ECPGR Activity Grant Scheme – Phase IX
Sixth Call, 2018

Activity Report

ImprovLoliumCol

1 March 2019 – 30 April 2022

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Tussock from a natural perennial ryegrass accession in the experimental garden of the IPK forage genebank at Malchow/Poel, Germany (photo by Evelin Willner, IPK)

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Introduction

Background and aims

The *ImprovLoliumCol* Activity was a contribution of the ECPGR Working Group for Forages to meet the ECPGR objectives for phase IX (2014-2018). It came after two previous activities of the Working Group granted in the frame of the First and Second ECPGR Calls, which brought progress towards Objectives 1 and 2 of phase IX. The *ImprovLoliumCol* Activity aimed to gain further progress for perennial ryegrass (*Lolium perenne L.*), a major forage grass species, by taking advantage of data and results of the FACCE-JPI ERA-NET+ project *GrassLandscape* in which several members of the Working Group had been involved. In this project, 427 accessions from the natural diversity of perennial ryegrass and 9 accessions from related taxa, provided by genebanks of almost all the Working Group members, were extensively genotyped, phenotyped and documented for the environment of their collection sites. Using these data, an innovative methodological approach (combination of landscape genomics and quantitative genetics approaches) was implemented to discover genomic diversity involved in climate adaptation of perennial ryegrass. Hence, the *GrassLandscape* project was an opportunity to record datasets of unprecedented size about the natural diversity of perennial ryegrass. This set of information makes a valuable basis for later investigations on the genetic diversity of perennial ryegrass or for selecting genetic resources for breeding purposes. The *ImprovLoliumCol* activity intended to help such future initiatives by targeting three main goals. The first goal was to register in the EURISCO database as many genebank accessions used in the *GrassLandscape* project as possible, and secure them in the European Forage Collection (EFC), which is the Working Group for Forages contribution to AEGIS. The second goal was that phenotypic data recorded in the frame of *GrassLandscape* were made easily available as C&E data *via* a forage crop portal connected to the EURISCO database and that some environmental descriptors of collection sites of accessions acquired by the *GrassLandscape* consortium were also made available through this portal. Using new knowledge on the spatial and environmental distribution of the natural diversity of perennial ryegrass provided by the *GrassLandscape* project, the third goal was to set up a core collection of perennial ryegrass accessions that could be used in future projects and to flag this as a core collection on the forage crop portal. The *ImprovLoliumCol* Activity was thus a new contribution of the ECPGR Working Group for Forages to objectives 1 and 2 of ECPGR phase IX.

Participants involved in the activity

The coordinators of the *ImprovLoliumCol* activity were Jean-Paul Sampoux (INRAE, France) and Evelin Willner (IPK, Germany). Anna Palmé (NordGen, Sweden) participated as Chair of the ECPGR Working Group for Forages. Stephan Weise (IPK, Germany) participated as EURISCO coordinator and member of the ECPGR Documentation & Information Working Group.

Other participants in the activity were members of the ECPGR Working Group for Forages with expertise that could help the fulfilment of the activity:

- An Ghesquiere, ILVO, Belgium
- Hilde Muylle, ILVO, Belgium
- Ana Maria Barata, INIAV, Portugal
- Egle Norkeviciene, LAMMC, Lithuania
- Vilma Kemesyte, LAMMC, Lithuania
- Dejan Sokolovic, IKBKS, Serbia
- Rene Avola, ETKI, Estonia.

It can be noted that INRAE, IPK and ILVO were participants in the *GrassLandscape* consortium, which also included IBERS (UK) and the Ecole Pratique des Hautes Etudes (France).

Methodology

The *ImprovLoliumCol* Activity was carried out through two workshops and three tasks.

First workshop

This workshop was held on 6-8 December 2018 in Paris. A detailed overview of perennial ryegrass accessions used in the *GrassLandscape* project was provided and the main results of this project were presented. Participants agreed that as many perennial ryegrass accessions used in *GrassLandscape* as possible should be flagged to the European Forage Collection (EFC). In the *GrassLandscape* project, 427 genebank accessions were chosen to sample as evenly as possible the natural diversity of perennial ryegrass across space in Europe and surroundings without redundancy. These accessions thus made a set of genetically unique plant genetic resources for food and agriculture of potential importance for Europe (ECPGR, 2013). It was therefore relevant to promote the flagging to AEGIS of as many accessions as possible.

Second workshop

The second workshop was held on 17 September 2019 at the IPK research centre at Gatersleben. Stephan Weise presented the operating principles of a forage crop portal connected to the EURISCO database that could store and display C&E data and environmental descriptors of collection sites of accessions. The participants decided on the final choice of phenotypic data from *GrassLandscape* that could be uploaded as C&E data and climate data to document the environment at accessions' collection sites.

Task 1: *Flagging accessions used in* GrassLandscape *to the EFC (2019-2020)*

A list of the *GrassLandscape* accessions not already flagged to the EFC was set up. A *memorandum* was written and sent to curators of ECPGR forage genebanks, showing the importance of flagging accessions used in *GrassLandscape* to the EFC. Genebank curators were invited to contact their National Focal Points to register accessions in EURISCO (https://eurisco.ipk-gatersleben.de) when not already done and their National Coordinator to flag accessions to be part of the European Collection AEGIS (https://www.ecpgr.cgiar.org/aegis/european-collection).

Task 2: *Upload of* GrassLandscape *data to the EURISCO forage crop portal (2021-2022)*

During the second workshop at IPK Gatersleben, it was agreed to upload as C&E data the means per location (three trial locations) of accessions for a number of traits selected during the meeting. A list of climate descriptors of collection sites of accessions to upload was also agreed on (1989-2010 climate norms of *Bioclim* variables) during this second meeting.

C&E data and climate norms were uploaded to the EURISCO forage crop portal (https://eurisco.ipk-gatersleben.de/apex/weise/r/forage/home) for all *GrassLandscape* accessions registered in EURISCO. C&E data tables were prepared according to the guidelines of the procedure 'Uploading characterization and evaluation data into EURISCO' (August 2017) and transferred to Stephan Weise for upload to the portal. C&E data were uploaded to EURISCO after obtaining the agreement of the relevant NFPs. Climate data were also prepared according to the agreed format and transferred to Stephan Weise for upload to the portal.

Task 3: *Setting up perennial ryegrass core collection levels to be flagged in the EURISCO forage crop portal (2022)*

During the *GrassLandscape* project, the perennial ryegrass accessions were partitioned into seven genetic clusters using their allele frequencies at 507 583 SNP loci (Blanco-Pastor et al., 2019). Accessions were also partitioned into three phenotypic clusters using trait data recorded in three trial locations (Keep et al., 2021). The cross-partition between genetic and phenotypic partitions resulted in

17 genetic x phenotypic clusters that formed the basis for a stratified selection of two levels of core collections.

Results

Task 1

During the second workshop at IPK Gatersleben, an update on the progress of Task 1 was presented (upload to EURISCO of as many perennial ryegrass accessions used in the *GrassLandscape* project as possible and flagging of these accessions as AEGIS).

Out of the 438 accessions used in the *GrassLandscape* project, 301 were registered in EURISCO at the start of the Activity. At the end of the Activity, 433 accessions were registered in EURISCO and two others were expected to be registered soon. At the start of the Activity, 171 accessions were flagged as AEGIS. At the end of the Activity, 231 accessions were flagged as AEGIS and 113 others were expected to be flagged soon (agreement given by genebank curators). See tables 1.1 (Annex 1) and 4.1 (Annex 4) for more details.

Accessions from the INRAE (France) genebank (83 accessions) and the IBERS (UK) genebank (86 accessions) are registered in EURISCO but are still not flagged to AEGIS. France is expected to sign the MoU of AEGIS during the next months. INRAE will then be able to sign the Associate Membership Agreement and these accessions could afterwards be flagged as AEGIS. IBERS has not yet planned to sign the AEGIS Associate Membership Agreement but has acknowledged that some of their accessions are included in the large and small core collections (see Task 3).

Seed backups of accessions were stored at IPK in the frame of the *GrassLandscape* project. But these backups are small (less than 1g for some accessions) as they were only stored as a provision in case the *GrassLandscape* investigations would need additional seed supply. They are not targeted to long-term maintenance and distribution, which is expected from the original genebanks, especially for accessions flagged as AEGIS.

Task 2

Upload of C&E data to the EURISCO forage crop portal

In the frame of the *GrassLandscape* project, 385 natural populations with sufficient seed availability and 12 control cultivars were sown in three field trials at Poel Island (IPK) in Germany (53.990 lat, 11.468 lon), Melle (ILVO) in Belgium (50.976 lat, 3.780 lon) and Lusignan (INRAE) in France (46.402 lat, 0.082 lon). The trials were sown in spring 2015 at Poel Island and Lusignan and in autumn 2015 at Melle. In each location, populations and cultivars were sown in three 1m² micro-swards with 2g, 4g or 6g seeds according to previously checked germination rate in a complete blocks design (Figure 1.1 in Annex 1). The trials were monitored until the end of 2017 at Poel Island and Melle and at the end of 2018 at Luignan.

Phenotypic traits recorded in these trials related to phenology, morphology, dynamics of vegetative growth, disease resistance, investment in seed production, forage quality (NIRS prediction of biochemical traits), tolerance to winter (cold) stress and summer (drought and heat) stresses and persistency of plant stand three or four years after sowing. Some traits were scored in all three locations and others only in two locations or one. The scoring protocols and scales were the same in the three locations. Some traits were scored at several dates or seasons across the three or four years of monitoring in each location (see Table 1.2 in Annex 1).

During the second workshop at IPK, it was agreed to upload as C&E data the trait means of accessions (means of three replicates) at each record date in each location. Thus, future users of the portal will be able to extract different information according to their needs (geographical area, season, etc.). For the upload, the different record dates of a trait in a location were considered as different phenotypic variables. Following this principle, 26 phenotypic variables were uploaded for Poel Island, 29 for Melle and 34 for Lusignan. C&E data were uploaded to the EURISCO forage crop portal for 385 natural populations and 10 control cultivars.

Upload of climate descriptors at collection sites to the EURISCO forage crop portal

In the frame of the *GrassLandscape* project, norms over the 1989-2010 period were computed for bioclimatic variables (bio1 to bio19) commonly used in ecological sciences (http://www.worldclim.org/bioclim) and for height additional variables (bio.ad.20 to bio.ad.27). See

Annex 2 for more details. The values of the 27 bioclimatic variables at the collection sites of 418 natural populations registered in EURISCO (including the 385 populations with C&E data) were uploaded to the forage crop portal.

Task 3

The clustering of the whole set of 427 perennial ryegrass natural populations that used their allele frequencies at 507 583 SNP loci resulted in a partition in seven genetic clusters. This partition revealed an essentially neutral structure mainly shaped by the history of the Pleistocene expansion of perennial ryegrass across Europe and by demographic factors like isolation by distance (Blanco-Pastor et al., 2019).

Furthermore, the 385 perennial ryegrass natural populations sown in the three field trials were clustered using the recorded phenotypic data and this resulted in a partition in three phenotypic clusters (Keep et al., 2021). The differentiation between these three phenotypic clusters was consistent with adaptation to different climatic conditions (Keep et al., 2021), see Figure 3.1, Annex 3.

The core collection was set up by selecting accessions in each cluster of the cross-partition between the genomic and phenotypic clusterings which comprised 17 genomic x phenotypic clusters (Figure 1, Annex 3). The basic objective was to have a relatively balanced contribution of each of the 17 clusters. However, more accessions were selected in the clusters that had the widest spatial range and the largest number of accessions. In each genomic x phenotypic cluster, accessions were selected as evenly as possible over the spatial range of the cluster. Two levels of the core collection, small and large, were set up. The 'small' level included 159 accessions (Figure 3.2, Annex 3). It can be seen as a minimum set to obtain a reliable representation of the initial collection of 385 phenotyped accessions. The 'large' level included 211 populations and was expected to provide a bit more exhaustive representation of the initial collection (Figure 3.3, Annex 3). The small core collection was fully nested within the large core collection. The small and large core collections were selected in order to include only accessions that had been flagged as AEGIS or that had been agreed to be soon flagged as AEGIS by genebank curators. However, as an exception, some accessions from GBR016 were included in the core collections although there was no prospect to date for their addition to AEGIS; this was considered necessary because these accessions sample essential parts of perennial ryegrass diversity that are not represented in other genebanks. Practically, the main search page of the forage crop portal for perennial ryegrass (*Lolium perenne*) now includes flags to easily select either all accessions used in the *GrassLandscape* project (which represent a first large level of core collection), or all accessions included in the small or large core collections. Information about membership of accessions in the whole *GrassLandscape* set and in the small and large core collections are displayed in the accession detail pages of the crop portal.

