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Vegetation response to grazing management in a Mediterranean grassland : a long-term synthesis

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Introduction A long-term synthesis (13 years) on the effects of cattle grazing management on the structure and composition of a Mediterranean grassland in north-eastern Israel is presented . This study provides new insights on the response of the vegetation to rainfall and grazing management .

Methods The relationships among plant functional groups was studied in the context of the effects of grazing pressure of the most recent and former grazing seasons , as well as on the rainfall amounts of the most recent and previous rainfall seasons . Treatments included manipulations of stocking rates (moderate , heavy and very heavy) and of grazing regimes (continuous vs . seasonal) , in a factorial design .

Results Inter-seasonal rainfall variation was a dominant factor in the expression of different grazing treatments on the structure of the plant community . Species diversity was significantly affected by grazing treatments and their effects were stronger in years with dry springs . Grazing effects were stronger on tall annual grasses and annual legumes in wet rainfall years . In dry springs and years , an increase in plant cover was noted in crucifers and thistles with increasing grazing intensity . A reduction in cover of tall grasses was correlated with an increase in cover of less palatable groups such as annual and perennial thistles as well of prostate and shorter groups such as annual legumes and short annual grasses . Cover of functional groups composed by hemicryptophytic species were less variable (lower CV) , in response to grazing treatments compared to functional groups with annual species .

Conclusions Increasing grazing intensity produced a shift in dominance of less palatable functional groups and was rainfall dependant . However , persistency of tall grasses and more palatable species support the idea that Mediterranean grasslands are highly resilient . This long-term study shows that the community is rather stable in spite important variation in grazing pressures and rainfall conditions . Grazing pressure could be increased compared to current management pressures , however , the effects of rainfall conditions should be included in the managerial protocols to prevent a reduction in forage quality of the grassland .