

BREEDING OF RYEGRASS AND FESTULOLIUM IN LITHUANIA

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Abstract

Perennial ryegrass has been bred in Lithuania since 1926. Applying various breeding techniques, seven ryegrass varieties have been developed during this period. The varieties ‘Veja’, ‘Sodré’, ‘Žvilgė’, ‘Verseka’ and ‘Elena’ are currently included in the National Plant Variety List and since 2007 ‘Sodré’, ‘Verseka’ and ‘Elena’ have been included in the EU Plant Variety Catalogue. ‘Alduva’ and ‘Raminta’ are still being tested.

Breeding of festulolium was started in 1979 and has been continued till now. Over this period, three festulolium varieties have been developed using intergeneric hybridisation. In 1998 ‘Punia’ was included in the National Plant Variety List and in 2007 it has been listed in the EU Plant Variety Catalogue. The varieties ‘Vėtra’ and ‘Puga’ are currently being tested.

Breeding of an annual form of Italian ryegrass was conducted during 1951–1972. The variety ‘Varpė’ was developed, which was not registered in Lithuania. Breeding of this species was resumed in 2006.

Breeding of Italian ryegrass was commenced in 1990. The variety ‘Ugnė’ was developed which has been tested at the Lithuanian and Polish Variety Testing Centres since 2006.

Key words: perennial ryegrass, festulolium, Italian ryegrass.

Introduction

In Lithuania ryegrass breeding was started in 1926 and has been continued until now. During this period, the greatest focus has been placed on perennial ryegrass breeding. Far less attention has been paid to breeding of Italian ryegrass and its annual form. The new species-festulolium has been developed using intergeneric hybridization.

Perennial ryegrass has been grown in Lithuania for a long time. It is attributed to the most valuable grasses. It has been noted for high productivity /Sparnina et al., 2002; Reheul et al., 2003/, very good forage quality /Kanapeckas et al., 1999; Aavola et al., 2003/. In mixtures intended for the establishment of long-term grasslands and pastures perennial ryegrass accounts for 15–20 % /Daugėlienė, 2003/.

Italian ryegrass is also characterised by good yield and sufficiently good forage quality. However, both perennial and especially Italian ryegrass exhibit a poor over winter survival under our country’s climate conditions /Lemežienė et al., 2000; Nekrošas, 2006/. Both grasses are relatively short-lived, since in the second year of use they are prone to considerable thinning out /Lemežienė et al., 2004/.

Annual form of Italian ryegrass is not widespread in Lithuania regardless of the fact that conditions for its growth are satisfactory. It is a fast-growing grass that produces

relatively good dry matter and seed yield and exhibits good forage quality /Vienametės svidrės, 1992; Dapkienė et al., 1999/.

Festulolium, the new grass species, combines the valuable qualities of the two ryegrass species and fescue. As was mentioned, ryegrass is characterised by valuable qualities, however, its major disadvantage is poor over winter survival. Fescue is characterised by good over winter survival, high herbage and dry matter yield but insufficiently good forage quality /Paplauskienė et al., 1999/, and disease susceptibility /Kanapeckas et al., 2002/.

The first intergeneric rye-fescue crossings were performed in England in 1933. In Lithuania such crossings were started in 1979 and in 1992 the first Lithuanian *festulolium* variety 'Punia' was developed /Nekrošas et al., 1995/.

Festulolium exhibits a much better over winter survival than ryegrass and compared with fescue, a better herbage quality /Nekrošas, Sliesaravičius, 2004/. The intergeneric hybrids produce higher herbage and dry matter yield /Kryszak et al., 2002; Adamovich, Adamovicha, 2003; Tarakanovas et al., 2004/, are much more resistant to diseases compared with their parental forms /Nekrošas, Sliesaravičius, 2002/, are well-suited for mixtures with red and especially white clover /Skuodienė, 2003; Petraitytė, 2005/.

During the period 1926–2006 there have been developed seven varieties of perennial ryegrass, one variety of Italian annual ryegrass and three varieties of *festulolium* in Lithuania.