Recommendations – Perspectives

The natural diversity of perennial ryegrass – A valuable genetic resource

Investigations carried out in the frame of the *GrassLandscape* project revealed that the natural diversity of perennial ryegrass was remarkably structured across Europe. The Pleistocene expansion of the species across Europe is still trackable despite several thousands of years of more and more intensive farming (Blanco-Pastor et al., 2019). Meanwhile, adaptation to climate variation across Europe is clearly perceptible at the phenotypic level (Keep et al., 2021) as well as at the genomic level (Blanco-Pastor et al., 2021). This results in a marked spatial distribution of the natural genomic and phenotypic diversity of perennial ryegrass across Europe.

The fact that the *GrassLandscape* project was able to reveal clear patterns of the natural diversity of perennial ryegrass from genebank accessions also shows the high quality of work carried out by a large number of on-field collectors and genebank curators over several decades in various countries. The guidelines dispensed by the ECPGR Working Group for Forages for many years have enabled the rationalization and harmonization of protocols for the collection and maintenance of accessions between genebanks. This common elaboration of good practices has undoubtedly been essential to obtain consistent results using this large set of genebank accessions.

Results of the *GrassLandscape* project strongly suggest that the natural diversity of grassland species remains a useful genetic resource for plant breeding. Blanco-Pastor et al. (2019) showed that plant

breeders have only used a limited part of the natural diversity of perennial ryegrass. Noticeably, Blanco-Pastor et al. (2021) showed that natural genomic adaptations to cold stress and heat/drought stress could be recombined to a large extent with valuable outcomes for adaptation to climate change. Genebank collections are of course a straightforward material for the use of natural diversity in plant breeding. *Ex situ* collections of grassland species are all the more important as natural populations of these species are increasingly threatened *in situ* by climate change, overseeding with cultivars and conversion to tilled acreages. New collections carried out in 2015 in the frame of the *GrassLandscape* project (not included in this report) have been exposed to these concerning trends. The 438 genebank accessions pertaining to this Activity report were collected between 1970 and 2000. A substantial number of them likely do not exist anymore or are significantly corrupted in their natural environment. Their *ex situ* maintenance in the network of ECPGR genebanks is thus essential.

The GrassLandscape *set of 438 accessions – A first level of core collection*

More than 3,500 natural populations of perennial ryegrass can be browsed as genebank accessions in the EURISCO database. The 427 genebank accessions used in the *GrassLandscape* project were chosen to sample as evenly as possible the natural diversity of perennial ryegrass across space in Europe and surroundings without redundancy. These accessions can thus be considered as making a first large level of core collection worthwhile to be flagged on the EURISCO forage crop portal. In the frame of the Activity, 418 of these accessions have been documented with new climate descriptors at collection sites and 385 of them with new C&E data. Furthermore, all 427 accessions are documented for their allele frequencies at a large number of SNPs from GBS and resequencing in candidate genes in the supplementary materials of Blanco-Pastor et al. (2019, 2021).

It is likely that the set of 427 accessions samples too poorly the diversity of some areas of Europe, noticeably Spain, Italy, the Balkans and Nordic countries. Perennial ryegrass accessions from these areas are actually rather few in the whole EURISCO database and it would certainly be worthwhile to improve this situation with new collection trips as long as natural stands are still present there.

Relevance of the small and large core collections flagged by the Activity

The two levels of flagged core collections, small and large, have the same objective, *i.e.* to capture most of the neutral structure of perennial ryegrass across Europe as well as most of its phenotypic climate adaptive diversity. Using the small or large level of core collection in future projects would mostly depend on technical issues and availability of experimental means.

The spatial range and resolution of the two levels of the core collection make them well-suited to capture climate adaptation of perennial ryegrass across Europe. In the natural diversity of perennial ryegrass across France, Monestiez et al. (1994) estimated that the range of geneflow reached 120km whereas the range of environmental selection spread over 300km for an agronomic trait (summer growth). These figures suggest that the distance between collection sites of neighbouring populations should be relevantly set between 120 and 300km when searching for associations between genomic diversity and climate adaptation. Indeed, the average distance between neighbouring sites roughly ranges between these distances in the two levels of the core collection. Such spatial resolution should avoid bias in association models due to autocorrelation patterns caused by geneflow. On the other hand, it should allow the retrieval of more or less similar selection pressures beyond the range of geneflow.

Furthermore, these small and large core collections could be expected to make valuable calibration sets to implement efficient models of genomic prediction of phenotypic performances for perennial ryegrass natural populations. Using the *GrassLandscape* data, Keep et al. (2020) found that a calibration set selected from a stratified sampling combining genomic and spatial distances was as efficient as the best calibration set possibly obtained by random selection for any trait. When using such combined selection, they found that 150 to 200 accessions were sufficient to obtain the best predictive ability. Indeed, our selection of the small and large core collections took into account genomic and spatial distances, but also differentiation for climate adaptive phenotypic traits. However, Keep et al. (2020) found that genomic prediction models set up with calibration sets composed of natural populations were efficient to predict the performance of cultivars for only some traits; they were likely not efficient for highly polygenic traits for which the breeder selection has broken the natural genetic structure.

References

Blanco-Pastor, J. L., Manel, S., Barre, P., Roschanski, A. M., Willner, E., Dehmer, K. J., Hegarty, M., Muylle, H., Ruttink, T., Roldán-Ruiz, I., Ledauphin, T., Escobar-Gutiérrez, A., Sampoux, J.-P. (2019). Pleistocene climate changes, and not agricultural spread, accounts for range expansion and admixture in the dominant grassland species Lolium perenne L. Journal of Biogeography (46), 1451-1465. , doi: 10.1111/jbi.13587

Blanco-Pastor, J.L., Barre, P., Keep, T, Ledauphin, T., Escobar-Gutiérrez, A., Roschanski, A.M., Willner, E, Dehmer, K. J., Hegarty, M., Muylle, H., Veeckman, E., Vandepoele, K., Ruttink, T., Roldán-Ruiz, I. Manel, S., Sampoux, J. P. (2021) Canonical correlations reveal adaptive loci and phenotypic responses to climate in perennial ryegrass. Molecular Ecology Resources, 21, 849–870, doi: 10.1111/1755-0998.13289

ECPGR, 2013. AEGIS. Revised simplified procedure for the selection and flagging of accessions for the European Collection, final version, 30 December 2013.

Keep, T., Sampoux, J. P., Blanco-Pastor, J. L., Dehmer, K. J., Hegarty, M. J., Ledauphin, T., Litrico, I., Muylle, H., Roldán-Ruiz, I., Roschanski, A. M., Ruttink, T., Surault, F., Willner, E., Barre, P. (2020). High-throughput genome-wide genotyping to optimize the use of natural genetic resources in the grassland species perennial ryegrass (Lolium perenne L.). Genes|Genomes|Genetics, doi:10.1534/g3.120.401491

Keep, T., Sampoux, J.P., Barre, P.; Blanco-Pastor, J.L., Dehmer, K., Durand, J.L., Hegarty, M., Ledauphin, T., Muylle, H., Roldan-Ruiz, I., Ruttink, T., Surault, F., Willner, E., Volaire, F. (2021) To grow or survive: which are the strategies of a perennial grass to face severe seasonal stress? Functional Ecology, 35, 1145–1158, doi: 10.1111/1365-2435.13770

Monestiez P. et al. (1994) Geostatistics for spatial genetic structures: study of wild populations of perennial ryegrass. Theor. Appl. Genet., 88, 33-41.

Annex 1

Table 1.1. Contributions of ECPGR genebanks to the set of accessions (*L. perenne* and related taxa) used in the *GrassLandscape* project, progress in registration in EURISCO and in flagging as AEGIS and contributions of genebanks to the two levels of core collection set up by the Activity.

Instcode	Number of accessions							
	GrassLand-scape	*GrassLand-scape* with C&E data	EURISCO at start of Activity	EURISCO at end of Activity	AEGIS at start of Activity	AEGIS at end of Activity	Large core collection[d]	Small core collection[d]
AUT060	1	1	0	1[e]	0	1[e]	1	1
BEL094	7	7	5	7	0	2 + 1[e]	2	1
CHE002	6	6	5	5	0	5[e]	3	2
CZE082	11	9	0	11	0	10	6	5
DEU271	183 (9)	183 (9)	183	183	160	183	87	68
DEU271 (GRIN)	22	0	0	22	0	22[c]	0	0
EST019	5	4	1	5	1	5	2	1
FRA001	83	83	0	83	0	83[e]	44	33
GBR016	86 (1)	79 (1)	86	86	0	0	51	38
ITA394	6	6	5	5	0	5	4	4
LTU001	9	9	0	9	0	9	5	2
NLD037	8	6	8	8	8	8	4	2
SRB000	1	1	0	1[e]	0	1[e]	1	1
SVN019	2 (1)	2 (1)	0	1	0	1	1	1
SWE054	8	0	8	8	2	8	0	0
Total	***438 (11)***	***396 (11)***	***301***	***435***	***171***	***344***	***211***	***159***

DEU271, GBR016 and SVN019 provided some accessions for taxa related to *L. perenne*. For these three genebanks, the columns '*GrassLandscape*' and '*GrassLandscape* with C&E data' display the total number of accessions provided (*L. perenne* + related taxa) followed by the number of accessions from taxa related to *L. perenne* in brackets. All the other genebanks provided only *L. perenne* accessions.

[e] Number of accessions expected, but not confirmed, to be soon flagged as AEGIS (and registered in EURISCO for AUT060 and SRB000).

[c] Number of accessions confirmed to be soon flagged as AEGIS.

[d] The large and small core collections have been selected by sampling accessions in each of the 17 clusters of a cross partition between a genomic partition based on 507 583 SNP loci and a phenotypic partition based on traits recorded in three trial locations with contrasted climatic conditions.

Table 1.2. C&E traits from the *GrassLandscape* project uploaded to the EURISCO forage crop portal.

Trait name	Location	Year	Trait method
DES	PO	2015	Number of days from sowing to emergence
DIS_15	LU, PO	2015	Susceptibility to indeterminate diseases
HFY	LU, PO	2015	Proportion of plants heading in first year
RAS	LU, ME, PO	2015	Regularity after sowing
VAS	LU, ME, PO	2015	Vigor after sowing
AHD_16	LU, ME, PO	2016	Aftermath heading
CH300h_16	LU, PO	2016	Canopy height at 300 growing-degree-days before spike emergence (heading)
CH400h_16	LU, PO	2016	Canopy height at 400 growing-degree-days before spike emergence (heading)
CHs300_16	LU, ME, PO	2016	Canopy height at 300 growing-degree-days after the start of spring growth
CHs500_16	LU, ME	2016	Canopy height at 500 growing-degree-days after the start of spring growth
DHE_01_16	LU	2016	Drechslera spp. (Syn. Helminthosporium spp.) susceptibility in January
DHE_07_16	LU	2016	Drechslera spp. (Syn. Helminthosporium spp.) susceptibility in July
DIS_16	LU, ME	2016	Susceptibility to indeterminate diseases
DRO	LU, PO	2016	Drought stress symptoms
HEA_16	LU, PO	2016	Heading (or spike emergence) date in growing-degree-days
SMH_16	LU, ME	2016	Summer canopy height
VAC_16	LU	2016	Vigour after cutting
WID_16	PO	2016	Winter damage
ADF_04_17	ME	2017	Acid detergent fiber (ADF) in dry matter from cut in April
ADF_10_17	ME	2017	Acid detergent fiber (ADF) in dry matter from cut in October
ADL_04_17	ME	2017	Acid Detergent Lignin (ADL) in dry matter from cut in April
ADL_10_17	ME	2017	Acid Detergent Lignin (ADL) in dry matter from cut in October
AHD_17	LU, ME, PO	2017	Aftermath heading
AMH	ME, PO	2017	Autumn canopy height
CH300h_17	LU, PO	2017	Canopy height at 300 growing-degree-days before spike emergence (heading)
CH400h_17	LU, PO	2017	Canopy height at 400 growing-degree-days before spike emergence (heading)
CHs300_17	LU, ME, PO	2017	Canopy height at 300 growing-degree-days after the start of spring growth
CHs500_17	LU, ME, PO	2017	Canopy height at 500 growing-degree-days after the start of spring growth
DHE_04_17	LU	2017	Drechslera spp. (Syn. Helminthosporium spp.) susceptibility in April
DIS_17	LU, ME, PO	2017	Susceptibility to indeterminate diseases
DNDF_04_17	ME	2017	In vitro neutral detergent fibre degradability (DNDF) from cut in April
DNDF_10_17	ME	2017	In vitro neutral detergent fibre degradability (DNDF) from cut in October
DST	LU, PO	2017	Density of elongated fertile stems
DVG	LU	2017	Sward density in April
HEA_17	LU, PO	2017	Heading (or spike emergence) date in growing-degree-days
HST	LU	2017	Straw (elongated stems) height
LMW	LU, ME, PO	2017	Leaf lamina width
LSL	LU	2017	Spikelet length
LSP	LU	2017	Spike length
NDF_04_17	ME	2017	Neutral detergent fiber (NDF) in dry matter (%DM) from cut in April
NDF_10_17	ME	2017	Neutral detergent fiber (NDF) in dry matter (%DM) from cut in October
NSL	LU	2017	Spikelet count
OMD_04_17	ME	2017	Organic matter digestibility from cut in April
OMD_10_17	ME	2017	Organic matter digestibility from cut in October
PRT_04_17	ME	2017	Crude protein content in % DM from cut in April
PRT_10_17	ME	2017	Crude protein content in % DM from cut in October
SMH_17	ME, PO	2017	Summer canopy height
VAC_17	LU, PO	2017	Vigour after cutting
WID_17	PO	2017	Winter damage
WSC_04_17	ME	2017	Water-soluble-carbohydrate content in % DM from cut in April

Trait name	Location	Year	Trait method
WSC_04_17	ME	2017	Water-soluble-carbohydrate content in % DM from cut in October
DRB	LU	2015-2016	Black rust (Puccinia graminis) susceptibility (average 2015-2016)
SCD	LU, ME, PO	2017 or 2018	Persistency of plant stand three (ME and PO) or four (LU) years after sowing

Field experiments: *Lusignan, INRAE, France (LU); Melle, ILVO, Belgium (ME); Poel Island, IPK, Germany (PO). More detailed information about experiments and trait methods is available on the EURISCO forage crop portal (https://eurisco.ipk-gatersleben.de/apex/weise/r/forage/home).*

Figure 1.1. Overview of one of the three field trials (Lusignan, INRAE, France) from which C&E data were recorded (shot from May 2017).

