

EVALUATION OF A EUROPEAN RYEGRASS CORE COLLECTION: RESULTS OF THE FIRST YEAR OF EVALUATION IN GALICIA

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Abstract A core collection of 162 populations of perennial ryegrass (*Lolium perenne* L.) native to 16 European countries is being evaluated across Europe in a multi-country trial. Each participating country contributes the lesser of 10 percent or 25 accessions from its collection of native populations. The accessions are being evaluated at 19 sites in 17 countries, together with four standard control varieties and additional local controls where appropriate. This paper presents the first year's results in Mabegondo (Galicia). Countries differed widely in the extent of differentiation among their populations. Populations also differed in their uniformity. Populations from Romania were the most uniform for conservation and annual yields. Spanish populations showed the greatest diversity for aftermath heading. Standard controls revealed the greatest diversity for emergence date and leaf width. Populations from Italy exhibited the best annual yield.

Keywords: core collection, wild populations, agronomic evaluation

INTRODUCTION

Perennial ryegrass is of high economic significance in the European Union (EU), being widely utilized for pastures and meadows, amenity and sports land, and land reclamation. Usage is changing with increasing emphasis on low input agriculture and environmental protection. More than 3 000 *Lolium* accessions were declared in the ECP/GR database (IBPGR, 1991). Characterization of these accessions is very heterogeneous. Although a list of forage grass descriptors has been established (CEC-IBPGR, 1985), it is rarely used. This paper describes a coordinated evaluation of a European collection of perennial ryegrass. It includes diverse native ryegrass germplasm originating from throughout Europe and evaluated in the Mabegondo Agronomic Station. The project originated through the activities of the Forages Network of the European Cooperative Programme for Crop Genetic Resources Networks (ECP/GR), which is coordinated by the International Plant Genetic Resources Institute (IPGRI).

MATERIALS AND METHOD

The curator of each country's gene bank selected a representative sample comprising the lesser of 10 percent or 25 populations of the country's native populations. At each site the populations were planted in four replicates, in rows of 1.5 m long with seven plants at 25 and 50 cm intervals.

Table 1. Analyses of variance for the characters evaluated for the conservation management system. Standard and local controls were classified as two additional levels of the factor origin.

Source of variation	df	Winter yield (kg DM/ha)		Spring yield (kg DM/ha)		Emergence date		Leaf width (1=narrow to 5=wide)		Conservation yield (kg DM/ha)		Aftermath heading (1=low to 5=high)		Autolytic yield (kg DM/ha)	
		MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS
Blocks	1	12 400.80	416 388.99	46.89	0.57	197 261.78	0.42	189 90							
Origin	17	405 500.98***	354 024.21	925.61***	0.99**	13 947 338.15***	7.85***	42 39							
Population (Origin)	153	56 287.17	237 409.70	501.60***	0.77***	3 168 966.89**	1.39*	27 13							
Residual	172	45 867.99	246 668.76	57.50	0.45	2 183 398.33	1.02	23 11							
Total	343														

Table 2. Means (with standard errors in parenthesis) for controls and for each country of origin in the *Lolium* core collection.

Country of Origin	Winter yield (kg DM/ha)	Emergence date	Leaf width (1=narrow to 5=wide)	Conservation yield (kg DM/ha)	Aftermath heading (1=low to 5=high)	Autumn yield (kg DM/ha)	Annual yield (kg DM/ha)
France	1 647.4 (30.6)	4 May 97 (2.4)	1.3 (0.12)	5 349.0 (269.7)	1.6 (0.15)	388.9 (24.2)	9 746.7 (316.8)
Germany	1 634.9 (43.8)	15 May 97 (5.0)	1.3 (0.13)	6 237.2 (251.6)	1.3 (0.13)	402.0 (30.2)	10 630.8 (279.8)
United Kingdom	1 593.9 (23.3)	4 May 97 (2.5)	1.2 (0.09)	5 317.8 (266.2)	1.6 (0.13)	383.4 (24.9)	9 604.0 (302.1)
Switzerland	1 526.7 (50.6)	19 April 97 (8.9)	2.0 (0.66)	5 438.2 (659.4)	1.2 (0.25)	427.8 (54.1)	9 739.1 (745.5)
Czech Republic	1 940.2 (191.4)	29 May 97 (1.0)	1.0 (0.00)	6 657.9 (656.9)	1.0 (0.00)	436.7 (101.7)	11 707.6 (774.0)
Netherlands	1 656.6 (75.7)	10 May 97 (4.1)	1.8 (0.50)	6 906.2 (370.2)	2.1 (0.34)	348.1 (48.4)	11 358.4 (480.8)
Nordic Countries	1 561.7 (23.0)	7 May 97 (8.1)	1.5 (0.33)	3 939.6 (664.2)	1.7 (0.36)	340.1 (59.8)	8 607.5 (650.8)
Italy	2 067.6 (125.4)	25 April 97 (2.7)	1.0 (0.00)	6 825.4 (279.1)	3.3 (0.33)	505.1 (35.6)	11 980.5 (412.9)
Ireland	1 629.2 (51.4)	14 May 97 (5.9)	1.3 (0.19)	5 212.8 (506.4)	1.6 (0.25)	477.5 (33.9)	9 655.6 (493.9)
Belgium	1 596.2 (12.6)	12 May 97 (5.3)	1.6 (0.30)	5 995.0 (300.4)	1.4 (0.26)	485.8 (40.6)	10 773.6 (335.9)
Greece	1 546.0 (18.9)	22 April 97 (1.0)	1.0 (0.00)	3 551.3 (348.9)	1.8 (0.39)	366.4 (43.9)	7 808.6 (390.1)
Hungary	1 675.9 (47.7)	10 May 97 (1.3)	1.0 (0.00)	6 057.9 (403.6)	2.4 (0.22)	452.4 (27.9)	10 576.4 (434.2)
Bulgaria	1 572.9 (15.7)	3 May 97 (1.6)	1.0 (0.00)	4 761.5 (468.7)	2.6 (0.31)	382.9 (43.8)	8 987.2 (523.2)
Poland	1 579.5 (9.9)	11 May 97 (2.9)	1.4 (0.18)	6 619.9 (297.7)	1.9 (0.26)	415.1 (29.3)	11 098.1 (326.7)
Romania	1 627.9 (33.2)	14 May 97 (1.7)	1.4 (0.15)	6 776.2 (191.9)	1.9 (0.18)	354.7 (31.4)	11 264.4 (217.8)
Spain	1 861.4 (77.3)	7 May 97 (2.1)	1.2 (0.14)	6 085.6 (428.6)	2.6 (2.92)	407.9 (40.5)	10 971.8 (445.5)
Standard Controls	1 593.1 (15.7)	7 May 97 (10.4)	1.5 (0.33)	6 789.8 (374.7)	1.0 (0.00)	546.3 (5.2)	11 504.5 (423.4)
Local Controls	2 139.7 (144.1)	15 May 97 (2.0)	1.2 (0.17)	6 681.7 (294.5)	4.0 (0.30)	467.3 (39.1)	11 364.2 (355.4)

