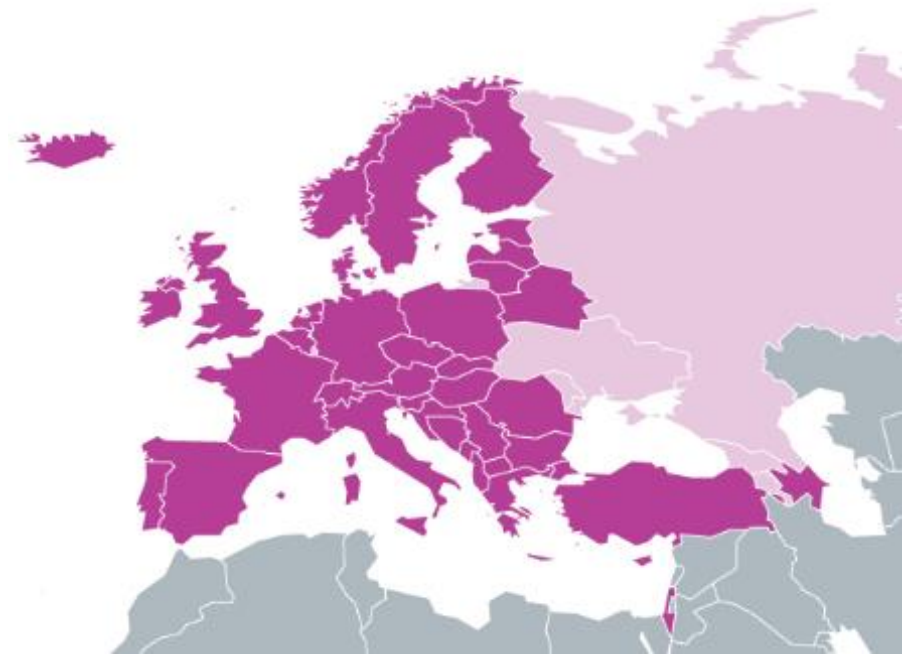


# Plant genetic resources conservation in Europe: the AEGIS Experience

Lorenzo Maggioni,  
Jan Engels, Elinor Lipman  
ECPGR Secretariat

ECPGR aims at conserving and facilitating the use of plant genetic diversity in Europe as a cooperative effort

- Countries
  - own the programme
  - contribute funds and implement activities
- Secretariat ensures coordination



- Countries participating in ECPGR Phase IX
- Countries invited to participate in ECPGR Phase IX

# ECPGR Long-term Goal

National, Sub-regional and Regional Programmes in Europe collaboratively, rationally and effectively conserve *ex situ* and *in situ* PGRFA, provide access and increase their utilization

# ECPGR – achievements (1980 – 2013)

- Working Group activities
- Collaborative projects
- EURISCO (European *ex situ* Internet catalogue)
- AEGIS (A European Genebank Integrated System)