Materials and methods

Various breeding methods were used in the development of the new rye varieties: selection (mass negative, mass positive, group – family, individual family and other selection types), biotype, intervarietal, interspecific, intergeneric hybridisation, self-pollination, polyploidy.

The breeding scheme of the newly developed rye varieties consists of the following stages: collection, nursery for the development of initial material, breeding nursery, clone nursery, control nursery, initial variety testing trials, and competitive variety testing trials.

For final assessment of the newly developed varieties the seed is sown in the plots of competitive variety testing trials that are set up in the crop rotation of the Lithuanian Institute of Agriculture's Grass Breeding Department. The prevailing soil type of the experimental site is calcareous medium heavy cambisol. Ryegrass is sown by a plot drill SN-10C at 15 cm row spacing. The area of a record plot, depending on the width of crop rotation fields, ranges from 8.5 to 10.5 m², the plots are replicated 4–6 times. Sowing is performed in the second half of May, beginning of June without a cover crop. N₁₅₀P₆₀K₆₀ fertilization is applied. Herbage is cut three times per growing season by a Hege-212 mower.

In the competitive variety trials the following is assessed: herbage dry matter yield, seed yield, chemical composition, digestibility, re-growth at the beginning of vegetation and after cuts, plant height, disease incidence, over winter survival, beginning of heading.

Herbage yield is measured by weighing herbage produced per plot, dry matter is measured in 0.5 kg sample collected at each cut. Seed yield is measured by weighing seed produced per plot. Plant chemical composition is determined at the analytical laboratory of the Lithuanian Institute of Agriculture. Crude fibre content in dry matter is determined after Kushner-Hanek method, crude protein after Kjeldahl method, digestibility *in vitro* using enzyme celoviridin. Re-growth, disease incidence and over winter survival are estimated using a 9 score system. When estimating re-growth at the beginning of vegetation and after cuts: 9 scores – re-growth very rapid, 1 score – very slow. When estimating disease incidence: 9 – plants severely affected, 1 – weakly affected. When estimating over winter survival of plants: 9 – very good, 1 – very poor. Beginning of heading is determined when 50 % of plants start heading: 1 point – the variety is very early, 9 – very late. Plant height is measured before each cut. The data obtained in the competitive variety trials are processed by analysis of variance using software developed by Tarakanovas et al., 2003.

The best performing breeding lines of ryegrass are transferred to the Lithuanian State Plant Variety Testing Centre for value for cultivation testing and to the Polish Plant Variety Testing Centre for DUS (distinctness, uniformity and stability) testing.

Experimental results and discussion

Perennial ryegrass. Breeding of perennial ryegrass has been carried out since 1926. During this period a total of 2.762 breeding lines and 7 varieties of perennial ryegrass have been developed.

The first variety of this species ‘Veja’ was developed in 1946 and in 1951 was transferred to the State Plant Variety Testing Centre. ‘Veja’ was registered in Lithuania in 1957. This variety is early, produces comparatively low dry matter and seed yield and exhibits insufficiently good over winter survival. The variety ‘Žvilgė’ is also not very high yielding and did not distinguish by other value for cultivation traits (Table 1). The varieties ‘Raminta’ and especially ‘Elena’ were noted for very high dry matter yield. In some years the dry matter yield produced by ‘Elena’ was as high as 14.5 t ha⁻¹. This variety stood out by very good seed yield in some years exceeding 1 t ha⁻¹. Of all varieties tested the best over winter survival was demonstrated by ‘Raminta’ and ‘Elena’. High forage quality was noted for the varieties ‘Verseka’, ‘Alduva’, especially ‘Raminta’ and ‘Elena’. The latest-ripening were ‘Žvilgė’, ‘Alduva’ and ‘Raminta’, while the earliest ripening were ‘Veja’ and ‘Sodré’ (Table 1).

