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Farmer's Pride

Networking, partnerships and tools to enhance *in situ* conservation of European plant genetic resources

Development of a European network for *in situ* conservation and sustainable use of plant genetic resources

A stakeholder analysis

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Summary

The Farmer's Pride project is working to build a permanent collaborative network for *in situ* conservation and sustainable use of Europe's plant diversity for food, nutrition and economic security throughout the region. To gain an understanding of the range of stakeholders involved or with an interest in *in situ*/on-farm conservation and sustainable use of plant genetic resources, and to help ensure full stakeholder representation in the Network, we carried out an online stakeholder survey. The results exceeded our expectations in terms of the overall number of responses, the geographic coverage, the breadth of stakeholder organizations represented, and the interests of respondents in the *in situ* conservation and sustainable use of plant genetic resources. Fundamentally, the majority of respondents are interested in becoming a member of the new European Network for *In Situ* Conservation and Sustainable Use of Plant Genetic Resources.

Notably, all countries in the target area (geographic Europe, the EU member states, Turkey, the Russian Federation, and the Caucasus) were represented, and critically, representatives of all the anticipated main broadly defined stakeholder groups responded to the survey, including independent farmers, protected area managers, seed companies and policymakers. Respondents have interests in all aspects of *in situ* conservation and sustainable use of plant genetic resources—from national policy development, through capacity building, improving access to material, direct utilization for own consumption or commerce, to research into stress resistance traits, new markets for neglected crops, diversification of grain-based products, and general resilience of humans and the environment. They also work with all types of plant genetic resources, including landraces, crop wild relatives and other wild species, conservation, amateur and obsolete varieties, forage and cereal mixtures, and a range of other types of heterogeneous populations.

The majority of respondents wish to receive further information about the Farmer's Pride project and the establishment of the European Network—a clear indication of the interest in *in situ* conservation and sustainable use of plant genetic resources and of the establishment of the Network. Combined with the fact that most respondents also indicated an interest in becoming a member of the Network, and the range of stakeholder groups, activities and interests that the survey has revealed, the results provide concrete evidence of the need for resources to not only establish the European Network, but to sustain it into the future.

1.0 Introduction

Our future food and nutrition security depends on the survival of a wide range of plant genetic resources (PGR), including wild relatives of crops (or *crop wild relatives* – CWR) and locally adapted cultivated varieties (or *landraces* – LR). In current times of global transformation—including the rapidly increasing human population and climate change—we need greater diversity to sustain food supplies than ever before as the environmental conditions in which crops are cultivated become more extreme, changeable and uncertain. CWR and LR are rich sources of genetic diversity that plant breeders can use to develop improved crop varieties to meet this challenge, and LR are directly important to the livelihoods of those who grow them. However, these resources are being lost due to a range of anthropogenic threats, taking with them their potential benefits to society. *In situ* conservation of PGR—that is, conservation on-site, whether in wild habitats or on-farm—is essential to maximize genetic diversity conservation and to support livelihoods. This is reflected in global policy and legislative instruments signed by the majority of countries worldwide—most notably, the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture (Second GPA – www.fao.org/agriculture/crops/thematic-sitemap/theme/seeds-pgr/gpa/) and International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA – www.fao.org/plant-treaty/). Despite this, PGR conservation activities have almost exclusively focused on the collection of seed and other plant materials for storage in seed (or gene) banks (i.e., *ex situ*, or off-site conservation). This does not cater for the conservation of sufficient diversity (due to the limitations of space and resources), nor does it conserve evolutionary adaptations in plant populations in response to changing environmental conditions (in the case of CWR) or to farmer selection (in the case of LR). Further, farmers of diverse crop varieties can be hindered by market pressures and prohibitive seed policies, and therefore require appropriate support to maintain their crops for their own livelihoods and those of local communities.

In three major reports published over the past two decades, the UN Food and Agriculture Organization (FAO, 1998, 2010, 2019)—recognizing the importance of CWR and LR diversity as vital resources for food, nutrition and economic security—has highlighted the need for concerted efforts to conserve them *in situ* and on-farm. Specifically, the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA) advocated the establishment of a global network for *in situ* and on-farm conservation, and has taken steps towards achieving this goal (e.g., Maxted and Kell, 2009; FAO, 2011, 2013). Concurrently, a number of notable initiatives have made significant strides in progressing CWR and LR conservation strategy planning at national, regional and global levels (e.g., see Vincent *et al*., 2013; Maxted *et al*., 2015; Kell *et al*., 2016; ECPGR 2017; Labokas *et al*., 2018; Allen *et al*., 2019), and an approach for establishing the envisioned global network involving an accumulative regional network approach has been proposed (Maxted *et al*., in prep).

In Europe, the European Cooperative Programme for Plant Genetic Resources (ECPGR) has developed and endorsed concepts for *in situ* and on-farm conservation of CWR (Maxted *et al*., 2015) and LR (ECPGR, 2017), which outline how *in situ* networks for PGR conservation could be established and maintained throughout the region. Subsequently, the European Commission (EC) published a call to establish "new partnerships and tools to enhance European capacities for *in situ* conservation" (EC H2020 Call SFS-04-2017), noting that:

> "Activities will help to build (a) network(s) of *in situ* (including on-farm and on-garden) conservation sites and stakeholders in order to develop new partnerships between the conservation, farming, gardening and breeding sectors and with the wider public. This will expand capacities to manage genetic resources in more dynamic and participatory ways and

> to support their use in breeding, farming and the food chain. Cooperation between conservation stakeholders will enhance knowledge of available resources, support the demonstration of *in situ* genetic resources to the wider public and improve access to this genetic reservoir."

The Farmer's Pride project (www.farmerspride.eu) was funded under the call and is working to build a permanent collaborative network for *in situ* conservation and sustainable use of Europe's plant diversity for food, nutrition and economic security throughout the region. Critically, the function of the Network is not only to ensure long-term *in situ* conservation of PGR, but to promote the use of the conserved resources—for example, by providing access to the user community (farmers and other landrace maintainers, researchers and plant breeders, and any other professionals with an interest in sustainable use of PGR). Members of the European Network may be farmers and farmers' associations, local communities, protected area managers and agencies, seed networks, or other PGR custodians, all of whom have common objectives and a commitment to long-term *in situ*/on-farm management to agreed minimum standards. Membership will confer recognition of the importance of the resources maintained and the role of custodians in sustaining them, thus adding value to members' activities.

To gain an understanding of the range of stakeholders involved or with an interest in *in situ*/on-farm conservation and sustainable use of PGR, and to help ensure full stakeholder representation in the Network, Farmer's Pride carried out an online survey using the EUSurvey tool (Annex 1). We published the survey in ten languages (Dutch, English, Finnish, French, German, Greek, Hungarian, Italian, Spanish and Turkish) to maximize the number of responses across the region. We launched the survey on 03 May 2018 and it remained open until 01 April 2019, during which time the project partners and Farmer's Pride Ambassadors (see www.farmerspride.eu/collaborators) disseminated it widely to potentially interested stakeholders. These included members of the ECPGR; farmer, gardener and trade associations; seed-saver networks; plant breeding and seed companies; public research and technology institutes; botanic gardens; national parks; agro-NGOs; protected area managers; government ministries and other policymakers; and national PGR coordinators (see Annex 2 for details of dissemination activities). The target area was geographic Europe, the EU member states, Turkey (represented as a partner in the Farmer's Pride project), the Russian Federation, and the Caucasus.

