

Population Dynamics of Willow Leaf Beetles in Managed and Natural Willow Stands

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Abstract It is generally believed that diversity leads to stability in ecosystems. One consequence would be that insect populations should fluctuate less in density over time in natural and diverse systems compared with managed systems. In this study, we measured densities of leaf beetles (Coleoptera: Chrysomelidae) over five years in 20 managed willow (*Salix viminalis*) plantations and in 22 natural willow (*S. cinerea*) stands. We found no significant difference in temporal variability (coefficient of variation) of leaf beetle density between managed and natural willow stands. However, outbreaks (i.e. drastic increases in leaf beetle density) tended to be more frequent in the willow plantations. In addition, leaf beetle populations showed strong negative density dependent growth in natural willow stands. No such patterns were observed in the managed willow stands. Although feedback effects were observed in the natural willow stands, this did not lead to a significantly greater stability of leaf beetle populations compared with willow plantations.