

EVALUATION OF GRASS SPECIES IN PURE CULTURES AND IN MIXTURE WITH WHITE CLOVER

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ABSTRACT

Four cultivars of three grass species and five grass/white clover mixtures were evaluated in field small-plot trials on persistence and dry matter production (DM) in 1993-95. Of pure grass species the meadow fescue (*Festuca pratensis*) was the most productive though its persistence has declined in the third year (3.2 points in 1995). Both perennial ryegrass (*Lolium perenne*)/white clover (*Trifolium repens*) mixtures have been well performing with 1.3 - 2.4 points for persistence and with yields of 6.4 - 9.56 t DM/ha¹.

KEYWORDS

Evaluation, grass species, cultivar, white clover, persistence, DM production

INTRODUCTION

Sustainable development of grassland in Slovakia needs the development of recommended grass/legume mixtures for different climatic conditions. Evaluation of grass/white clover mixtures is needed to know their environmentally friendly potential when no fertilizers are used.

MATERIALS AND METHODS

In the continental climate of Central Slovakia with an average annual temperature of 6.3½C (13.5½C during the growing season) and an annual rainfall of 848 mm (451 mm during the growing season), the persistence and DM production of four pure grasses and simple grass/clover mixtures were evaluated in 1993-95. Perennial ryegrass (cv. Merlinda and Merganda), meadow fescue (cv. Merifest), cocksfoot (cv. Lemba), Festulolium (cv. Felina) and white clover (cv. Merwi) were used in the study. All cultivars but Festulolium (Czech), were of Belgian origin.

The trial was established on 5 May 1992 at Banská Bystrica, site Suchý vrch - Radvan. The soil type was rendzina with a pH of 6.8, and P and K contents of 8.7 mg/kg⁻¹ and 107 mg/kg⁻¹, respectively. No fertilizers and no inoculation with rhizobium were used. Pure grasses were sown at a seeding rate of 15 - 20 kg/ha⁻¹ and grasses in mixtures at the seeding rate of 12 kg in combination with Merwi at 9 kg/ha⁻¹. Variants were sown in four replicates, harvested plot area was 10 m².

Over 3 harvest-yr (1993-94) the persistence, according to the Swiss system of Charles and Joggi (1988) on a 1 - 9 point system (1 = best, 9 = worst) and dry matter (DM) yields were assessed.

RESULTS AND DISCUSSION

Meadow fescue (*Festuca pratensis*), both ryegrasses, and all mixtures

established satisfactorily, cocksfoot (*Dactylis glomerata*) less satisfactorily. The dominant weeds were *Chenopodium album* and *Stachys recta*.

DM yields are presented in Table 1. Over the 3 harvest-yr the limiting yield factor was summer drought while the winters were rather mild. The highest yields of perennial ryegrass/white clover mixtures were recorded in 1994: Merganda/Merwi and Merlinda/Merwi 9.56 and 8.08 t DM/ha, respectively. The highest decrease of DM yield was recorded for cocksfoot which probably resulted from no fertilizer input. No fertilization seems to be responsible also for the rather low DM yield of pure ryegrass swards (Merlinda 3.21 - 4.54 and Merganda 3.22 - 5.76 t DM/ha¹). The magnitude of forage production in continental climate was lower in comparison with Britain where Frame (1992) confirmed 10 - 13 t DM/ha in grassland production and 6 - 8 t DM/ha¹ in farm practice for grass/white clover mixtures.

Persistence of grass species in pure cultures and in mixtures was comparable though its value for mixture included both grass and legume components (Table 2). Over 3 yr the ryegrass/white clover mixtures proved most persistent and pure swards of cocksfoot and cocksfoot/white clover mixture proved least persistent.

REFERENCES

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Table 1
Herbage DM yields (t ha⁻¹) in 1993-95

Cultivar/mixture	Total DM yield		
	1993	1994	1995
Merifest	6.67	5.02	5.15
Merlinda	4.01	3.21	4.54
Meganda	5.74	3.22	4.20
Lemba + Merwi	4.33	4.74	4.44
Felina + Merwi	4.42	5.29	6.06
Merifest + Merwi	4.82	6.37	4.45
Lemba	6.52	5.01	3.05
Merganda + Merwi	7.38	9.56	6.58
Merlinda + Merwi	7.71	8.08	6.40

Table 2
Persistence of grass species and grass/white clover mixtures (points) in 1993-95

Cultivar/mixture	1993	1994		1995	
	28/9	28/4	3/11	5/5	20/7
Merifest	1.5	1.5	3.1	2.3	3.2
Merlinda	1.5	2.1	2.6	2.4	2.8
Meganda	1.5	2.4	1.5	2.0	2.5
Lemba + Merwi	1.4	4.7	2.4	4.1	3.5
Felina + Merwi	1.3	1.5	2.5	3.9	3.3
Merifest + Merwi	1.4	1.3	2.7	3.7	3.1
Lemba	2.5	2.4	2.9	3.2	3.6
Merganda + Merwi	1.4	1.7	2.3	2.0	2.3
Merlinda + Merwi	1.3	2.2	2.1	2.2	2.4