Annex 2. Climate descriptors of accession collection sites uploaded to the EURISCO forage crop portal

Base climate variables used to compute climate descriptors

Daily mean temperature (*tas*, in °C), minimum temperature (*tasmin*, in °C), maximum temperature (*tasmax*, in °C) and daily cumulated rainfall (*pr*, in mm) were extracted from EURO4M-MESAN (1989-2010) NetCDF grids (0.05° longitude and latitude resolution) (http://www.euro4m.eu/). Surface incident shortwave solar radiation per day (*sis*, in W m^{-2}) was extracted from EUMETSAT CM SAF (1989-2013) NetCDF grids (0.11° longitude and latitude resolution) (https://www.cmsaf.eu/).

The 365-days year was broken down into 25 year-slices of 14 days and a last one of 15 days. Norms over the 1989-2010 period for *tas*, *tasmin*, *tasmax* and *pr* and over the 1989-2013 period for *sis* were computed for average values per year-slice by CERFACS (http://cerfacs.fr). Norms of potential evapotranspiration (*pet*) were also computed over the 1989-2010 period by CERFACS at the resolution of the 0.05° EURO4M-MESAN NetCDF grid for average value per year-slice using the formula of Turc (1961):

pet = 0,013 x number of days in slice x (*tas*/(*tas*+15)) x (*gR* + 50), where *gR* = global radiation in Cal cm^{-2} day^{-1}.

These base climatic variables were used to compute BIOCLIM derived variables at the resolution of the 0.05° EURO4M-MESAN NetCDF grid as described hereunder. Values of BIOCLIM derived variables at collection sites of perennial ryegrass populations were set as the values of grid cells containing these sites.

Climate descriptors uploaded to the perennial ryegrass portal

The norms of *tas*, *tasmin*, *tasmax* and *pr* set up over the 1989-2010 period for year-slices were used to compute the bioclimatic variables (*bio1* to *bio19*) usually derived in ecological sciences from the *WorldClim* database (http://www.worldclim.org/bioclim). While the computation of these variables from the *WorldClim* data uses norms set up on a monthly time span, our computation used the 14/15 days time span of our 26 year-slices. Consequently, our computation of *bio5*, *bio6*, *bio13* and *bio14* addressed the warmest, coldest, wettest and driest year-slice of 14/15 days, respectively, instead of the warmest, coldest, wettest and driest month when computed from *WorldClim* data. Similarly, our computation of *bio2* addressed the mean of 14/15 days slices instead of the mean of monthly periods.

The BIOCLIM derived variables uploaded to the EURISCO perennial ryegrass portal as climate descriptors of accession collection sites were:

- ***bio1***: annual mean temperature
- ***bio2***: mean diurnal range (mean of 14/15 days year-slices (*tasmax* – *tasmin*))
- ***bio3***: isothermality (*bio2*/*bio7*×100)
- ***bio4***: temperature seasonality (standard deviation of average daily mean temperature per year-slice × 100)
- ***bio5***: average daily maximum temperature (*tasmax*) of the warmest 14/15 days year-slice
- ***bio6***: average daily minimum temperature (*tasmin*) of the coldest 14/15 days year-slice
- ***bio7***: temperature annual range (*bio5* – *bio6*)
- ***bio8***: mean temperature of wettest quarter
- ***bio9***: mean temperature of driest quarter
- ***bio10***: mean temperature of warmest quarter
- ***bio11***: mean temperature of coldest quarter
- ***bio12***: annual precipitation
- ***bio13***: precipitation of wettest 14/15 days year-slice
- ***bio14***: precipitation of driest 14/15 days year-slice
- ***bio15.mod***: precipitation seasonality (standard deviation of cumulated precipitation per year-slice × 100, instead of coefficient of variation for the actual BIOCLIM variable *bio15*)
- ***bio16***: precipitation of wettest quarter
- ***bio17***: precipitation of driest quarter
- ***bio18***: precipitation of warmest quarter
- ***bio19***: precipitation of coldest quarter.

We also used potential evapotranspiration norms to compute several additional 'BIOCLIM like' variables quantifying seasonal variations of potential evapotranspiration (*pet*) and climatic water balance (precipitation *minus* evapotranspiration or *pr - pet*):

- ***bio.ad.20***: *pr - pet* of wettest quarter
- ***bio.ad.21***: *pr - pet* of driest quarter
- ***bio.ad.22***: *pr - pet* of warmest quarter
- ***bio.ad.23***: *pr - pet* of coldest quarter
- ***bio.ad.24***: *pet* of wettest quarter

- ***bio.ad.25***: *pet* of driest quarter
- ***bio.ad.26***: *pet* of warmest quarter
- ***bio.ad.27***: *pet* of coldest quarter.

Annex 3.

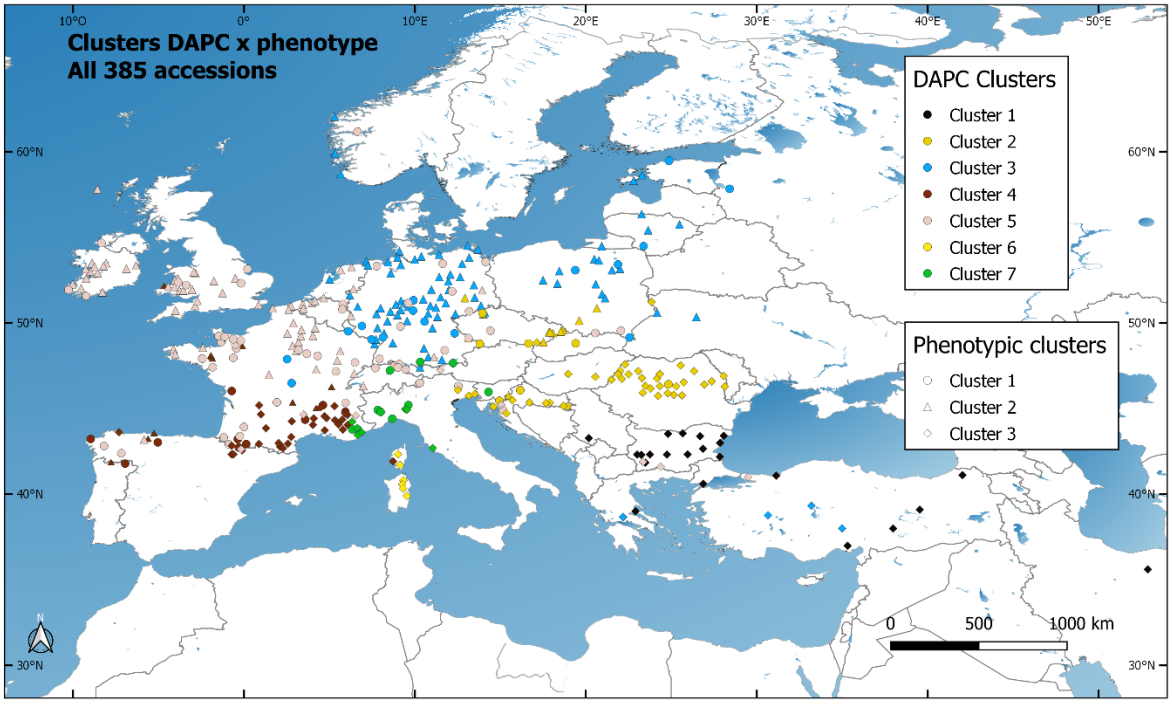

Figure 3.1. Map of collection sites of the 385 perennial ryegrass genebank accessions with C&E data broken down in genetic (DAPC) and phenotypic clusters.

The differentiation between the three phenotypic clusters was consistent with adaptation to different climatic conditions (Keep et al., 2021).

Populations from phenotypic cluster 1 originated from areas with the most favourable conditions which combined mild winter and cool summer seasons. These populations had early heading and high speed of spring growth, which are features assumed to provide adaptation to high competition for resources between plants.

Populations from phenotypic cluster 2 had late start of spring growth and late heading but strong growth in cold spring conditions (Poel 2016), which are features favouring adaptation to cold winter and spring. These populations also had good summer stay-green and consistent canopy growth potential in summer in accordance with adaptation to cool and wet summer seasons.

Populations from phenotypic cluster 3 had high investment in seed production and very small canopy growth potential in summer, in accordance with adaptation to hot and dry summer seasons. They also had some growth potential in early spring, and even in winter for some of them, in accordance with adaptation to mild winter seasons.

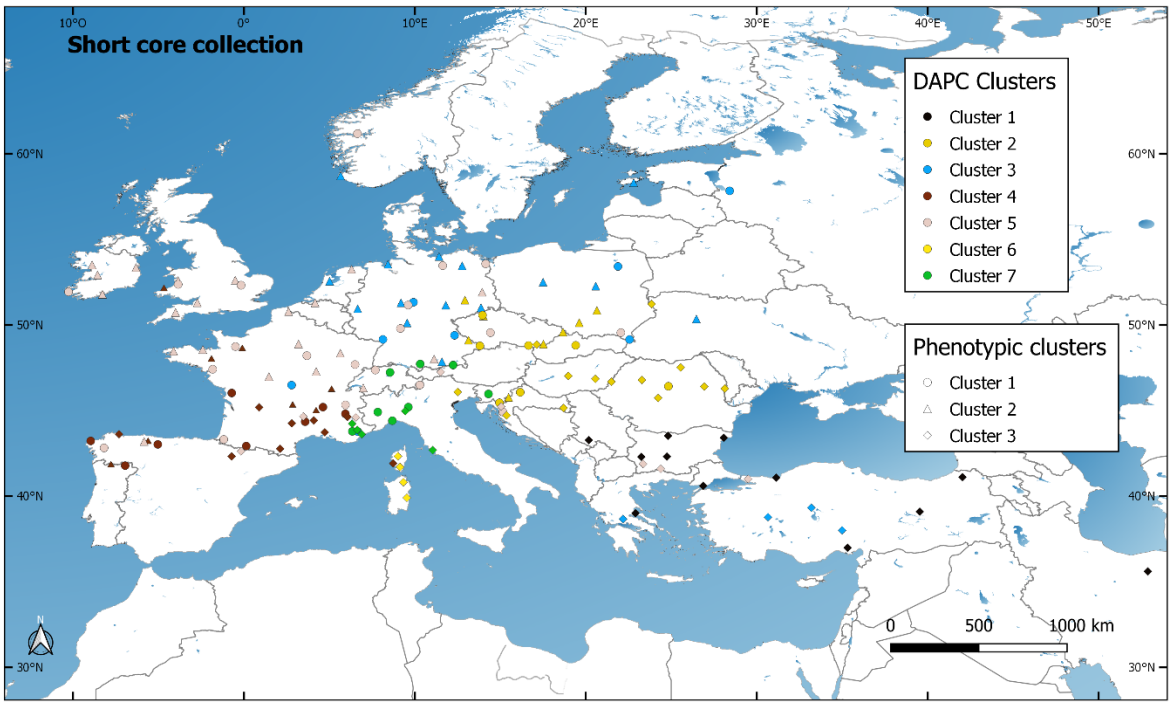

Figure 3.2. Map of collection sites of the small core collection including 159 perennial ryegrass accessions broken down in genetic (DAPC) and phenotypic clusters.