We designed the survey in three sections: 1) respondents' contact details (for those who wish to be contacted further) and main areas of work; 2) their roles and interests in *in situ* conservation and sustainable use of PGR; and 3) communication needs. In this report, we present the main results of the survey and discuss their implications for the establishment of the European Network for *In Situ* Conservation and Sustainable Use of PGR.

2.0 Survey results

2.1 Geographic coverage

We received 1022 complete individual responses from stakeholders in 35 countries (Table 1)—555 from Turkey and the remaining 467 from all the other countries. The disproportionate number of responses from Turkey, and notably higher numbers from Italy, Spain, Hungary, Greece and Finland is most likely due to the relative effectiveness of dissemination activities, and does not imply less PGR stakeholder activity in other countries.

Table 1. Numbers of survey responses per country, based on the countries in which the respondents or their organizations are based[1]

Turkey	555	France	3
Italy	97	Serbia	3
Spain	78	Slovenia	3
Hungary	49	Bulgaria	2
Greece	34	Ireland; UK	2
Finland	25	Poland	2
Netherlands	18	Serbia; Turkey	2
United Kingdom	18	Slovakia; Turkey	2
Germany	16	Armenia	1
Switzerland	13	Azerbaijan	1
Denmark	11	Germany; Switzerland	1
Czech Republic	8	Germany; Latvia; Netherlands; Switzerland	1
Austria	7	Ireland; Italy	1
Croatia	7	Lithuania	1
Estonia	7	Romania	1
Ireland	7	Russian Federation	1
Belgium	6	Switzerland; Italy	1
Portugal	6	Switzerland; Latvia	1
Sweden	6	Turkey; Cyprus	1
Norway	5	Turkey; Other	1
Albania	4	Ukraine	1
Bosnia and Herzegovina	4	Other[2]	5
Latvia	4	**Total**	**1022**

We also asked respondents in which country or countries they or the organization they represent work. This increased the geographic coverage to include Andorra, Belarus, Georgia, Iceland, Kosovo, Liechtenstein, Luxembourg, Macedonia, Malta, Moldova, Monaco, Montenegro, San Marino and Vatican City. Thus, all countries in the target area were represented, either directly or indirectly in the survey.

[1] In some cases, respondents indicated an association with more than one country.
[2] Responses received from stakeholders outside the target area.

2.2 Stakeholders' interests

In the questionnaire we asked respondents to indicate: a) the type of organization they are associated with and/or their individual area(s) of work/interest(s) (if they are not associated with an organization) (Fig. 1); b) their main interest(s) in *in situ* conservation of PGR (Fig. 2); and c) the type(s) of PGR they work with (Figs. 3 and 4)[3].

Representatives of all the main stakeholder groups responded to the survey (Fig. 1). A large proportion (65%) of respondents from Turkey are associated with a public body, while the largest proportion (44%) from all other countries works on aspects of agrobiodiversity conservation. Notably, the survey attracted responses from a significant number of independent farmers, as well as individuals who are associated with farmers' consortia, which highlights the value placed by farmers on PGR conservation and sustainable use. While the proportion of respondents associated with the seed sector was low (5% across all countries), the numbers of individual responses (47) was nonetheless very encouraging. This indicates that commercial seed companies are also highly concerned about sufficient PGR being available for future use in crop improvement, which in turn is critical for bolstering the agricultural economy in the region. It is also noteworthy that 55 respondents who are involved in aspects of policy related to PGR responded to the survey. Putting in place appropriate policies to support PGR *in situ* conservation and sustainable use is critical to the success of the European Network, and one of the key tasks of the Farmer's Pride project is to draw the attention of policymakers and lobby for the changes needed in the policy environment related to PGR.

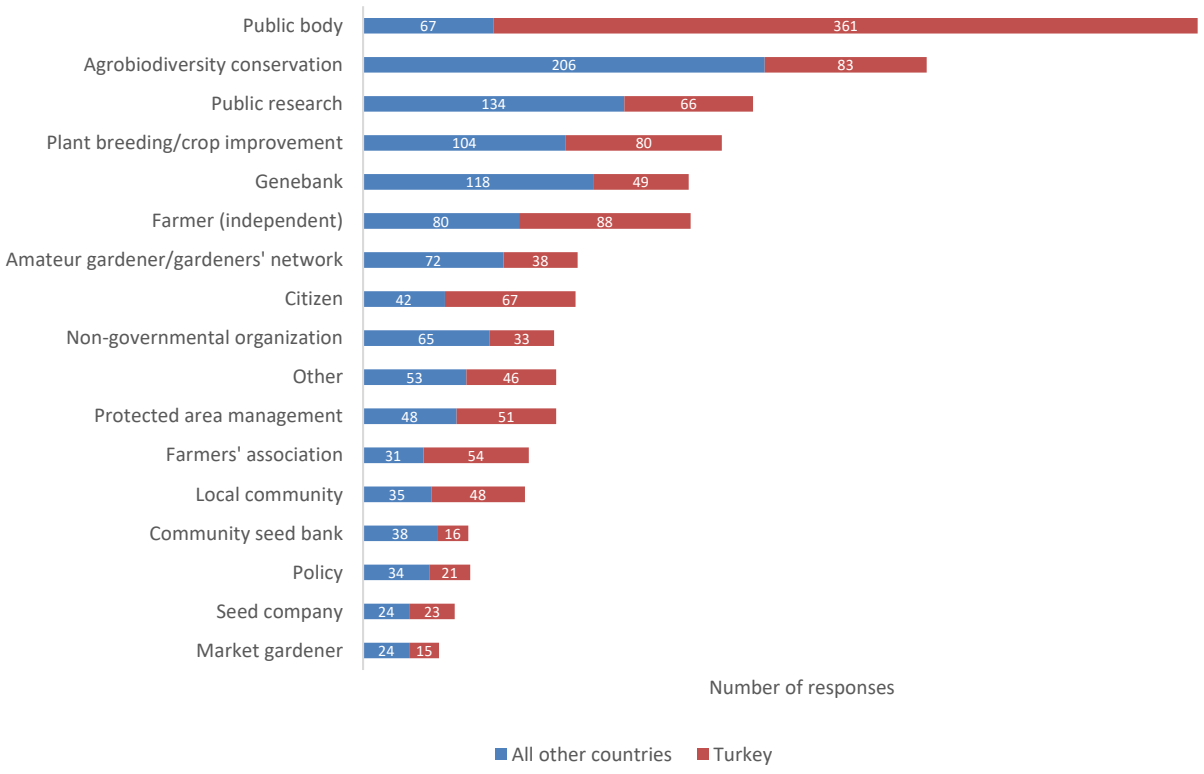

Figure 1. The types of organizations respondents are associated with and/or their individual areas of work/interests (if not associated with an organization). The total number of options selected were 1139 from 555 respondents (Turkey) and 1175 from 467 respondents (all other countries).

[3] Due to the disproportionate number of responses received from Turkey, we present the results for that country separately.

The proportion of respondents involved in protected area management (10% across all countries) is also significant. Advocating the essential role of protected area managers and agencies in PGR conservation has been central in efforts to bring together agricultural and nature conservation organizations to work together towards the common goal of maintaining and making available plant genetic diversity for food, nutrition and economic security. Other types of organizations and areas of work represented among the respondents included: plant variety testing, production and health; seed associations and networks; botanic, museum and castle gardens; slow food; environmental education; biodiversity inventory; organic production; plant systematics; rural development; apiculture research; consulting company; and other professional associations.

