

# The Establishment of A European Genebank Integrated System

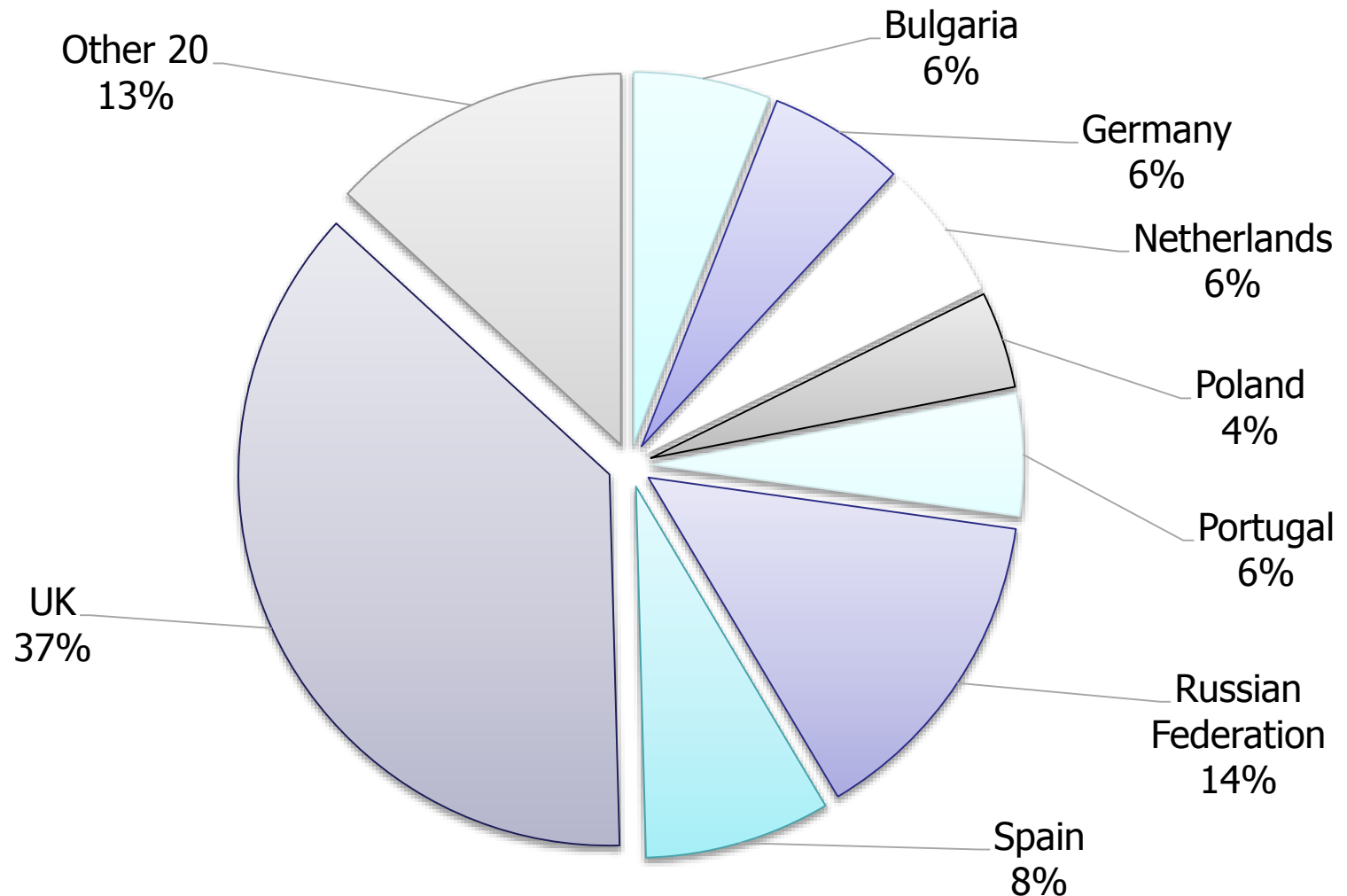
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# Background – *Ex situ* conservation in Europe

- 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

# Fragmented collections

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



# Terms of access to germplasm – variable by crop

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

# Access not always guaranteed

	Trait	Number of accessions	Available through SMTA	%
<i>B. hilarionis</i>	Resistance to pod shattering	7	2	28 %
<i>B. incana</i>	Resistance to <i>Verticillium</i> 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

