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**ASSESSMENT OF PERENNIAL RYEGRASS (*LOLIUM PERENNE* L.)  
GENOTYPES UNDER LATVIA AGRO-ECOLOGICAL CONDITIONS**

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**Introduction**

Within the frame of the Nordic/Baltic public-private partnership “PPP for pre-breeding in perennial ryegrass” assessment of *L. perenne* (*Lp*) genotypes under agro-ecological conditions of Latvia was performed. This presentation summarizes the data obtained in two harvest years for 19 intermediate tetraploid (4x) *Lp* genotypes and two interspecies hybrids (*Fl*) developed in Latvia – *L. × boucheanum* ‘Saikava’ and *× Festulolium* ‘Vizule’.

**Research Aim**

The aim – to compare with each other and find the most productive and persistent perennial ryegrass (*Lp*) genotypes under Latvia agro-climatic conditions; to evaluate performance of *Lp* in comparison with *festulolium*.

**Materials and Methods**

The field trial conducted in Skriveri (56°37 N, 25°07 E) in *Eutric Retisol* (WRB, 2014), loamy sand, pH KCl 5.7, OM 22 g kg<sup>-1</sup>, 85 mg kg<sup>-1</sup> P<sub>2</sub>O<sub>5</sub>; 95 mg kg<sup>-1</sup> K<sub>2</sub>O. Fertilisation: 20-40-100 NPK in the sowing year; 200-90-130 NPK in harvest years. 9 – point scale for crown rust susceptibility (*EUCARPIA Multisite Rust evaluation*), regrowth, culming intensity. DMY – 3 mowings in the 1st ley year (2019); 4 mowings in the 2nd ley year (2020). Feed quality for dry matter samples: crude protein (LVS EN ISO 5983-2: 2009); NDF (LVS EN ISO16472: 2006); ADF (LVS ENISO13906: 2008). Relative feed value (RFV) detected using the calculation methodology (*Summary of feed ...*, 2013).

**Results**

**Heading time** - *Lp* genotypes differed within six days: the heading date for earliest ‘LIA 58’ fixed on the 29th day; for latest (‘Raminta’, LVA02526 ‘and’ LVA 1058’) – on the 34th day, calculating from the 1st May. For most genotypes heading date was fixed on the 31st–33rd day, for *FL* varieties – ‘Saikava’ and ‘Vizule’ – on the 31st day.

**Growth rate** ranged from 6.4 to 9.0 points in spring and from 6.0 to 9.0 points after the 1st cut (Table 1). The *Lp* ‘Elena DS’ and the hybrid ryegrass ‘Saikava’ grew more intensively both in spring and after mowing (scored with 9.0 points).

Table 1

**The assessment of *Lp* and *FL* genotypes in two harvest years**

Genotype	Assessment in points (1 – 9)			DMY aver. in 2 years, t ha <sup>-1</sup>	Feed quality			
	Spring growth	Culms-3 <sup>rd</sup> cut	Cr. rust susc. (2019)		Cr. prot, %	NDF, %	ADF, %	RFV
SW Birger	8.0	4.4	3.5	11.38	9.09	42.75	23.85	153
Raite	7.0	4.5	4.6	10.30	7.15	39.01	19.92	175
Elena DS	9.0	8.6	3.6	11.40	9.59	44.05	23.61	149
Alduva	6.9	6.0	3.6	10.40	7.16	42.57	22.75	156
Verseka	7.6	5.1	4.9	10.51	7.71	42.08	21.95	159
Garbor	6.5	3.0	2.6	11.01	6.99	40.07	21.75	167
Ovambo	7.0	3.1	2.0	9.35	7.40	42.17	21.85	159
Vifelt	7.1	4.5	2.1	10.62	9.14	38.79	21.94	172
LIA 58	7.1	3.5	3.3	9.86	8.29	43.91	22.95	150
Vir 50774	6.9	5.0	2.6	10.50	9.44	42.77	23.38	154
EST 158	7.4	3.0	3.2	9.21	7.96	41.95	21.86	159
Vir 51515	7.5	4.4	4.4	10.26	10.10	41.36	21.72	162
EST 50	6.4	4.0	4.1b	11.12	8.42	42.15	22.31	158
Vir 51516	7.1	2.9	4.8	10.23	7.56	41.80	22.60	159
Vir 50929	7.0	4.5	4.4	10.29	8.85	39.67	20.82	170
LVA 02526	7.0	3.4	6.5	10.05	7.93	43.18	22.86	153
LIA 1058	7.0	4.1	4.2	9.99	10.68	40.24	21.37	167
155238	6.4	4.0	4.4	9.06	9.29	42.42	22.43	157
Raminta	6.5	4.0	4.4	10.22	9.90	41.97	22.26	159
Saikava	9.0	4.9	3.8	10.85	7.84	46.74	25.11	138
Vizule	8.1	5.0	4.5	10.42	8.31	45.07	24.01	145
LSD <sub>0,05</sub>	0.54	1.38	1.41	1.26	×	×	×	×

The highest **proportion of DM yield** *Lp* provided in the 1st harvest – 58% of the total DM yield; in the 2nd and 3rd cut DMY was similar, 21% and 17%, respectively. The 4th harvest in the 2nd ley year was only 4% of the total DMY (Fig. 1).