Figure 2 shows that interests in all aspects of *in situ* conservation of PGR are relevant to survey respondents. However, the imperative for the conservation of genetic diversity is clear, with 62% of all respondents (46% in Turkey and 81% in all other countries) selecting this as a main interest. Other interests reported by respondents include: research into stress resistance traits for crop improvement (e.g., frost, drought, pests); production and sale of typical local products; own consumption; setting up a living national seed bank; new markets for old neglected crops; finding new grains for bakers to work with; promoting the cultivation of medicinal and aromatic plants; farmer training for implementation of agri-environment measures; and building resilience for soil, water, air, plants, animals and people.

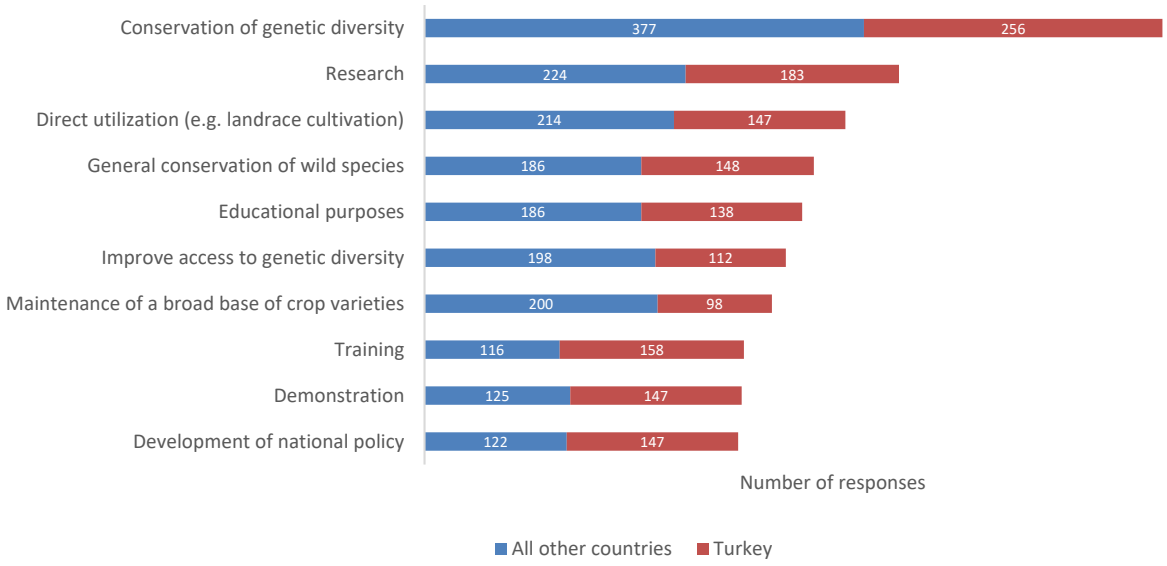

Figure 2. The main interests of respondents in *in situ* conservation of PGR. The total number of options selected were 1534 from 555 respondents (Turkey) and 1948 from 467 respondents (all other countries).

Respondents work with all types of PGR, although landraces are clearly of paramount importance, with 47% of all respondents (32% in Turkey and 66% in all other countries) indicating that they work with these materials (Fig. 3). Among listed materials, conservation varieties are also of great interest. Commission Directives 2008/62/EC and 2009/145/EC (EC 2008, 2009) allow the registration of landraces, or different materials characterized by adaptation to 'local' and 'regional' conditions and in threat of genetic erosion, as conservation varieties, of which seed is legally marketable in Europe. The interest in such materials highlighted by this survey suggests the opportunity/need for wider registration of landraces using this designation than currently achieved. As this material is marketable, it could serve the need for variable populations expressed by survey respondents, and as a consequence, increase on farm (*in situ*) conservation

activities. The usefulness of registering landraces as conservation varieties to meet seed requests from the organic farming sector was already suggested by Spataro and Negri (2013). Regarding the different types of materials purposely developed by farmers, farmers' organizations and/or by breeders, including through participatory plant breeding (i.e., 'other heterogeneous populations'), composite cross populations (CCP), mixtures of registered varieties, and large mixtures of a wide range of germplasm are clearly significant (Fig. 4). However, relatively few respondents (11% of all respondents – 6% Turkey, 17% all other countries) indicated that they work with these types of materials compared for example with LR (see above), conservation varieties (34% – 15% Turkey, 55% all other countries) and CWR (28% – 18% Turkey, 39% all other countries). Other types of materials respondents work with include: modern cultivars, open pollinated and hybrid plant varieties, protected farmers' products, forest biodiversity, rare, threatened and endemic wild plant species, and medicinal and aromatic plants.

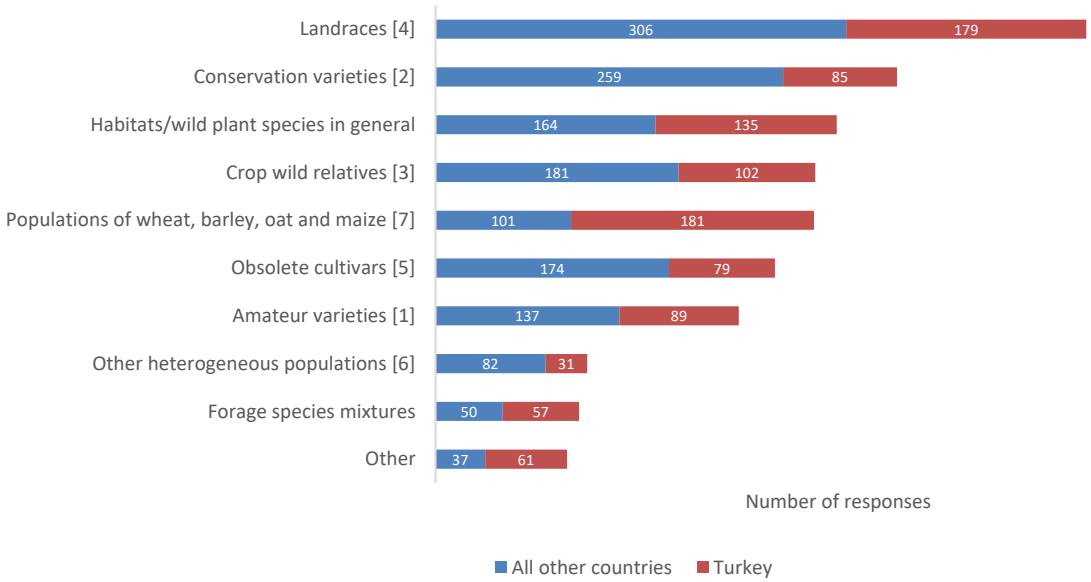

Figure 3. The types of PGR respondents work with. The total numbers of options selected were 999 from 555 respondents (Turkey) and 1941 from 467 respondents (all other countries). Definitions: [1] *Vegetable varieties with no intrinsic value for commercial production* (2009/145/EC – EC, 2009); [2] *Varieties which are naturally adapted to the local and regional conditions* (Commission Directives 2008/62/EC and 2009/145/EC – EC, 2008, 2009); [3] *Wild species related to crops which contain important diversity for crop enhancement* (Maxted *et al.* 2006); [4] *Diverse, locally adapted crop populations which not only contain diversity for crop enhancement, but are also important for local food and economic security* (Casañas *et al.* 2017); [5] *Cultivars having no or limited intrinsic value for commercial crop production* (ECPGR 2017); [6] *Different types of materials purposely developed by farmers, farmers' organizations and/or by breeders, including through participatory plant breeding* (ECPGR 2017); [7] As defined by Commission Implementing Decision of 18 March 2014 (EC, 2014).