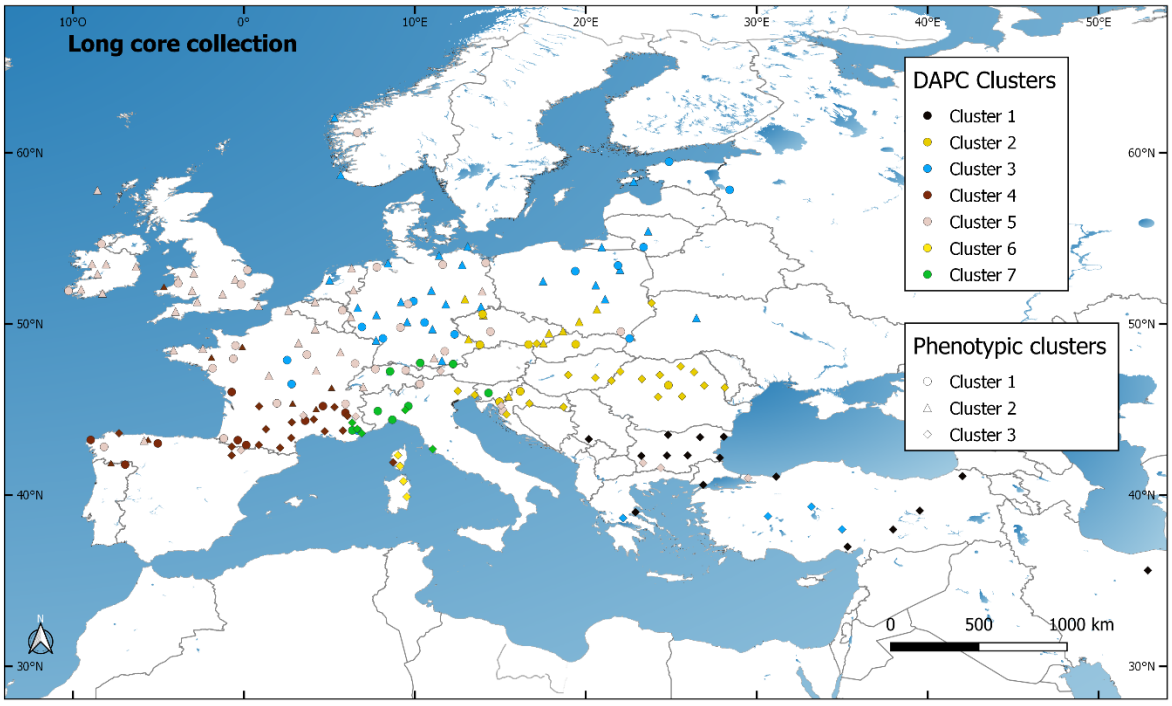

Figure 3.3. Map of collection sites of the large core collection including 211 perennial ryegrass accessions broken down in genetic (DAPC) and phenotypic clusters.

Annex 4.a

Table 4.1 List of the *L. perenne* and related taxa accessions used in the *Grasslandscape* project displayed with their status regarding EURISCO, AEGIS and large and small core-collections.

(1) Entry nb	(2) Instcode	(3) Accenumb	(4) Taxon	(5) Samp stat	(6) colldate	(7) Origcty	(8) In EURISCO at end of activity	(9) In AEGIS at end of activity	(10) Large core collection	(11) Small core collection	(12) IPK Lemnatec platform	(13) Field trials (IPK, INRAE, ILVO)	(14) Ploidy control	(15) In Blanco-Pastor et al., 2019	(16) In Blanco-Pastor et al., 2021	(17) In Keep et al., 2020 & 2021
1	DEU271	GR 12391	*Lolium perenne*	120	08/01/2006	DEU	y	y			y	y	2x	y	y	y
2	DEU271	GR 12499	*Lolium perenne*	120	07/01/2006	DEU	y	y	y	y	y	y	2x	y	y	y
3	DEU271	GR 12652	*Lolium perenne*	120	06/28/2006	DEU	y	y	y	y	y	y	2x	y	y	y
6	DEU271	GR 3252	*Lolium perenne*	100	1971	DEU	y	y			y	y	2x	y	y	y
7	DEU271	GR 3283	*Lolium perenne*	100	1971	DEU	y	y	y	y	y	y	2x	y	y	y
8	DEU271	GR 3300	*Lolium perenne*	100	1971	DEU	y	y			y	y	2x	y	y	y
9	DEU271	GR 3318	*Lolium perenne*	100	1971	DEU	y	y			y	y	2x	y	y	y
10	DEU271	GR 3319	*Lolium perenne*	100	1971	DEU	y	y			y	y	2x	y	y	y
11	DEU271	GR 3321	*Lolium perenne*	100	1971	DEU	y	y	y	y	y	y	2x	y	y	y
12	DEU271	GR 3327	*Lolium perenne*	100	04/06/1990	DEU	y	y			y	y	2x	y	y	y
13	DEU271	GR 3350	*Lolium perenne*	100	04/03/1990	DEU	y	y	y	y	y	y	2x	y	y	y
14	DEU271	GR 3403	*Lolium perenne*	130	04/17/1991	DEU	y	y	y	y	y	y	2x	y	y	y
15	DEU271	GR 3422	*Lolium perenne*	130	04/11/1991	DEU	y	y			y	y	2x	y	y	y
16	DEU271	GR 5106	*Lolium perenne*	130	05/17/1991	DEU	y	y	y	y	y	y	2x	y	y	y
17	DEU271	GR 3439	*Lolium perenne*	130	05/17/1991	DEU	y	y			y	y	2x	y	y	y
21	DEU271	GR 5028	*Lolium perenne*	100	1984	DEU	y	y	y	y	y	y	2x	y	y	y
22	DEU271	GR 5029	*Lolium perenne*	100	1984	DEU	y	y			y	y	2x	y	y	y
24	DEU271	GR 5032	*Lolium perenne*	100	07/18/1984	DEU	y	y	y		y	y	2x	y	y	y
25	DEU271	GR 5035	*Lolium perenne*	100	1984	DEU	y	y	y		y	y	2x	y	y	y
26	DEU271	GR 5036	*Lolium perenne*	100	1984	DEU	y	y			y	y	2x	y	y	y
27	DEU271	GR 5038	*Lolium perenne*	100	1984	DEU	y	y			y	y	2x	y	y	y
28	DEU271	GR 5039	*Lolium perenne*	100	08/10/1988	DEU	y	y	y	y	y	y	2x	y	y	y
29	DEU271	GR 5040	*Lolium perenne*	130	NA	DEU	y	y			y	y	2x	y	y	y
30	DEU271	GR 5041	*Lolium perenne*	130	NA	DEU	y	y			y	y	2x	y	y	y
31	DEU271	GR 5042	*Lolium perenne*	100	NA	DEU	y	y	y	y	y	y	2x	y	y	y

(1) Entry nb	(2) Instcode	(3) Accenumb	(4) Taxon	(5) Samp stat	(6) colldate	(7) Origcty	(8) In EURISCO at end of activity	(9) In AEGIS at end of activity	(10) Large core collection	(11) Small core collection	(12) IPK Lemnatec platform	(13) Field trials (IPK, INRAE, ILVO)	(14) Ploidy control	(15) In Blanco-Pastor et al., 2019	(16) In Blanco-Pastor et al., 2021	(17) In Keep et al., 2020 & 2021
32	DEU271	GR 5043	*Lolium perenne*	100	1974	DEU	y	y			y	y	2x	y	y	y
33	DEU271	GR 5044	*Lolium perenne*	100	1976	DEU	y	y			y	y	2x	y	y	y
34	DEU271	GR 5111	*Lolium perenne*	130	04/10/1991	DEU	y	y	y		y	y	2x	y	y	y
35	DEU271	GR 5410	*Lolium perenne*	100	NA	DEU	y	y	y	y	y	y	2x	y	y	y
36	DEU271	GR 6021	*Lolium perenne*	130	09/02/1995	DEU	y	y			y	y	2x	y	y	y
37	DEU271	GR 6031	*Lolium perenne*	130	09/06/1995	DEU	y	y			y	y	2x	y	y	y
38	DEU271	GR 6305	*Lolium perenne*	100	06/01/1997	DEU	y	y	y	y	y	y	2x	y	y	y
39	DEU271	GR 7617	*Lolium perenne*	100	NA	DEU	y	y	y	y	y	y	2x	y	y	y
40	DEU271	GR 7654	*Lolium perenne*	100	NA	DEU	y	y			y	y	2x	y	y	y
41	DEU271	GR 7878	*Lolium perenne*	100	NA	DEU	y	y			y	y	2x	y	y	y
42	DEU271	GR 7879	*Lolium perenne*	100	NA	DEU	y	y			y	y	2x	y	y	y
43	DEU271	GR 7928	*Lolium perenne*	100	NA	DEU	y	y			y	y	2x	y	y	y
44	DEU271	GR 7979	*Lolium perenne*	100	NA	DEU	y	y			y	y	2x	y	y	y
46	DEU271	GR 8636	*Lolium perenne*	100	NA	DEU	y	y			y	y	2x	y	y	y
47	DEU271	GR 8882	*Lolium perenne*	100	NA	DEU	y	y	y	y	y	y	2x	y	y	y
48	DEU271	GR 8901	*Lolium perenne*	100	NA	DEU	y	y	y	y	y	y	2x	y	y	y
49	DEU271	GR 8956	*Lolium perenne*	100	NA	DEU	y	y	y	y	y	y	2x	y	y	y
50	DEU271	GR 8995	*Lolium perenne*	100	NA	DEU	y	y	y		y	y	2x	y	y	y
51	DEU271	GR 2692	*Lolium perenne*	100	09/04/1980	DEU	y	y			y	y	2x	y	y	y
52	DEU271	GR 3286	*Lolium perenne*	100	1971	DEU	y	y			y	y	2x	y	y	y
53	DEU271	GR 3530	*Lolium perenne*	100	08/11/1987	DEU	y	y			y	y	2x	y	y	y
54	DEU271	GR 3554	*Lolium perenne*	100	04/23/1991	DEU	y	y			y	y	2x	y	y	y
55	DEU271	GR 5091	*Lolium perenne*	130	04/10/1991	DEU	y	y			y	y	2x	y	y	y
56	DEU271	GR 5093	*Lolium perenne*	130	04/24/1991	DEU	y	y	y	y	y	y	2x	y	y	y
57	DEU271	GR 5102	*Lolium perenne*	130	04/23/1991	DEU	y	y			y	y	2x	y	y	y
58	DEU271	GR 6835	*Lolium perenne*	100	NA	DEU	y	y			y	y	2x	y	y	y
59	DEU271	GR 6839	*Lolium perenne*	100	NA	DEU	y	y	y	y	y	y	2x	y	y	y
60	DEU271	GR 7982	*Lolium perenne*	100	NA	DEU	y	y			y	y	2x	y	y	y
62	DEU271	GR 9524	*Lolium perenne*	100	NA	DEU	y	y			y	y	2x	y	y	y

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67	BEL094	RVP 554	*Lolium perenne*	120	03/01/1987	BEL	y				y	y	2x	y	y	y
68	BEL094	RVP 750	*Lolium perenne*	120	1988	BEL	y	e	y		y	y	2x	y	y	y
69	BEL094	RVP 751	*Lolium perenne*	120	1988	BEL	y				y	y	2x	y	y	y
70	BEL094	RVP 757	*Lolium perenne*	120	1988	BEL	y				y	y	2x	y	y	y
71	BEL094	RVP 891	*Lolium perenne*	120	1990	BEL	y				y	y	2x	y	y	y
72	BEL094	ILVO6415	*Lolium perenne*	120	2013	BEL	y	y			y	y	2x	y	y	y
73	BEL094	ILVO6436	*Lolium perenne*	120	2013	BEL	y	y	y	y	y	y	2x	y	y	y
77	FRA001	FR 2693	*Lolium perenne*	110	1983	FRA	y	e	y		y	y	2x	y	y	y
81	FRA001	FR 2699	*Lolium perenne*	110	1983	FRA	y	e	y	y	y	y	2x	y	y	y
82	FRA001	FR 2702	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
83	FRA001	FR 2703	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
84	FRA001	FR 2705	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
85	FRA001	FR 2708	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
86	FRA001	FR 2714	*Lolium perenne*	110	1984	FRA	y	e			y	y	2x	y	y	y
87	FRA001	FR 2715	*Lolium perenne*	110	1984	FRA	y	e			y	y	2x	y	y	y
88	FRA001	FR 2716	*Lolium perenne*	110	1984	FRA	y	e			y	y	2x	y	y	y
90	FRA001	FR 2721	*Lolium perenne*	110	1984	FRA	y	e	y			y	2x	y	y	y
92	FRA001	FR 2743	*Lolium perenne*	110	1984	FRA	y	e	y	y	y	y	2x	y	y	y
93	FRA001	FR 2747	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
94	FRA001	FR 2748	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
95	FRA001	FR 2749	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
96	FRA001	FR 2751	*Lolium perenne*	110	1983	FRA	y	e	y	y	y	y	2x	y	y	y
97	FRA001	FR 2753	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
98	FRA001	FR 2754	*Lolium perenne*	110	1983	FRA	y	e	y	y	y	y	2x	y	y	y
99	FRA001	FR 2755	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
100	FRA001	FR 2756	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
103	FRA001	FR 2778	*Lolium perenne*	110	1984	FRA	y	e	y	y	y	y	2x	y	y	y
108	FRA001	FR 2839	*Lolium perenne*	110	1984	FRA	y	e	y	y	y	y	2x	y	y	y
109	FRA001	FR 2846	*Lolium perenne*	110	1983	FRA	y	e	y	y	y	y	2x	y	y	y

