Report of a Working Group on Leafy Vegetables and of the EVA Lettuce Network

Third Meeting of the ECPGR Leafy Vegetables Working Group and Fourth Meeting of the EVA Lettuce Network
7–8 October 2026, Skierniewice, Poland

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The **European Cooperative Programme for Plant Genetic Resources (ECPGR)** is a collaborative programme among most European countries. It aims to contribute to the rational and effective conservation of plant genetic resources for food and agriculture (both *ex situ* and *in situ*), as well as to provide access to these resources and to increase their sustainable use (http://www.ecpgr.cgiar.org).

The Programme, which is entirely financed by the member countries, is overseen by a Steering Committee composed of National Coordinators nominated by the participating countries. The Coordinating Secretariat is hosted by the Alliance of Bioversity International and CIAT.

The Programme operates through Working Groups composed of experts nominated by the National Coordinators. The ECPGR Working Groups deal with either specific crops or general themes related to plant genetic resources (such as crop wild relatives, cryopreservation, documentation and information, and on-farm conservation). Members of the Working Groups carry out activities aligned with specific ECPGR objectives, using ECPGR funds and/or their own resources.

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SUMMARY REPORT OF THE MEETING

Introduction

Opening of the meeting

After a short welcome to the group by Mariusz Chojnowski, Chair of the ECPGR Leafy Vegetables Working Group, Krzysztof Rutkowski, Director of the National Institute of Horticultural Science (InHort), Skierniewice, welcomed all the participants and gave a quick outline of the history and current facilities and activities of InHort, a governmental R&D organization supervised by the Ministry of Agriculture and Rural Development. InHort was established in 2011 by merging the Research Institute of Pomology and Floriculture and the Institute of Vegetable Crops. The institute is authorized to grant scientific degrees and is structured into ten scientific departments, organized across eight modern research and development centres. The Department of Horticultural Crop Breeding, besides advanced analytical equipment, also has access to fields (165ha), greenhouses (2ha) and apiaries.

Accredited laboratories include the Laboratory of Quality Investigation of Horticultural Products, the Food Safety Laboratory and the Bee Products Quality Testing Laboratory. InHort has established cooperative links with numerous horticultural research centres and clusters across Europe and is involved in several joint research projects, co-financed by the European Commission and other international organizations.

Miroslav Sitarek, Head of the Genebank, outlined the conservation of horticultural genetic resources at the National Institute of Horticultural Research (InHort) in Skierniewice, Poland.

He detailed the institute's extensive field collections, which include fruit trees, berry plants, ornamental plants, and melliferous plants, totalling a few thousand accessions. The presentation highlighted that these collections are maintained through funding from the Ministry of Agriculture and Rural Development.

ECPGR in Phase XI – Outcomes and perspectives

(*Lorenzo Maggioni*)

The presentation provided a comprehensive overview of the European Cooperative Programme for Plant Genetic Resources (ECPGR) as it operates under its Phase XI strategic framework (2024–2028). It outlined the organization's history, structural components, current initiatives, financial mechanisms, and future direction, with a specific focus on how these elements relate to the Leafy Vegetables Working Group.

The *Plant Genetic Resources Strategy for Europe (*PGR Strategy), launched in 2021, guides ECPGR's priorities for the current decade. Key priorities include *ex situ* conservation, *in situ* conservation of crop wild relatives, and promoting sustainable use.

Financially, the Phase XI regular budget is €3.9 million, with specific allocations for Working Group activities (€510,000) and EURISCO maintenance (€555,000). Additionally, external funding plays a crucial role, including German-funded projects supporting EVA networks and AEGIS implementation totalling ca. €983,000 (2021–2027) and EC Horizon projects (AGENT, PRO-GRACE, COLiBRI, etc.) worth approximately €850,000. The presentation detailed how Working Groups can access funds through the ECPGR Grant Scheme and meeting support, emphasizing the need for cost-effectiveness and alignment with

ECPGR priorities. Specific to the audience, the presentation traced the Working Group's history from its inception in 2003. To illustrate the impact of AEGIS, the presentation provided data on leafy vegetable accessions registered in the system, including *Lactuca* (1,674 accessions), *Cichorium* (325), and *Spinacia* (284). It also detailed the priorities for the Grant Scheme, encouraging members to submit proposals that support AEGIS inclusion, data transfer to EURISCO, and the creation of public–private partnerships.

Updates were provided about the Steering Committee meeting held in June 2026. Key decisions included covering all Phase XI costs, allowing the Genebank Managers Network to apply for funds, and maintaining hosting arrangements at the Bioversity International. The Committee has also begun preparations for Phase XII (2029–2033), which includes updating the PGR Strategy and establishing a Communication Task Force.

Finally, the new ECPGR Secretariat lineup was introduced, effective 1st January 2027.

Overview of the Leafy Vegetables Working Group current and future activities and some history

(*Mariusz Chojnowski*)

The ECPGR Vegetables Network extended its mandate to leafy vegetables in May 2000 in Vila Real, Portugal. An ad hoc group first met in Skierniewice in May 2003 and decided to focus on lettuce, spinach, *Cichorium* and their wild relatives. A formal Working Group was endorsed in October 2003, with its first meeting in Olomouc, Czech Republic, in October 2005. The second meeting took place in Ljubljana, Slovenia, in October 2013, with 16 participants from 13 countries.