All developed varieties were or still are being tested at the Lithuanian State Variety testing centre for value for cultivation. The first variety registered in Lithuania in 1957 was ‘Veja’, the varieties that were registered (included in the National Plant Variety List) were ‘Sodré’, ‘Žvilgė’, ‘Verseka’ and ‘Elena’ (Table 2). For our varieties to be included in the EU Plant variety Catalogue they have to be tested for distinctness, uniformity and stability.

Since the varieties ‘Veja’ and ‘Žvilgė’ were not noted for especially good value for cultivation (VCU) characteristics, they were not transferred for DUS testing. All the rest of the varieties were or are being tested for DUS in Poland’s Plant Variety Centre. DUS testing for ‘Sodré’, ‘Verseka’ and ‘Elena’ was completed in 2007 and they were included in the EU Plant Variety Catalogue (Table 2).

Table 1. Description of Lithuanian perennial ryegrass varieties
1 lentelė. *Daugiamečių svidrių lietuviškų veislių charakteristika*
Dotnuva, 1926–2006

Variety <i>Veislė</i>	Breeders <i>Veislės autoriai</i>	Year of development <i>Sukūrimo metai</i>	Methods <i>Metodai</i>	Characteristics <i>Savybės</i>
1	2	3	4	5
Veja	J. Klevaitis J. Pivoriūnas	1946	Developed by mass selection method from unknown origin commercial seed sample <i>Sukurta masinės atrankos metodu iš nežinomos kilmės prekybinio sėklos pavyzdžio</i>	Early, low dry matter and seed yield. Moderate forage quality. Over winter survival unsatisfactory. <i>Ankstyva, nedidelis sausųjų medžiagų ir sėklų derlius. Pašaro kokybė vidutinė. Žiemojimas vidutinis.</i>
Sodrė	H. Černiauskas R. Brazauskas S. Nekrošas	1973	Developed by individual selection and hybridization method from breeding line Nr. 104 of Belarus origin <i>Sukurta individualinės atrankos ir hibridizacijos metodu iš baltarusiškos kilmės Nr. 104</i>	Early, satisfactory dry matter yield, moderate seed yield. Moderate forage quality, moderate over winter survival. <i>Ankstyva, sausųjų medžiagų derlius geras, sėklų derlius vidutinis. Pašaro kokybė vidutinė, žiemojimas vidutinis.</i>
Žvilgė	S. Nekrošas R. Brazauskas H. Černiauskas	1978	Developed by individual selection and hybridization method from a Dutch origin seed sample. <i>Sukurta individualinės atrankos ir hibridizacijos metodu iš olandiškos kilmės sėklos pavyzdžio</i>	Moderately early. Moderate dry matter and seed yield. Moderate over winter survival. <i>Vidutinio vėlyvumo. Sausųjų medžiagų ir sėklų derlius vidutinis. Pašaro kokybė vidutinė, žiemojimas vidutinis.</i>
Verseka	S. Nekrošas	1987	Developed by crossing a Finnish variety 'Jo 0110' with a Dutch variety 'Barenza' <i>Sukurta sukryžminus suomišką veislę 'Jo 0110' su olandiška veisle 'Barenza'</i>	Moderately early. Good dry matter and seed yield. Good forage quality. Moderate over winter survival. <i>Vidutinio ankstyvumo. Sausųjų medžiagų ir sėklų derlius geras. Pašaro kokybė gera. Žiemojimas vidutinis.</i>

