

Malus/Pyrus WG

Short summary



Composition of WGs

- We asked to enlarge the expertise of the WG members.
- Malus/Pyrus WG: 89 members

Genebank curators: 23

Plant breeders: 14

Policy and law: 9

Crop specialists: 39

Info/Doc specialist: 22

Other: 2

- Too large now!
- **Make an 'Hybrid' ? : 2 kind of members**
 - 1 country representative
 - Diversity of experts invited when appropriate
- **We need finer description of expertises**

Looking for sources of complementary fundings...



Fruit Breedomics
BRIDGING THE GAP BETWEEN GENOMICS
AND FRUIT BREEDING

**Molecular markers
as tools to manage
practical issues in
germplasm collections**

C.E. DUREL
INRA, Angers



Questions when curating a germplasm collection :

- Is my accession corresponding to the true genotype ? (TTT = « True To Type »)
- Is my accession unique or redundant within my collection or with other collections ?
- Are these 2 accessions related ?
- Are these 2 accessions genetically close or distant ?
- How representative of the genetic diversity is my collection ?
- Is my collection structured in subgroups ?

Background

- Different research groups using different sets of markers and different methods for characterisation of their collections
- Lack of common genotypes hampers comparisons
 - Even with well known cvs: HiDRAS (EU-project) identified > 5 different genotypes for the cultivar ‘Fuji’ amongst 10 partners

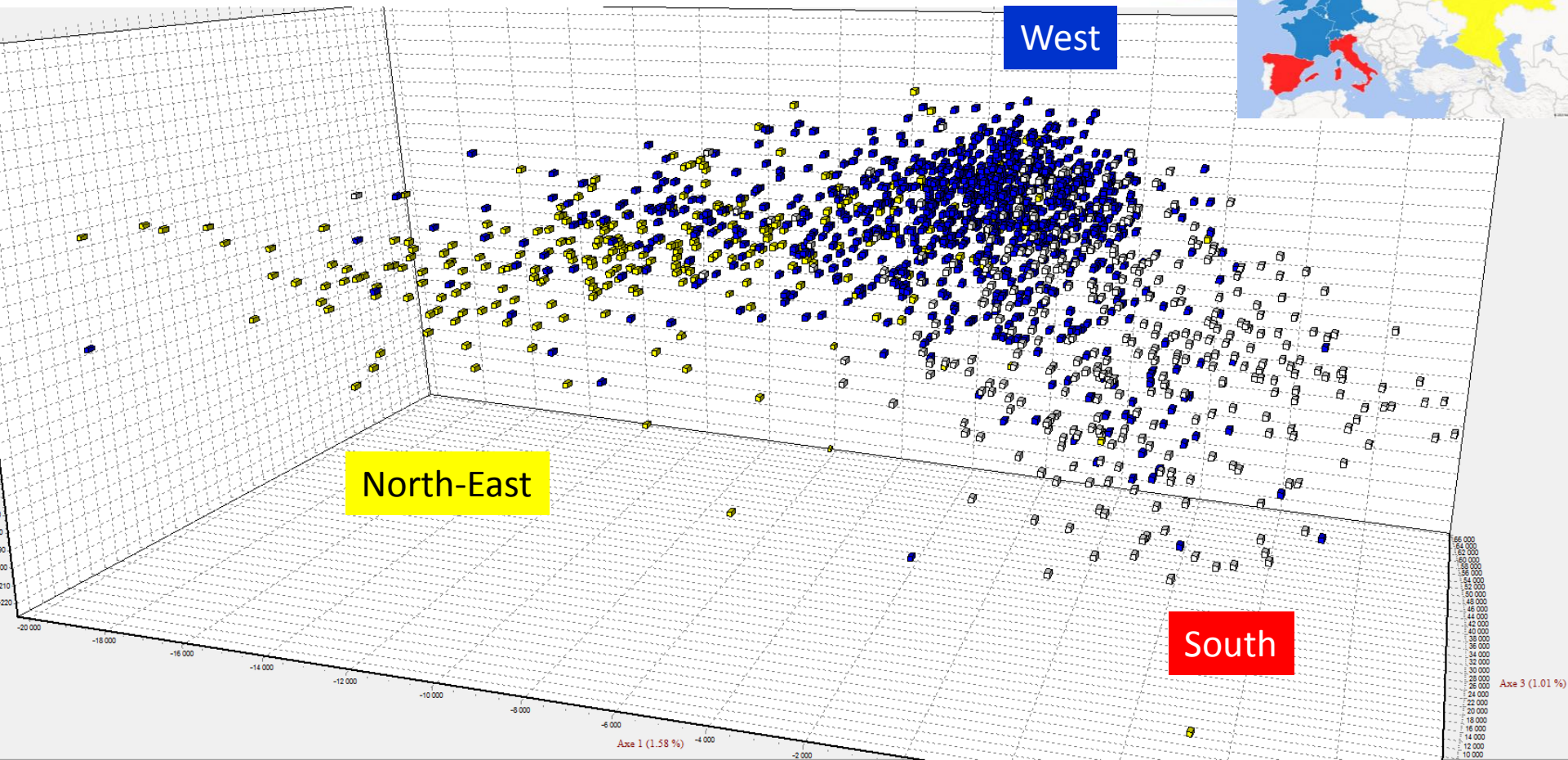
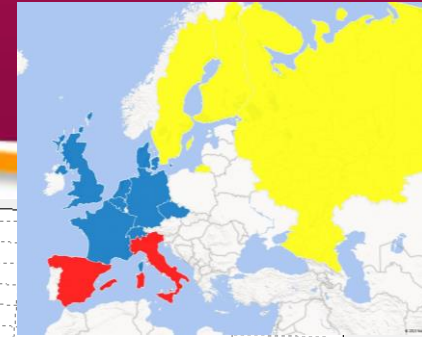