# Opportunities for task sharing



Variability of climatic  
conditions in Europe:

ideal to share tasks

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



# Variable quality standards across genebanks

## 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		



*A European  
Genebank  
Integrated System*

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

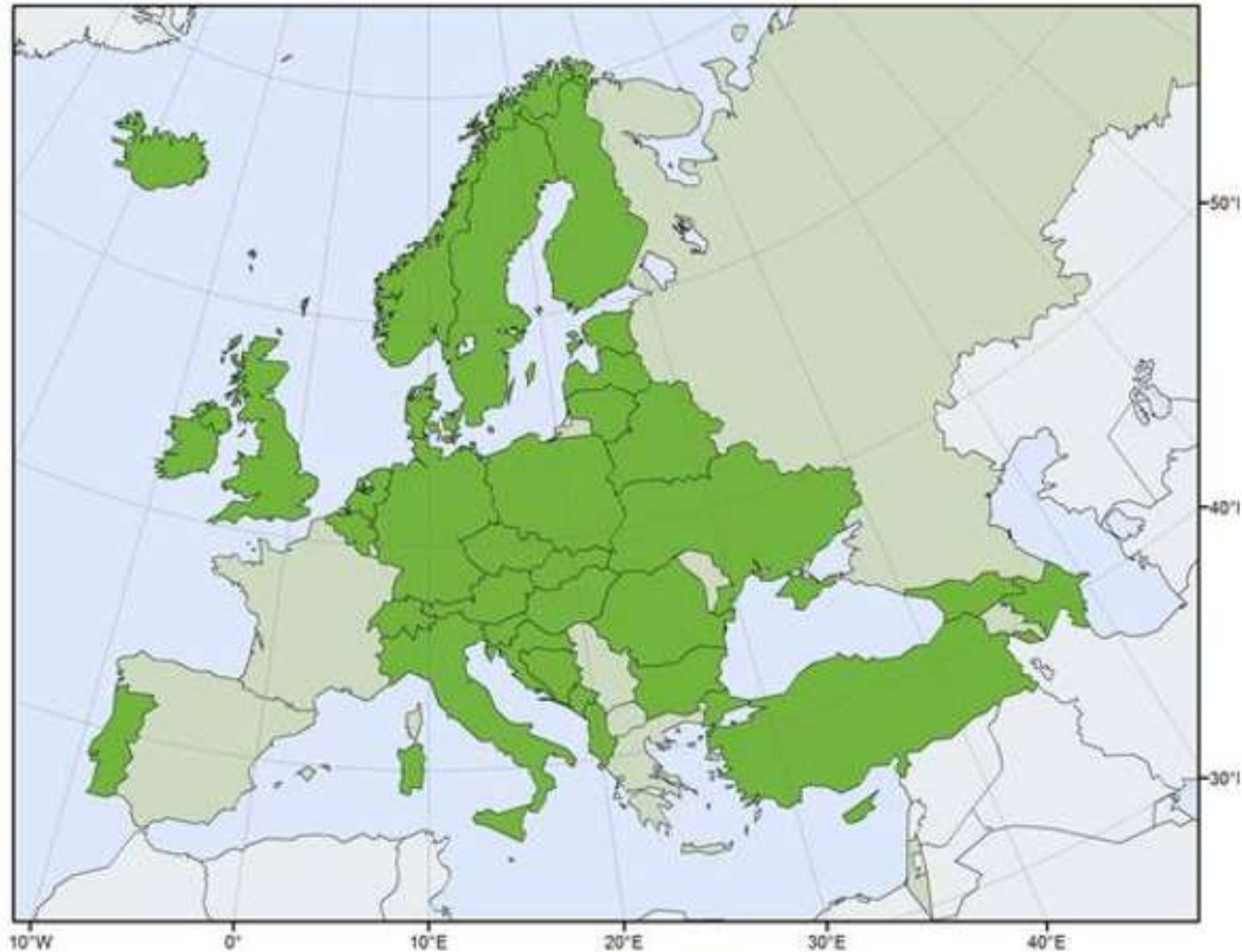
- MoU (Memorandum of Understanding)
- European Collection
- AQUAS (AEGIS Quality System)

# Memorandum of Understanding

By signing the MoU, countries accept responsibility for European Accessions:

- Long-term conservation according to quality standards – including characterization data
- Availability through Standard Material Transfer Agreement (SMTA)
- Safety-duplication

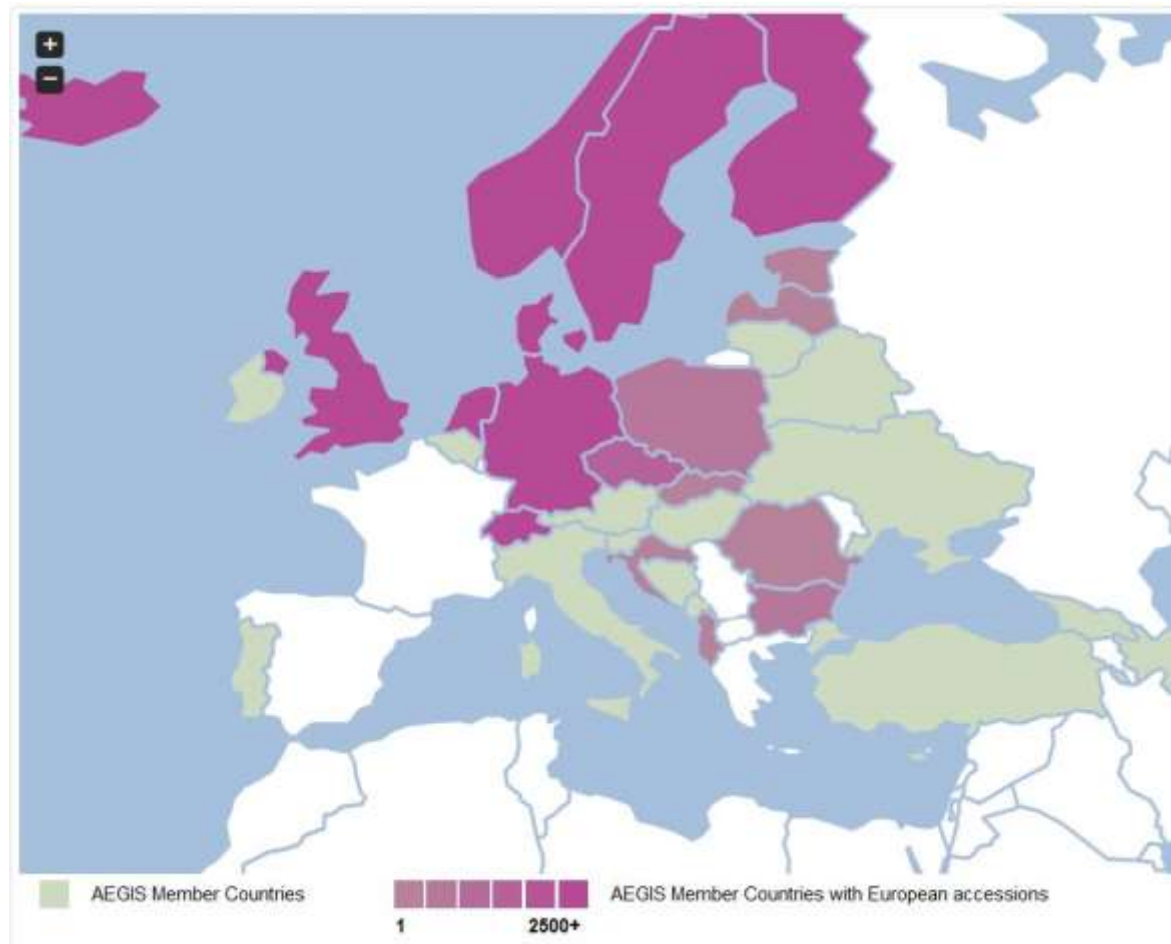
# AEGIS membership



34 Member countries  
61 Associate Members' Agreements

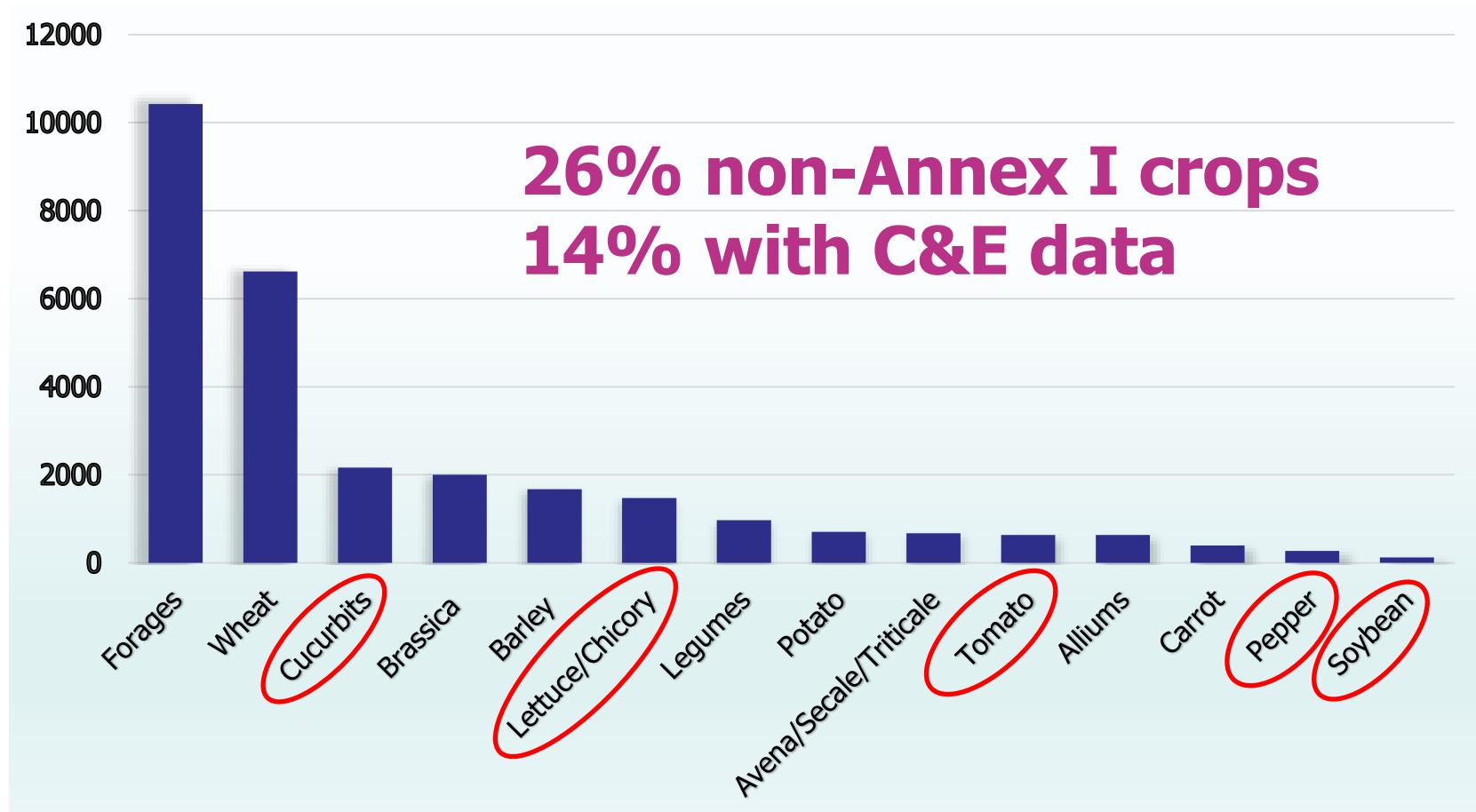
# The European Collection

**32 791** accessions  
included in the European  
Collection



Country	No of accessions
Albania	8
Bulgaria	261
Croatia	90
Czechia	1285
Estonia	89
Germany	14183
Latvia	21
Netherlands	5853
Nordic Countries	3708
Poland	303
Romania	194
Slovakia	299
Switzerland	4838
United Kingdom	1659
<b>Total</b>	<b>32791</b>

# European Collection by crops



# AQUAS – Quality system

- Transparency: operational **genebank manuals**
- Agreed common conservation **standards** (FAO + crop-specific)
- **Safety-duplication** policy
- **Distribution** guidelines
- **Monitoring** system: voluntary peer review

# AEGIS as a Network of services

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



# Concluding remarks

- AEGIS ensures framework for prompt **availability of quality material** under standard terms, **and of data**
- European Collection needs to expand with more material. AEGIS material is a priority for investment of national and international funds
- Virtuous circle from a regional evaluation partnership:
  - AEGIS material **should be characterized**
  - Characterized material **should be included into AEGIS**

Thank you  
for your attention!