Table 1 continued
1 lentelės tęsinys

1	2	3	4	5
Elena	S. Nekrošas	1988	Developed by crossing a German variety 'Alex' with a Czech variety 'Tarpan', a Dutch variety 'Uri' and a Belgian variety – 'Meltra R. v. p.' <i>Sukurta sukryžminus vokišką veislę 'Alex' su čekiška veisle 'Tarpan', olandiška – 'Uri' ir belgiška – 'Meltra R. v. p.'</i>	Moderately early. Very good dry matter and seed yield. Higher than average over winter survival. <i>Vidutinio ankstyvumo. Sausųjų medžiagų ir sėklų derlius labai geras. Pašaro kokybė labai gera. Žiemojimas geresnis už vidutinį.</i>
Alduva	S. Nekrošas	1991	Developed by self-pollination method from Dutch varieties 'Elite 502' and 'Barlatra' and Lithuanian breeding lines 869 and 870 <i>Sukurta savidulkos metodu iš olandiškų veislių 'Elite 502' ir 'Barlatra' bei lietuviškų selekcinų numerių 869 ir 870</i>	Moderately late. Good dry matter and seed yield. Good forage quality. Moderate over winter survival. <i>Vidutinio vėlyvumo. Sausųjų medžiagų ir sėklų derlius geras. Pašaro kokybė gera. Žiemojimas vidutinis.</i>
Raminta	S. Nekrošas R. Dapkienė	1998	Developed by polyploidization of Lithuanian breeding line No. 302 <i>Sukurta poliploidizavus lietuvišką selekcinį Nr. 302</i>	Moderately late. Very good dry matter yield. Good seed yield. Very good forage quality. Better than average over winter survival. <i>Vidutinio vėlyvumo. Sausųjų medžiagų derlius labai geras. Sėklų derlius geras. Pašaro kokybė labai gera. Žiemojimas geresnis už vidutinį.</i>

Festulolium. Breeding of this grass species has been continued since 1979. Over this period a lot of festulolium breeding lines have been developed and tested in various breeding nurseries – 106 have been tested in the variety testing trials. Three festulolium varieties have been developed.

Festulolium varieties were developed using various crossing combinations: meadow fescue x perennial ryegrass, perennial ryegrass x meadow fescue, meadow fescue x Italian ryegrass, Italian ryegrass x meadow fescue, annual ryegrass x meadow fescue, meadow fescue x annual ryegrass, Italian ryegrass x tall fescue.

Table 2. Perennial ryegrass varieties developed over the period 1926–2007 in Dotnuva.
2 lentelė. Daugiamėčių svidrių veislės, sukurtos nuo selekcinio darbo pradžios iki 2007 m.

Catalogue No. <i>Katalogo Nr.</i>	Variety <i>Veislė</i>	Ploidy <i>Ploidiškumas</i>	Year of transfer for official testing <i>Perdavimo Valstybiniam tyrimams metai</i>	Year of transfer for DUS testing <i>Perdavimo išskirtinumo vienodumo, stabilumo nustatymui metai</i>	Year of registration in Lithuania <i>Rajonavimo metai*</i> <i>Lietuvoje</i>	Year of inclusion in the EU catalogue <i>Įtraukimo į Europos Sąjungos katalogą metai</i>
1	Veja	2n	1951	Not transferred <i>Neperduota</i>	1957	-
299	Sodrė	4n	1984	2004	1992	2007
601	Žvilgė	4n	1989	Not transferred <i>Neperduota</i>	1996	-
1429	Verseka	4n	1999	2004	2007	2007
1509	Elena	4n	2001	2004	2007	2007
1894	Alduva	4n	2002	2005	Still being tested <i>Tiriama</i>	Still being tested <i>Tiriama</i>
2811	Raminta	4n	2005	2006	Still being tested <i>Tiriama</i>	Still being tested <i>Tiriama</i>

* Earlier the new varieties were registered, later were included in the List of varieties Most Suitable for Cultivation in Lithuania and since 2005 the varieties have been included in the National Plant Variety List

* Anksčiau naujos veislės buvo rajonuojamos, vėliau – įrašomos į Tinkamiausių Lietuvoje auginti augalų veislių sąrašą, o nuo 2005 metų įrašomos į Nacionalinį augalų veislių sąrašą

The first festulolium variety ‘Punia’ was developed by crossing meadow fescue with Italian ryegrass. ‘Punia’ was transferred to the State variety testing in 1992, included in the National Plant Variety List in 1998, and in 2007 ‘Punia’ was included in the EU Plant Variety Catalogue (Table 3).