UK's example of duplicates identified



Is my collection structured in subgroups ?

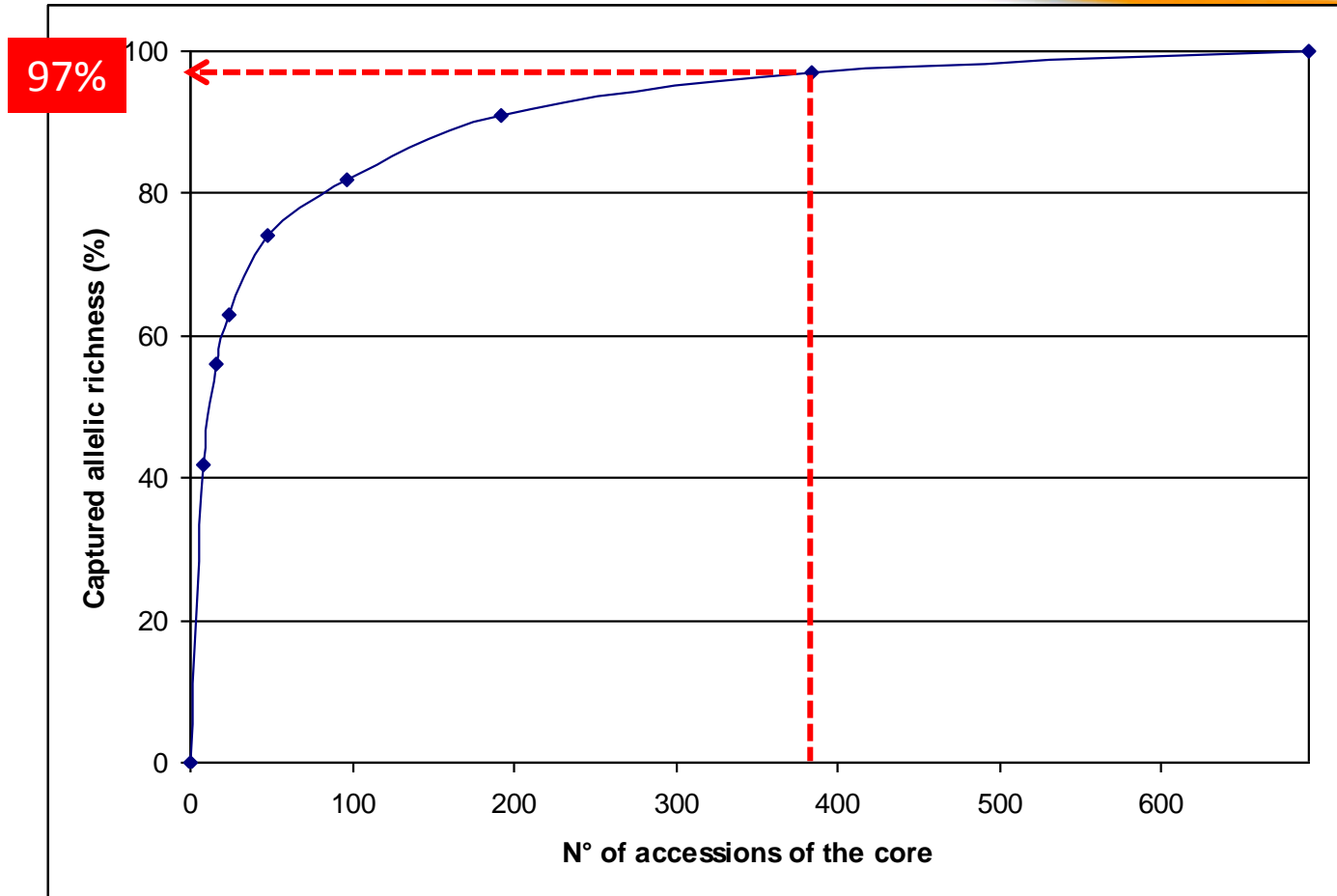
Faint structure in 3 European regions



(1550 diploid genotypes with known geographic origin)

Can I get a subset of cvrs representative of my (neutral) genetic diversity ?

Core collection



PomeFruitGenRes

Management and utilization of pome fruit genetic resources for sustainable horticulture and healthy food production