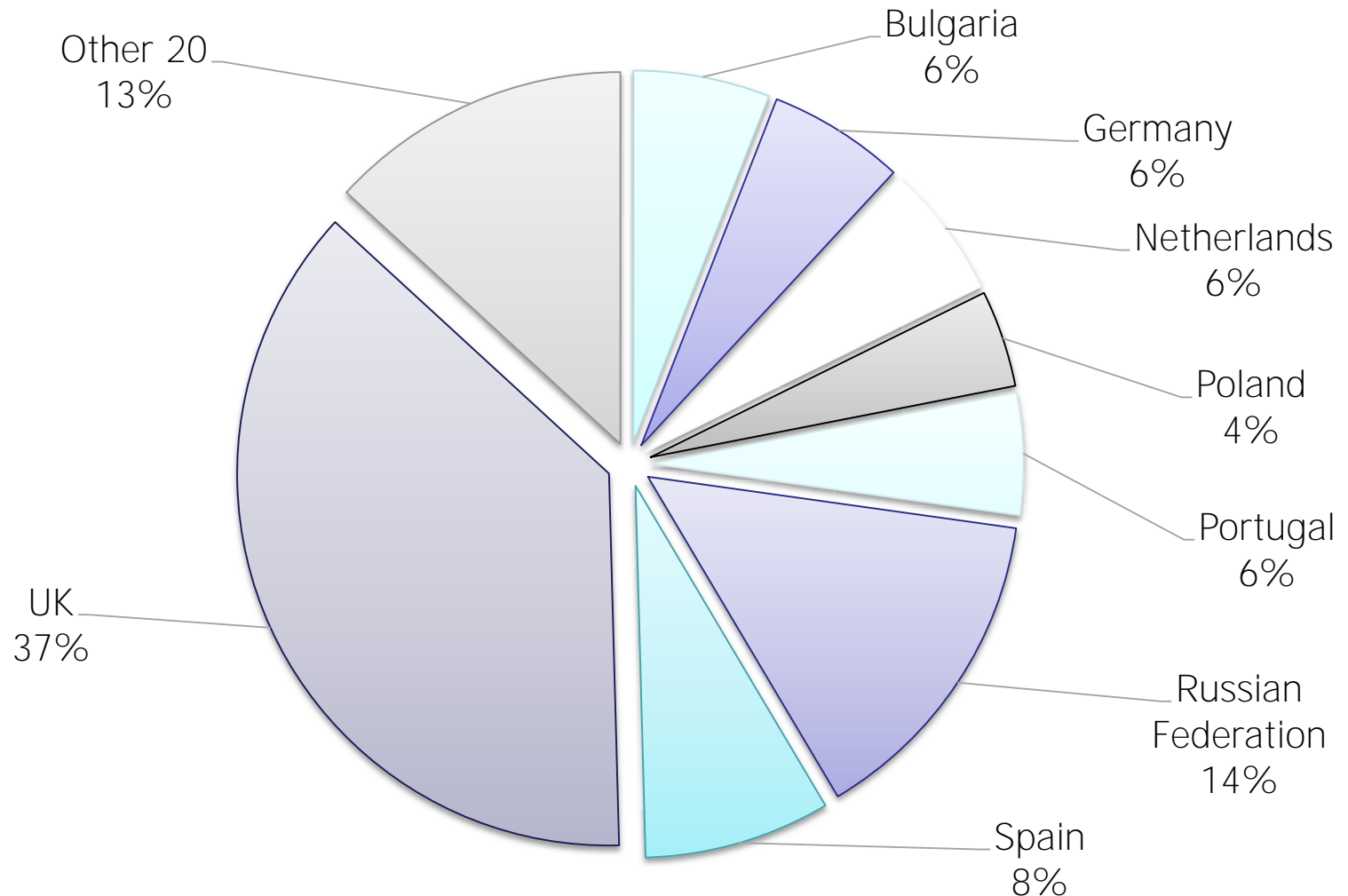


# Background – *Ex situ* conservation in Europe

- 600 germplasm collections/genebanks in Europe (WIEWS)
- > 1.7 million accessions (SOW II, 2010)
- 35-50% unique accessions
- Significant differences in quality of conservation
- Accessions for a given crop are distributed across several countries