The Working Group developed crop-specific genebank standards for orthodox seeds (2016), minimum descriptors for asparagus (2014) and leafy vegetables (2009), and collection status overviews. Under the EU GENRES project, descriptor lists for *Eruca* and *Valerianella* were also produced.

There is a need to increase the AEGIS Collection, improve phenotypic information in EURISCO, and conduct a survey on *in situ* conservation of crop wild relatives (CWR) and on-farm management. Phenotyping is challenging in Poland due to high costs and lack of specialists. Also CWR collecting is critically difficult, given the lack of support from the Ministry of Argriculture for this important task.

During ECPGR Phase XI (2024–2028), activities should support the *Plant Genetic Resources Strategy for Europe*, focusing on excellence in *ex situ* conservation and accessibility of conserved materials. Planned actions include exchanging knowledge on regeneration and storage standards, organizing meetings on AEGIS and genebank standards, promoting safety duplication (including Svalbard and CGIAR centres), inventorying landraces, CWR and wild food plant species, and strengthening cooperation with the EVA Lettuce Network, which currently involves only eight countries.

Presentations of Working Group members (National reports)

Austria

(Wolfgang Palme)

Austria maintains three genebanks holding vegetable collections:

1. Horticultural College and Research Institute Schoenbrunn – 127 accessions of professional Austrian cultivars (25 leafy vegetables: lettuces, corn salad, spinach),

stored at AGES Linz. However, accessions are in deep-freeze status and not available; regeneration after 40 years is problematic due to limited staff, and cooperation with Austrian seed companies has so far been unsuccessful.

2. Federal Experimental Station for Specialty Crops in Wies (Land Steiermark) – 153 accessions, including 13 leafy vegetables, also in deep-freeze status.
3. ARCHE NOAH Seed Bank – a private Austrian NGO with 13,000 members, maintaining about 5,500 accessions of rare vegetables, grains and agricultural crops, focusing not only on domestic cultivars but on diversity across Europe.

France

(Manon Bouët – online)

This presentation provided an overview of the French INRAE Biological Resource Center for Vegetable Germplasm (CRB-Lég).

The CRB-Lég operates within the broader French inter-institute network RARe, and particularly the plant pillar BRC4Plant, comprising 20 Plant BRCs managed by INRAE and other major agricultural research institutes (IRD, CIRAD, Institut Agro). The CRB-Lég maintains five distinct collections (tomato, pepper, melon, aubergine, and lettuce), encompassing approximately 12,000 accessions. These consist of landraces, modern varieties, crop wild relatives, and scientific genetic resources. The centre supports three public–private networks: melon, Solanaceae (tomato, aubergine, pepper), and *Lactuca* (lettuce).

A significant focus is placed on the lettuce collection in this presentation. It includes roughly 200 CWR accessions representing 11 species other than *L. sativa* (with *L. saligna* representing the majority). Conservation is done *ex situ* at -18°C in airtight containers for 15 to 20 years, with periodic multiplication by network partners and phenotype stability verification.

Collections are thoroughly described using passport data, primary descriptors (seed, leaf, and flower traits with photos), and secondary descriptors (pathogen resistance). The Lettuce sub-collections are categorized into 'network' and 'national' collections. The network's collection is available for distribution to the network's partners and for public research purposes. Distribution to parties other than these two categories is possible with the partners' consent, while the national collection is open to research and selection under the Standard Material Transfer Agreement (SMTA). The presentation concluded by highlighting ongoing valorization and collaborative projects with the network partners including private seed companies (e.g. Gautier, Enza Zaden, Vilmorin, Rijk Zaan, Agrosemens), with some also within the frame of EVA Lettuce.

(*Pascal Coquin – online*)

This presentation outlined the French genetic resources chicory collection.

France manages its genetic resources through roughly 20 species networks, coordinated by GEVES and involving public institutes (INRAE) and private partners.

The Chicory Collection was established in 1994. It is the largest globally, comprising over 2,000 accessions (807 in the National Collection and 1,296 in the Network Collection). It covers *Cichorium intybus* (allogamous) and *C. endivia* (autogamous), including witloof, leaf chicory, sugarloaf, and wild species.

Regeneration, characterization and evaluation are ongoing, with 35–40 accessions regenerated annually by ten partners. Morphological and molecular (ISSR) characterizations

are performed. A major research focus is screening for resistance to diseases like *Thielaviopsis basicola* and *Sclerotinia*. Organoleptic and composition traits (e.g. bitterness) are also evaluated.

Despite being the largest collection, it requires more evaluation and greater utilization/visibility.

The main expectation from the ECPGR Working Group is support to increase evaluations for users, thereby aiding the agricultural transition.

Greece

(*Apostolos Kalyvas*)

ELGO-DIMITRA is a public agricultural research organization supervised by the Ministry of Rural Development and Food, responsible for collecting, conserving, evaluating and utilizing plant genetic resources. The Greek national leafy vegetable collection holds 215 accessions across 19 taxa: *Lactuca* (132, the main component), *Spinacia* (38), *Cichorium* (21) and other minor leafy vegetables (24, including *Eruca*, *Cynara*, *Asparagus*, *Rumex* and *Chenopodium*). By category, 155 are traditional cultivars/landraces, 57 wild (a substantial CWR component, especially within *Lactuca*) and 3 breeding/research materials.

Only 72 accessions are currently available; 61 are not available, 55 have insufficient seed, and 27 lack an availability code. Clarifying status and regenerating material is a priority.