Call: Sustainable Food Security

Topic SFS-07b-2015: Management and sustainable use of genetic resources

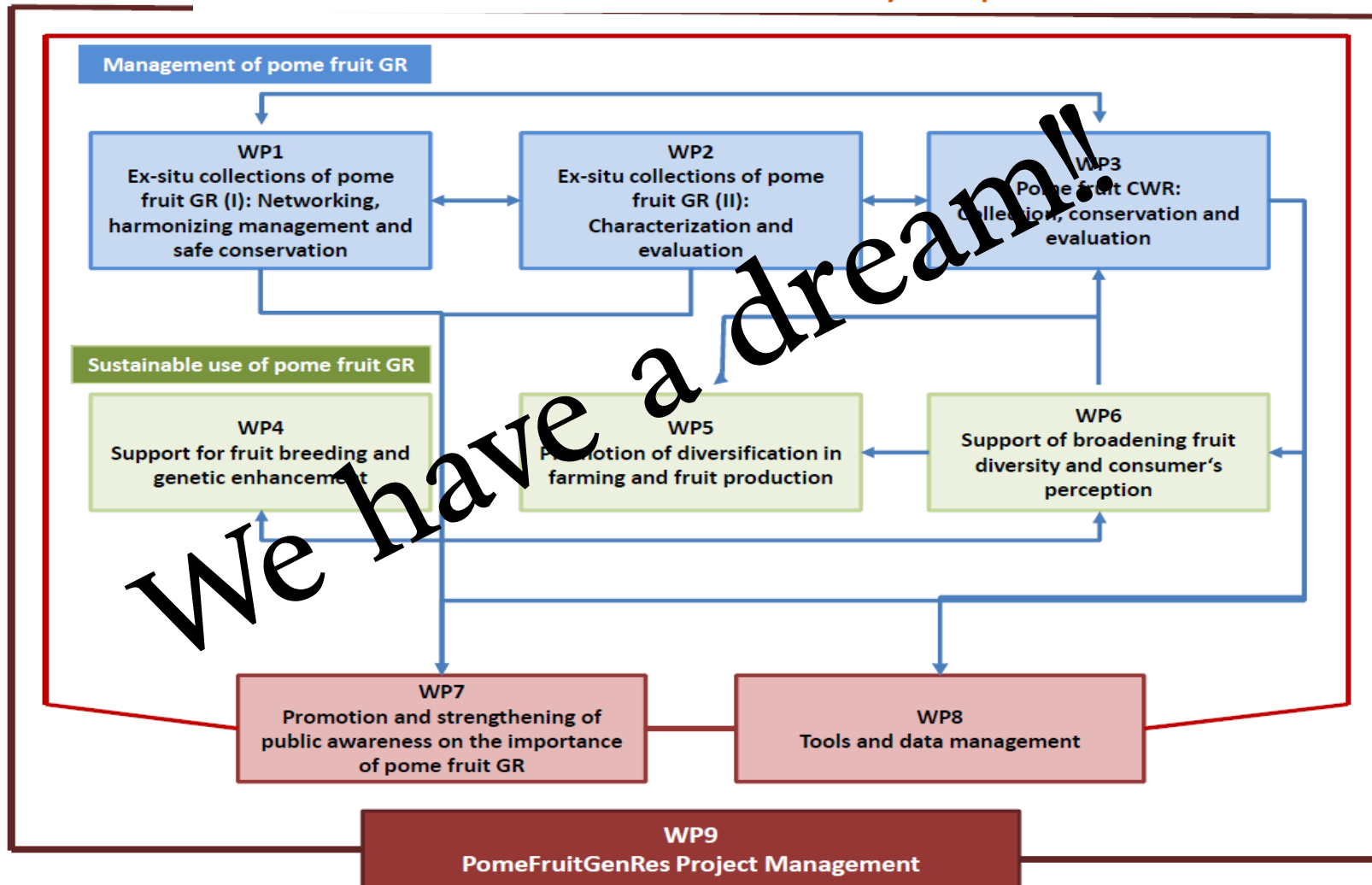
Research and Innovation actions

No	Short	Participant organisation name	Country
1*	JKI	Julius Kühn-Institut, Institute for Breeding Research on Fruit Crops	DE
2	UNIBO	University of Bologna	IT
3	SLU	The Swedish University of Agricultural Sciences, Department of Plant Breeding	SW
4	WINEFRUIT	Federal Education and Research Institute for Viticulture and Pomology	AU
5	IH-LRCAF	Lithuanian Research Centre for Agriculture and Forestry, Institute of Horticulture	LT
6	InHort	Research Institute of Horticulture Skierniewice	PO
7	Agroscope	Agroscope, Institute for Plant Production Sciences	CH
8	CRA-W	Walloon Agricultural Research Centre, Life Sciences Department	BE
9	NOFIMA	Norwegian Institute of Food Research, Division Food Science	NO
10	CReSO	Fruit Crops Research Agency of Piedmont	FR
11	RCL	Research Centre for Agriculture and Forestry Laimburg, South Tyrol	IT
12	FiBL	Research Institute of Organic Agriculture	CH

x18 = 30 Partners

PomeFruitGenRes

Management and utilization of pome fruit genetic resources for sustainable horticulture and healthy food production



Making use of EU fundings... 'Participatory Organic Breeding'



SUSTAINABLE FOOD SECURITY

Call: H2020, SFS-7-2016-2017

Call topic: SFS-7-2016-2017

Organic breeding – Increasing the competitiveness of the organic breeding and farming sectors

Title of Proposal

Sustainable Organic Fruits through Integrated Evaluation and participatory Breeding Approaches

Proposal acronym: SOFIBA

Grant Scheme

1) 'European collection of historical pears' - **EcoHisPy**

- 17 collections
- 140 pear accessions
- E & C priority data
- Standard model of user's friendly global description

Grant Scheme

1) 'European collection of historical pears' - EcoHisPy



Bronzée d'Enghien - BEL

Synonym: 'Bronzierte von Enghien' (LUC-etal1).

Origin: Old Belgian pear raised around 1830, first published by « Société Van Mons » but seems to be gained by M. Paternoster, small trader from the Enghien town in Wallony. Since 2015, this cultivar has been selected by the « Centre Wallon de Recherches Agronomiques » to be released for the nursery market under the label *RGF-Gb/x* - *CERTIFRUIT*.