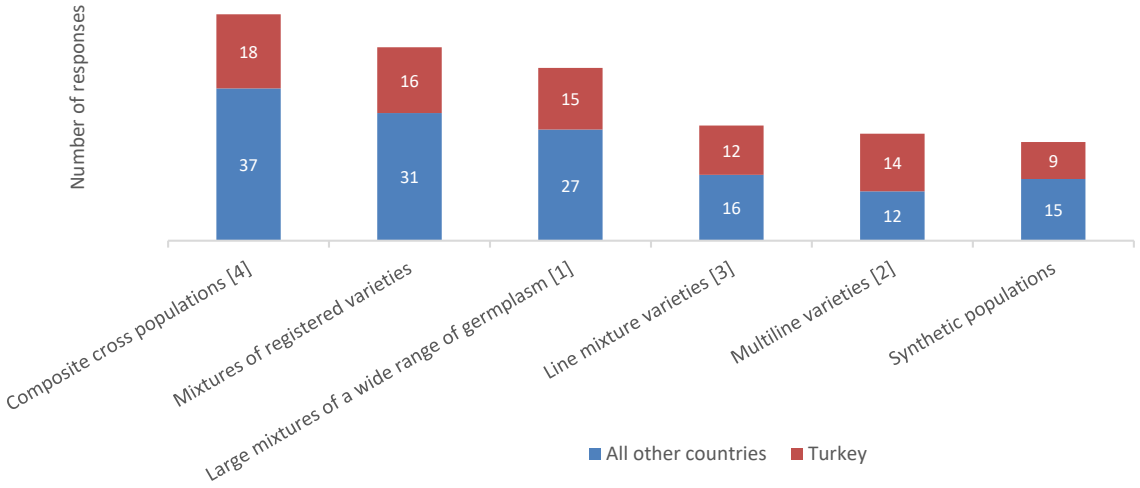

Figure 4. The types of heterogeneous populations that respondents work with. The total numbers of options selected were 84 from 31 respondents (Turkey) and 138 from 82 respondents (all other countries). Definitions: [1] *Including wild relatives, landraces from several countries and modern breeding material, used as 'evolutionary populations'* (Ceccarelli, 2012); [2] *Composed of up to ten lines that are isogenic for almost all agronomic traits, but only genetically dissimilar in resistance against one particular disease – for example, the Dutch wheat variety 'Tumult'* (Lammerts van Bueren, 2002); [3] *Lines that are carefully selected for mixing ability on the basis of phenotypic uniformity for a number of traits but which are genetically different* (Lammerts van Bueren, 2002); [4] *Populations of segregating individuals derived from inter-crossing a number of parents and then exposed to natural selection in each subsequent generation = Evolutionary Plant Breeding* (Suneson, 1956).

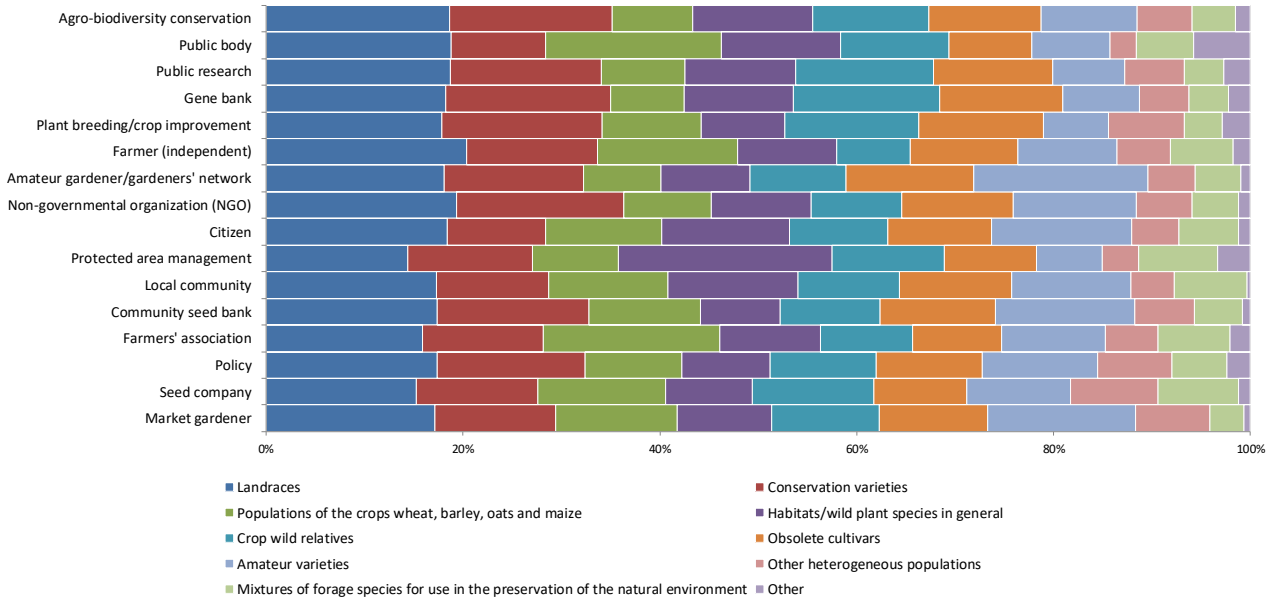

Figure 5. The types of PGR of main interest for each type of organization respondents are associated with and/or their individual areas of work/interests, shown as percentages per stakeholder group.

Interests in different types for each stakeholder group were also analysed (Fig. 5). Because the groups of stakeholders were defined according to 'area of work' and 'interests', the groups are not strictly defined. Further, since multiple responses were allowed for this question, the preferences of the same stakeholder can be included in different groups. Nonetheless, the results indicate that all types of materials are important for all stakeholder groups.

2.3 Network membership

The survey revealed that a substantial proportion of respondents in all countries other than Turkey (43%) are already members of a conservation network (either as individuals or via their organizations) (Fig. 6). Examples are: AEGILOPS[4]; Federparchi[5]; Fondation pour la recherché sur la biodiversité[6]; Foreningen Frøsamlerne (Danish Seed Savers)[7]; Garden Organic's Heritage Seed Library[8]; Global Ecovillage Network[9]; Let's Liberate Diversity[10]; Nordic Heritage Seed Network; and Red de Semillas Resembrando e Intercambiando[11]. In Turkey, respondents belong to the Turkish agricultural development cooperatives, plant genetic resources network, and olive breeders' association.

Encouragingly, a large proportion of respondents (43% in Turkey and 73% in all other countries) is interested in becoming a member of the European Network for *In Situ* Conservation and Sustainable Use of Plant Genetic Resources (Fig. 7). Figure 8 shows that all stakeholder groups are interested in joining the Network, with the exception of public bodies. However, the low proportion of positive responses in this group is mainly due to the high number of respondents from Turkey, where a general lower interest in joining the network has been observed in comparison with other European countries (see Figure 7). It is therefore expected that a significant number of stakeholders from all the stakeholder groups will join the Network. Notably, the highest interest in joining the Network is indicated for stakeholders involved in agrobiodiversity conservation, gene bank management and community seed banks, with the latter expected to play an important role in increasing seed availability and in promoting its distribution and exchange among stakeholders.