All festulolium varieties produced high dry matter and seed yield and were noted for satisfactory over winter survival. The dry matter yield produced by ‘Vėtra’ and ‘Puga’ in some years was as high as 18.3 t ha⁻¹, ‘Punia’ also produced a satisfactory dry matter yield, ‘Vėtra’ stood out by satisfactory over winter survival whis was very similar to that of meadow fescue, and ‘Puga’ exhibited a very good forage quality (Table 4). None of the varieties were affected by rust and the incidence of leaf spots was very low.

Annual form of Italian ryegrass. Breeding of this form was started in 1951. During the period 1963–1970 the variety ‘Varpė’ was developed by the method of mass selection from the seed sample of unknown origin. The variety was bred by J. Židonytė, H. Černiauskas, and I. Petrauskienė. In 1972 ‘Varpė’ was transferred to the State Plant Variety Testing but was not registered in Lithuania. In 1978 it was registered in Kabardo-Balkaria. ‘Varpė’ produced a dry matter yield of 8.5 t ha⁻¹ and that of seed about 0.8 t ha⁻¹. Breeding of this ryegrass species was discontinued later, however it was resumed in 2006 and V. Kemešytė is in charge of it.

Table 3. Festulolium varieties developed over the period 1979–2007 in Dotnuva
3 lentelė. *Eraičinsvidrių veislės, sukurtos nuo selekcinio darbo pradžios iki 2007 m.*

Catalogue No. <i>Katalogo Nr.</i>	Variety <i>Veislė</i>	Ploidy <i>Ploidiškumas</i>	Year of transfer for official testing <i>Perdavimo Valstybiniam tyrimams metai</i>	Year of transfer for DUS testing <i>Perdavimo išskirtinumo, vienodumo, stabilumo nustatymui metai</i>	Year of registration in Lithuania <i>Rajonavimo metai*</i> <i>Lietuvoje</i>	Year of inclusion in the EU catalogue <i>Įtraukimo į Europos Sąjungos katalogą metai</i>
1493	Punia	4n	1992	2004	1998	2007
2051	Vėtra	8n	2003	2005	Still being tested <i>Tiriama</i>	Still being tested <i>Tiriama</i>
2444	Puga	4n	2004	2006	Still being tested <i>Tiriama</i>	Still being tested <i>Tiriama</i>

Table 4. Description of festulolium varieties
4 lentelė. *Lietuviškų eraičinsvidrių veislių charakteristika*
Dotnuva, 1979-2007

Variety <i>Veislė</i>	Breeders <i>Veislės autoriai</i>	Year of development <i>Sukūrimo metai</i>	Methods <i>Metodai</i>	Characteristics <i>Savybės</i>
1	2	3	4	5
Punia	A. Sliesaravičius S. Nekrošas R. Dapkienė	1987	Intergeneric hybridization (meadow fescue x Italian ryegrass) <i>Tarpgentinė hibridizacija (tikrieji eraičinai x gausiažiedės svidrės)</i>	Early. Satisfactory dry matter and seed yield. Better than average over winter survival. Satisfactory forage quality. <i>Ankstyva. Sausųjų medžiagų ir sėklų derlius geras. Žiemojimas geresnis už vidutinį. Pašaro kokybė gera.</i>
Vėtra	A. Sliesaravičius S. Nekrošas	1993	Intergeneric hybridization (Italian ryegrass x tall fescue) <i>Tarpgentinė hibridizacija (gausiažiedės svidrės x nendriniai eraičinai)</i>	Early. Very good dry matter yield. Satisfactory seed yield. Satisfactory over winter survival. Satisfactory forage quality. <i>Ankstyva. Sausųjų medžiagų derlius labai geras. Sėklų – geras. Žiemoja gerai. Pašaro kokybė gera.</i>
Puga	A. Sliesaravičius S. Nekrošas	1995	Intergeneric hybridization (Italian ryegrass x meadow fescue) <i>Tarpgentinė hibridizacija (gausiažiedės svidrės x tikrieji eraičinai)</i>	Moderately early. Very good dry matter yield. Satisfactory seed yield. Better than average over winter survival. Very good forage quality. <i>Vidutinio ankstyvumo. Sausųjų medžiagų derlius labai geras. Sėklų derlius geras. Žiemojimas geresnis už vidutinį. Pašaro kokybė labai gera.</i>