Fruit description: Size medium to small in relation with tree yield (40-55 mm). Shape like an elongated drop. Skin thick*: green as ground color and nearly completely over coated by brown russet. Three to five fruits are very often hanging as a cluster*. Stalk quite long, thick, straight inserted in a quite wide shallow cavity*. Eye irregular, closed or half open, long converged sepals quite thick at base* in a medium to shallow cavity. Flesh quality medium fine to coarse, core surrounded by grit cells, good cooking fruit since half October to end November, becomes then juicy and melting with an acidic and very light astringent taste up to January. Harvest period: late – mid-October.

Tree description: Vigor: good, easy tree to train in central leader or pyramid bushes; good compatibility with Quince for dwarfed bushes or espaliers and well adapted on seedling rootstocks for raising standard trees. Fertility: early in production and very good cropping trees. Pollination: flowering in medium season, very good pollinator.

Disease susceptibility: Hardy and robust cultivar, very low susceptible to scab on fruit, leaves and twigs.

Traditional uses and advices from own experiences: Good late autumn and early winter pear, very robust, quick and reliable fertility, well adapted in cold regions. Both used as good cooking pear during the first month after picking and later on as juicy rather acidic dessert pear. The cultivar has a very positive trait to be fairly not susceptible to fruit drop near harvest maturity period – even after leaves fall, majority of fruits stays hanging on the tree – therefore the cultivar was formerly often used in grazed standard tree orchards.



*= Typical distinguish trait for the cultivar.

Reference pomological description: VCAS, p.28 : Van Cauwenbergh E. (1948). Pomologie, Tome 3, Cours d'arboriculture fruitière, Pointes. Ecole d'Horticulture de l'Etat, Vilvorde, pp. 61.

Author: Marc LATEUR (Wallon Agricultural Research Centre-CRA-W)

Grant Scheme

1) 'European collection of historical pears' - EcoHisPy

- Use and limits in the use of SSR's

Nationality	sample number	sample name	accordance of the cultivar name
Latvia	099	Ecohispy_099_Vidzemes_Zala_Sviesta	Ecohispy_115_Krol_Sobieski
Norway	100	Ecohispy_100_Anna_	
Norway	101	Ecohispy_101_Bonke	
Norway	102	Ecohispy_102_Gronnes	
Norway	103	Ecohispy_103_Hyllapaere	
Norway	104	Ecohispy_104_Keiserinne	Cuisse Dame
Norway	105	Ecohispy_105_Nalum	
Norway	106	Ecohispy_106_Raud_Haustbergamott	
Norway	107	Ecohispy_107_Skansk_sukkerpare	Ecohispy_140_Skansk_Sockerparon
Poland	108	Ecohispy_108_Bara_Sucka	
Poland	109	Ecohispy_109_Bera_Biala	
Poland	110	Ecohispy_110_Bergamota	
Poland	111	Ecohispy_111_Bergamotka	
Poland	112	Ecohispy_112_Cytrynowka	
Poland	113	Ecohispy_113_Gnika	
Poland	114	Ecohispy_114_Hrabiego_Pomorskiego	
Poland	115	Ecohispy_115_Krol_Sobieski	Ecohispy_099_Vidzemes_Zala_Sviesta
Poland	116	Ecohispy_116_Krolewna	
Poland	117	Ecohispy_117_Ogoniara	Ulmer Butterbirne
Slovakia	118	Ecohispy_118_Dvorna_maslovka	Ecohispy_057_Pederstruppaere
Slovakia	119	Ecohispy_119_Krivica	Pero centenario
Slovakia	120	Ecohispy_120_Krvavka	
Slovakia	121	Ecohispy_121_Nagevicova	
Slovakia	122	Ecohispy_122_Ruzova	
Slovakia	123	Ecohispy_123_Smolienka	
Spain	124	Ecohispy_124_Abugo	
Spain	125	Ecohispy_125_Blanquilla	
Spain	126	Ecohispy_126_Castell	
Spain	127	Ecohispy_127_Ceremeno	
Spain	128	Ecohispy_128_Don_Guindo	Ecohispy_069_Basdouvaniko
Spain	129	Ecohispy_129_Flor_de_Invierno	
Spain	130	Ecohispy_130_Magallon	
Spain	131	Ecohispy_131_Roma	Ecohispy_090_Spina_Carpi