(1) Entry nb	(2) Instcode	(3) Accenumb	(4) Taxon	(5) Samp stat	(6) colldate	(7) Origcty	(8) In EURISCO at end of activity	(9) In AEGIS at end of activity	(10) Large core collection	(11) Small core collection	(12) IPK Lemnatec platform	(13) Field trials (IPK, INRAE, ILVO)	(14) Ploidy control	(15) In Blanco-Pastor et al., 2019	(16) In Blanco-Pastor et al., 2021	(17) In Keep et al., 2020 & 2021
110	FRA001	FR 2851	*Lolium perenne*	110	1983	FRA	y	e	y		y	y	2x	y	y	y
111	FRA001	FR 2852	*Lolium perenne*	110	NA	FRA	y	e			y	y	2x	y	y	y
112	FRA001	FR 2854	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
113	FRA001	FR 2857	*Lolium perenne*	110	1983	FRA	y	e	y	y	y	y	2x	y	y	y
118	FRA001	FR 2873	*Lolium perenne*	110	1984	FRA	y	e	y	y	y	y	2x	y	y	y
120	FRA001	FR 2875	*Lolium perenne*	110	1984	FRA	y	e			y	y	2x	y	y	y
121	FRA001	FR 2879	*Lolium perenne*	110	1984	FRA	y	e	y	y	y	y	2x	y	y	y
122	FRA001	FR 2882	*Lolium perenne*	110	1984	FRA	y	e	y	y	y	y	2x	y	y	y
123	FRA001	FR 2883	*Lolium perenne*	110	1984	FRA	y	e	y	y	y	y	2x	y	y	y
124	FRA001	FR 2888	*Lolium perenne*	110	1984	FRA	y	e	y	y		y	2x	y	y	y
126	FRA001	FR 2897	*Lolium perenne*	110	1983	FRA	y	e	y	y	y	y	2x	y	y	y
127	FRA001	FR 2906	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
128	FRA001	FR 2907	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
130	FRA001	FR 2911	*Lolium perenne*	110	1983	FRA	y	e	y	y	y	y	2x	y	y	y
131	FRA001	FR 2915	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
132	FRA001	FR 2920	*Lolium perenne*	110	1984	FRA	y	e			y	y	2x	y	y	y
134	FRA001	FR 2931	*Lolium perenne*	110	1984	FRA	y	e			y	y	2x	y	y	y
135	FRA001	FR 2936	*Lolium perenne*	110	1984	FRA	y	e	y	y	y	y	2x	y	y	y
138	FRA001	FR 2946	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
139	FRA001	FR 2955	*Lolium perenne*	110	1984	FRA	y	e	y		y	y	2x	y	y	y
142	FRA001	FR 2964	*Lolium perenne*	110	1984	FRA	y	e	y	y	y	y	2x	y	y	y
144	FRA001	FR 2970	*Lolium perenne*	110	1984	FRA	y	e			y	y	2x	y	y	y
145	FRA001	FR 2982	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
146	FRA001	FR 2984	*Lolium perenne*	110	1983	FRA	y	e	y	y	y	y	2x	y	y	y
147	FRA001	FR 2988	*Lolium perenne*	110	1983	FRA	y	e	y		y	y	2x	y	y	y
148	FRA001	FR 2990	*Lolium perenne*	110	1983	FRA	y	e	y	y	y	y	2x	y	y	y
149	FRA001	FR 2992	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
150	FRA001	FR 2996	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
151	FRA001	FR 3008	*Lolium perenne*	110	1984	FRA	y	e			y	y	2x	y	y	y

(1) Entry nb	(2) Instcode	(3) Accenumb	(4) Taxon	(5) Samp stat	(6) colldate	(7) Origcty	(8) In EURISCO at end of activity	(9) In AEGIS at end of activity	(10) Large core collection	(11) Small core collection	(12) IPK Lemnatec platform	(13) Field trials (IPK, INRAE, ILVO)	(14) Ploidy control	(15) In Blanco-Pastor et al., 2019	(16) In Blanco-Pastor et al., 2021	(17) In Keep et al., 2020 & 2021
152	FRA001	FR 3012	*Lolium perenne*	110	1984	FRA	y	e	y	y	y	y	2x	y	y	y
153	FRA001	FR 3021	*Lolium perenne*	110	1984	FRA	y	e	y	y	y	y	2x	y	y	y
154	FRA001	FR 3027	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
155	FRA001	FR 3029	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
157	FRA001	FR 3032	*Lolium perenne*	110	1983	FRA	y	e	y	y	y	y	2x	y	y	y
159	FRA001	FR 3038	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
160	FRA001	FR 3041	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
162	FRA001	FR 3043	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
164	FRA001	FR 3047	*Lolium perenne*	110	1983	FRA	y	e	y		y	y	2x	y	y	y
166	FRA001	FR 3062	*Lolium perenne*	110	1984	FRA	y	e			y	y	2x	y	y	y
167	FRA001	FR 3063	*Lolium perenne*	110	1984	FRA	y	e	y		y	y	2x	y	y	y
168	FRA001	FR 3064	*Lolium perenne*	110	1984	FRA	y	e			y	y	2x	y	y	y
171	FRA001	FR 3078	*Lolium perenne*	110	1983	FRA	y	e	y	y	y	y	2x	y	y	y
172	FRA001	FR 3083	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
173	FRA001	FR 3086	*Lolium perenne*	110	1983	FRA	y	e	y		y	y	2x	y	y	y
174	FRA001	FR 3089	*Lolium perenne*	110	1983	FRA	y	e	y	y	y	y	2x	y	y	y
176	FRA001	FR 3099	*Lolium perenne*	110	1984	FRA	y	e	y		y	y	2x	y	y	y
178	FRA001	FR 3132	*Lolium perenne*	110	1983	FRA	y	e	y		y	y	2x	y	y	y
179	FRA001	FR 3134	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
180	FRA001	FR 3135	*Lolium perenne*	110	1983	FRA	y	e	y	y	y	y	2x	y	y	y
181	FRA001	FR 3136	*Lolium perenne*	110	1983	FRA	y	e			y	y	2x	y	y	y
182	FRA001	FR 3147	*Lolium perenne*	110	1984	FRA	y	e	y	y	y	y	2x	y	y	y
185	FRA001	FR 3166	*Lolium perenne*	110	1984	FRA	y	e			y	y	2x	y	y	y
188	FRA001	FR 3176	*Lolium perenne*	110	1984	FRA	y	e	y	y	y	y	2x	y	y	y
190	FRA001	FR 3198	*Lolium perenne*	110	1983	FRA	y	e	y	y	y	y	2x	y	y	y
191	FRA001	FR 3202	*Lolium perenne*	110	1983	FRA	y	e	y	y	y	y	2x	y	y	y
192	FRA001	FR 3209	*Lolium perenne*	110	1984	FRA	y	e			y	y	2x	y	y	y
193	FRA001	FR 3210	*Lolium perenne*	110	1984	FRA	y	e	y	y	y	y	2x	y	y	y
194	FRA001	FR 3219	*Lolium perenne*	110	1984	FRA	y	e	y		y	y	2x	y	y	y

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195	FRA001	FR 3222	*Lolium perenne*	110	1984	FRA	y	e	y	y	y	y	2x	y	y	y
196	FRA001	FR 3224	*Lolium perenne*	110	1984	FRA	y	e	y	y	y	y	2x	y	y	y
199	FRA001	FR 3300	*Lolium perenne*	110	NA	FRA	y	e	y	y	y	y	2x	y	y	y
210	NLD037	CGN15665	*Lolium perenne*	100	1990	NLD	y	y			y		2x	y	y	
211	NLD037	CGN15666	*Lolium perenne*	100	1990	NLD	y	y			y		2x	y	y	
214	NLD037	CGN23734	*Lolium perenne*	100	2001	NLD	y	y	y	y	y	y	2x	y	y	y
215	NLD037	CGN23735	*Lolium perenne*	100	2001	NLD	y	y	y		y	y	2x	y	y	y
216	NLD037	CGN23739	*Lolium perenne*	100	2001	NLD	y	y	y		y	y	2x	y	y	y
217	NLD037	CGN23741	*Lolium perenne*	100	2001	NLD	y	y			y	y	2x	y	y	y
218	NLD037	CGN23745	*Lolium perenne*	100	2001	NLD	y	y	y	y	y	y	2x	y	y	y
219	NLD037	CGN23747	*Lolium perenne*	100	2001	NLD	y	y			y	y	2x	y	y	y
221	SWE054	NGB1568	*Lolium perenne*	110	08/11/1985	SWE	y	y			y		2x	y	y	
222	SWE054	NGB4262	*Lolium perenne*	110	09/11/1980	NOR	y	y			y		2x	y	y	
223	SWE054	NGB4264	*Lolium perenne*	110	09/01/1981	NOR	y	y			y		2x	y	y	
224	SWE054	NGB4266	*Lolium perenne*	110	08/16/1981	NOR	y	y			y		2x	y	y	
225	SWE054	NGB4339	*Lolium perenne*	110	08/17/1983	SWE	y	y					NA	y	y	
226	SWE054	NGB4547	*Lolium perenne*	110	08/23/1984	DNK	y	y			y		2x	y	y	
227	SWE054	NGB5040	*Lolium perenne*	110	09/23/1983	DNK	y	y			y		2x	y	y	
228	SWE054	NGB8476	*Lolium perenne*	110	05/08/1985	DNK	y	y			y		2x	y	y	
229	CZE082	14G2000505	*Lolium perenne*	100	09/21/1993	CZE	y	y	y	y	y	y	2x	y	y	y
230	CZE082	14G2000546	*Lolium perenne*	100	09/09/1994	CZE	y	y	y	y	y	y	2x	y	y	y
231	CZE082	14G2000548	*Lolium perenne*	100	09/24/1994	CZE	y	y			y	y	2x	y	y	y
232	CZE082	14G2000585	*Lolium perenne*	100	08/05/1995	CZE	y	y	y	y	y	y	2x	y	y	y
233	CZE082	14G2000586	*Lolium perenne*	100	08/06/1995	CZE	y	y	y	y	y	y	2x	y	y	y
234	CZE082	14G2000587	*Lolium perenne*	100	08/06/1995	CZE	y	y			y	y	2x	y	y	y
235	CZE082	14G2000630	*Lolium perenne*	100	08/17/2006	CZE	y	y			y		2x	y	y	
236	CZE082	14G2000631	*Lolium perenne*	100	08/13/1996	CZE	y	y	y		y	y	2x	y	y	y
237	CZE082	14G2000632	*Lolium perenne*	100	08/13/1996	CZE	y	y			y	y	2x	y	y	y
240	CZE082	14G2000657	*Lolium perenne*	100	08/25/1992	CZE	y	y	y	y		y	2x	y	y	y

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246	SVN019	SRGB 5431	*Lolium perenne*	100	07/20/2004	SVN	y	y	y	y	y	y	2x	y	y	y
248	CHE002	RHZ110128	*Lolium perenne*	120	06/11/1999	CHE	y	e	y		y	y	2x	y	y	y
249	CHE002	RHZ110126	*Lolium perenne*	120	06/10/1999	CHE	y	e	y	y	y	y	2x	y	y	y
250	CHE002	RHZ110129	*Lolium perenne*	120	06/09/1999	CHE	y	e			y	y	2x	y	y	y
251	CHE002	RHZ110124	*Lolium perenne*	120	09/01/1982	CHE	y	e	y	y	y	y	2x	y	y	y
252	CHE002	RHZ110123	*Lolium perenne*	120	05/03/1991	CHE	y	e			y	y	2x	y	y	y
253	CHE002	RHZ120012	*Lolium perenne*	120	05/03/1991	CHE					y	y	2x	y	y	y
254	SRB000	SRBLP001	*Lolium perenne*	100	08/20/2009	SRB	e	e	y	y	y	y	2x	y	y	y
264	AUT060	GUMP-LP00441	*Lolium perenne*	100	NA	AUT	e	e	y	y	y	y	2x	y	y	y
265	LTU001	AGB00659	*Lolium perenne*	100	NA	LTU	y	y	y		y	y	2x	y	y	y
266	LTU001	AGB00684	*Lolium perenne*	100	NA	LTU	y	y			y	y	2x	y	y	y
267	LTU001	AGB04959	*Lolium perenne*	100	NA	LTU	y	y			y	y	2x	y	y	y
268	LTU001	AGB02535	*Lolium perenne*	100	NA	LTU	y	y	y		y	y	2x	y	y	y
269	LTU001	LZI-3817	*Lolium perenne*	100	NA	UKR	y	y	y	y	y	y	2x	y	y	y
270	LTU001	LZI-3895	*Lolium perenne*	100	NA	UKR	y	y			y	y	2x	y	y	y
271	LTU001	LZI-3898	*Lolium perenne*	100	NA	UKR	y	y	y	y	y	y	2x	y	y	y
272	LTU001	LZI-3377	*Lolium perenne*	100	NA	RUS	y	y	y		y	y	2x	y	y	y
273	LTU001	LZI-3392	*Lolium perenne*	100	NA	RUS	y	y			y	y	2x	y	y	y
274	EST019	EST962	*Lolium perenne*	100	8/14/2002	EST	y	y			y	y	2x	y	y	y
275	EST019	EST963	*Lolium perenne*	100	8/14/2002	EST	y	y			y		2x	y	y	
276	EST019	EST965	*Lolium perenne*	100	8/15/2002	EST	y	y	y	y	y	y	2x	y	y	y
277	EST019	EST3002	*Lolium perenne*	100	NA	EST	y	y	y		y	y	2x	y	y	y
278	EST019	EST3003	*Lolium perenne*	100	NA	EST	y	y			y	y	2x	y	y	y
279	DEU271	GR 3122	*Lolium perenne*	300	NA	RUS	y	y	y	y	y	y	2x	y	y	y
280	DEU271	GR 3316	*Lolium perenne*	100	1971	DEU	y	y	y	y	y	y	2x	y	y	y
281	DEU271	GR 3376	*Lolium perenne*	100	08/03/1990	POL	y	y	y	y	y	y	2x	y	y	y
282	DEU271	GR 3494	*Lolium perenne*	100	08/08/1989	CZE	y	y	y	y	y	y	2x	y	y	y
283	DEU271	GR 3511	*Lolium perenne*	100	08/09/1989	CZE	y	y	y	y	y	y	2x	y	y	y
284	DEU271	GR 3512	*Lolium perenne*	100	08/09/1989	SVK	y	y	y	y	y	y	2x	y	y	y

