EU CAP Network Focus Group

'Local perennial plant genetic resources in view of climate change and biodiversity loss'

Mini Paper 1

How to conserve local perennial germplasm (LG) 'on farm' and 'in situ'

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Introduction and motivation

The conservation of local germplasm (LG) on farm and in situ is imperative as climatic change and anthropogenic practice threaten the genetic heritage of local perennial plant genetic resources (PGR). A major long-term concern is the loss of valuable traits and characteristics that could have been essential for future breeding efforts, or the reintroduction of cultivars.

Farmers and landowners have limited experience on how to conserve on farm LG (that includes local under-used or non-used landraces, varieties and cultivars) and especially crop wild relatives (CWRs) and wild edible crops (WEC). Farmers in most cases do not know where LGs, CWRs and WECs can be found which is further worsened by a lack of propagation knowledge / capacity and of the scarcity / absence of appropriate reproductive material that could be used.

An additional limiting factor is the absence of social and public awareness of the importance of perennial species germplasm conservation for long-term production, and the maintenance of healthy natural and agricultural ecosystems. There is already a clear link between the speed of climatic change and coping problems of varieties, leading to reduced production, or to larger inputs to maintain present production levels. There is a clear and present danger of losing local, CWR and WEC germplasm and associated traditional agricultural practices, permanently and completely. One of the basic motives of conservation science that "we conserve today to address the needs of tomorrow", has not yet gained wide acceptance by farmers and the public at large. Conservation mostly conducted on farm focuses on landraces, varieties and cultivars, being frequently the result of the farmer's commitment and attitude towards LG, rather than the outcome of State or EU support. In situ conservation concerns CWR and WEC natural populations and when a farm includes suitable set-aside land, it can be conducted on-farm as well.

There is an urgent need to generate awareness and provide training for the farmers, public authorities and other stakeholders regarding on farm and in situ conservation. It is essential to initiate a discussion / crosstalk on the possibilities, options, and opportunities that conservation actions will create for the farmer and the potential benefits for farmers (knowledge and participation in research and technology, timely acquisition of novel knowledge, better characterization of local germplasm, participatory plant breeding). The inclusion of the public sector and civil society will raise awareness of the LG importance. In conclusion, conservation actions will link the farmers with an important and necessary initiative at the national and EU levels. Moreover, acknowledging farmers that are already involved in conservation successful actions by local and regional communities, will ensure that their activities are continued and will enhance the chances of wider participation.

1. Dissertation

Description of key issues

We consider four key issues towards the improvement of local perennial germplasm conservation, on farm and in situ. Regarding local germplasm there is an urgent need for:

1.1 Need for better identification and characterization

A primary challenge is the rationalization and harmonization of varietal identification protocols and the accurate attribution of LG identification. Synonyms—where the same cultivar/variety is known by different names across regions—and homonyms—where different varieties share the same name in various locations—are key sources of confusion. These issues contribute to conflicts and hinder the success of germplasm conservation efforts. Genetics and breeding have provided new tools that are now indispensable for identification. While detailed phenotyping, biometric and pomological analyses can serve as preliminary steps in identifying cultivars, DNA markers are the only reliable methods for assigning a unique and unequivocal identity to a cultivar.

1.2 Establishing local germplasm phytosanitary standards

There is a need for developing a phytosanitary network at the European level that will facilitate the secure and speedy movement of interesting germplasm, while approving its phytosanitary status. This network should be part of a well-defined germplasm management and exchange system which will benefit farmers. Since vegetative propagation is the method to multiply and maintain PGR in most perennial crops, the presence of viruses, phytoplasmas, or bacterial agents is unacceptable. However, strict regulations on the movement of plant material, while essential for preventing the spread of pathogens, can also pose obstacles to conservation efforts. Striking a balance is therefore crucial. These aspects underscore the need for strong collaboration among research institutions, growers, and public regulatory and funding bodies. Genetic conservation cannot succeed without the active participation of farmers. In this context, equipping farmers with proper training in plant propagation techniques (e.g., grafting, cuttings, rooting) is essential to enable autonomous conservation efforts. There is also a need for the harmonisation of conservation protocols and standards. Providing adequate EU support for initiatives aimed at preserving genetic material—both by researchers and growers—is imperative. Regional support currently represents the most significant (but still limited) source of funding for growers engaged in germplasm conservation, which is often an investment with no direct economic return, and as such germplasm conservation is still limited in the farmers communities.

