Effect of Genotype and Cutting System on Agronomic and Feed Quality Characteristics of Perennial Ryegrass (*Lolium perenne* L.) Grown in Three Sites in Northern Germany

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Key words: perennial ryegrass, ploidy level, digestibility, fibre

Introduction Perennial ryegrass is the most widely used species in grassland in temperate regions. The main target of the current study is to investigate the differences between some diploid genotypes and the tetraploid derivatives that share a similar genetic background. In this paper, results of the first growing season regarding fiber fractions, digestible organic matter (DOM), and metabolizable energy (ME) content are presented and discussed.

Materials and methods A Lattice Design was used to evaluate 25 genotypes under two cutting regimes. These 25 genotypes (20 *Lolium perenne*, 3 *L. multiflorum*, and 2 *Festuca pratense*) belonged to 9 ploidy families, each consisting of one diploid genotype and the tetraploid near isogenic line(s) derived from it. First cut and annual forage quality was estimated by NIRS, then NDF and ADF were determined using the semiautomatic ANKOM apparatus (Van Soest et al. 1991). DOM (g kg^{-1} DM) and ME (MJ kg^{-1} DM) were calculated according to WeiBbach et al. (1999).

Results Since the main target is to highlight the impact of ploidy level, only the significant interactions including genotypes will be presented. In the 1st cut (Figure 1) the 2n genotypes in families A, E and I were superior over their 4n deriv-atives for NDF and ADF contents. On the contrary, the 4n of the families A, E and F showed higher values than the 2n of the same families for DOM. The trend was not clear in the amount of ME produced.
Concerning the annual average, the significant influence of the 3-way inter-action (site* genotype* cutting regime) was clear only in few ploidy families (Figure 2). For example, *in families E, F and I the* 2n genotypes showed higher NDF values than their 4n derivatives.

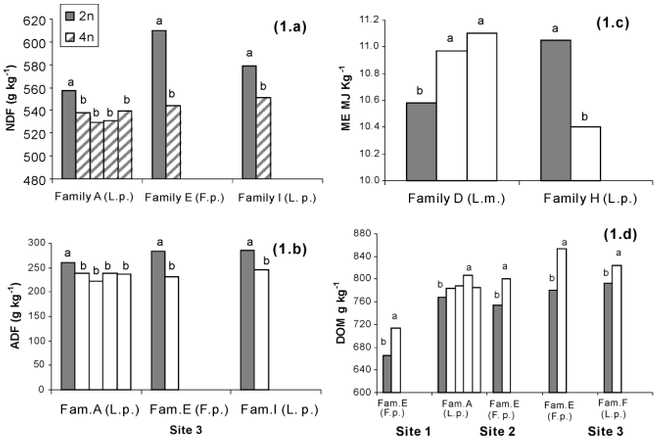

Figure 1 *Differences in 1st cut NDF % (1.a), ME MJ kg^{-1} (1.b), ADF % (1.c) and DOM % (1.d) between 2n and 4n within the same ploidy family.*

Conclusion The unclear trend of the 2n genotypes and their 4n derivatives observed in this study may be attributed to the genetic makeup of the near isogenic lines incorporated in the study, as the effect of 4n on quality parameters is dependent on the genetic background of the genotypes (Smith *et al.* 2001). Therefore, more attention should be paid to the genetic constitution of the genotypes under comparison.

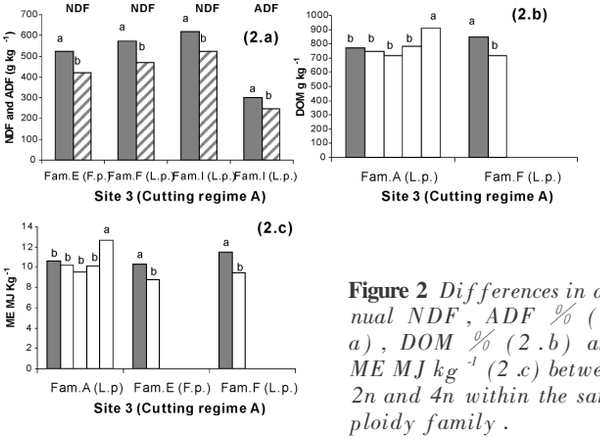

Figure 2 *Differences in annual NDF, ADF % (2.a), DOM % (2.b) and ME MJ kg^{-1} (2.c) between 2n and 4n within the same ploidy family.*

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