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285	DEU271	GR 3517	*Lolium perenne*	100	08/11/1989	SVK	y	y			y	y	2x	y	y	y
286	DEU271	GR 5435	*Lolium perenne*	100	1954	IRN	y	y	y	y	y	y	2x	y	y	y
288	DEU271	GR 5560	*Lolium perenne*	100	07/16/1993	ROM	y	y			y	y	2x	y	y	y
289	DEU271	GR 5561	*Lolium perenne*	130	07/16/1993	ROM	y	y	y		y	y	2x	y	y	y
290	DEU271	GR 5565	*Lolium perenne*	130	07/16/1993	ROM	y	y	y	y	y	y	2x	y	y	y
291	DEU271	GR 5569	*Lolium perenne*	130	07/16/1993	ROM	y	y			y	y	2x	y	y	y
295	DEU271	GR 5586	*Lolium perenne*	130	07/25/1993	ROM	y	y			y	y	2x	y	y	y
296	DEU271	GR 5587	*Lolium perenne*	130	07/26/1993	ROM	y	y			y	y	2x	y	y	y
297	DEU271	GR 5588	*Lolium perenne*	120	07/27/1993	ROM	y	y			y	y	2x	y	y	y
298	DEU271	GR 5589	*Lolium perenne*	130	07/27/1993	ROM	y	y			y	y	2x	y	y	y
300	DEU271	GR 5597	*Lolium perenne*	130	07/16/1993	ROM	y	y			y	y	2x	y	y	y
301	DEU271	GR 5600	*Lolium perenne*	100	07/17/1993	ROM	y	y	y	y	y	y	2x	y	y	y
302	DEU271	GR 5603	*Lolium perenne*	120	07/19/1993	ROM	y	y			y	y	2x	y	y	y
303	DEU271	GR 5604	*Lolium perenne*	120	07/22/1993	ROM	y	y	y	y	y	y	2x	y	y	y
304	DEU271	GR 5607	*Lolium perenne*	130	07/26/1993	ROM	y	y			y	y	2x	y	y	y
305	DEU271	GR 5611	*Lolium perenne*	100	07/16/1993	ROM	y	y			y	y	2x	y	y	y
306	DEU271	GR 5620	*Lolium perenne*	100	07/18/1993	ROM	y	y			y	y	2x	y	y	y
307	DEU271	GR 5621	*Lolium perenne*	120	07/19/1993	ROM	y	y			y	y	2x	y	y	y
308	DEU271	GR 5623	*Lolium perenne*	130	07/20/1993	ROM	y	y			y	y	2x	y	y	y
309	DEU271	GR 5625	*Lolium perenne*	120	07/20/1993	ROM	y	y	y	y	y	y	2x	y	y	y
310	DEU271	GR 5626	*Lolium perenne*	100	07/20/1993	ROM	y	y			y	y	2x	y	y	y
311	DEU271	GR 5627	*Lolium perenne*	120	07/20/1993	ROM	y	y	y		y	y	2x	y	y	y
312	DEU271	GR 5628	*Lolium perenne*	130	07/20/1993	ROM	y	y	y	y	y	y	2x	y	y	y
313	DEU271	GR 5629	*Lolium perenne*	130	07/23/1993	ROM	y	y	y		y	y	2x	y	y	y
314	DEU271	GR 5631	*Lolium perenne*	120	07/25/1993	ROM	y	y	y	y	y	y	2x	y	y	y
315	DEU271	GR 5838	*Lolium perenne*	120	1993	POL	y	y	y	y	y	y	2x	y	y	y
316	DEU271	GR 5841	*Lolium perenne*	100	1993	POL	y	y			y	y	2x	y	y	y
317	DEU271	GR 5847	*Lolium perenne*	120	1993	POL	y	y	y		y	y	2x	y	y	y
318	DEU271	GR 5850	*Lolium perenne*	100	1993	POL	y	y			y	y	2x	y	y	y

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319	DEU271	GR 5852	*Lolium perenne*	120	1993	POL	y	y			y	y	2x	y	y	y
320	DEU271	GR 5862	*Lolium perenne*	120	1993	POL	y	y	y	y	y	y	2x	y	y	y
321	DEU271	GR 5866	*Lolium perenne*	120	1993	POL	y	y			y	y	2x	y	y	y
322	DEU271	GR 5868	*Lolium perenne*	120	1993	POL	y	y	y		y	y	2x	y	y	y
323	DEU271	GR 5870	*Lolium perenne*	130	1993	POL	y	y	y	y	y	y	2x	y	y	y
324	DEU271	GR 5871	*Lolium perenne*	120	1993	POL	y	y			y	y	2x	y	y	y
326	DEU271	GR 6306	*Lolium perenne*	120	09/23/1997	HRV	y	y			y	y	2x	y	y	y
327	DEU271	GR 6307	*Lolium perenne*	120	09/24/1997	HRV	y	y			y	y	2x	y	y	y
328	DEU271	GR 6309	*Lolium perenne*	130	09/25/1997	HRV	y	y	y	y	y	y	2x	y	y	y
329	DEU271	GR 6335	*Lolium perenne*	130	09/21/1997	HRV	y	y	y	y	y	y	2x	y	y	y
330	DEU271	GR 6339	*Lolium perenne*	130	09/20/1997	HRV	y	y	y	y	y	y	2x	y	y	y
333	DEU271	GR 6349	*Lolium perenne*	120	09/22/1997	HRV	y	y	y	y	y	y	2x	y	y	y
335	DEU271	GR 6368	*Lolium perenne*	130	07/18/1993	ROM	y	y			y	y	2x	y	y	y
336	DEU271	GR 6369	*Lolium perenne*	130	07/21/1993	ROM	y	y			y	y	2x	y	y	y
337	DEU271	GR 6370	*Lolium perenne*	120	07/20/1993	ROM	y	y	y	y	y	y	2x	y	y	y
338	DEU271	GR 6371	*Lolium perenne*	130	07/21/1993	ROM	y	y	y		y	y	2x	y	y	y
339	DEU271	GR 6380	*Lolium perenne*	130	09/19/1996	HRV	y	y	y	y	y	y	2x	y	y	y
340	DEU271	GR 6383	*Lolium perenne*	120	09/23/1996	HRV	y	y			y	y	2x	y	y	y
341	DEU271	GR 6384	*Lolium perenne*	120	09/23/1996	HRV	y	y	y	y	y	y	2x	y	y	y
343	DEU271	GR 6386	*Lolium perenne*	120	09/25/1996	HRV	y	y			y	y	2x	y	y	y
344	DEU271	GR 6389	*Lolium perenne*	130	09/26/1996	HRV	y	y			y	y	2x	y	y	y
345	DEU271	GR 6391	*Lolium perenne*	130	09/27/1996	HRV	y	y	y		y	y	2x	y	y	y
346	DEU271	GR 6394	*Lolium perenne*	130	09/29/1996	HRV	y	y	y	y	y	y	2x	y	y	y
347	DEU271	GR 6562	*Lolium perenne*	120	08/25/1998	BGR	y	c	y	y	y	y	2x	y	y	y
348	DEU271	GR 6568	*Lolium perenne*	130	08/27/1998	BGR	y	c	y		y	y	2x	y	y	y
349	DEU271	GR 6569	*Lolium perenne*	130	08/27/1998	BGR	y	c			y	y	2x	y	y	y
350	DEU271	GR 6578	*Lolium perenne*	130	08/28/1998	BGR	y	c	y		y	y	2x	y	y	y
351	DEU271	GR 6585	*Lolium perenne*	130	08/30/1998	BGR	y	c			y	y	2x	y	y	y
352	DEU271	GR 6587	*Lolium perenne*	120	08/30/1998	BGR	y	c	y	y	y	y	2x	y	y	y

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353	DEU271	GR 6590	*Lolium perenne*	130	08/31/1998	BGR	y	c	y		y	y	2x	y	y	y
354	DEU271	GR 6595	*Lolium perenne*	120	09/01/1998	BGR	y	c			y	y	2x	y	y	y
355	DEU271	GR 6598	*Lolium perenne*	130	09/01/1998	BGR	y	c	y	y	y	y	2x	y	y	y
356	DEU271	GR 6600	*Lolium perenne*	130	09/02/1998	BGR	y	c	y	y	y	y	2x	y	y	y
357	DEU271	GR 6608	*Lolium perenne*	130	09/06/1998	BGR	y	c			y	y	2x	y	y	y
358	DEU271	GR 6720	*Lolium perenne*	130	09/06/1998	BGR	y	c	y	y	y	y	2x	y	y	y
359	DEU271	GR 6724	*Lolium perenne*	130	09/06/1998	BGR	y	c			y	y	2x	y	y	y
360	DEU271	GR 6876	*Lolium perenne*	100	08/03/1999	ESP	y	y			y	y	2x	y	y	y
363	DEU271	GR 6911	*Lolium perenne*	100	07/28/1999	ESP	y	y	y	y	y	y	2x	y	y	y
364	DEU271	GR 6972	*Lolium perenne*	130	09/05/1998	BGR	y	c			y	y	2x	y	y	y
367	DEU271	GR 7004	*Lolium perenne*	120	08/05/1999	ESP	y	y	y	y	y	y	2x	y	y	y
368	DEU271	GR 7149	*Lolium perenne*	130	09/05/1998	BGR	y	c	y	y	y	y	2x	y	y	y
369	DEU271	GR 7393	*Lolium perenne*	100	07/23/1999	ESP	y	y	y	y	y	y	2x	y	y	y
370	DEU271	GR 7455	*Lolium perenne*	100	07/20/2001	FRA	y	y			y	y	2x	y	y	y
371	DEU271	GR 7456	*Lolium perenne*	100	07/22/2001	FRA	y	y			y	y	2x	y	y	y
372	DEU271	GR 7457	*Lolium perenne*	120	07/22/2001	FRA	y	y			y	y	2x	y	y	y
373	DEU271	GR 7459	*Lolium perenne*	130	07/23/2001	FRA	y	y	y	y	y	y	2x	y	y	y
374	DEU271	GR 7460	*Lolium perenne*	100	07/23/2001	FRA	y	y	y	y	y	y	2x	y	y	y
375	DEU271	GR 7462	*Lolium perenne*	100	07/26/2001	FRA	y	y	y	y	y	y	2x	y	y	y
376	DEU271	GR 7463	*Lolium perenne*	100	07/26/2001	FRA	y	y			y	y	2x	y	y	y
377	DEU271	GR 7464	*Lolium perenne*	130	07/27/2001	FRA	y	y	y	y	y	y	2x	y	y	y
378	DEU271	GR 7465	*Lolium perenne*	100	07/28/2001	FRA	y	y	y	y	y	y	2x	y	y	y
379	DEU271	GR 7528	*Lolium perenne*	100	NA	DEU	y	y			y	y	2x	y	y	y
380	DEU271	GR 7619	*Lolium perenne*	100	NA	DEU	y	y			y	y	2x	y	y	y
381	DEU271	GR 7638	*Lolium perenne*	100	NA	DEU	y	y			y	y	2x	y	y	y
382	DEU271	GR 7663	*Lolium perenne*	100	NA	DEU	y	y			y	y	2x	y	y	y
383	DEU271	GR 7696	*Lolium perenne*	100	NA	DEU	y	y			y	y	2x	y	y	y
384	DEU271	GR 7747	*Lolium perenne*	100	NA	DEU	y	y	y	y	y	y	2x	y	y	y
385	DEU271	GR 7780	*Lolium perenne*	100	NA	DEU	y	y			y	y	2x	y	y	y