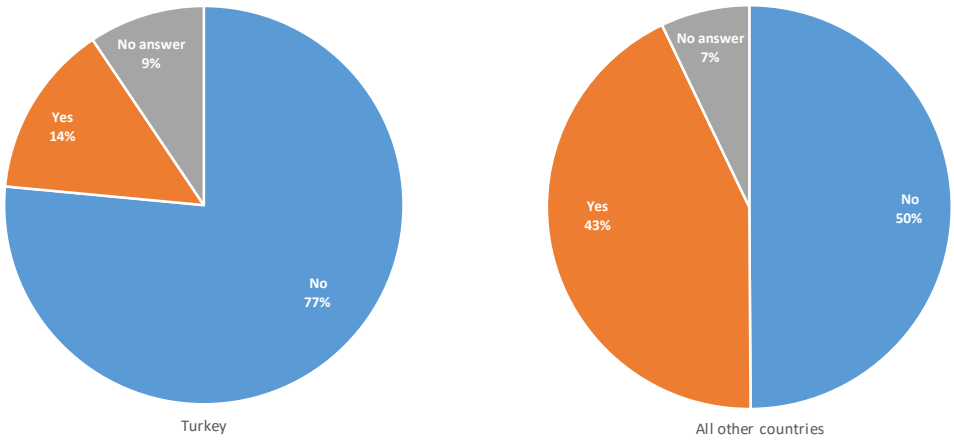

Figure 6. Membership of existing conservation networks/associations (Turkey: *n* = 555; All other countries: *n* = 467).

[4] www.aegilops.gr/en/
[5] www.parks.it/federparchi/
[6] www.fondationbiodiversite.fr/
[7] www.froesamlerne.dk/
[8] www.gardenorganic.org.uk/hsl
[9] ecovillage.org/
[10] liberatediversity.org/
[11] www.redsemillas.info/

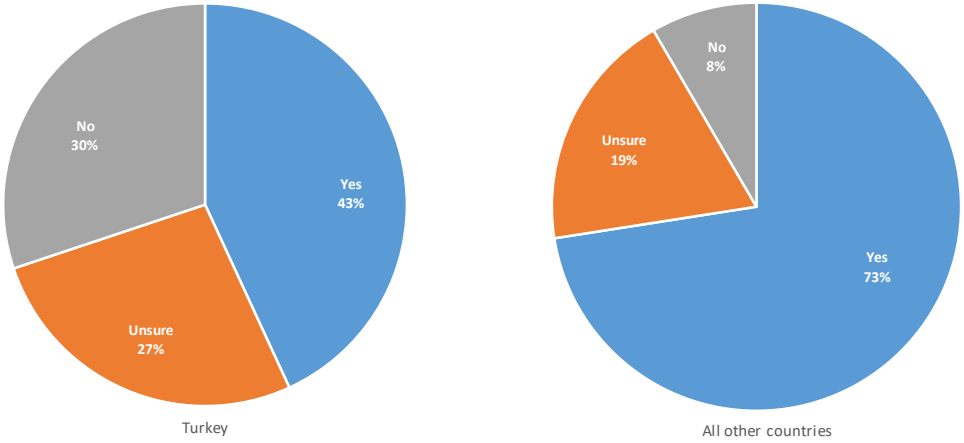

Figure 7. Interest in joining the European Network (Turkey: *n* = 555; All other countries: *n* = 467).

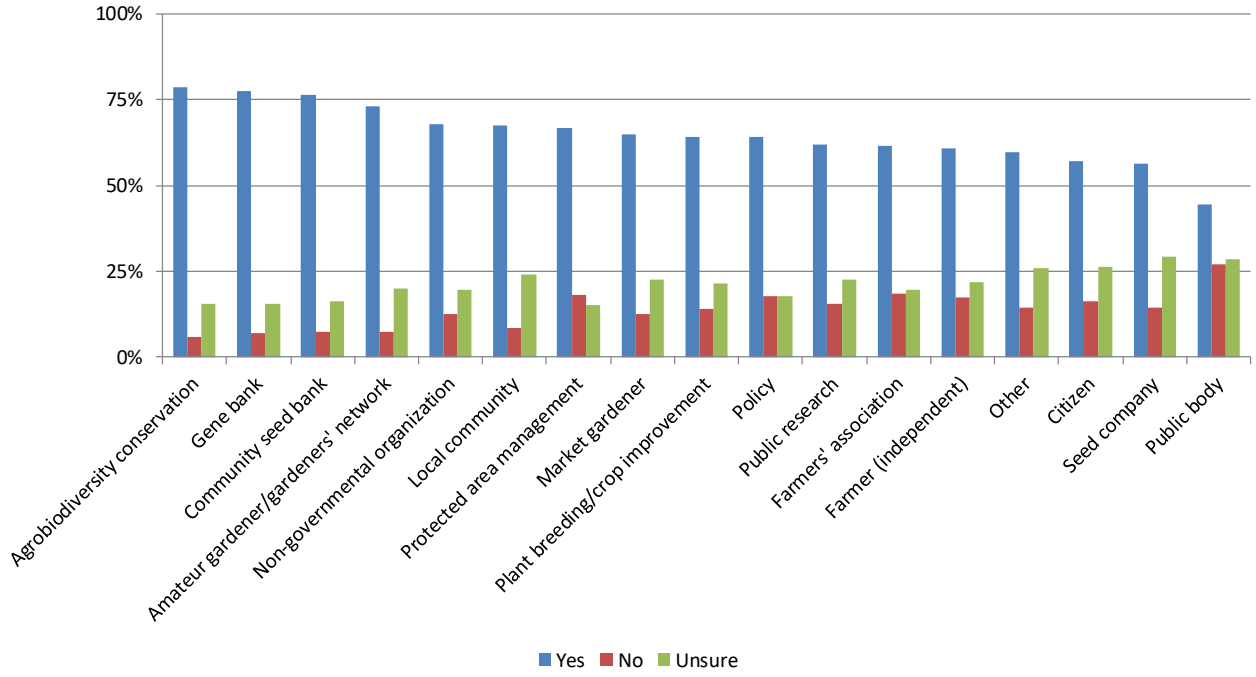

Figure 8. Interest of stakeholders in becoming members of the European Network by type of organization respondents are associated with and/or their individual areas of work/interests.

2.4 Communication needs

We asked respondents to indicate: a) the channels of communication they prefer to use for their PGR conservation activities (Fig. 9); b) the types of information they are interested in receiving (Fig. 10); and c) the types of communications they consider as priorities to support *in situ* PGR conservation in the region (Fig. 11).

Preferred channels of communication range between 57% and 10% of respondents across all countries, with e-news from the Farmer's Pride project being of greatest interest and Twitter of least interest (Fig. 9). All types of information are of interest to all but 4% of respondents, and range between 58% of respondents being interested in receiving information about the establishment of the European Network and 18% interested in blogs (Fig. 10). In terms of priority types of communications, all are of significant value, with a maximum of 59% of respondents indicating the importance of participatory workshops and conferences, and minimum of 30% acknowledging the importance of socioeconomic analyses in exploring effective ways to support *in situ* PGR conservation (Fig. 11).