Research access follows a national administrative procedure via the Ministry. A draft ELGO-DIMITRA Material Transfer Agreement (MTA) was developed under AgriGenRe for transfers outside the International Treaty for Plant Genetic Resources for Food and Agriculture; Treaty material (e.g. *Asparagus*, an Annex I case) uses the SMTA. The MTA is a completed draft, but final approval is unconfirmed. A pending EURISCO data sharing agreement limits regular national data updating.

The Genebank conserves far more diversity (215 accessions; of which 155 landraces) than the National Catalogue (only 6 varieties, of *Lactuca sativa* and *Spinacia oleracea*).

It is important moving from stored material to usable resources. Pre-breeding (especially *Lactuca* and wild relatives) is the main opportunity; evaluation data is the main gap. Priorities include harmonized documentation and EURISCO updates, regeneration and safety duplication, joint characterization, stronger breeder links and European collaboration.

Italy

(*Pasquale Tripodi*)

Italy's leafy vegetable conservation efforts were outlined, emphasizing the integration of genetic resources with a thriving agri-food sector.

Italy's primary genebank is the CNR-IBBR in Bari, which maintains thousands of vegetable samples in the Mediterranean Germplasm Database and safety-duplicates them at the Svalbard Global Seed Vault. Additionally, CREA-OF manages active *ex situ* collections across specialized centers in Campania and Marche, focusing on rocket, lettuce, chicories, and leafy brassicas. A network of regional banks and universities (in Apulia, Tuscany, Veneto, and Sicily) preserves local ecotypes and CWR.

Traditional landraces are protected through European quality labels (PDO/PGI), such as Radicchio Rosso di Treviso and Insalata di Lusia. At-risk ecotypes (e.g. Cicoria di Galatina, Cavolo Nero di Toscana) are formally registered in the National Register of Conservation Varieties, and hundreds more are catalogued as Traditional Agro-Food Products (PAT) to support local, short-supply-chain gastronomy.

The Italian fresh-cut leafy vegetable market has a massive national turnover of €1.0–1.1 billion per year. It is the largest market in Europe and a leading exporter. Production is concentrated in two main hubs: Piana del Sele (Campania) for raw baby-leaf farming (supplying 60-70% of Italy's crop), and the Brescia-Bergamo Axis (Lombardy) for advanced processing, packaging, and export logistics.

Extensive research is conducted on rocket (*Eruca sativa* and *Diplotaxis tenuifolia*) and lettuce, including genome reference sequencing, GWAS analysis, mapping population development, salt-stress trials, and metabolome plasticity studies. The team also develops precision phenotyping and SNP assays for population genomics.

The Netherlands

(*Rik Lievers & Lynn Vorstenbosch - online*)

L. Vorstenbosch outlined the organization's management of leafy vegetable collections.
CGN maintains significant collections of lettuce (3,240+ accessions), spinach (650+), chicory (280+), and corn salad (115+), with a notable percentage being cultivated varieties or CWR. Documentation is robust, encompassing passport data, photographs, field trials, and disease evaluations (such as Bremia in lettuce and Peronospora in spinach). All phenotypic and genotypic data are publicly accessible on the website. Furthermore, over 99% of accessions are readily available at no cost under the Standard Material Transfer Agreement (SMTA) of the ITPGRFA.

The collection is highly utilized, with 4,471 seed samples distributed in 2025 alone. Lettuce and pepper were the most requested crops. Distribution heavily favours European users, alongside significant non-governmental and private sector recipients. To address conservation constraints – specifically regeneration capacity and limited storage/workspace – CGN is expanding its infrastructure with a new building.

CGN is actively engaged in current and future international collaborations across Europe, North Africa, the Middle East, and Asia. These ongoing projects involve partnerships with various global agricultural institutes and research centres (e.g. WorldVeg, ICARDA, and European universities). Finally, regarding *in situ* conservation, CGN focuses on raising awareness and designating CWR populations to serve as *ex situ* backups in EURISCO, working in coordination with land management organizations and adhering to local legislation and landowner permissions.

NordGen

(*Pawel Chrominski*)

This presentation detailed the NordGen leafy vegetable active collection as of September 2026, highlighting a collection of 353 accessions across 21 taxa in 13 genera. NordGen, established in 1978 as the Nordic Gene Bank and headquartered in Alnarp, Sweden, serves Denmark, Finland, Iceland, Norway, and Sweden.

The collection is heavily focused on *Lactuca* (47%, 166 accessions) and *Spinacia* (23%, 83 accessions), which together make up over 70% of holdings. The remaining accessions are a long tail of minor crops, including orache, sorrel, Caucasian spinach, Good King Henry, and chicory, with 11 genera having fewer than 25 accessions each.
Regarding biological status and origin, 41% of accessions are wild, semi-natural, or weedy material (145), including 84 wild prickly lettuce (*L. serriola*) populations. The other 59% are landraces, breeding material, and advanced cultivars (208). The collection is truly Nordic: 96%

originate from Nordic countries, with Sweden (188) and Denmark (140) accounting for 93%.

NordGen has a strong wild relative base and a rich Nordic heritage, including historical Danish spinach cultivars and Swedish heirloom vegetables. Safety duplication is robust: 88% is backed up in Denmark, and 80% is deposited in the Svalbard Global Seed Vault. However, 43 accessions (12%) lack any safety backup, mostly spinach F1 hybrids.

Forty-two per cent of active leafy vegetable accessions (149) are in AEGIS, including 58 crop wild relatives. Three patterns keep accessions outside AEGIS: non-core status (0 of 56 in AEGIS), lack of backup (0 of 44), and landrace status (only 1 of 33 traditional cultivars is in AEGIS).