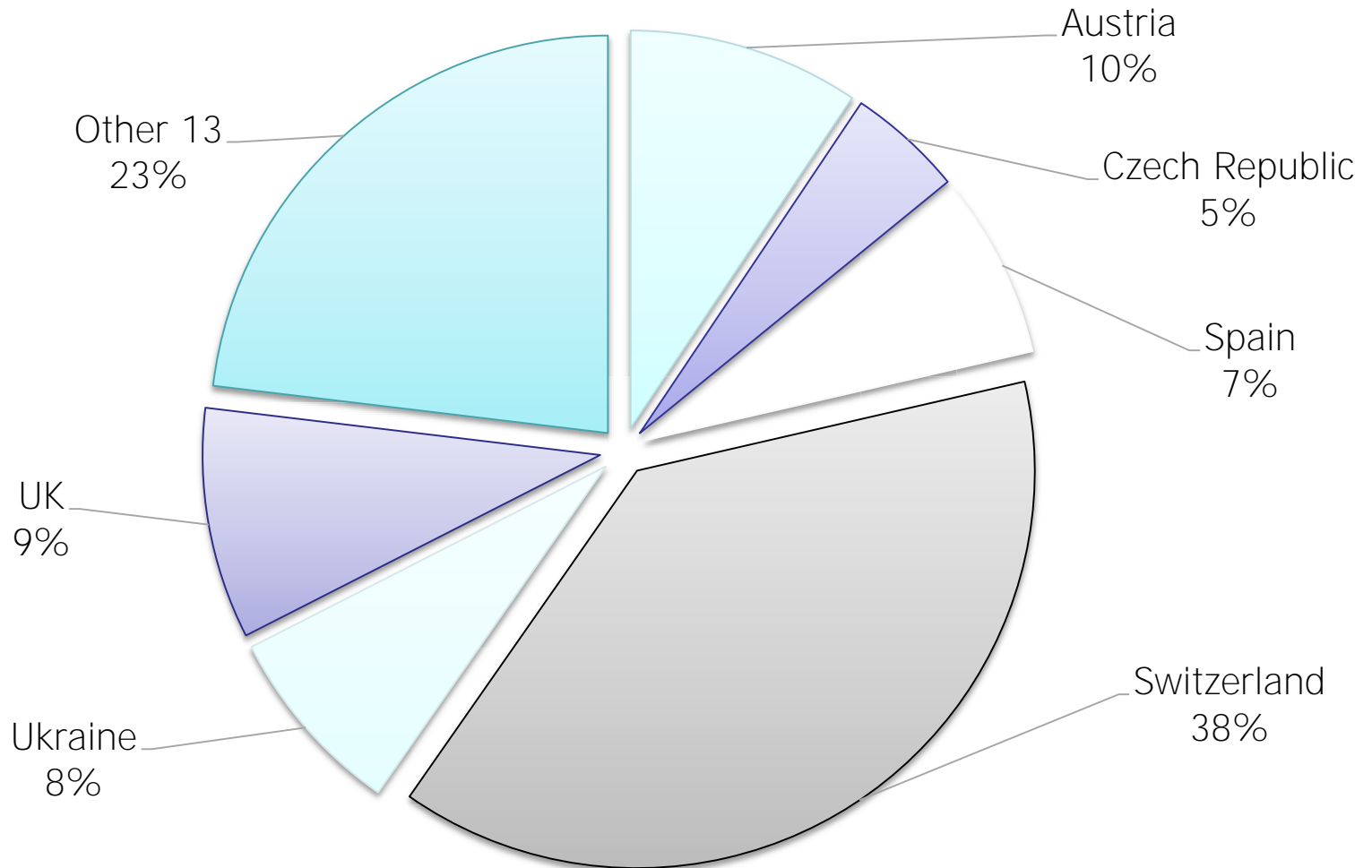
# Decentralized collections

12 000 *Brassica oleracea* accessions in Europe  
(source: EURISCO)



# Decentralized collections

23 000 *Malus domestica* accessions in Europe  
(source: EURISCO)



# Terms of access to germplasm

Annex I crops (35 food crops, incl. Wheat, Beans, Apple):

Standard Material Transfer Agreement of the  
International Treaty on PGRFA (Multilateral System)

Non-Annex I crops (e.g. Soybean, Tomato, Pear):

Bilateral arrangements as per Convention on Biodiversity



# Wild brassicas as sources of agronomic traits

	<b>Trait</b>	<b>Number of accessions</b>	<b>Available through SMTA</b>	<b>%</b>
<i>B. hilarionis</i>	Resistance to pod shattering	7	2	28 %
<i>B. incana</i>	Resistance to Verticillium wilt and white fly	373	7	2 %
<i>B. macrocarpa</i>	Resistance to pod shattering	70	12	17 %
<i>B. montana</i>	Resistance to white fly	118	14	12 %
<i>B. villosa</i>	Anti-oxidant glucosinolates, resistance to flea beetles and white fly	85	9	10 %

Sources: Happstadius et al. 2013; Maggioni et al. 2014; Mithen 2014; Mithen and Herron 1991; Palaniswamy and Bodnaryk 1981; Pelgrom et al. 2015; Vosman et al. 2015; Warwick 1993

# Importance of taxonomic identification

## Genus *Patellifolia*

- Source of resistance genes (beet cyst nematode) for sugar beet
- Ca. 60 accessions in European genebanks
- Taxonomy is still confused
- Need for reference material and certain identification to evaluate the distribution of genetic diversity



*Patellifolia procumbens* © Lothar Frese

# Regeneration



Variability of climatic  
conditions in Europe:

ideal to share tasks

*Brassica oleracea* subsp. *capitatoides* © L. Maggioni

# Quality standards: variability and cross-checking

## Seed regeneration

- Vector used for insect-pollinated, wild species
- FAO: no standard



Institute	Lettuce	Spinach
BGR-IPGR	not specified	
CZE-CRI	bees	
DEU-IPK	solitary bees, wild insects	
GBR-WGRU	no vector	
HUN-RCAT	no vector	
ISR-IGB	bees	
ISR-IOE		
NLD-CGN	flies	
SVN-KIS		



## AEGIS objective:

**Conserving** in a **collaborative way** and at **agreed quality standards**, the **genetically unique** and important accessions for Europe of **all crops** and making them **available** for breeding and research **through SMTAs**

# Key components of AEGIS

- MoU (Memorandum of Understanding)
- European Collection
- AQUAS (AEGIS Quality System)