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386	DEU271	GR 7788	*Lolium perenne*	100	NA	DEU	y	y	y		y	y	2x	y	y	y
387	DEU271	GR 7871	*Lolium perenne*	100	NA	DEU	y	y	y		y	y	2x	y	y	y
388	DEU271	GR 7898	*Lolium perenne*	100	NA	DEU	y	y			y	y	2x	y	y	y
389	DEU271	GR 7970	*Lolium perenne*	100	NA	DEU	y	y	y		y	y	2x	y	y	y
390	DEU271	GR 7991	*Lolium perenne*	100	NA	DEU	y	y	y	y	y	y	2x	y	y	y
391	DEU271	GR 7998	*Lolium perenne*	100	NA	DEU	y	y			y	y	2x	y	y	y
392	DEU271	GR 8155	*Lolium perenne*	100	NA	DEU	y	y			y	y	2x	y	y	y
393	DEU271	GR 8329	*Lolium perenne*	100	NA	DEU	y	y			y	y	2x	y	y	y
395	DEU271	GR 12038	*Lolium perenne*	130	07/27/2002	IRL	y	y	y	y	y	y	2x	y	y	y
397	DEU271	GR 12049	*Lolium perenne*	130	08/02/2002	IRL	y	y			y	y	2x	y	y	y
398	DEU271	GR 12050	*Lolium perenne*	130	08/03/2002	IRL	y	y	y		y	y	2x	y	y	y
399	DEU271	GR 12051	*Lolium perenne*	130	08/04/2002	IRL	y	y	y	y	y	y	2x	y	y	y
401	DEU271	GR 12054	*Lolium perenne*	130	08/05/2002	IRL	y	y			y	y	2x	y	y	y
403	DEU271	GR 12303	*Lolium perenne*	130	07/28/2002	IRL	y	y			y	y	2x	y	y	y
404	DEU271	GR 12311	*Lolium perenne*	130	07/29/2002	IRL	y	y	y		y	y	2x	y	y	y
405	DEU271	GR 12317	*Lolium perenne*	130	07/30/2002	IRL	y	y	y	y	y	y	2x	y	y	y
406	DEU271	GR 12319	*Lolium perenne*	100	07/31/2002	IRL	y	y			y	y	2x	y	y	y
407	DEU271	GR 12320	*Lolium perenne*	120	07/31/2002	IRL	y	y			y	y	2x	y	y	y
408	DEU271	GR 12324	*Lolium perenne*	130	08/01/2002	IRL	y	y	y	y	y	y	2x	y	y	y
409	DEU271	GR 12327	*Lolium perenne*	120	08/03/2002	IRL	y	y			y	y	2x	y	y	y
411	GBR016	ABY-Ba 8318	*Lolium perenne*	100	08/06/1963	TUR	y		y	y	y	y	2x	y	y	y
412	GBR016	ABY-Ba 8591	*Lolium perenne*	120	01/01/1967	ITA	y		y	y	y	y	2x	y	y	y
413	GBR016	ABY-Ba 8593	*Lolium perenne*	120	01/01/1967	ITA	y				y	y	2x	y	y	y
414	GBR016	ABY-Ba 8617	*Lolium perenne*	120	01/01/1967	ITA	y		y	y	y	y	2x	y	y	y
415	GBR016	ABY-Ba 9123	*Lolium perenne*	100	08/26/1971	TUR	y		y	y	y	y	2x	y	y	y
416	GBR016	ABY-Ba 9126	*Lolium perenne*	100	08/29/1971	TUR	y		y	y	y	y	2x	y	y	y
418	GBR016	ABY-Ba 9792	*Lolium perenne*	100	08/23/1979	GBR	y		y	y	y	y	2x	y	y	y
419	GBR016	ABY-Ba 9799	*Lolium perenne*	120	10/15/1979	GBR	y				y	y	2x	y	y	y
420	GBR016	ABY-Ba 9800	*Lolium perenne*	120	10/15/1979	GBR	y				y	y	2x	y	y	y

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421	GBR016	ABY-Ba 9805	*Lolium perenne*	120	10/16/1979	GBR	y				y	y	2x	y	y	y
422	GBR016	ABY-Ba 9813	*Lolium perenne*	120	10/19/1979	GBR	y				y	y	2x	y	y	y
423	GBR016	ABY-Ba 9814	*Lolium perenne*	120	10/24/1979	GBR	y				y	y	2x	y	y	y
424	GBR016	ABY-Ba 9817	*Lolium perenne*	120	10/25/1979	GBR	y				y	y	2x	y	y	y
425	GBR016	ABY-Ba 9834	*Lolium perenne*	100	11/16/1979	GBR	y				y	y	2x	y	y	y
426	GBR016	ABY-Ba 9835	*Lolium perenne*	120	11/16/1979	GBR	y		y		y	y	2x	y	y	y
427	GBR016	ABY-Ba 9999	*Lolium perenne*	120	01/01/1976	GBR	y				y	y	2x	y	y	y
428	GBR016	ABY-Ba 10008	*Lolium perenne*	120	01/01/1977	GBR	y		y	y	y	y	2x	y	y	y
429	GBR016	ABY-Ba 10011	*Lolium perenne*	120	01/01/1977	GBR	y		y		y	y	2x	y	y	y
430	GBR016	ABY-Ba 10016	*Lolium perenne*	120	01/01/1977	GBR	y		y		y	y	2x	y	y	y
432	GBR016	ABY-Ba 10103	*Lolium perenne*	120	08/15/1981	NOR	y		y	y	y	y	2x	y	y	y
433	GBR016	ABY-Ba 10112	*Lolium perenne*	120	01/01/1982	NOR	y		y		y	y	2x	y	y	y
434	GBR016	ABY-Ba 10113	*Lolium perenne*	120	08/18/1981	NOR	y		y	y	y	y	2x	y	y	y
436	GBR016	ABY-Ba 10127	*Lolium perenne*	120	08/20/1981	IRL	y				y	y	2x	y	y	y
437	GBR016	ABY-Ba 10129	*Lolium perenne*	120	08/21/1981	IRL	y				y	y	2x	y	y	y
441	GBR016	ABY-Ba 11138	*Lolium perenne*	120	09/29/1987	GBR	y		y		y	y	2x	y	y	y
442	GBR016	ABY-Ba 11154	*Lolium perenne*	120	10/03/1987	GBR	y		y	y	y	y	2x	y	y	y
443	GBR016	ABY-Ba 11158	*Lolium perenne*	120	10/03/1987	GBR	y				y	y	2x	y	y	y
444	GBR016	ABY-Ba 11418	*Lolium perenne*	100	08/30/1990	POL	y		y	y	y	y	2x	y	y	y
445	GBR016	ABY-Ba 11427	*Lolium perenne*	120	08/25/1990	POL	y				y	y	2x	y	y	y
446	GBR016	ABY-Ba 11428	*Lolium perenne*	120	08/25/1990	POL	y		y		y	y	2x	y	y	y
447	GBR016	ABY-Ba 11435	*Lolium perenne*	120	08/28/1990	POL	y		y	y		y	2x	y	y	y
448	GBR016	ABY-Ba 11449	*Lolium perenne*	120	09/03/1990	POL	y				y	y	2x	y	y	y
449	GBR016	ABY-Ba 11887	*Lolium perenne*	120	08/18/1992	SVK	y		y	y	y	y	2x	y	y	y
450	GBR016	ABY-Ba 11923	*Lolium perenne*	100	NA	ITA	y		y	y	y	y	2x	y	y	y
451	GBR016	ABY-Ba 11924	*Lolium perenne*	100	NA	ITA	y		y	y	y	y	2x	y	y	y
452	GBR016	ABY-Ba 11925	*Lolium perenne*	100	NA	ITA	y				y	y	2x	y	y	y
453	GBR016	ABY-Ba 11934	*Lolium perenne*	100	NA	FRA	y		y	y	y	y	2x	y	y	y
454	GBR016	ABY-Ba 11937	*Lolium perenne*	100	NA	FRA	y		y	y	y	y	2x	y	y	y

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455	GBR016	ABY-Ba 12960	*Lolium perenne*	100	07/27/1983	GRC	y		y	y	y	y	2x	y	y	y
456	GBR016	ABY-Ba 13104	*Lolium perenne*	100	05/10/1995	PRT	y		y	y	y	y	2x	y	y	y
458	GBR016	ABY-Ba 13445	*Lolium perenne*	100	09/02/1998	ITA	y				y	y	2x	y	y	y
459	GBR016	ABY-Ba 13463	*Lolium perenne*	100	09/08/1998	ITA	y				y	y	2x	y	y	y
460	GBR016	ABY-Ba 13705	*Lolium perenne*	120	05/23/2001	ESP	y				y	y	2x	y	y	y
461	GBR016	ABY-Ba 13709	*Lolium perenne*	100	05/24/2001	ESP	y		y		y	y	2x	y	y	y
462	GBR016	ABY-Ba 13718	*Lolium perenne*	120	05/26/2001	ESP	y				y	y	2x	y	y	y
463	GBR016	ABY-Ba 13723	*Lolium perenne*	120	05/27/2001	ESP	y		y	y	y	y	2x	y	y	y
464	GBR016	ABY-Ba 13724	*Lolium perenne*	100	05/27/2001	ESP	y				y	y	2x	y	y	y
465	GBR016	ABY-Ba 13736	*Lolium perenne*	120	05/30/2001	ESP	y				y	y	2x	y	y	y
466	CZE082	14G2000326	*Lolium perenne*	100	09/20/1991	CSK	y				y		2x	y	y	
473	GBR016	ABY-Ba 10802	*Lolium perenne*	120	05/02/1984	GBR	y		y	y	y	y	2x	y	y	y
474	GBR016	ABY-Ba 10111	*Lolium perenne*	120	08/17/1981	NOR	y				y	y	2x	y	y	y
475	GBR016	ABY-Ba 10148	*Lolium perenne*	120	08/26/1981	IRL	y		y	y	y	y	2x	y	y	y
476	GBR016	ABY-Ba 10178	*Lolium perenne*	120	09/01/1981	IRL	y		y		y	y	2x	y	y	y
477	GBR016	ABY-Ba 10958	*Lolium perenne*	120	08/22/1986	GBR	y		y	y	y	y	2x	y	y	y
478	GBR016	ABY-Ba 10997	*Lolium perenne*	120	09/19/1986	AUT	y		y	y	y	y	2x	y	y	y
479	GBR016	ABY-Ba 11001	*Lolium perenne*	120	09/23/1986	DEU	y				y	y	2x	y	y	y
480	GBR016	ABY-Ba 11004	*Lolium perenne*	120	09/24/1986	DEU	y		y		y	y	2x	y	y	y
481	GBR016	ABY-Ba 11011	*Lolium perenne*	120	09/26/1986	DEU	y				y	y	2x	y	y	y
482	GBR016	ABY-Ba 11310	*Lolium perenne*	100	08/01/1988	HUN	y		y	y	y	y	2x	y	y	y
483	GBR016	ABY-Ba 11311	*Lolium perenne*	100	08/01/1988	HUN	y		y	y	y	y	2x	y	y	y
484	GBR016	ABY-Ba 11417	*Lolium perenne*	100	08/26/1990	POL	y		y	y	y	y	2x	y	y	y
485	GBR016	ABY-Ba 12143	*Lolium perenne*	120	04/23/1994	GBR	y		y	y	y	y	2x	y	y	y
486	GBR016	ABY-Ba 13102	*Lolium perenne*	120	05/09/1995	PRT	y		y	y	y	y	2x	y	y	y
487	GBR016	ABY-Ba 13220	*Lolium perenne*	120	08/21/1996	GBR	y				y	y	2x	y	y	y
488	GBR016	ABY-Ba 13242	*Lolium perenne*	100	09/17/1996	GBR	y		y	y	y	y	2x	y	y	y
490	GBR016	ABY-Ba 13449	*Lolium perenne*	120	09/03/1998	ITA	y		y		y	y	2x	y	y	y
491	GBR016	ABY-Ba 13452	*Lolium perenne*	100	09/06/1998	ITA	y		y	y	y	y	2x	y	y	y