A PhD project,'Back to Basics' (SLU & NordGen), evaluates Nordic heirloom vegetables for food security, starting with garden orache (*Atriplex hortensis*); 48 accessions were evaluated in 2025 against commercial spinach.

Priorities include closing the backup gap, revisiting AEGIS nominations for landraces and minor crops, completing passport data, and expanding the collection with further Nordic wild relatives and heirlooms.

Poland

(*Mariusz Chojnowski*)

This presentation provided an overview of leafy vegetable genetic resources conserved in Poland, specifically within the INHORT.

The lettuce collection is the most detailed, comprising 438 accessions. The vast majority belong to *Lactuca sativa* (394), followed by *L. serriola* (17), *L. virosa* (10), *L.* sp. (12), *L. saligna* (3), and *L. angustana* (2). Regarding sample status, the collection is predominantly composed of advanced or improved cultivars (229) and traditional cultivars/landraces (150), alongside breeder's lines (17), wild accessions (11), and natural materials (4). These accessions originate primarily from Central and Eastern Europe, with a strong concentration in Poland and neighbouring countries such as Germany, Czechia, Slovakia, and Ukraine, extending into the Baltic states and the Balkans.

Other Leafy Vegetable collections include:

- Spinach (*Spinacia oleracea*): 31 accessions, consisting mostly of traditional cultivars/landraces (15) and advanced/improved cultivars (14), plus 2 hybrids.
- Asparagus (*Asparagus officinalis*): 158 accessions, with a significant portion being advanced/improved cultivars (91) and breeder's lines (60), alongside traditional cultivars/landraces (5) and hybrids (2).
- Rhubarb (*Rheum rhabarbarum*): 9 accessions, almost entirely traditional cultivars/landraces (8), with 1 advanced/improved cultivar.

Overall, the data highlights Poland's focus on preserving both historical landraces and modern breeding lines, particularly for lettuce, reflecting the regional agricultural heritage and ongoing breeding efforts in Central and Eastern Europe.

Romania

(*Dan Sandru*)

The presentation outlined the status and conservation of leafy vegetable genetic resources at the Suceava Genebank in Romania. The genebank operates a full workflow – collecting, documenting, regenerating, characterizing, conserving, and exchanging germplasm – utilizing base collections at -20°C and active collections at +4°C.

The major leafy vegetable holdings include *Lactuca sativa* (lettuce) with 157 accessions, *Cichorium intybus* (chicory) with 25, and *Spinacia oleracea* (spinach) with 5. Minor collections include rocket, lamb's lettuce, asparagus, and artichoke. The collection is rich in landraces, particularly for lettuce, reflecting Romania's agricultural heritage. Germplasm is available for research, breeding, and direct use under the Standard Material Transfer Agreement (SMTA).

The genebank is transitioning to the open-source GeneDataBank platform for real-time data access, integrated with EURISCO and FAO MCPD standards. Provenance, taxonomic, and characterization data are rigorously documented with DOI traceability. The genebank actively distributes samples (max 25 seeds per request) to universities, researchers, and local growers, and promotes on-farm conservation by reintroducing traditional landraces.

Key constraints include a regeneration backlog, isolation requirements for cross-pollinating species, maintaining seed viability, and limited specialized human resources. Regarding CWR, the genebank conserves 25 accessions of *Atriplex hortensis* alongside various *Brassica*, *Chenopodium*, and *Taraxacum* species. Future priorities include establishing genetic reserves, integrating *in/ex situ* conservation, and utilizing CWR in breeding. The genebank participates in international projects like INCREASE and ECPGR, and expresses strong interest in collaborating with the ECPGR Leafy Vegetables Working Group.

Serbia

(*Milan Ugrinović*)

The presentation outlined the status of leafy vegetable genetic resources in Serbia, which are managed across three national institutions:

The National Gene Bank (Belgrade) has been operational since 2015. The facility holds 5,194 accessions across 261 species, though vegetables represent only 214 accessions (11 species). It features mid-term (+4°C) and long-term (-18°C) storage with a capacity for 100,000 accessions. While infrastructure and protocols for germination testing and drying exist, leafy vegetables have not been a breeding focus. The collection faces significant challenges: a small number of accessions, limited seed quantities, passport data only, and a lack of evaluation due to funding, staff, and coordination issues. The expectation is to regenerate vegetable collections and transfer accessions from other institutes to Belgrade.

Institute of Field and Vegetable Crops (Novi Sad): This institute maintains a small-capacity mid-term collection (+4°C). Leafy vegetables (excluding cabbage) are noted as the most neglected group of vegetable species.

Institute of Vegetable Crops (Smederevska Palanka): This institute suffered severe setbacks. Prior to 2014, it held 32 lettuce and 15 spinach accessions. However, a month-long flood of the experimental field and a summer power outage in the cold chamber devastated the collection, leaving only 8 lettuce and 3 spinach accessions saved. The current collection (2,265 accessions total, including 32 lettuce) is maintained at +4°C.

Despite past losses, the Smederevska Palanka institute has a new research team, extensive isolation fields, greenhouses, and experience with the EVA Pepper project. They express strong interest in future collaboration and project proposals within the ECPGR Leafy Vegetables Working Group.

Slovenia

(*Jelka Šuštar Vozlič*)

This presentation outlined Slovenia's leafy vegetable genetic resources conservation.

