

Forage and livestock productivity on pastures of differing plant diversity

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Introduction Plant diversity and its function in grassland ecosystems has been the focus of many recent studies, and debate, in the ecological literature (Wardle 1999, Loreau and Hector 2001). We know less about the role of plant diversity in pastures used solely for agricultural production (Sanderson et al. 2004). The objective of this study was to learn how pastures planted with increasing levels of plant diversity would affect forage yields and beef cattle performance.

Materials and methods In August 2001, 9 pastures (3-5 ha) were sown with 3, 5 and 8 forage species at the Orr Beef Research Center in western Illinois, USA. Pastures were rotationally grazed by beef cattle from 2002 to 2004. Cow-calf pairs (black purebred Simmental) were assigned to pastures to achieve an initial stocking rate of ~2.5 animals/ha. Initial and final calf weights were measured on two consecutive days to assess performance. Forage yields were estimated using a rising plate meter technique.

Results Figure 1 shows mean standing crop from rotationally grazed paddocks in 2003. Forage yields were similar most of the season until August when the 3 species mixtures were more productive. Forage yields in 2002 showed a similar trend. Calf gain per hectare was higher in 2003 but showed no differences among the different pasture mixtures (Figure 2).

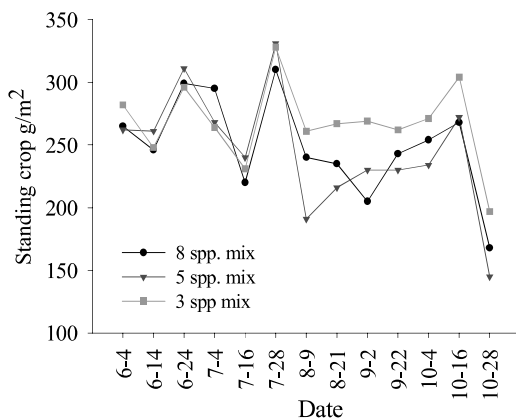


Figure 1 Forage standing crop from June to Nov. 2003

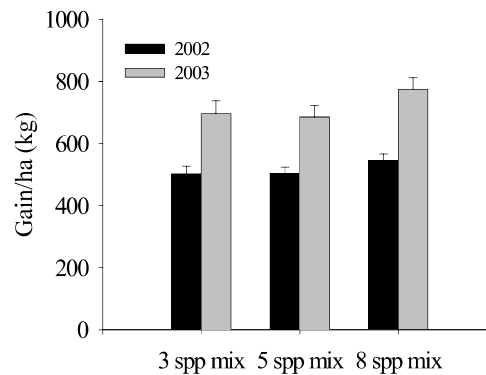


Figure 2 Calf weight gain per hectare in 2002 and 2003

Conclusions Results from this study support previous research. Good forage yields and stability can be achieved by planting 2 or 3 forage species that are well adapted to local conditions. Yield differences among the mixtures were not great enough to affect cattle performance. Overall, it appears that sowing additional plant species beyond a simple mixture of 2 perennial grasses and 1 legume does little to improve agricultural production.

References

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