1.3 Linking local germplasm with ex situ collections

Linking on farm conservation with ex-situ collections is important because it can lead to better collaborative work for identification, sanitation, and conservation of PGR (FAO, 2024). FAO (2024) stresses the need for better coordination between national genebanks and community seed banks. This includes targeted collecting of CWRs, underutilized species, landraces, and varieties. Public genebanks generally possess LGs collected from their maintainers, i.e. farmers. However, there is a diminutive number of on-farm conservation activities of public genebanks with resonant involvement of farmers, and the access of farmers to ex situ collections is not simple. Genebanks need to increase their communication activities and reach out especially to farmers who usually have a limited idea on what a genebank is and what it does. Taking a more inclusive approach with regards to germplasm exchange with farmers, could be an effective step in this direction.

1.4 Linking local germplasm to farmers

The spread of commercial varieties improved production and the status of farmers, but it also greatly caused genetic erosion and a decrease in the diversity of cultivated crops. However, a substantial number of local populations and obsolete varieties have been preserved on some family farms (FAO, 2012). The preservation and maintenance of these local PGR is always connected with traditional knowledge. Specific programs are needed that will introduce young farmers to the value of local PGR, the need for their further preservation and the possibilities of sustainable use.

2 State-of-the-art of research and practice

A recent study on the European situation identified 19,335 georeferenced landrace cultivation sites, with 141 herbaceous and 48 tree species grown as landraces; about 20% of these sites are in Natura 2000 areas .Over 4,500 different landraces seem to still be cultivated across Europe. Landraces are often cultivated in marginal areas and under organic or low-input systems, providing income for farmers in conditions where conventional agriculture is not feasible. Due to centuries of cultivation in diverse microclimates and under specific farming practices, landraces have developed adaptive traits that help them endure various stresses, such as water scarcity, salinity, low nutrient availability and cold. Their ongoing adaptation to marginal lands supports the European Green Deal and the Farm to Fork strategy. Also, landraces have often been preserved for their cultural value, prized for their unique tastes, shapes, colours, and/or use in dishes, or cultural traditions. European quality marks (e.g. DOC, DOCG, PDO, PGI, TSG, 'Organic Agriculture' label), have also helped preserve certain landraces in agriculture.

Besides landrace cultivation, fruit PGR are being studied by ECPGR (European Cooperative Programme for Plant Genetic Resources, Fig. 1, https://www.ecpgr.org/groups) Working Groups, the groups on *Prunus*, *Malus/Pyrus*, Berries and *Vitis*. There are also three relevant thematic WGs: Crop Wild Relatives, Cryopreservation, and On-farm Conservation and Management. In *Prunus*, recent work has focused on testing, use and alignment of genetic data to distinguish unique and characterized accessions, while for *Pyrus/Malus* on common protocols and tools available for characterization and evaluation of PGR. For grapevines, the ECPGR European Vitis Database, serves as the benchmark catalogue for varietal identification and registration (www.eu-vitis.de). This publicly accessible initiative enables researchers and private individuals to compare ampelometric and molecular marker data with existing records, providing a reliable reference for identifying correspondence between newly collected accessions and known varieties.

