



## Total Sulphur Content and N:S Ratio as Indicators for S Deficiency in Grasses

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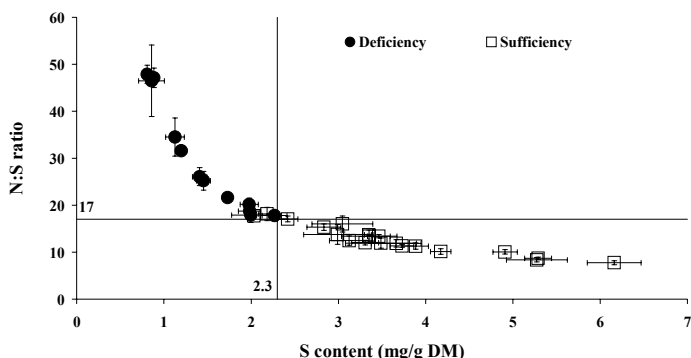
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**Introduction** Recently, sulphur (S) deficiencies have been observed throughout Europe (Zaoh *et al.*, 2002). Grassland covers about 50 % of the agricultural area in the European Union. In cutting regimes exports are *ca* 30 kg S/ha per year. Atmospheric depositions provide, at the present, *ca* 15 kg S/ha per year and S is not considered in fertiliser programmes. Without fertilisation, the S balance at the field scale is negative and therefore some cut swards could be S deficient. Tools for determining whether the grassland is deficient are required. The utilisation of indicators based on S content and N:S ratio was investigated by using S deficient grasses produced in a controlled environment.

**Materials and methods** Grass (*Lolium multiflorum* cv Meroa) was grown in pots on 12 different soils. The grasses were cultivated in a controlled environment, 16 hours day (artificial light) at 22 °C and 8 hours night at 16 °C. Two treatments, one with S fertiliser, +S, and one without S fertiliser, -S, were followed in 6 replicates. Plants received water and all nutrients for maximum plant growth (Lombaert, 1992). Grasses were considered S deficient when there was a significant difference in DM yield between +S and -S treatments. The grasses were analysed for DM yield, S content (Leco) and N content (NIRS). Total S content and N:S ratio of grasses coming from non deficient (sufficiency) -S treatment were compared with deficient S grasses from the -S treatment.

**Results** Deficiencies were observed at the second or the third cut depending on the soil. Grasses receiving enough S for maximum plant growth had a S content higher than 2.0 mg S/g DM and a N:S ratio lower than 18.1 (Figure 1). Deficient grasses had a S content lower than 2.3 mg S/g DM and an N:S ratio higher than 17.8.



**Figure 1** Relationship between grass N:S ratios and S contents (mean and standard deviation) (sufficiency) for S

**Conclusions** S contents or N:S ratios are useful for determining S deficiency in grasses. Plants with a S content lower than 2.3 mg S/g DM or a N:S ratio greater than 17.0 can be considered as deficient. However, values used as indicators should be adapted to the analytical method used for S determination (Crosland *et al.*, 2001)

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