Italian ryegrass. Small-scale breeding of this species was started on A. Sliesaravičius initiative in 1990. In 2006 Italian ryegrass breeding was expanded. Having crossed Italian ryegrass varieties ‘Dilana’, ‘Barmultra’ and ‘Tetrone’ using intervartietal hybridization method, the variety ‘Ugnė’ was developed. The breeders of the variety are A. Sliesaravičius and S. Nekrošas.

‘Ugnė’ was tested at the Lithuanian Institute of Agriculture’s variety testing trials where it exhibited high dry matter yield, relatively good over winter survival and satisfactory re-growth after cuts (Table 5).

In 2006 ‘Ugnė’ was transferred to the State Variety Testing in Lithuania and was dispatched to Poland for DUS testing.

Table 5. Assessment of Italian, perennial ryegrass and festulolium in variety testing trials
5 lentelė. *Gausiažiedžių, daugiamečių svidrių ir eraičinsvidrių vertinimas veislių tyrimuose*

Dotnuva, 2002–2003

Variety, breeding line <i>Veislė, numeris</i>	Species <i>Žolių rūšis</i>	Dry matter yield <i>Sausųjų medžiagų derlius</i>		Over winter survival (scores) <i>Žiemoji- mas balais</i>	Disease incidence (scores) <i>Ligotumas balais</i>		Re-growth after cuts (scores) <i>Atžėlimas po pjūčių balais</i>
		t ha ⁻¹	relative values <i>santyk. skaič.</i>		leaf spot <i>dėmėt- ligės</i>	rust <i>rūdys</i>	
Punia	Festulolium <i>Eraičinsvidrės</i>	10.8	100.0	7.3	0.4	0.0	8.2
Sodrė	Perennial ryegrass <i>Daugiametės svidrės</i>	6.3	58.3	5.6	2.3	0.0	7.2
3096	Festulolium <i>Eraičinsvidrės</i>	10.1	93.5	7.5	0.5	0.0	8.5
3098	Festulolium <i>Eraičinsvidrės</i>	8.7	80.6	6.5	0.5	0.0	8.2
3101	Festulolium <i>Eraičinsvidrės</i>	10.9	100.9	7.0	0.0	0.0	8.4
1656	Festulolium <i>Eraičinsvidrės</i>	9.8	90.7	6.5	0.2	0.0	8.4
Ugnė	Italian ryegrass <i>Gausiažiedės svidrės</i>	10.6	98.1	6.8	0.5	0.0	8.4
3102	Italian ryegrass <i>Gausiažiedės svidrės</i>	9.1	84.3	6.5	0.5	0.0	8.2
3104	Italian ryegrass <i>Gausiažiedės svidrės</i>	9.5	88.0	6.8	0.5	0.0	8.2
R ₀₅ / LSD ₀₅		1.87	17.31	0.93	0.52		0.76

In summary, we can maintain that festulolium, compared with perennial and Italian ryegrass, produces the highest dry matter yield, exhibits better over winter survival, which is very important under Lithuanian climate conditions. As a result, the area under this species should be rapidly expanded, however, other ryegrass species should not be neglected either, since for example forage quality is the highest of perennial ryegrass. The breeding of annual Italian ryegrass was unadvisedly discontinued, regardless of the fact that it is resistant to adverse wintering conditions and produces quite a satisfactory dry matter and seed yield.