# Network of services

Identify expertise across Europe and provision of services, such as:

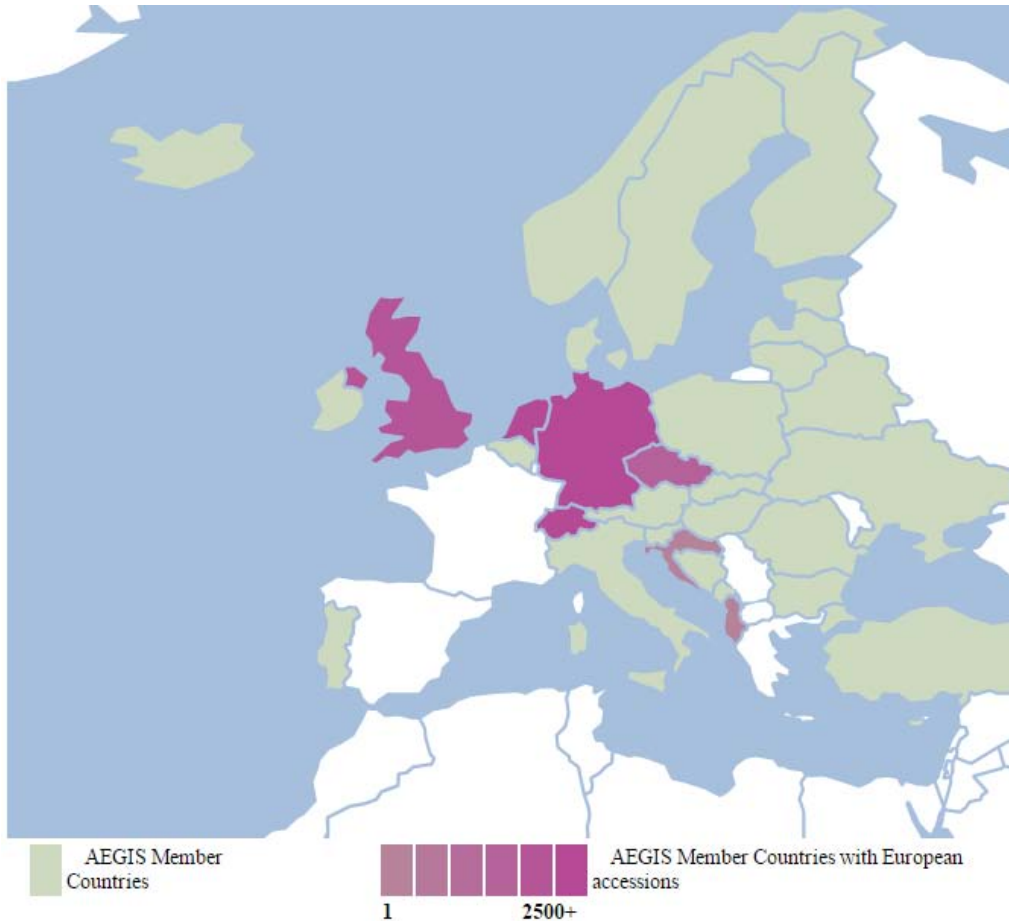
- Cryopreservation units
- Safety-duplication sites (e.g. national genebanks; Svalbard)
- Multiplication fields at different locations (environment!)
- Taxonomy expertise
- Sequencing facilities and bioinformatics
- Genotyping / Phenotyping facilities
- Documentation (i.e. EURISCO; Crop Portals)
- Capacity building





# The European Collection today

25 291 accessions



Germany: 7904

The Netherlands: 5862

Switzerland: 4838

UK: 1659

Czech Republic: 1222

Croatia: 90

Albania: 8

# Concluding remarks -1

- The AEGIS principles have been unanimously endorsed by the technical representatives (National Coordinators)
- Users (e.g. breeders) easily see the benefits and recommend implementation of the system
- At the Ministerial level, sometimes there is fear of increasing costs and long-term commitment
- Genebanks do not always perceive a benefit (increasing efficiency of the system requires local adjustments and investments)
- Progress is dependent on good coordination at national level of all the stakeholders

## Concluding remarks -2

Too early to say if AEGIS will be successful

- Hopefully progress will lead to:
    - **Better conservation (coverage, efficiency, quality, safety)**
    - **Better knowledge of the material (documentation system, characterization)**
    - **Better availability (policy, speed, quality)**
- = Better collaboration and sharing of responsibilities

Thank you  
for your attention!



*Brassica macrocarpa* © L. Maggioni