**Culming** or development of generative shoots in aftermath is typical for *Lp*. Particularly intensive culming in the 3rd cut was observed for *Lp* ‘Elena DS’ (8.6); several *Lp* genotypes were evaluated with 4.5 to 6.0 points. Very weak culming was noticed for ‘Vir 51516’ (2.9), ‘EST 158’ (3.0) and ‘Garbor’ (3.0).

**Crown rust** - more resistant in the conditions of 2019 were *Lp* ‘Ovambo’ (2.0) and ‘Vifelt’ (2.1). Rust resistance of *Fl* was moderate – 3.8 points for ‘Saikava’ and 4.5 points for ‘Vizule’.

**Dry matter (DM) yield** on average in the two ley years ranged from 9.06 to 11.4 t ha<sup>-1</sup>, depending on genotype. More productive were: *Lp* ‘SW Birger’ and ‘Elena DS’ (Table 1).

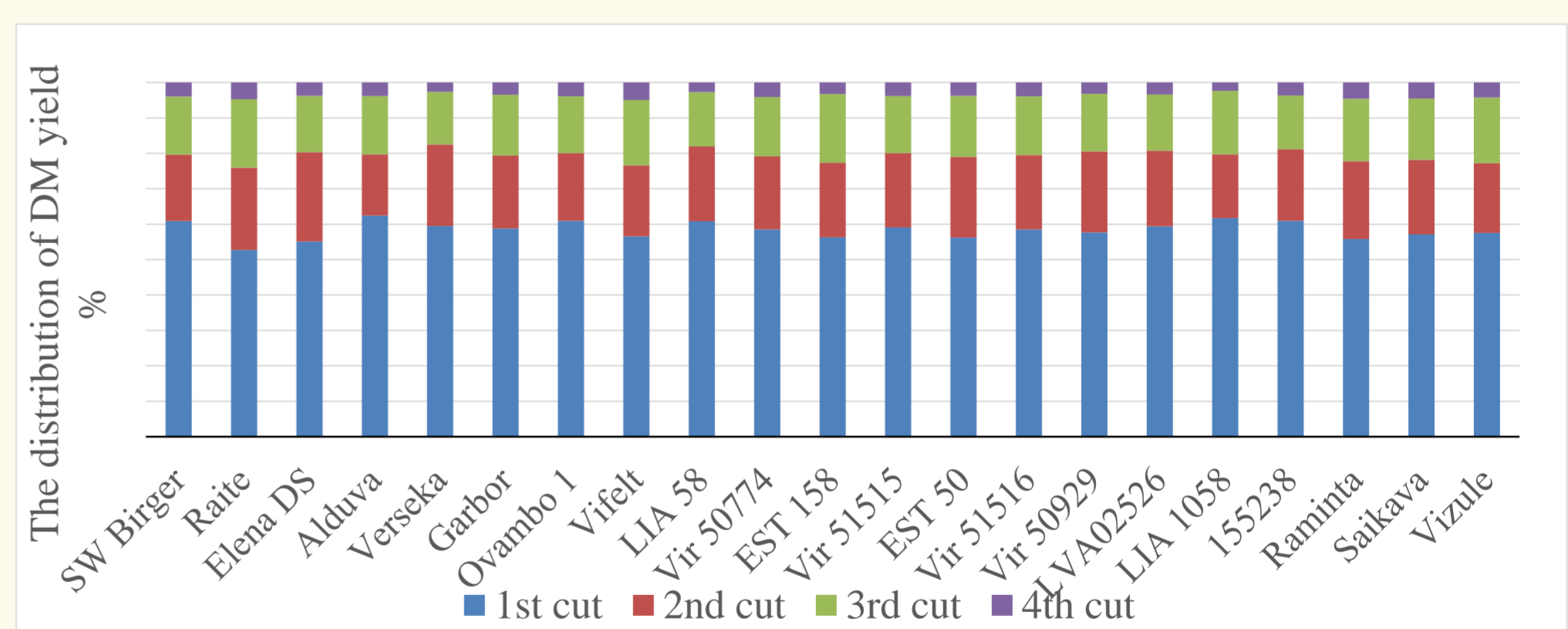


Fig. 1. The distribution of DM yield by mowings in 2 ley years

**Forage quality** of the 1st mowing: content of crude protein (CP) ranged from 6.99 to 10.68% for *Lp*; slightly lower (7.84 to 8.31%) it was for *Fl* (Table 1). The RFV for *Lp* ranged between 149 and 175; slightly lower it was for *Fl* ‘Vizule’ (145) and ‘Saikava’ (138). On overall, the highest forage quality was found for *Lp* ‘Raite’, ‘Vifelt’ and ‘Vir 50929’.

**Conclusions**

- Lp* genotypes provided high DM yields – on average 10.56 and 10.05 t ha<sup>-1</sup> in the 1st and in the 2nd ley year, respectively. DMY of *Lp* did not differ significantly from *FL*. No significant differences were found between *Lp* and *FL* in terms of grass quality and forage value.
- The highest DM yield proportion of *Lp* was provided in the 1st cut giving 58% of the total DM yield.

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