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493	GBR016	ABY-Ba 13696	*Lolium perenne*	120	05/21/2001	ESP	y		y	y	y	y	2x	y	y	y
494	GBR016	ABY-Ba 13853	L. multiflorum	120	05/26/2003	ESP	y				y	y	2x	y		
495	GBR016	ABY-Ba 13858	*Lolium perenne*	100	05/28/2003	ESP	y		y	y	y	y	2x	y	y	y
496	GBR016	ABY-Ba 13873	*Lolium perenne*	120	05/31/2003	ESP	y		y	y	y	y	2x	y	y	y
499	GBR016	ABY-Ba 13888	*Lolium perenne*	100	06/05/2003	ESP	y				y	y	2x	y	y	y
500	GBR016	ABY-Ba 13892	*Lolium perenne*	100	06/06/2003	ESP	y		y	y	y	y	2x	y	y	y
502	GBR016	ABY-Ba 14052	*Lolium perenne*	100	06/30/2005	GBR	y		y		y	y	2x	y	y	y
504	GBR016	ABY-Ba 9072	*Lolium perenne*	120	08/22/1971	LUX	y				y	y	2x	y	y	y
505	GBR016	ABY-Ba 9095	*Lolium perenne*	120	08/28/1971	CHE	y		y	y	y	y	2x	y	y	y
507	GBR016	ABY-Ba 9135	*Lolium perenne*	100	09/02/1971	TUR	y		y	y	y	y	2x	y	y	y
508	GBR016	ABY-Ba 9136	*Lolium perenne*	100	09/03/1971	TUR	y		y		y	y	2x	y	y	y
509	GBR016	ABY-Ba 9150	*Lolium perenne*	120	09/08/1971	TUR	y		y	y	y	y	2x	y	y	y
510	GBR016	ABY-Ba 9996	*Lolium perenne*	120	01/01/1976	GBR	y		y		y	y	2x	y	y	y
512	SVN019	SRGB09138	L. multiflorum	100	08/15/1994	SVN					y	y	2x	y		
532	DEU271	GR 11870	*L. temulentum*	100	06/10/1980	ITA	y	y			y	y	NA	y		
536	DEU271	GR 11916	*Lolium rigidum*	100	11/26/1995	ITA	y	y			y	y	2x	y		
537	DEU271	GR 12128	*Festuca pratensis*	100	07/25/2002	IRL	y	y			y	y	2x	y		
539	DEU271	GR 3585	*L. temulentum*	100	05/21/1942	GRC	y	y			y	y	NA	y		
540	DEU271	GR 5449	*L. multiflorum*	100	1976	POL	y	y			y	y	2x	y		
542	DEU271	GR 6064	*Festuca pratensis*	100	09/01/1995	DEU	y	y			y	y	2x	y		
543	DEU271	GR 6558	*Lolium rigidum*	100	09/01/1998	BGR	y	c			y	y	2x	y		
544	DEU271	GR 6929	*L. multiflorum*	100	08/01/1999	ESP	y	y			y	y	2x	y		
545	DEU271	GR 6938	*L. multiflorum*	100	08/01/1999	ESP	y	y			y	y	2x	y		
546	DEU271	GR 8486	*Lolium perenne*	100	NA	TUR	y	c	y	y	y	y	2x	y	y	y
547	DEU271	GR 8494	*Lolium perenne*	100	NA	TUR	y	c	y	y	y	y	2x	y	y	y
548	DEU271	GR 8504	*Lolium perenne*	100	NA	GRC	y	c	y	y	y	y	2x	y	y	y
549	DEU271	GR 8524	*Lolium perenne*	100	NA	GRC	y	c	y	y	y	y	2x	y	y	y
550	DEU271	GR 8531	*Lolium perenne*	100	NA	TUR	y	c	y	y	y	y	2x	y	y	y
551	DEU271	GR 8543	*Lolium perenne*	100	NA	TUR	y	c	y	y	y	y	2x	y	y	y

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552	DEU271	GR 8545	*Lolium perenne*	100	NA	GRC	y	c			y	y	2x	y	y	y
553	GBR016	ABY-Ba 11900	*Lolium perenne*	100	05/15/1992	GRC	y				y		2x	y	y	
554	GBR016	ABY-Ba 11902	*Lolium perenne*	100	10/19/1991	ITA	y				y		2x	y	y	
558	GBR016	ABY-Ba 13458	*Lolium perenne*	120	09/07/1998	ITA	y				y		2x	y	y	
559	GBR016	ABY-Ba 13470	*Lolium perenne*	100	09/09/1998	ITA	y						NA	y	y	
560	GBR016	ABY-Ba 8590	*Lolium perenne*	120	07/19/1967	ITA	y				y		2x	y	y	
561	GBR016	ABY-Ba 8622	*Lolium perenne*	120	01/01/1967	ITA	y				y		2x	y	y	
562	GBR016	ABY-Ba 9151	*Lolium perenne*	120	09/09/1971	TUR	y				y		2x	y	y	
580	DEU271 (GRIN)	PI 229702	*Lolium perenne*	100	NA	IRN	y	c					NA	y	y	
581	DEU271 (GRIN)	PI 229703	*Lolium perenne*	100	NA	IRN	y	c			y		2x	y	y	
582	DEU271 (GRIN)	PI 230260	*Lolium perenne*	100	NA	IRN	y	c			y		2x	y	y	
583	DEU271 (GRIN)	PI 249751	*Lolium perenne*	100	NA	GRC	y	c					NA	y	y	
585	DEU271 (GRIN)	PI 250969	*Lolium perenne*	100	NA	MNE	y	c			y		2x	y	y	
586	DEU271 (GRIN)	PI 251141	*Lolium perenne*	100	NA	MKD	y	c			y		2x	y	y	
587	DEU271 (GRIN)	PI 251142	*Lolium perenne*	100	NA	MKD	y	c					NA	y	y	
588	DEU271 (GRIN)	PI 254898	*Lolium perenne*	100	NA	IRQ	y	c					NA	y	y	
590	DEU271 (GRIN)	PI 418701	*Lolium perenne*	100	NA	SRB	y	c					NA	y	y	
592	DEU271 (GRIN)	PI 423137	*Lolium perenne*	100	NA	ESP	y	c			y		2x	y	y	
593	DEU271 (GRIN)	PI 440474	*Lolium perenne*	100	NA	NA	y	c					NA	y	y	
594	DEU271 (GRIN)	PI 440475	*Lolium perenne*	100	NA	RUS	y	c					NA	y	y	
598	DEU271 (GRIN)	PI 598512	*Lolium perenne*	100	NA	TUR	y	c			y		2x	y	y	
599	DEU271 (GRIN)	PI 598514	*Lolium perenne*	100	NA	TUR	y	c			y		2x	y	y	

(1) Entry nb	(2) Instcode	(3) Accenumb	(4) Taxon	(5) Samp stat	(6) colldate	(7) Origcty	(8) In EURISCO at end of activity	(9) In AEGIS at end of activity	(10) Large core collection	(11) Small core collection	(12) IPK Lemnatec platform	(13) Field trials (IPK, INRAE, ILVO)	(14) Ploidy control	(15) In Blanco-Pastor et al., 2019	(16) In Blanco-Pastor et al., 2021	(17) In Keep et al., 2020 & 2021
616	DEU271 (GRIN)	PI 610928	*Lolium perenne*	100	NA	ITA	y	c			y		2x	y	y	
617	DEU271 (GRIN)	PI 610929	*Lolium perenne*	100	NA	ITA	y	c			y		NA	y	y	
618	DEU271 (GRIN)	PI 610931	*Lolium perenne*	100	NA	ITA	y	c			y		2x	y	y	
619	DEU271 (GRIN)	PI 610932	*Lolium perenne*	100	NA	ITA	y	c			y		NA	y	y	
622	DEU271 (GRIN)	PI 610962	*Lolium perenne*	100	NA	ITA	y	c			y		NA	y	y	
623	DEU271 (GRIN)	PI 610965	*Lolium perenne*	100	NA	ITA	y	c			y		2x	y	y	
624	DEU271 (GRIN)	PI 611036	*Lolium perenne*	100	NA	RUS	y	c			y		2x	y	y	
625	DEU271 (GRIN)	PI 611044	*Lolium perenne*	100	NA	RUS	y	c					2x	y	y	
627	ITA394	LPP0007	*Lolium perenne*	100	NA	ITA	y	y	y	y	y	y	2x	y	y	y
628	ITA394	LPP0011	*Lolium perenne*	100	NA	ITA	y	y	y	y	y	y	2x	y	y	y
629	ITA394	LPP0009	*Lolium perenne*	100	NA	ITA	y	y	y	y	y	y	2x	y	y	y
630	ITA394	LPP0114	*Lolium perenne*	100	NA	ITA					y	y	2x	y	y	y
631	ITA394	LPP0032	*Lolium perenne*	100	NA	ITA	y	y	y	y	y	y	2x	y	y	y
632	ITA394	LPP0005	*Lolium perenne*	100	NA	ITA	y	y			y	y	2x	y	y	y

Column 1 is the entry number assigned to accessions in the *GrassLandscape* project.

Columns 2, 3, 5, 6 and 7 are descriptors included in the FAO/Bioversity Multi-crop passport descriptors (MCPD V2.1) list released in December 2015.

Column 8: e - accessions expected (but not confirmed) to be soon registered in EURISCO, y - accessions registered in EURISCO at the end of the Activity.

Column 9: c - accessions confirmed to be soon flagged as AEGIS, e - accessions expected (but not confirmed) to be soon flagged as AEGIS, y - accessions flagged as AEGIS at the end of the Activity.

Column 10: Accessions included in the large core collection set up by the Activity.

Column 11: Accessions included in the small core collection set up by the Activity.

Column 12: Accessions included in a high throughput phenotyping assay at IPK in 2015.

Column 13: Accessions included in a field trial evaluation at three locations from 2015 to 2018 (IPK, ILVO) or 2019 (INRAE).

Column 14: Control of ploidy level, 2x - diploid, NA - not controlled.

Column 15: Accessions included in the study of Blanco-Pastor et al. (2019), Journal of Biogeography (46), 1451-1465. , doi: 10.1111/jbi.13587.

Column 16: Accessions included in the study of Blanco-Pastor et al. (2021), Molecular Ecology Resources, 21, 849–870, doi: 10.1111/1755-0998.13289.

Column (17): Accessions included in the studies of Keep et al. (2020), Genes|Genomes|Genetics, doi:10.1534/g3.120.401491 and Keep et al. (2021), Functional Ecology, 35, 1145–1158, doi: 10.1111/1365-2435.13770

Table 4.2 List of *L. perenne* cultivars included in the *Grasslandscape* project for which C&E data have been uploaded to the EURISCO forage crop portal

(1) Entry nb	(2) Instcode	(3) Accenumb	(4) Taxon	(5) Sampstat	(6) Cultivar name	(7) Origcty	(8) In EURISCO	(9) IPK Lemnatec platform	(10) Field trials (IPK, INRAE, ILVO)	(11) Ploidy control	(12) In Blanco-Pastor et al., 2019	(13) In Blanco-Pastor et al., 2021	(14) In Keep et al., 2020 & 2021
568	FRA001	6034	*Lolium perenne*	500	Clerpin	FRA	y	y	y	2x	y		y
569	DEU271	GR 12182	*Lolium perenne*	500	Lipresso	DEU	y	y	y	2x	y		y
570	DEU271	GR 3236	*Lolium perenne*	500	Vigor	DEU	y	y	y	2x	y		y
571	DEU271	GR 2767	*Lolium perenne*	500	Fennema	DEU	y	y	y	2x	y		y
572	DEU271	GR 5279	*Lolium perenne*	500	Aurora	DEU	y	y	y	2x	y		y
573	GBR016	ABY-Ba 14090	*Lolium perenne*	500	AberDart	GBR	y	y	y	2x	y		y
574	GBR016	ABY-Ba 14172	*Lolium perenne*	500	Premium	GBR	y	y	y	2x	y		y
575	GBR016	ABY-S503	*Lolium perenne*	500	AberAvon	GBR	y	y	y	2x	y		y
576	BEL094	ILVOLp1547	*Lolium perenne*	500	Merks	BEL	y	y	y	2x	y		y
577	BEL094	ILVOLp2167	*Lolium perenne*	1500	Meloni	BEL	y	y	y	2x	y		y

Column 1 is the entry number assigned to cultivars in the *GrassLandscape* project.

Columns 2, 3, 5 and 7 are descriptors included in the FAO/Bioversity Multi-crop passport descriptors (MCPD V2.1) list released in December 2015.

Column 9: Cultivars included in a high throughput phenotyping assay at IPK in 2015.

Column 10: Cultivars included in a field trial evaluation at three locations from 2015 to 2018 (IPK, ILVO) or 2019 (INRAE).

Column 11: Control of ploidy level, 2x - diploid.

Column 12: Cultivars included in the study of Blanco-Pastor et al. (2019), Journal of Biogeography (46), 1451-1465. , doi: 10.1111/jbi.13587

Column 13: Cultivars included in the study of Blanco-Pastor et al. (2021), Molecular Ecology Resources, 21, 849–870, doi: 10.1111/1755-0998.13289

Column 14: Cultivars included in the studies of Keep et al. (2020), Genes|Genomes|Genetics, doi:10.1534/g3.120.401491 and Keep et al. (2021), Functional Ecology, 35, 1145–1158, doi: 10.1111/1365-2435.13770