Slovenia has collected local varieties for ~80 years. Since 1996, the Ministry of Agriculture has financed the Slovene Plant Genetic Resources Programme, establishing the Slovene Plant Gene Bank. Since 2018, this has operated through a Public Service for Plant Genetic Resources covering collection, documentation, regeneration, characterization, conservation, and utilization.

Collections:

- *Lactuca sativa*: 199 accessions
- *Lactuca serriola*: 1 accession
- *Cichorium intybus*: 4 accessions
- *Diplotaxis* sp.: 18 accessions
- *Valerianella locusta*: 4 accessions

Base and active collections are stored at −20°C (no safety duplication yet). Lettuce is regenerated at 20 accessions/year; *Diplotaxis* needs regeneration. Passport data exists for all accessions in a national database and EURISCO. Three lettuce accessions hold AEGIS status. Slovenia has published national guidelines for managing lettuce and other vegetable collections, plus AEGIS inclusion procedures.

Lettuce has been grown in Slovenia for centuries, with crisphead types predominating. The landrace 'Ljubljanska ledenka' (originating from Ljubljana, spread to Austria as 'Laibacher Eis' in the 19th century) is an ‘umbrella variety’ with derived varieties listed in the EU Common Catalogue. A 2021 *Genetic Resources and Crop Evolution* study examined its morphological and genetic diversity. An EU Preparatory Action project characterized the variety, selecting green- and red-leaf variants.

Safety duplication, *in situ* conservation/CWR, AEGIS accession flagging, and further characterization remain priorities. The presentation calls for collaboration at all levels.

Türkiye

(*Seyfullah Binbir and Ayşe Kahraman*)

Türkiye's plant genetic resource activities began in 1964, formalized within the National Plant Genetic Resources/Diversity Research Programme in 1976. A National Code of Conduct (1992) governs cooperation among institutions. Türkiye participates in ECPGR, and is represented in all four ECPGR Thematic Working Groups and all 20 Crop Working Groups, including Leafy Vegetables. Its flora is exceptionally rich due to overlapping Vavilovian centres (Near Eastern and Mediterranean), three phytogeographical regions, and high endemism.

Two genebanks hold collections: the National Seed Genebank (Izmir, 1964) and the Türkiye Seed Genebank (Ankara, 2010). Storage spans short-term (+4°C), medium-term (0°C), and long-term (−20 °C) conditions, with viability monitored at 5- and 10-year intervals.

Since 1964, over 1,012 leafy vegetable accessions have been collected. Major holdings include lettuce (*Lactuca sativa*, 395), spinach (251), garden cress (162), *Lactuca* spp. (121), rocket (59), purslane (18), chicory (1), and asparagus (5). Collection continues, prioritizing gap-filling of landraces in unsurveyed regions. Türkiye is a centre of origin/diversity for lettuce, spinach, rocket, garden cress, purslane, and asparagus.

Accessions with low germination or insufficient material undergo regeneration; 25 garden cress and 10 rocket accessions have been multiplied and characterized so far.

Seven projects at TAGEM currently cover vegetable genetic resources, lettuce and salad breeding, mutation breeding for lettuce yield/quality, spinach breeding, rocket and garden cress line development, Bayrampaşa artichoke selection, and collection/characterization of

Turkish asparagus genotypes.

United Kingdom
(*Nick Fenby*)

This presentation provided an overview of the UK Vegetable Genebank (UKVGB) based at the University of Warwick. The UKVGB is one of seven crop-specific genebanks in the UK, focusing primarily on brassicas, onions, carrots, and lettuce, alongside other leafy vegetables and herbs.

The genebank currently holds 1,806 leafy vegetable accessions (including lettuce, spinach, and cress), with 56% backed up. Most of these are cultivars (75%), followed by landraces and wild types. The team conducts viability testing on roughly 1,000 accessions annually and runs characterization trials (e.g. 106 lettuce accessions in 2024). All data are managed via the GRIN-Global database, providing public search access.

Efficient conservation is limited by financial constraints, specifically regarding staffing and glasshouse space for regeneration. Since 2024, 324 seed samples have been distributed in 22 orders, primarily within the UK (90%).

Ongoing projects:

- The Vegetable Genetic Improvement Network (VegIN) connects researchers and industry, now expanding to include wild rocket.
- A lettuce diversity set of 96 lines capturing natural variation has been established.
- An iCASE studentship is developing Fusarium disease resistance for leafy greens with Tozer Seeds.
- The team uses Gridscore NEXT for digital data entry and QR code tracking.
- Conservation efforts include work with Nigel Maxted on UK vegetable landraces and *in situ* conservation.

The UKVGB expresses openness to further collaboration with the Working Group.

Leafy vegetables crop wild relatives (CWR) conservation

Nigel Maxted – online

This presentation focused on the forthcoming Horizon Europe Call (HORIZON-NATURE-2027-02-02) for a Research and Innovation Action (RIA) on 'Living labs co-creating solutions for the restoration of ecosystems addressing implementation bottlenecks and improving resilience to risks'.

This is an opportunity to pick up on implementing the PGR Strategy for Europe. Recent agrobiodiversity threat assessments confirmed that 16–38% of globally assessed CWR are threatened. In terms of genetic conservation, Castañeda-Álvarez *et al* (2016) concluded that over 70% of taxa are identified as high priority for further collecting in order to improve their representation in genebanks, and only 5% are sufficiently represented with regard to the full range of geographic and ecological variation in their native distributions. Specifically for leafy vegetables in the UK, recent work by Clarke found that out of 184 lettuce varieties existing in 1930, only 32 can still be traced today.

