

Effect of Disturbance Size on Similarity and Resilience of Vegetation to the Disturbance (Advanced Studies on Sustainable Animal Production: Interrelationships among Human, Animal and Environment, 8th International Symposium of Integrated Field Science)

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9. Effect of Disturbance Size on Similarity and Resilience of Vegetation to the Disturbance

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Cattle create disturbance patches of varied sizes in sloping pasture through their activities (grazing and trampling). We investigated the effect of disturbance size on similarity and resilience of vegetation to the disturbances. This study was carried out at three vegetation types (improved pasture, partially improved semi-natural pasture and semi-natural pasture) in Kawatabi Research Station of Tohoku University, Japan. We created diameter 20, 40, 60 and 100cm of trampling (removal of soil surface at 5cm deep) and grazing (mowing at 5cm height) treatments in mid-May, late June and early August. A 100 ×100cm undisturbed treatment (control) was set in each plot. Similarities of species composition between the disturbance sizes and control were calculated from the species composition in the one month after the disturbances in each season. In all vegetation types, a similarity between 20cm and control was the smallest in each combination. Species composition of grazing treatment was relatively similar to that of control. Resilience of vegetation at 20cm and 100 cm of trampling treatment created in May were shown by continuous resultant cover from May to September. Resilience tended to be greater at 100cm than 20cm of trampling treatment, in the improved pasture and partially improved semi-natural pasture (p values = 0.09, 0.08, respectively). Also, resilience of the semi-natural pasture was significantly greater at 100cm ($p < 0.001$). We suggest that small disturbance size had a profound effect on the similarity and resilience of vegetation, probably because surrounding vegetation shaded the sun.