Recognizing the importance of providing information in different languages to reach a wide audience, we asked respondents to inform us about their national languages (or that of the organization they work with), and other languages they or their organization can work with. Respondents reported 29 national languages and 31 other languages that they can work with. Sixty-five percent of respondents across all countries (55% in Turkey and 77% in all other countries) indicated that they can communicate in English as a second language, showing the importance of making information available in other languages to cater for all stakeholders.

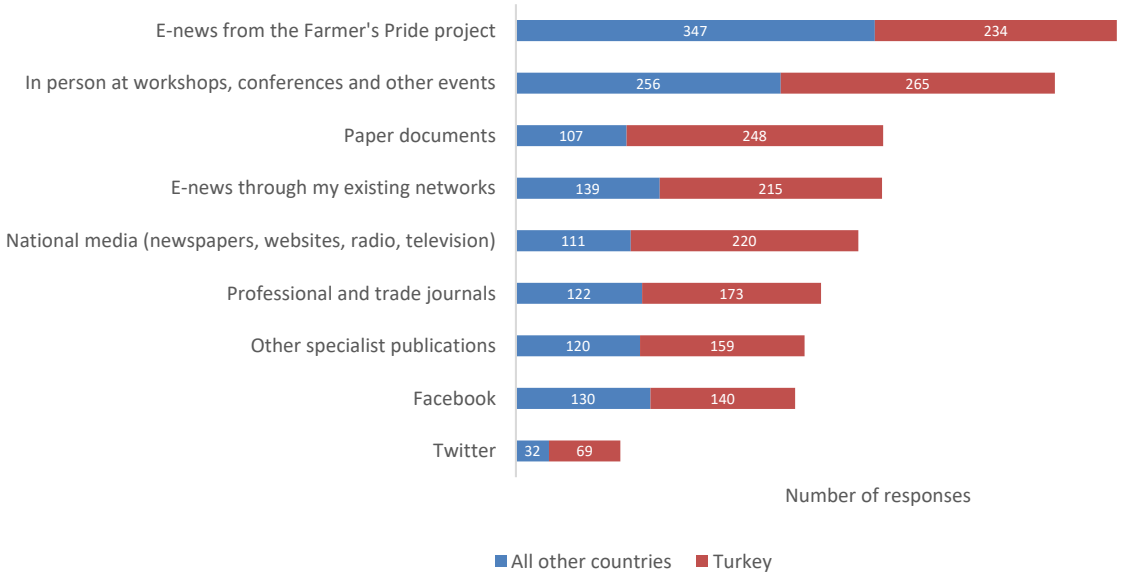

Figure 9. The channels of communication respondents prefer to use for their PGR conservation activities. The total numbers of options selected were 1723 from 555 respondents (Turkey) and 1364 from 467 respondents (all other countries).

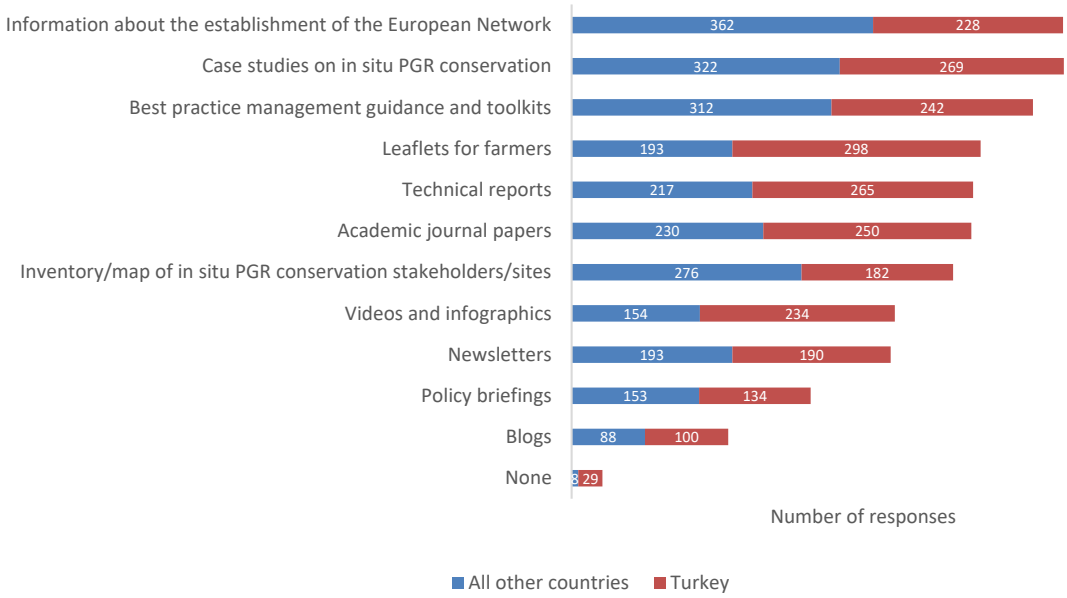

Figure 10. The types of information respondents are interested in receiving. The total numbers of options selected were 2421 from 555 respondents (Turkey) and 2508 from 467 respondents (all other countries).

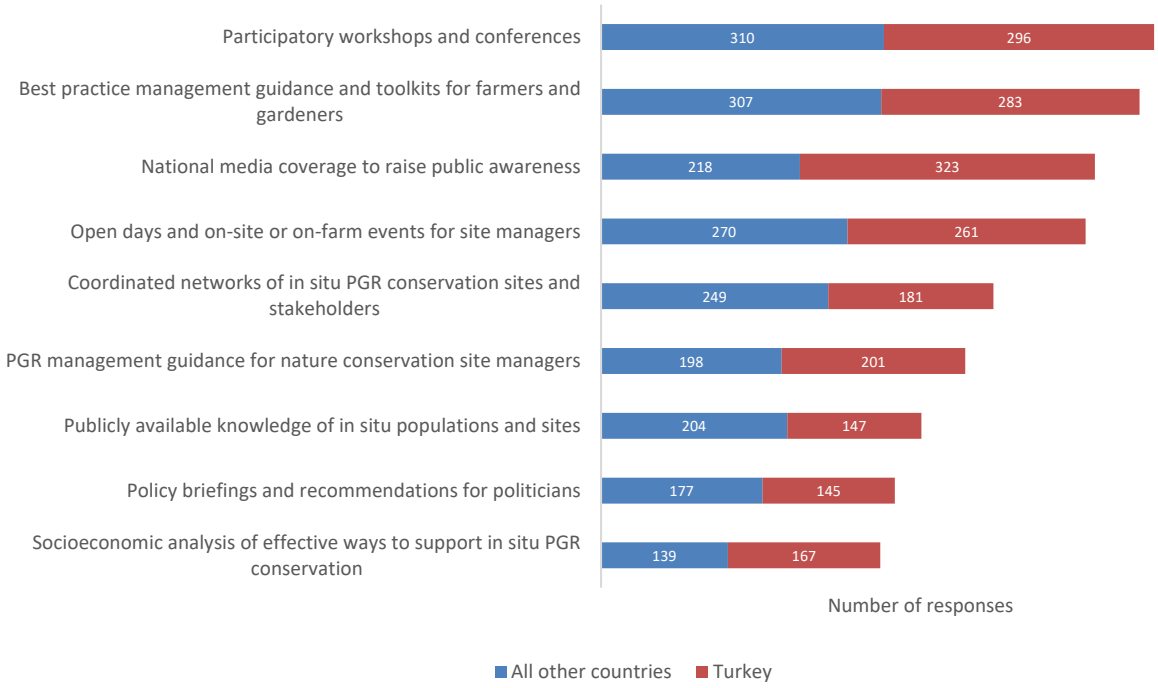

Figure 11. The types of communications respondents consider as priorities to support *in situ* PGR conservation in the region. The total numbers of options selected were 2004 from 555 respondents (Turkey) and 2072 from 467 respondents (all other countries).