Due to climatic change many cultivated tree species will increasingly rely on germplasm currently harboured within their crop wild relatives (CWRs), i.e. taxa which are phylogenetically and taxonomically closely related to a crop species. CWRs represent a paramount source of genetic diversity for breeding, although insofar CWR PGR have been underused. The European Forest Genetic Resources Programme (EUFORGEN, Fig 1, https://www.euforgen.org/) is an international effort that promotes the conservation and sustainable use of forest genetic resources. EUFORGEN promotes, coordinates and monitors the in situ and ex situ conservation of forest genetic resources (FGR) and the exchange of forest reproductive material (FRM). Presently, the EUFORGEN database contains 3231 Gene Conservation Units (GCUs) of 113 tree species located in 35 countries. The units harbour 4017 tree populations. Out of those, GCUs of CWRs consider 15 species and 279 populations. EUFORGEN serves as a platform for developing and implementing European research projects on FGR/FRM and coordinates existing research initiatives in all forest species, including tree CWRs.

Fig. 1 The PGR and the FGR Strategies for Europe: two important documents for the conservation of perennial plant genetic resources. (Source: www.ecpgr.org; www.euforgen.org)

2.1. How is on-farm and in situ conservation applied.

The application of conservation actions should consider:1.**Plant material suitable for on-farm conservation**: landraces, of which two types can be distinguished: (a) sensu stricto - landraces that have preserved their connection to the original region where their unique characteristics were developed, and (b) landraces that have been

introduced to a new region from their original area to meet the needs of local communities or reintroduced to their original region after a period of abandonment. 2. **Other variable populations:** plant materials developed by farmers and breeders, currently used to enhance field diversity. 3. **Evolutionary populations:** plant material obtained by: (a) mixing the seed of different varieties or landraces, and (b) mixing progeny from crossing multiple parents, which can involve the participation of farmers. 4. **Selections from landraces**: synthetic populations developed through participatory plant breeding by intercrossing multiple genotypes (derived from landraces or mass-selected landraces), evaluated for superior performance when crossed in various combinations or when lines selected from landraces are used. 5. **Obsolete cultivars:** cultivars that were once registered in seed catalogues and commercialized, but later removed from the lists, yet have been continuously maintained on farms and are sometimes composed of different genotypes.

2.2. On-farm conservation: main actors and gaps

The **main actors** involved in on farm conservation are: **1. Single farmers and amateur gardeners:** They select their materials to preserve their desired crop ideotype, while in some cases also maintaining new off-types that result from accidental crosses. It is in these collections that most of the unknown, unrecorded, untapped, and not securely ex situ duplicated landraces can be found. Due to their localized nature, they are at considerable risk of extinction. **2. Farmer consortia of producers:** Primarily established in the southern regions of Europe, where landrace products are highly valued by consumers due to their strong connection with local culture, including numerous culinary traditions. **3. Farmer and gardener networks:** This is already a broader, often regional or even national level activity, which involves broader lobbying efforts to ensure the continued public availability of landraces. It also promotes their use beyond their areas of origin and maintains strong connections with national and EU decision-makers to influence seed production and exchange regulations. **4. Commercial companies:** Seed companies or nurseries, which market varieties that are either selected or bred from landraces, including those covered by Commission Directives 2008/62/EC, 2009/145/EC, and 2010/60/EU. **5. Local communities and associations:** Non-profit local communities, associations and foundations often support the cultivation of typical, strictly linked to a certain territory landrace (e.g. seed saver organizations, community seed banks). **6. Public authorities:** National and sub-national authorities often fund on-farm conservation activities for landraces and neglected species through national programs, which frequently leverage EU financing and regulations for agriculture and the environment.
The **main gaps** regarding on-farm conservation are: **1. Lack of clear and coordinated measures** at the EU level for the preservation, conservation, and maintenance of landraces. **2. Limited availability of propagation materials** continues to hinder the broader use of landraces in Europe, as these materials are a crucial component of agricultural production. **3. Many landraces remain at risk**, particularly those of horticultural crops maintained by small farmers and gardeners.