The scope of the project proposal was described, which is related to the EC Nature Restoration Regulation (NRR), specifically Article 11 on the restoration of agricultural ecosystems aiming at developing high-diversity landscape features. Three living labs will be proposed, each composed of 8–15 sites. The lost biodiversity will be restored and placed in a sustainable framework. Key Performance Indicators will be developed. This will be a project

important for PGR in Europe, including for leafy vegetables.

D. Dostatny also highlighted the importance of Art. 10 of the NRR on the protection of pollinators in areas where CWR are found. However, this aspect was said to belong to a different project.

N. Maxted reminded the meeting that the CWR Working Group aims to support and join forces with the crop Working Groups. In this regard, R. Lievers expressed the need to have more CWR available with SMTA and wondered whether the project can ensure more diversity is available, especially from countries that are not very accessible.

N. Maxted replied that the best way to radically increase available diversity is through enacting *in situ* conservation of CWR and LRs. This is an enormous opportunity for genebanks, when nature conservation agencies become interested in PGR. Genebanks need to become PGR centres managing *ex situ*, *in situ* and on-farm coordination, supporting active conservation to expand the diversity available. Moreover, ECPGR has a key role in involving all countries and encouraging their sharing attitude.

AEGIS approaches for leafy vegetables, application of standards, regeneration protocols, status, gaps, challenges, opportunities – discussion

(Introductory presentation by Jelka Šuštar Vozlič)

This presentation introduced AEGIS and its current status regarding leafy vegetables.

AEGIS (A European Genebank Integrated System) is a platform connecting European genebanks for the long-term conservation of unique plant genetic resources. Operating under ECPGR, it involves 36 member countries and 76 Associate Member agreements. Designated accessions form the European Collection – a virtual genebank where material is conserved to agreed quality standards (AQUAS) and made available via SMTAs.

The presentation highlighted significant growth in leafy vegetable accessions within AEGIS. Since 2023, representation has increased by roughly 30%, now exceeding 2,600 European accessions. The genus *Lactuca* is the most represented (1,674 accessions), followed by *Cichorium* (325) and *Spinacia* (284). Newly included minor leafy vegetables and crop wild relatives include *Blitum bonus-henricus*, *Brassica nigra*, *Cynara* species, and various *Lepidium* species. Germany, the Netherlands, the Nordic Countries, and the UK remain the major contributors.

Recent German-funded projects, 'New AEGIS' and 'AEGIS PLUS,' have strengthened the AQUAS quality system. Achievements include the development of 19 new operational genebank manuals, two new crop-specific standards, reciprocal review visits, and the multiplication and safety duplication of ca. 700 AEGIS accessions.

Discussion points for the Working Group were outlined, focusing on the application of standards, regeneration protocols, current gaps, challenges, and a future action plan for leafy vegetables within the European Collection.

Following a request to comment on the status of the AEGIS approach in their respective countries/institutions, the representatives of France, Greece, and Türkiye reported that joining AEGIS remains a political decision that has not yet been confirmed by their ministries.

Other institutes were not associate members of AEGIS due to insufficient availability of

accessions or seeds (Research Centre for Vegetable and Ornamental Crops, CREA, Italy; Institute for Vegetable Crops, Serbia). At HBLFA für Gartenbau, Austria, there is no capacity to regenerate. Cooperation with local seed companies is not easy, but it would be useful, since they are skilled in regeneration and could help.

NordGen is working actively on all AEGIS topics, flagging accessions based on internal criteria. A bottleneck has been the purity test, since they need to be sure that 95% of the seed is pure. Recently, funds were received for regeneration from the Novo Nordisk foundation, and the rate of multiplication and purity tests is up to speed. Safety duplication is systematically carried out, except for those species/accessions that do not reach the minimum threshold of 80% germination rate.

At the Suceava Genebank, Romania, safety duplication arrangements were established with Georgia. The Warwick Genebank, UK, is working on publishing the operational genebank manual, as well as the Standard Operational Procedures.

At the National Institute of Horticultural Research (Inhort), Poland, cooperation and knowledge sharing are needed to improve the procedures and the management of leafy vegetable seeds, among others.

Introduction to EVA Networks and the Lettuce network progress

(*Sandra Goritschnig*)

This presentation provided an update on the European Evaluation Network (EVA) for Lettuce, a public–private partnership established in 2019 to evaluate plant genetic resources across Europe.

EVA operates by selecting accessions from European genebanks, developing standard scoring protocols, and distributing seeds via the SMTA. Partners evaluate these accessions across multiple environments, with data stored in the EURISCO-EVA database. As of now, EVA encompasses 131 partners from 38 countries. EVA Lettuce is part of a broader portfolio (including Wheat/Barley, Carrot, Pepper, Maize, and Legumes), supported by ongoing projects like the EVA project (2019–2025) and the EVA Boost project (2024–2027), both funded by Germany.

The Lettuce network, comprising ten partners from eight countries, including four breeding companies, focuses on *Lactuca sativa* (iceberg and butterhead) and *L. serriola*.
For cultivated lettuce the experimental approach was split in two phases. During Phase 1 (2020–2022), 178 *L. sativa* accessions were evaluated across three sites. During Phase 2 (2023–2024), single-seed descent lines of a subset of 61 accessions were evaluated with larger plots, including quality traits.

