Morphological Characteristic to Discriminate *Festulolium* Hybrids (*Festuca Pratensis* × *Lolium Perenne*)

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Introduction Environmental change and uncertainty is likely to pose new challenges in plant breeders. Recently attention has focused on the crossing of *Lolium* and *Festuca* species to obtain hybrids exhibiting many desirable traits of both parents. Key objectives of such programs are to combine the persistency, winter hardiness and drought tolerance of fescues with the high herbage yields and quality of ryegrasses (Zwierzykowski, Naganowska, 1994). One of the hybrids with great practical significance is a *F. pratensis* × *L. perenne* hybrid [*Festulolium loliaceum* (Huds.) P.V. Fourn]. Many morphological traits of *Festulolium* hybrids demonstrate intermediate character, however, in relation to inflorescence type they are similar to *L. perenne*; the hybrids and perennial ryegrass have spike-like inflorescences, though they may be rarely a little-branched. Occurrence of a reduced inner glume in hybrid spikelets is a trait, which enables discrimination between *Festulolium* and *L. perenne* plants. The aim of this work was to analyse the morphological trait of inflorescences to aid the identification of the hybrids *Festulolium* in relation to *L. perenne*.

Materials and methods The initial hybrids between tetraploid forms of *Festuca pratensis* and *Lolium perenne* were obtained at the Institute of Plant Genetics PAS in Poznań. Breeding materials were developed at Szelejewo Plant Breeding. Plants from two *Festulolium* strains were used in preliminary research in Sosnowica (south-east part of Poland). Monocultures of both strains were sown in 2003 on mineral light soil. Plants for analysis were selected at random in 2004 (50 individuals per strain) at the stage of promotion or at the beginning of maturation. Basic morphological analyses were qualified with special regard of spikelet number on inflorescence as well as occurrence of inner glume.

Results *Festulolium loliaceum* is a loosely tufted grass. It has folding in the bud leaves, short ligule and characteristic auricles. Spikes are 20 to 30 cm long with 12 to 20 spikelets alternately arranged directly to the axis of inflorescence. Spikelets are shorter (1,7 to 2,5 cm long) and contain 7 to 14 florets. All these traits are similar to perennial ryegrass (Falkowski, 1982), however one characteristic trait was a reduced inner glume, which is absent from the spikelets (Figure 1). In both strains, frequency of occurrence initially decreased before increasing within the higher situated spikelets (numbers 11 to 12) thereafter frequency again declined. Mean numbers of inner glumes were 6,98 for strain I and 4,7 for strain II. Significant correlation were not observed between spikelets numbers per spike and the number of inner glumes per spikelet. Furthermore, this trait was characterized by high variability (Table 1).

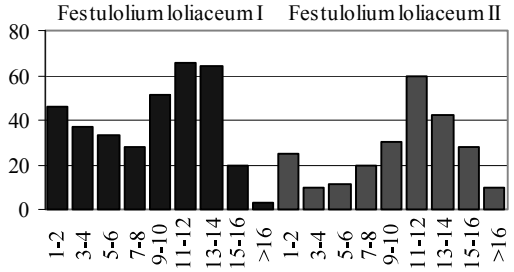

Figure 1 Frequency of reduced inner glume per spikelet in particular ranges

Table 1 Relation between number of spikelets per inflorescence (a) and number of inner glumes per spikelet (b) in *Festulolium loliaceum* I and II strains

Strain	Trait	Mean	Variability factor	Correlation factor
I	a	15.04	9.49	- 0.17
	b	6.98	53.87	
II	a	15.76	11.99	- 0.05
	b	4.7	64.08	

Conclusions These findings confirm that visual distinction between *Festulolium loliaceum* and *L. perenne*, is possible due to the occurrence of an inner glume within the spikelet. Visual identification should focus on spikelet number 11 and 12 as it is here where the trait is frequently exhibited.

References

Falkowski M., (1982). Trawy polskie. Państwowe Wydawnictwo Rolnicze i Leśne, Warszawa.

Zwierzykowski Z., & B. Naganowska (1994). The use of *Lolium-Festuca* hybrids in breeding. Genetica Polonica, 35A, 11-17.