Their preservation relies on the continuation of family traditions, which is increasingly challenging due to significant societal changes and the loss of specialized skills in plant cultivation and propagation. **4. Farmers often select materials to maintain their preferred crop ideotype** while, in some cases, preserving new off-types resulting from accidental crosses. These fields and gardens are home to many unknown, unrecorded, untapped landraces that are not securely duplicated ex situ. Due to their localized nature, these landraces face a high risk of extinction. **5. On-farm germplasm conservation is largely regional and fragmented** across various societal groups, lacking a unified methodology, consistent conservation principles, and a centralized information platform for sharing best practices in biodiversity preservation under changing climate conditions. The selection of varieties conserved on-farm also varies, encompassing both landraces and other plant materials, such as improved varieties. **6. On-farm germplasm conservation is often combined with in situ conservation, despite significant differences** in their goals and methods, leading to some confusion in practices. **7. Only a limited number of Member States have implemented the option to register landraces as conservation varieties**, and even then, only for a small number of landraces from a few species. This restricts the conservation, utilization, and promotion of these varieties.

2.3. In situ conservation: main actors and gaps

The **main actors** in relation to in situ conservation engage in the conservation of CWR populations in protected areas or within GCUs and of CWR populations or individuals outside of protected areas or protection schemes. The main actors are: **1. National Parks, Nature2000 National Networks, 2. National Forest Services, 3. NGOs, 4. Forest Owners.**
The **main gaps** regarding in situ conservation are: **1. Lack of clear and coordinated measures and strategy at the EU level** for the preservation, conservation, and maintenance of CWRs. **2. Absence of assigned GCUs for many CWR important species** , or existence of very few GCUs that do not cover all the environmental zones / genetically interesting populations of the CWRs. **3. Idiosyncratic protection of CWRs in Europe at the species level**: the available conservation strategies do not have a notable component of interaction and complementarity among cultivated species / landraces / cultivars of fruit trees and tree CWRs / WECs of the same or close species. **4. Conservation strategies remain species-specific**.

3. Existing best practices and tools

3.1. An exemplary model of existing conservation practices at country level

A well-established system of comprehensive national PGR conservation for perennial plant species that includes all facets of local germplasm is that of Sweden. It is based on the principle of on-farm storage for historically significant cultivars and landraces of fruit trees, berries, ornamental plants, vegetables, medicinal and aromatic plants, and on the system of GCUs of natural populations that cover important national CWRs and WEGs. The on-farm program is the (government funded) Swedish Programme for Diversity of Cultivated Plants https://www.slu.se/en/Collaborative-Centres-and-Projects/the-programme-for-diversity-of-cultivated-plants/) which represents a successful model of decentralised conservation, that combines traditional knowledge with modern scientific approaches. Its strength lies in the active participation of farmers and local communities, supported by a robust institutional framework and technical expertise.

Figure 2. National inventory of plant genetic resources, Sweden Photo: Pom, SLU.

The system consists of the National Coordination (at the Swedish University of Agricultural Sciences, SLU)), which cooperates with the Nordic Genetic Resource Centre (NordGen) and the Network of partner institutions and organisations, such as botanical gardens, museums and historical sites, research institutions, agricultural Universities, local farming communities and horticultural societies.
Currently, the Network consists of 3 main gene bank sites, 30+ local clone archives, eight botanical gardens, five research stations, 150+ private gardens, 80+ heritage farms, 25+ municipal gardens, and 15+ educational institutions. Currently, the network's Mandated Collections are defined as: trees, primarily apple (220+ varieties), pear (180+ varieties), plum (150+ varieties), and cherry varieties (100+ varieties); small

fruits (80+ varieties), currants, gooseberries, and raspberries; plants, roses (300+ varieties), perennials (1000+ accessions), and bulb flowers (200+ varieties); vegetables, primarily those that can be vegetatively propagated (450+ varieties). Wild population conservation is also linked to Sweden's participation in EUFORGEN. It covers four perennial fruit and nut species and 32 gene conservation units.