Conclusions

1. During the period 1926–2006, seven perennial ryegrass varieties have been developed. Our experimental findings suggest that the varieties ‘Elena’ and ‘Raminta’ are characterised by high dry matter yield, which in some years was as high as 14.5 t ha^{-1} , relatively satisfactory over winter survival, and very good forage quality. Satisfactory dry matter yield was also produced by the varieties ‘Sodrė’, ‘Verseka’, ‘Alduva’. The earliest ripening varieties were found to be ‘Veja’ and ‘Sodrė’, while the latest ripening ones were ‘Žvilgė’, ‘Alduva’ and ‘Raminta’. The varieties ‘Veja’, ‘Sodrė’, ‘Žvilgė’, ‘Elena’ and ‘Verseka’ are currently registered (included in the national Plant Variety List) in Lithuania, and in 2007 ‘Sodrė’, ‘Verseka’ and ‘Elena’ will be included in the EU Plant Variety Catalogue. The varieties ‘Alduva’ and ‘Raminta’ are currently at the stage of testing.

2. During the period 1979–2006, three festulolium varieties have been created: ‘Punia’, ‘Vėtra’, and ‘Puga’. Very high dry matter yield, which in some years reached 18.3 t ha^{-1} was produced by ‘Vėtra’ and ‘Puga’. The dry matter yield of ‘Punia’ was also satisfactory. ‘Vėtra’ was noted for satisfactory over winter survival, and ‘Puga’ for satisfactory forage quality. ‘Punia’ is registered in Lithuania and in 2007 will be included in the EU Plant variety Catalogue. ‘Vėtra’ and ‘Puga’ are being tested at Lithuanian and Polish Plant Variety Centres.

3. Annual Italian ryegrass was bred during the period 1951–1972 and the variety ‘Varpė’ was developed, which was not registered in Lithuania. Breeding of this ryegrass species was resumed in 2006. Breeder in charge is Vilma Kemešytė.

4. Italian ryegrass breeding was started in 1990 and has been continued till now. The variety ‘Ugnė’ was developed. The data from our variety testing trials indicate that it produced a satisfactory dry matter yield of 10.6 t ha^{-1} and exhibited satisfactory over winter survival and re-growth after cuts. Since 2006 ‘Ugnė’ has been tested at the Lithuanian and Polish variety Testing Centres.

5. Since festulolium is higher yielding, exhibits better over winter survival and disease resistance than the perennial, Italian ryegrass and annual form of Italian ryegrass tested, the area under festulolium should be expanded not forgetting various species of ryegrass.

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SVIDRIŲ IR ERAIČINSVIDRIŲ SELEKCIJA LIETUVOJE

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Santrauka

Daugiametės svidrės selekcionuojamos nuo 1926 m. iki šiol. Per šį laikotarpį, taikant įvairius selekcinis metodus, sukurtos septynios veislės. ‘Veja’, ‘Sodrė’, ‘Žvilgė’, ‘Verseka’ ir ‘Elena’ šiuo metu įrašytos į Nacionalinį augalų veislių sąrašą, o nuo 2007 m. ‘Sodrė’, ‘Verseka’ ir ‘Elena’ įtrauktos į Europos Sąjungos žemės ūkio augalų veislių katalogą. ‘Alduva’ ir ‘Raminta’ dar tiriamos.

Eraičinsvidrių selekcija pradėta 1979 m. ir tęsiama iki šiol. Per šiuos metus, panaudojus tarpgentinę hibridizaciją, sukurtos trys eraičinsvidrių veislės. ‘Punia’ 1998 m. įrašyta į Nacionalinį augalų veislių sąrašą, o 2007 m. ji įtraukta į Europos Sąjungos žemės ūkio augalų veislių katalogą. Veislės ‘Vėtra’ ir ‘Puga’ šiuo metu tiriamos.

Gausiažiedžių svidrių vienametės formos buvo selekcionuojamos 1951–1972 metais. Sukurta veislė ‘Varpė’, kuri Lietuvoje neregistruota. Šios žolių rūšies selekcija atnaujinta 2006 metais.

Gausiažiedės svidrės pradėtos selekcionuoti 1990 m. Sukurta veislė ‘Ugnė’, kuri nuo 2006 m. tirinama Lietuvos ir Lenkijos augalų veislių tyrimo centruose.

Reikšminiai žodžiai: daugiametės svidrės, eraičinsvidrės, gausiažiedės svidrės.