3.0 Conclusions

We launched the stakeholder survey to gain an understanding of the range of stakeholders involved or with an interest in *in situ*/on-farm conservation and sustainable use of PGR, and to help ensure full stakeholder representation in the European Network for *In Situ* Conservation and Sustainable Use of Plant Genetic Resources. The results exceeded our expectations in terms of the overall number of responses, the geographic coverage, the breadth of stakeholder organizations represented, and the interests of respondents in the *in situ* conservation and sustainable use of PGR. Fundamentally, the majority of respondents are interested in becoming a member of the European Network for *In Situ* Conservation and Sustainable Use of Plant Genetic Resources.

Notably, although the response rate in some countries was low, all countries in the target area (geographic Europe, the EU member states, Turkey, the Russian Federation, and the Caucasus) were represented, either directly by respondents located in the countries, or indirectly by respondents who work in other countries. Critically, representatives of all the anticipated main broadly defined stakeholder groups responded to the survey, including independent farmers, protected area managers, seed companies and policymakers—groups that can be difficult to reach using this type of survey approach. This likely indicates the success of the survey dissemination, and importantly, the interest of these stakeholder groups in *in situ* conservation and sustainable use of PGR, due to their willingness to participate in the survey. Particularly noteworthy is the participation of commercial seed companies—they are clearly concerned about sufficient PGR being available for future use in crop improvement, which in turn is critical for sustaining the agricultural economy throughout the region. The contributions of protected area managers are also significant because of their vital role in the management of CWR populations, as well as in promoting diversity farming within the boundaries of their sites.

Also notable is the range of organizations and areas of work represented amongst the respondents under the 'other' category—for example, plant variety testing, production and health, botanic, museum and castle gardens, environmental education, organic production, rural development, and apiculture research. Further, respondents have interests in all aspects of *in situ* conservation and sustainable use of PGR—from national policy development, through capacity building, improving access to material, direct utilization for own consumption or commerce, to research into stress resistance traits, new markets for neglected crops, diversification of grain-based products, and general resilience of humans and the environment. They also work with all types of PGR, including landraces, CWR and other wild species, conservation, amateur and obsolete varieties, forage and cereal mixtures, and a range of other types of heterogeneous populations. It is clear that the range of stakeholder groups and interests is extremely broad and diverse, which means the European Network will be complex in terms of providing for the wide variety of roles, activities and needs of different members and understanding how to bring them together towards a common aim. Strong, stable and sustained governance of the Network will be essential.

Finally, the collection of information on existing network membership and communication needs is important to inform the establishment of the European Network. By investigating the range of networks that respondents are already associated with, we can gain a better understanding of their functions, how they operate, the people they cater for, and how they might become part of a wider regional network to support PGR conservation and sustainable use *in situ*. Communication is also central to Network success. Whether promoting the Network to potential members and donors, offering technical support, providing a platform for information-sharing, publicizing relevant events, or maintaining regular general communications, understanding the preferred channels of communication and the types of information of interest to

members is fundamental. Notably, in the immediate term, the majority of respondents wish to receive further information about the Farmer's Pride project and the establishment of the European Network. This outcome alone is a clear indication of the interest in *in situ* conservation and sustainable use of PGR and of the establishment of the European Network. Combined with the fact that the majority of respondents also indicated an interest in becoming a member of the Network, and the range of stakeholder groups, activities and interests that the survey has revealed, we clearly have concrete evidence of the need for resources to not only establish the Network, but to sustain it for years to come.

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ANNEX 1. The survey

European Network for *In Situ* Conservation of Plant Genetic Resources

Fields marked with * are mandatory.

Welcome to this consultation on a new European network for *in situ* conservation of plant genetic resources

Funded by the European Union (EU), the Farmer's Pride project (www.farmerspride.eu) is working to strengthen *in situ* conservation of plant genetic resources (PGR) in Europe [1].

The focus is on conserving the diversity of both wild and cultivated populations of species that are important for food, nutrition and economic security [2].

We are establishing a new European network for *in situ* conservation of plant genetic resources that brings together stakeholders and sites across the region and coordinates actions to conserve diversity for crop enhancement and adaptation in the future.

This consultation aims to understand which stakeholders (organizations or individuals) are involved or have an interest in the conservation and sustainable use of PGR *in situ*. If you consider that you are (or may be) a custodian of wild or cultivated populations of PGR, or if conserving PGR *in situ* is important to you, we would like to hear from you.

The survey will take 10–15 minutes to complete.

Please feel free to distribute the link to this survey among potential respondents in your network.

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[1] *In situ* conservation means the management of populations in their natural habitats in the case of wild species (which may be in wild, semi-natural, managed, or abandoned habitats) and in the locations where they are cultivated in the case of crops (which may be in farms, smallholdings, home gardens, and allotments).

1

[2] Species known as crop wild relatives (CWR – wild species related to crops which contain important diversity for crop enhancement) and landraces (LR – diverse, locally adapted crop populations which not only contain diversity for crop enhancement, but are also important for local food and economic security. They are also known as "farmer varieties").

The survey

- By completing this survey you are consenting to the Farmer's Pride project storing the information you provide, which will only be accessed by authorized personnel working in the project.
- We will not make your contact details available in the public domain or pass them on to any third parties.
- The information you contribute to this survey will not be used for any other purpose than for the establishment of the European Network for *In Situ* Conservation of Plant Genetic Resources, and for reporting on its establishment.
- A synthesis of the results will be published in a document available on the Farmer's Pride project website and may also be published in other forms, such as in a journal article.
- Any such publications arising from this survey will contain no identifying information that could associate it with you or the organization you represent.
- We will only contact you with information about the development of the European Network if you provide your email address and we will only contact you with information about the Farmer's Pride project with your consent (see question 3.2). You may opt out of receiving communications at any time.

The survey comprises three sections:

1. Your contact information and area of work.
2. Your roles and interests in the *in situ* conservation of plant genetic resources.
3. Communication needs.

Please note that:

- Questions flagged with asterisks are mandatory.
- At any point in the survey you may go back to the previous question if you wish to change an answer. This action will overwrite the previous answer given.

If you have any questions about this survey, please contact Dr. Lorenzo Raggi: lorenzo.raggi@unipg.it.
For further information please visit www.farmerspride.eu.

1. Your contact information and area of work

We would like to keep you informed about the development of the European Network for *In situ* Conservation of Plant Genetic Resources. For this purpose,

please provide your name and/or a means of contacting you.

Please note that no identifiable personal data will be published and your contact details will only be used as stated in the previous section, 'The survey'.

1.1 Family name:

Surname

1.2 Given name:

First name

1.3 Email address:

Preferably your work email account
Please provide at least one email address or phone number

1.4 Phone number:

Country code (i.e. +39), national destination code (i.e. 075), subscriber number 123456. Format +39075123456
Please provide at least one email address or phone number

Please now provide information about your organization, or about you if you are not affiliated with an organization.