3.2. An exemplary model of existing conservation practices at regional level

A great example of a comprehensive conservation strategy, from identifying ancient trees to preserving them directly on farms, was conducted in northeastern Spain, focusing on olive trees. In this project, more than 4,500 monumental olive trees were studied, some of which were estimated to be over a thousand years old. By analyzing their DNA, researchers found that most of these ancient trees belong to a local variety called '*Farga*'. However, they also discovered several related types that show some interesting differences in appearance and traits. These old trees hold a treasure of genetic diversity, which includes qualities that help them survive and adapt to tough environmental conditions. Their exceptional longevity may even be linked to their resilience against harsh climates. What is truly remarkable is that this rich genetic heritage has been preserved thanks to the efforts of local farmers who kept these trees growing on their land. In recent years, these same farmers have taken steps to highlight the value of these ancient trees, not only by producing and promoting olive oil made from them, but also by organizing guided tours and tourism experiences around them, as well. These initiatives have created new opportunities for income while helping to protect a living piece of agricultural history.

Figure 3. (Photo source: https://botiga.dk/products/lacrima-olea-1000-oove)

3.3. Existing tools: Recommendations on how to start conserving perennial germplasm

Growers should independently propagate perennial plant material, while also being able to participate in established networks. This is important for two key reasons: (1) in perennial crops, the loss of diverse local accessions is a real risk if adequate propagation skills are not maintained; (2) individual cultivated plants can vary due to the accumulation of natural mutations driven by environmental pressures in specific areas.

A classic example of this is the grapevine, where cultivars like the *Pinot blanc* and the *Pinot gris* were developed from bud mutations observed in a *Pinot noir* vine. Similarly,

the self-propagation and conservation of plant material could serve as a foundation for the development of unique biotypes. Universities, local research centres, and growers' associations are typically the primary sources for generating interest in the conservation of a particular accession.

Tree plant propagation relies mostly on the techniques below.

1. ***Rooted cuttings***: This method is suitable for the conservation of species that do not require a rootstock and naturally exhibit a high rooting potential. Typically carried out in spring, the process uses a one-year-old shoot segment containing at least one node and one internode. The segment is placed in a substrate such as perlite: the node with a live dormant bud remains above the surface, while the opposite end of the internode is buried a few centimetres deep. To enhance root development, the buried portion may be treated with auxins. Optimal rooting conditions include warming the substrate to promote root formation before bud break and applying mist irrigation after leaf emergence to minimize transpiration.

Figure 4. Growers could destine a portion of their courtyard for the propagation and conservation of plant material. (here: on-farm conservation of local grapevine varieties in Colli Piacentini, Italy. (Source: Photo by Tommaso Frioni)

2. ***Grafting***: For accessions with low rooting ability or vulnerability to biotic and abiotic stresses affecting young roots. Grafting results in two genetically distinct components: the lower part (rootstock), a selected species or variety that provides tolerance to specific stresses, and the upper part (scion), the aerial part derived from the accession intended for cultivation and conservation. Methods use either lignified or herbaceous buds or cuttings and require a precise cut in the rootstock and inserting a portion of the desired variety (containing at least one viable bud) so that the inner living tissue responsible for growth of rootstock and scion align.

Figure 5. Grafting in the field, summer, Romania (Photo by Raluca A. Deneș)

3. ***Layering:*** This technique involves burying a portion of a branch or shoot from the parent plant at the end of winter, without detaching it from the mother plant. By keeping the buried section in contact with the soil, it encourages the formation of adventitious roots while still receiving nutrients from the parent plant. At the end of the growing season, the buried portion is uncovered, and if roots have successfully developed, it can be severed just below the rooted section to create an independent new plant. For unknown, or potentially novel varieties, the next step in the conservation process is determining whether the plant material genetically corresponds to other varieties within the region or globally. Universities and research centres now offer affordable analyses using DNA markers such as microsatellites, i.e. specific segments of genetic material that can reveal potential matches between different accessions. Operational groups, grower networks, associations and private individuals can play a crucial role in collecting and amplifying conservation efforts. The establishment of local germplasm collections, often funded by regional, national, or EU programs, enables large-scale conservation that would be impractical for individual growers. Many countries and regions often provide financial and technical support to growers interested in cultivating local, underutilized perennial varieties. Local growers' associations and specialists typically can serve as key contact points for accessing such support.

