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## Response of natural and cultivated hay meadows to fertilizer applied by small scale livestock farmers in the mountainous Sandzak region of Serbia

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**Key words:** fertilizer, nitrogen, pasture, mountains

**Introduction** Farmers rely on hay as winter feed from 1<sup>st</sup> October to 1<sup>st</sup> May. They will graze their cows part time if grass is available. It may be possible to extend the grazing season, with increased milk yields and lower production costs, by early fertilization with N applied at T<sub>sum200</sub> to jump-start growth of natural pastures (NP) and artificial pastures (AP).

**Materials and methods** Farmers from 9 forage machinery and forage groups took part from three municipalities, and provided areas of NP and AP normally used as hay meadows, at altitudes from 500~1300 m a.s.l. On each pasture 3 plots 10×10 m were set out. A 12:6:6 N:P<sub>2</sub>O<sub>5</sub>:K<sub>2</sub>O compound fertilizer was used for basal dressing. Extra N was from calcium ammonium nitrate (KAN) at 27% N. Treatments for NP (9 sites) were Control: no fertilizer (0:0:0), Basal: 200 kg/ha compound (24:12:12), and Basal + N: 200 kg/ha compound + 200 kg/ha KAN (78:12:12); and for AP (7 sites) were Control: no fertilizer (0:0:0), Basal: 300 kg/ha compound (36:18:18), and Basal + N: 300 kg/ha compound + 200 kg/ha KAN (90:18:18), applied 28 March-10 April 2004. Plots were sampled 1 week before hay stage, after 66-87 days' growth.

**Results and discussion** Variation in DM yield was high among both NP and AP sites (Figure 1). Yields without fertilizer were 57% greater for AP than for NP. Response to spring fertilization was 40.6 and 54.5 kg DM/kg N for NP and AP respectively. Response tended to be curvilinear for NP, but was linear for AP up to 90 kg N/ha. Altitude accounted for 23 and 35% of the variation in response to the high level of N in NP and AP (Figure 2). At 2005 prices for hay and fertilizers returns over the cost of fertilizer for Basal and Basal + N were 243 and 224% for NP and 312 and 371% for AP respectively.

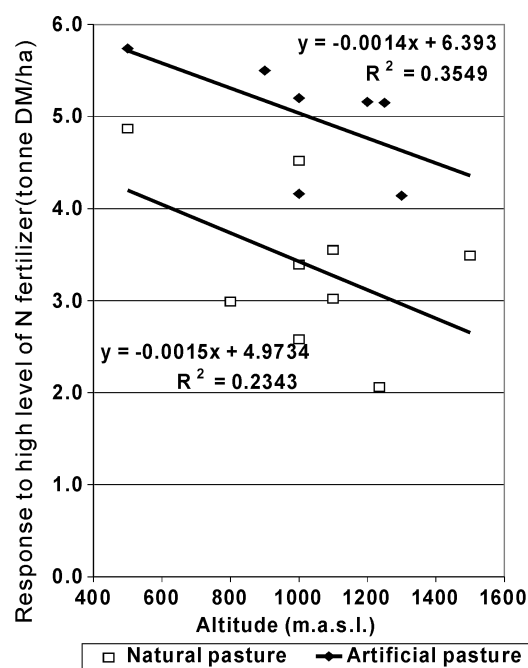
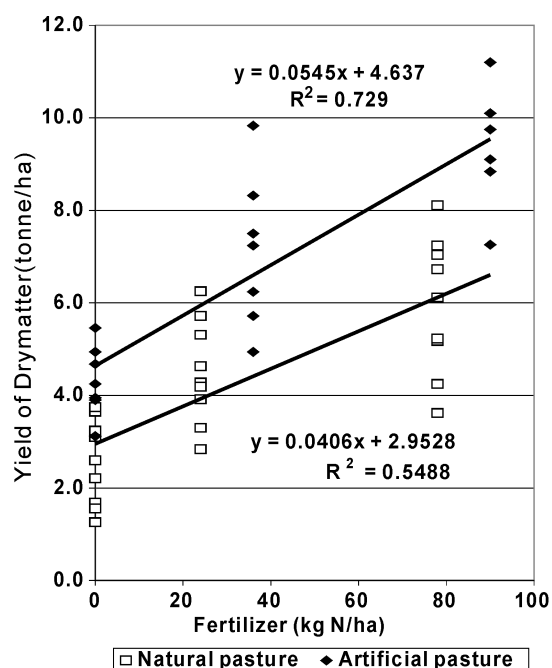


Figure 1 Response of pastures to early N fertilization.

Figure 2 Effect of altitude on response of pastures to N.

**Conclusions** DM yields of both natural and artificial pastures were doubled by early application of 1 kg N/ha/day of growth. This response was reduced by altitude, but was highly economic at 2005 prices for fodder and fertilizer.