance including soil and water erosion, habitat loss, air pollution etc. This study was conducted to address the influence of re-vegetation of shrub and herbage mixtures on vegetation community including species composition, distribution pattern, community diversity etc. The findings of this study can be used as reference for restoring the roadside vegetations destroyed by highway construction in the similar geographical areas.

Materials and methods This study was conducted along the roadside of Bi-Tong Highway in Tongbai County (N32°23', E113°28'), which is in a transition zone between subtropical and temperate. The yellow soil in the sample site is very poor in terms of fertility. The native vegetation is broadleaf forestry, which degraded seriously due to long-history human activity. The characteristics of road vegetation along roadside including species composition, plant cover, plant density and species diversity were sampled in 3 repeated 5m×5m quadrats. The collected data were statistically analyzed by using software of SPSS 15.0.

Results The results show that *Leguminosae*, *Gramineae* and *Compositae* dominated the plant community and play important roles in the re-vegetated plots. The density, coverage, height and biomass of re-vegetated communities increased gradually with the increased density of planted herbage. The highest value presented when the seeding rate of herbage reached 700 plant·m⁻². The species richness (Margalef index), plant diversity (Shannon-Wiener index) and Pidou evenness index tended to increase with species density at the beginning, but decreased when the seeding rate of herbage was over 500 plant·m⁻². With the increase of seeding rate of herbage, the species similarity between planted communities and naturally restored communities decreased first and increased thereafter. This indicates that the type not density of the species planted plays important role in community composition. 500 plant·m⁻² of seeding rate of herbage is appropriate to prohibit the ruderal from invading into restoration plots, to promote plant coverage and increase the similarities of planted community to naturally restored communities.

Conclusion The configuration of plants in the re-vegetation is helpful to boost the progressive succession of plant community. The moderate seeding rate of herbage can increase the community diversity index.

Reference

Forman R T T, Sperling D, Bissonette J A, et al. Roadecology: science and solutions. Inland Press, 2002, 3~397.