Figure 6: Grafted outside the field trees, winter, Romania (Photo by Raluca A. Deneș)

3.3. Balance between traditional farming practices and newer agricultural techniques

Integrating modern technology without disrupting existing agro-ecosystems is essential for effective on-farm conservation. On-farm germplasm storage farmers are interested in introducing the latest cultivation technologies to bring economic opportunity to their farms. Modern technology may be at odds with preserving the germplasm of the farmer's collection where the traditional material is usually more suited to the principles of low input or near-wild growing Therefore, the farmer should balance between traditional farming practices and newer agricultural techniques.

Conclusions

There is an urgent need to establish or improve both on-farm and in situ conservation of local germplasm that includes local under-used or non-used landraces, varieties, and cultivars, as well as crop wild relatives (CWRs) and wild edible crops. Four key issues need further development in local germplasm conservation: (a) better identification and characterization of germplasm, (b) establishment of the germplasm phytosanitary status, (c) linking in situ and on farm conservation with ex situ collections and (d) linking the conservation effort to farmers. On the other hand, details regarding on-farm and in situ conservation are well established for suitable plant material, main actors involved, existing knowledge gaps and model approaches that can serve as a paradigm.

Research needs from practice

On-farm conservation of PGR faces many challenges that need addressing to ensure successful preservation of valuable agricultural biodiversity:

Challenge 1: The genetic composition and diversity of the germplasm conserved on farm and in situ is largely unknown. The lack of comprehensive monitoring limits our knowledge of what is stored on-farm, which can lead to the loss of valuable germplasm.

Possible solution 1: Use of long-term Genetic Diversity Monitoring to evaluate the genetic diversity maintained on farms. New methods (DNA barcoding, DNA genetic monitoring) with increased speed of genetic analysis and lower costs are today available. Some further development on the methodology and the guidelines for in situ and especially on farm application is needed to be implemented on a broad scale. Geographical area: across EU.

Challenge 2: Identification and characterization of germplasm for important adaptive traits, particularly those related to climate change adaptation: drought and heat tolerance, waterlogging, increasing CO_2 and ozone concentrations, disease resistance.

Possible solution 2: Development of long-term combined molecular and classical breeding program. Use of DNA fingerprinting, and state of the art molecular breeding and omics techniques, such as genome wide association mapping (GWAS) to gain knowledge. Use pre-breeding activities to enhance the value of local cultivars and CWR: selection of promising genotypes. Evaluate in pilot projects, testing genotype x environment interaction, introducing cultivars with positive characteristics into cultivation and promote this best practice and the resulting cultivars along the value chain in the agrifood sector. Geographical area: across EU.

Challenge 3: Sustainability of conservation efforts requires ongoing financial and technical support, especially in southern Europe in areas close to environmental niche margins where higher genetic diversity could be expected related to adaptation to changing environments. A lack of funding and resources can often lead to the abandonment of conservation projects and practises.

Possible solution 3: Integrated long-term national and international programmes for the preservation and sustainable use of the perennial PGR are necessary. Application of a multidisciplinary approach combining genetic research, modern and traditional practices, socio-economic insights, better policy frameworks, and formulation of sustainable investment frameworks to successfully conserve PGR on farms. Geographical area: across EU, with priority for southern Europe.

Challenge 4: Propagation, sanitation and transfer across regions and countries of interesting germplasm for conservation is not optimal.

Possible solution 4: Investigate state of the art propagation and sanitation methods to preserve cultivar identity and health status of perennial LGs; develop *in vitro* protocols for recalcitrant species.

Challenge 5: Traditional knowledge linked to local cultivars and CWRs is being lost at accelerating rates.