A single primer enrichment technology (SPET) assay was developed based on the *L. sativa* V8 genome, with 41,500 probes with 96% in coding regions, thus effectively covering the gene space. The assay was used to genotype 155 *L. sativa* and 5 *L. serriola* accessions and revealed that clustering occurs by typology rather than geographic origin and identified candidate genes for traits like seed colour and bolting time. The genotyping assay was published in *Frontiers in Plant Science* (Tripodi et al, 2023) and is publicly available.

The network plans to expand by adding new phenotyping data (e.g. leaf shape, performance trials) and pre-breeding activities. Future priorities include improving data curation, and mobilizing resources, potentially applying for the next ECPGR Grant Scheme (deadline February 2027, max €30,000) to support collaborative projects and the transition to 'EVA Lettuce 2.0'.

Dissemination and exploitation of results – *Lactuca serriola* SPET genotyping

(*Paquale Tripodi*)

Recent experiments expanded the SPET genotyping to additional *L. serriola* accessions to support genetic analysis and candidate gene discovery for Bremia resistance, which was screened on the same panel by EVA partners.
Preliminary analysis of the genotyping data of 101 *L. serriola* accessions yielded ~42,000 useful SNPs and most accessions showed low missing data and heterozygosity averaging ~20%. Principal component analysis (PCA) and ADMIXTURE analysis revealed distinct genetic clusters linked to geographic origin and resistance profiles.

The SPET panel successfully provided a robust SNP set for *L. serriola*, enabling population structure analysis and the identification of genetic markers associated with disease resistance.

In the discussion, it was clarified that all material from NordGen is of Nordic origin, with *L. serriola* mainly originating from Sweden.

Pasquale Tripodi noted that initial analysis used the *L. sativa* genome for SNP mapping and suggested to verify alignment against the available *L. serriola* genome to find better associations.

Pawel Chrominski offered to look into the passport data of the Nordic material to seek any additional useful information.

Damien Peltier confirmed that the EVA lettuce network enabled a very nice collaboration between the public and private sectors and that it was easy to screen Bremia and obtain phenotypic data.

Pasquale Tripodi explained that the analysis will be completed after verification of the phenotypic datasets with the three involved partners. Results will be published as soon as possible, given the lettuce network embargo conditions.

Leafy Vegetable Working Group and EVA Network joint discussion on project

The group discussed possibilities for undertaking activities within the ECPGR framework through the two possible funding channels: the Grant Scheme or Working Group meetings.

Artur Paszkowski highlighted the user perspective, whereby interest is focused on phenotyping projects and on working together with breeders. All relevant traits would be interesting for testing, such as fungal resistance, heat stress, etc. He also suggested strengthening outreach about the group's activities.

Mariusz Chojnowski raised concern about the low engagement of breeders with genebanks in Poland, since they do not source material from genebanks. However, they can cooperate in the multiplication of accessions. He also described the difficulties in obtaining support for working with CWR in Poland, as the importance of this type of action is not valued by the Ministry of Agriculture.

Jelka Sustar and Denise Dostatny expressed interest in topics related to CWR, such as the need to fill gaps in the collections and improve the quality of passport data in the databases.

Pasquale Tripodi proposed extending the phenotyping and genotyping analysis to other wild species, or exploring additional phenotypes in the already genotyped collection, perhaps using a core collection of 50 genotypes.

Damien Peltier appreciated the result of the EVA Lettuce Network, which produced a new tool (SPET genotyping assay) and applied it for a specific purpose. For the future, he

recommended looking for new partners for phenotyping in order to provide new information on accessions in the collection.

Nick Fenby informed the group that the University of Warwick holds a lettuce diversity set, which is extensively studied, and that adding genetic data to it would be very valuable. Damien Peltier commented that using RILs/MAGIC lines would be a very useful approach.

Ayşe Kahraman thought that it would be useful to genotype other CWRs such as *L. virosa*. Very old landraces could also be compared with modern types.

Milan Ugrinović was favourable to any plan for phenotyping accessions under different climatic conditions.

Apostolos Kalyvas suggested focusing on Mediterranean germplasm from Greece, Italy and Spain as the most likely to hold water-stress-resistance traits, which could also be useful for other parts of Europe, considering climate change.

Pawel Chrominski thought that all projects that would increase characterization and evaluation data would be interesting, and that the group could analyze interesting materials from breeding programmes and CWR from Nordic countries.

Rik Lievers thought that we should listen to the users, who can best tell us in which direction to go. The CGN collection is large, expanding and available. He mentioned the difficulty in accessing material from certain countries/genebanks.

Wolfgang Palme expressed interest in joining a trial on abiotic traits, for example winter hardiness in Alpine conditions. Lettuce is not suited to hot climates, while in cooler climates it can withstand temperatures down to -10°C.

Dan Sandru suggested collecting more CWR and landraces.

As a summary of the discussion and the prevailing indications from the group, Mariusz Chojnowski concluded that the main points that emerged were:

1. The need to better conserve CWR, filling gaps in the collections and including more species
2. Carrying out evaluations for biotic and abiotic stresses.

General consensus emerged on the possibility of preparing a proposal under the next Call of the ECPGR Grant Scheme, including CWR gap analysis and plans for collecting missions. Addressing limitations on the availability of germplasm from certain countries could also have a place in the proposal. Representatives from the Netherlands, NordGen, Poland, Romania and the UK expressed interest in getting involved. Greece and Türkiye would check internally their possibility of joining. Poland and the Netherlands were indicated as the ideal coordinators to set up the project.

