PRODUCTIVITY AND YIELD QUALITY OF WHITE CLOVER-GRASS MIXED SWARDS DEPENDING ON CUTTING FREQUENCY

Aleksandrs Adamovičs, Olga Adamoviča

Latvia University of Agriculture, Institute of Agrobiotechnology,
Liela iela 2, Jelgava, LV-3001, Latvia

Introduction

The perennial ryegrass (*Lolium perenne* L.) is one of the word's primary grazed grasses in temperate reģions. Breeding perennial ryegrass cultivars with high forage yield and forage quality is of great importance for animal nutrition. Perennial ryegrass is a perennial forage grass that has a short life period, bunch-type grass, cultivated for fresh, hay, pasture and also for silage in regions having a regular rainfall all over the world. Because of easy establishment, fast regrowth after cutting and also a high feeding quality, it is an important species in Europe.

Hybrid ryegrass (*Lolium x boucheanum* Kunth.) gives better production than perennial or long rotation ryegrass, and in summer wet areas, most varieties will persist for up to 5 years. In summer dry environments hybrids generally last for 2-3years.

Festulolium hybrids are promising species to be used as fodder grasses. Due to its competitive productivity *Festulolium* may be equally ranked with the main forage grasses timothy and meadow fescue grown in the climatic zone of Eastern Europe.

Key words: white clover - grass, mixtures, cutting, productivity

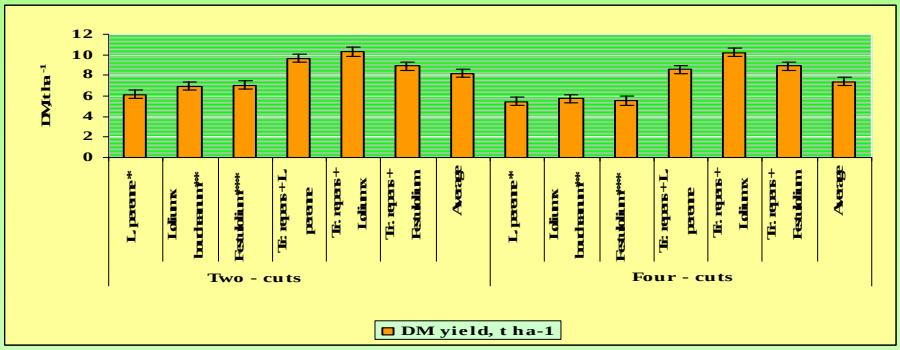
Materials and Methods

Field trials (2005 - 2008) were carried out with the aim to study continuous green forage production from white clover-grass swards in the stage of intensive growth. The 16 pure and 16 mixed binary swards were developed on Stagnic Luvisol (pHKCl 6.7), containing available P 52 mg kg $^{-1}$, K 128 mg kg $^{-1}$, organic matter content 21 to 25 g kg $^{-1}$ of soil and were fertilized with N 0, N90 (45+45), P 78 and K 90 kg N ha $^{-1}$. The binary swards were composed of white clover cv. Rivendell and 6 perennial ryegrass (Spidola , Napoleon , Belida , Tove , Tetramax , Tivoli), 6 *Festulolium* (Punia , Paulita , Perun , Lofa , Felina , Hykor) and 4 hybrid ryegrass (Saikava , Solid , Riga , Tapirus) cultivars. Swards were cut two to four times during the growing season.

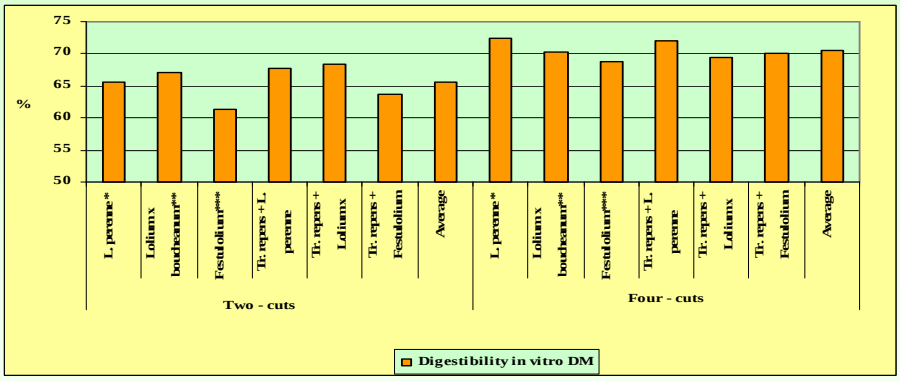
The plots were fertilised as follows: P 40, K 150 kg ha^{-1} and N 90(45+45).

Results

In pure stand the average dry matter (DM) yield of grasses was 6.12-7.06 t ha^{-1} under two–cuts, and 5.45-5.72 t ha^{-1} under four–cuts of sward utilization. White clover in binary mixtures with grasses developed productive forage grass swards with the average DM yields ranging from 8.91 to 10.30 t ha^{-1} under two–cuts in 3 yr. of sward utilization, and 8.56 to 10.21 t ha^{-1} under four–cuts in a growing season. Increased sward cutting frequency lowered the DM yield of all swards on average by 0.76 t ha^{-1} (15.5 %) however the productivity of the mixed swards under intensified cutting was reduced only by 4.2 %. The botanical composition of the sward essentially influences crude protein (CP) and NDF content in dry matter.



In pure stands the average CP content in the grass species ranged from 139 – 153 g kg $^{-1}$ DM under two - cuts and 153–164 g kg $^{-1}$ DM under four- cuts of sward utilization. The CP of white clover-grass swards ranged from 147 – 167 g kg $^{-1}$ DM and 172 –180 g kg $^{-1}$ DM respectively. *Tr. repens + L. perenne* and *Tr. repens + Lolium x boucheanum* swards have a higher CP content. NDF content was from 325 to 470 g kg $^{-1}$ DM. Our studies show that mixed white clover-grass swards provided CP yields of 1.31 - 1.86 t ha^{-1}. Tall and phytocenotically active grass species, such as *Festulolium cv.*Felina and Hykor significantly eliminated the ratio of white clover in a stand, particularly under two-cuts. More frequent sward use has promoted the reduction of NDF content in dry matter by 10.2 % on the average and had a positive effect on DM digestibility. The coefficient of DM digestibility for pure grass and mixed white clover–grass swards in vitro was comparatively high being 61.3 to 72.5 % on the average.



Conclusions

Pure perennial ryegrass, hybrid ryegrass, *Festulolium* and mixed mixed whiteclover–grass swards have a high and comparatively stable productivity. These swards can be used in different forage production systems and produce qualitative grass forage.

Cultivars of hybrid ryegrass and *Festulolium* are promising species of fodder grasses in climatic zone of Latvia.

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