Possible solution 5: Inventory of traditional knowledge linked to local cultivars and CWRs as a legacy of cultural identity Implementation of the UN Declaration on the Rights of Peasants and Other People Working in Rural Areas (UNDROP) and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) into practice, at national and regional levels. Geographical area: across EU.

Ideas for Innovation

Proposal for a potential Idea for Innovation (this proposal may also be implemented as a series of potential OGs each operating at a small territory scale).

Title: How to conserve local germplasm (LG) on farm and in situ
Objectives:
Stage I: Training the team: horticultural engineers and researchers
1. The voice of nature: Establishing suitable perennial crops at the regional level.
2. The voice of the farmer: Knowing the history of cultivating local perennial plants.
3. Ways to obtain planting material.
4. Arousing farmer interest by highlighting benefits of local perennial crops.

Stage II_ Training Course/Workshop for farmers
5. Training farmers in cultivating local perennial plants (1 farmer/locality); Courses-Workshops suggested to obtain grants.

Stage III: Dissemination of the results

Activities, team and implementation schedule:
Stage I: Training the team: horticultural engineers and researchers

1. The voice of nature: Establishing suitable crops at the regional level

	Project Implementation - Activities to be conducted
1a)	Preparation of the list of local perennial varieties at local/national level - Census of local perennial varieties at local/national level. Morphometric and genetic diversity of local cultivars. Introduction and use of UPOV Guidelines.
1b)	Land mapping with soil type, details about rainfall, water availability, wind, land exposure. Soil sampling to update/reclassify soils at local/national level; match to soil type and current climatic context crops that can be suitable. Creating new crop patterns. Updating information on the current limits of the cultivation area of certain species. On farm conservation. In situ conservation on "set-aside" private lands.
1c)	Preparation of a garden calendar.

2. The voice of the farmer: Knowing the history of cultivating local perennial plants

	Project Implementation - Activities to be conducted
2a)	Documenting, searching for stories and asking questions to old farmers about local perennial plants cultivated in the past; Knowing old crop patterns, and based on them, interpreting and integrating them into the current edaphic and climatic context. Determination of cultivars using morphological and/or genetic analysis. Identification of synonyms/homonyms.

3. Ways to obtain planting material

	Project Implementation - Activities to be conducted
3a)	Lists of cultivars, varieties, clones to be conserved. Lists of local/national nurseries that could obtain planting material and discussions with their representatives; Finding a nursery available to present multiplication techniques and providing support to GO farmers.

3b)	Identification and creation of seed banks and gene banks; Collaboration with Garden / Seed / Conservation Centres. Conducting seed exchange activities. Taking over genetic information resulting from DNA analysis (genetic markers, whole genome sequencing), from other entities (Universities, Research Centres) that have analysed local plants in national or European projects.
3c)	Exemplification and actual testing of all methods of propagating planting material for each individual variety. Development of short-term budstick-cuttings collections. Development of long-term seed collections.
3d)	Developing a guide for plant propagation and collection maintenance.

4. Arousing farmer interest by highlighting benefits of local perennial crops

	Project Implementation - Activities to be conducted
4a)	Use of local perennial crops as intermediate crops between other modern varieties. Knowledge from monitoring local varieties. Benefits from immediate availability of germplasm.

Stage II: Training farmers
5. Training farmers in cultivating local perennial plants (1 farmer/locality)

	Project Implementation - Activities to be conducted
5a)	Evaluation and Course Graduation Document for the participating farmers. a course in the field will be requested This document should demonstrate that they have the necessary skills to implement the cultivation and conservation of local perennial species (this may become mandatory for m=payment application (e.g. as in the cases of Measures 10 or 11), a. Application of Training Course/Workshop: EU wide. Timeframe: periodically organized for at least 1 farmer/locality, in as many regions as possible. Slight Course/Workshop modifications on "how to" regarding on farm and in situ conservation, in cultivating local perennial plants and their benefits. Collaboration with the Agricultural Agencies and/or Forest Service to contact farmers and distribute the invitation to participate in the course;

Stage III: Dissemination of the results

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