Grant Scheme

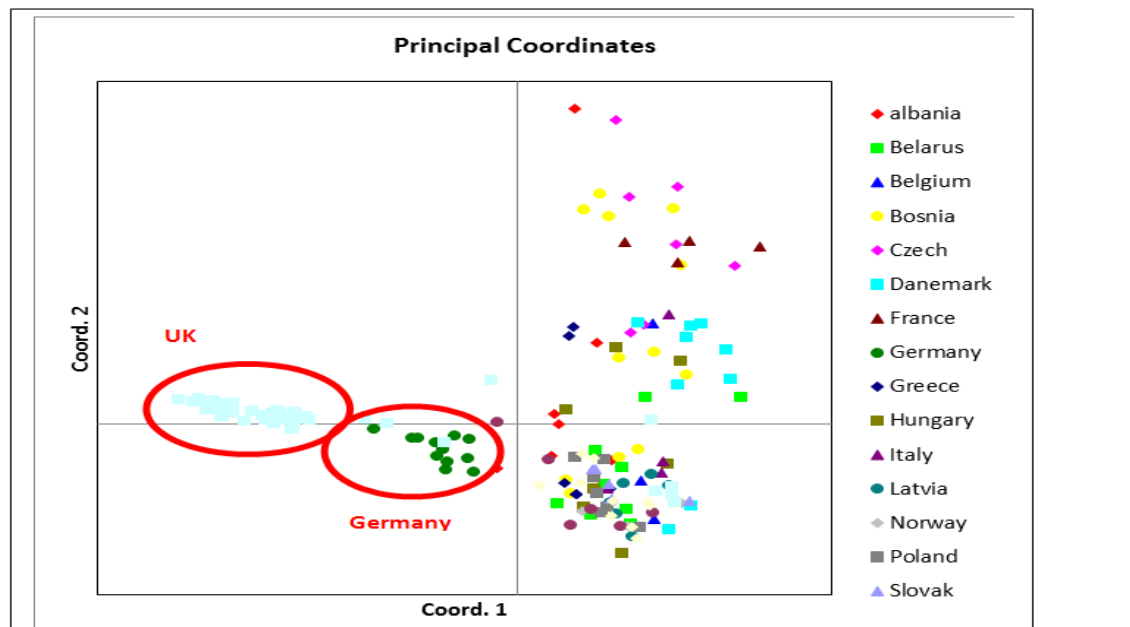
1) 'European collection of historical pears' - EcoHisPy

- Use and limits in the use of SSR's

3. Problems with merging data from different analyses

We tried to merge the Ecohispy data detailed above with data originating from a UK analysis (Brogdale) and from a German analysis.

A PCoA analysis conducted with GenAlEx, v 6.2 highlighted problems with the merging of the data (figure 3): the UK and German data formed two very distinct clusters and such a clustering is obviously not related to genetic differences.



Grant Scheme

2) Common ECPGR protocols and tools available for Characterisation & Evaluation of *Malus/Pyrus* genetic resources – **On going**

- 22 partners (many self-funded...)
- Objective 1: “**ECPGR Methods and descriptor lists for the Characterization and Evaluation of apple & pear genetic resources**” finalized, approved and widely disseminated through ECPGR and partners channels.

Grant Scheme

2) Common ECPGR protocols and tools available for Characterisation & Evaluation of *Malus/Pyrus* genetic resources – **On going**

- Objective 2:
 - **Harmonization and adjustment of SSR allele sizes over the various sources of data** (>5000 apple accessions and around 500 of pears); defining putative accession denomination errors, synonyms/homonyms situations and question marks.
 - Encoding all standardized apple & pear data ready to use for diffusion in EURISCO.

Some questions to share

- How to better make profit of the CCDB expertises – linked with EURISCO ?
- How to enhance the central place of EURISCO as a practical, user's friendly tool for both curators and users ?
- How to deal inside ECPGR with the issue of quarantine pest & diseases especially for vegetative propagated crops?