Additionally, Mariusz Chojnowski clarified that the group would benefit from organizing technical meetings to discuss various aspects of the management of leafy vegetable collections, especially CWR, such as germination protocols, dormancy issues and the most important steps of the regeneration procedure. Experts could be invited to discuss these topics in appropriate training workshops.

COLiBRI workshop – Brainstorming on needs and gaps for breeding R&I and how a European network could support our work

(*Sandra Goritschnig*)

COLiBRI is a new Horizon Europe Coordination and Support Action strengthening European

plant breeding research and innovation, in which ECPGR is coordinating the Stakeholder Engagement work package. COLiBRI brings together key actors from across the plant breeding value chain, to jointly assess priorities, gaps and opportunities for plant breeding R&I in the EU, covering all farming systems and approaches. The goal of COLiBRI is to deliver a shared European roadmap and implementation strategy for crop breeding R&I, accompanied by a collaborative framework for a future EU-wide plant breeding network and funding mechanism.

In this workshop session, meeting participants engaged in co-creation activities around stakeholder priorities, funding knowledge and roadmap input that deliver sector-specific input to the project's evidence base. After a brief introduction to the project, participants were divided in four small groups, which discussed issues relevant for leafy vegetables genetic resources, breeding and technologies. The first exercise focused on identifying and cluster each group's top breeding, genetic-resource and innovation priorities for leafy vegetables. In the second exercise, the groups mapped current national, EU and private funding supporting leafy vegetables well, and where there are gaps. During the third and final exercise, groups converted their top priorities and funding gaps into concrete, roadmap-ready statements, which were presented to the whole room. All participants engaged in a joint ranking exercise identifying the top five cross-cutting priorities and associated actions for leafy vegetables which should be considered when developing the Roadmap.
Common themes emerging from the different groups were the need for long-term collaborative consortia across the value chain that can enable the sustainable use of leafy vegetables PGR in crop breeding, with a secondary focus on introducing also opportunity crops into a diverse diet. Their work requires that leafy vegetable germplasm is available and well characterized, thus prioritizing better collection and data management ,and collection of novel CWR resources as sources for stress resilience. New technologies (high-throughput genotyping or phenotyping and related data infrastructure, new genomic techniques, etc.) can become game changers, especially for the development of varieties with biotic stress resistance. Overall, sustainable and appropriate funding for PGR conservation and breeding was highlighted as a priority, reflecting also comments from earlier in the meeting.
A detailed report is available to the Leafy Vegetables Working Group and the COLiBRI project, to feed sector-specific evidence into COLiBRI's Roadmap development and support the development of future projects.

Closure of the meeting
M. Chojnowski concluded the meeting, thanking all the participants for their lively discussion and exchange of ideas. The constructive planning will facilitate closer cooperation and joint activities. He was looking forward to organizing the next meeting in one or two years' time.
The local organizers were deeply thanked for their dedication, efficiency and hospitality.

ANNEXES

Annex I. Agenda

Third Meeting of the ECPGR Leafy Vegetables Working Group and the EVA Lettuce Network
7-8 October 2026, Skierniewice, Poland

Tuesday 6 October - Arrival day

Airport/train station transportation

Wednesday 7 October – LV WG activities *(Chair: Mariusz Chojnowski)*

9:00 – 9:20	Welcome address and introduction of the meeting – (president/head of institute/chair)
9:20 – 9:45	Tour de table of all participants
9:45 – 10:15	ECPGR in Phase XI – Outcomes and perspectives *(Lorenzo Maggioni)*
10:15 – 10:30	Overview of LV WG current and future activities and some history *(Mariusz Chojnowski)*
10:30 – 11:00	*Coffee break*
11:00 – 13:00	Presentations of the WG members (*5 minutes per country):* size, status and availability of the national collection; documentation level of the collection; constraints to efficient conservation; existing use and its valorization; ongoing projects (national and international level); status of in situ conservation actions and CWR of leafy vegetables, legislation; expectations from WG
13:00 – 14:00	*Lunch*
14:00 – 14:20	Leafy Vegetables CWR conservation (*Nigel Maxted – online*)
14:20 – 15:00	Discussion of Action Plan for Leafy Vegetables CWR conservation planning and implementation (status, gaps, challenges, opportunities) – *All*
15:00 – 16:00	AEGIS approaches for Leafy vegetables, application of standards, regeneration protocols, status, gaps, challenges, opportunities – discussion (*introduced by Jelka Šuštar-Vozlič)*
16:00 – 16:30	*Coffee break*
16:30 – 18:00	*Visiting the Regional Center for Horticultural Biodiversity – Vegetable Genebank*
19:30	Social Dinner

Thursday 8 October: EVA Lettuce network & collaboration *(Chair: S. Goritschnig)*

9:00 – 9:30	Introduction EVA networks
9:30 – 10:00	Overview EVA Lettuce network and recent progress
10:00 – 10:30	Dissemination and exploitation of results
10:30 – 11:00	*Coffee break*
11:00 – 12:30	Leafy Veg and EVA network joint discussion on projects
12:30 – 14:00	*Lunch*
14:00 – 16:00	COliBRI workshop – brainstorming on needs and gaps for breeding R&I and how a European network could support our work.
16:00 – 16:30	*Coffee break*
16:30 – 17:30	Final discussion and next steps
17:30 – 17:45	*Any other business*
17:45 – 18:00	close of meeting

Friday 9 October: Departure day

Annex II. List of participants

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