1.5 Organization name in the national language:

Name in the language of origin

1.6 Organization name in English (if applicable):

Name in English

***1.7 Country:**

Country in which your organization is based, or in which you are based if you are not affiliated with an organization

Albania	Estonia	Lithuania	San Marino
Andorra	Finland	Luxembourg	Serbia
Armenia	France	Malta	Slovakia
Austria	Georgia	Moldova	Slovenia

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- [ ] Azerbaijan
- [ ] Belarus
- [ ] Belgium
- [ ] Bosnia and Herzegovina
- [ ] Bulgaria
- [ ] Croatia
- [ ] Cyprus
- [ ] Czech Republic
- [ ] Denmark
- [ ] Germany
- [ ] Greece
- [ ] Hungary
- [ ] Iceland
- [ ] Ireland
- [ ] Italy
- [ ] Kosovo
- [ ] Latvia
- [ ] Liechtenstein
- [ ] Monaco
- [ ] Montenegro
- [ ] Netherlands
- [ ] Norway
- [ ] Poland
- [ ] Portugal
- [ ] Republic of Macedonia
- [ ] Romania
- [ ] Russian Federation
- [ ] Spain
- [ ] Sweden
- [ ] Switzerland
- [ ] Turkey
- [ ] Ukraine
- [ ] United Kingdom of Great Britain and Northern Ireland
- [ ] Vatican City
- [ ] Other

1.8 City/town:

City in which your organization is based, or in which you are based if you are not affiliated with an organization

***1.9 The type of organization you are associated with and/or your individual area(s) of work/interest(s):**

You may select more than one

- [ ] Agro-biodiversity conservation
- [ ] Amateur gardener/gardeners' network
- [ ] Citizen
- [ ] Community seed bank
- [ ] Farmer (independent)
- [ ] Farmers' association
- [ ] Gene bank
- [ ] Local community
- [ ] Market gardener
- [ ] Non-governmental organization (NGO)
- [ ] Plant breeding/crop improvement
- [ ] Policy
- [ ] Protected area management
- [ ] Public body
- [ ] Public research
- [ ] Seed company
- [ ] *Other* (please specify below)

Other type

***1.10 Main country(ies) in which you or the organization you represent work:**

Please select all that apply

- [ ] Albania
- [ ] Andorra
- [ ] Armenia
- [ ] Austria
- [ ] Azerbaijan
- [ ] Belarus
- [ ] Belgium
- [ ] Estonia
- [ ] Finland
- [ ] France
- [ ] Georgia
- [ ] Germany
- [ ] Greece
- [ ] Hungary
- [ ] Lithuania
- [ ] Luxembourg
- [ ] Malta
- [ ] Moldova
- [ ] Monaco
- [ ] Montenegro
- [ ] Netherlands
- [ ] San Marino
- [ ] Serbia
- [ ] Slovakia
- [ ] Slovenia
- [ ] Spain
- [ ] Sweden
- [ ] Switzerland

- [ ] Bosnia and Herzegovina
- [ ] Bulgaria
- [ ] Croatia
- [ ] Cyprus
- [ ] Czech Republic
- [ ] Denmark
- [ ] Iceland
- [ ] Ireland
- [ ] Italy
- [ ] Kosovo
- [ ] Latvia
- [ ] Liechtenstein
- [ ] Norway
- [ ] Poland
- [ ] Portugal
- [ ] Republic of Macedonia
- [ ] Romania
- [ ] Russian Federation
- [ ] Turkey
- [ ] Ukraine
- [ ] United Kingdom of Great Britain and Northern Ireland
- [ ] Vatican City
- [ ] *Other* (please specify below)

Other country(ies)

2. Your roles and interests in the *in situ* conservation of plant genetic resources

Please now provide some information about your activities and interests, and/or the activities and interests of the organization you represent.

2.1 The type(s) of plant genetic resources you work with:

- [ ] Amateur varieties [1]
- [ ] Conservation varieties [2]
- [ ] Crop wild relatives [3]
- [ ] Habitats/wild plant species in general
- [ ] Landraces [4]
- [ ] Obsolete cultivars [5]
- [ ] Other heterogeneous populations [6]
- [ ] Mixtures of forage species for use in the preservation of the natural environment
- [ ] Populations of the crops wheat, barley, oats and maize [7]
- [ ] *Other* (please specify below)

Definitions:

[1] *vegetable varieties with no intrinsic value for commercial production; 2009/145/EC, European Commission 2009.*

[2] *varieties which are naturally adapted to the local and regional conditions; Commission Directives 2008/62 /EC, European Commission 2008 and 2009/145/EC, European Commission 2009.*

[3] *wild species related to crops which contain important diversity for crop enhancement.*

[4] *diverse, locally adapted crop populations which not only contain diversity for crop enhancement, but are also important for local food and economic security.*

[5] *cultivars having no or limited intrinsic value for commercial crop production.*

[6] *different types of materials purposely developed by farmers, farmers' organizations and/or by breeders, including through participatory plant breeding.*

[7] *Commission Implementing Decision of 18 March 2014, European Commission 2014a.*

2.1.1 Other heterogeneous populations:

- [ ] Mixtures of registered varieties

- [ ] Large mixtures of a wide range of germplasm [1]
- [ ] Multiline varieties [2]
- [ ] Line mixture varieties [3]
- [ ] Composite cross populations [4]
- [ ] Synthetic populations

Definitions:
[1] *including wild relatives, landraces from several countries and modern breeding material, used as 'evolutionary populations' – Ceccarelli 2012.*
[2] *composed of up to 10 lines that are isogenic for almost all agronomic traits, but only genetically dissimilar in resistance against one particular disease; for example, the Dutch wheat variety 'Tumult' – Lammerts van Bueren 2002.*
[3] *lines which are carefully selected for mixing ability on the basis of phenotypic uniformity for a number of traits but which are genetically different – Lammerts van Bueren 2002.*
[4] *populations of segregating individuals derived from intercrossing a number of parents and then exposed to natural selection in each subsequent generation = evolutionary population breeding.*

Other type of plant genetic resources

2.2 What is/are your main interest(s) in *in situ* conservation of plant genetic resources?

Please select all that apply

- [ ] Conservation of genetic diversity
- [ ] Demonstration
- [ ] Development of national policy
- [ ] Direct utilization *(e.g. landraces cultivation)*
- [ ] Educational purposes *(e.g. to support PGR-related research or to teach students about the importance of PGR)*
- [ ] General conservation of wild species
- [ ] Improve access to genetic diversity
- [ ] Maintenance of a broad base of crop varieties *(including farmers' varieties)*
- [ ] Research
- [ ] Training *(e.g. to teach plant genetic resources conservation techniques)*
- [ ] *Other* (please specify below)

Other interest(s)

2.3 Are you or your organization part of a conservation network/association?

e.g. a farmers' association, or a protected area or site network

- ( ) Yes (please provide the name below)
- ( ) No

Network/association name

***2.4 Are you or your organization interested in being part of a European *in situ* conservation network of stakeholders/sites?**

As a member of this network, you or your organization will be recognized for your contribution to the conservation of plant genetic resources in Europe and will have the chance to share knowledge and develop partnerships with other members. Specific benefits for farmers include increased market opportunities for local crop products, access to a wider range of seed samples and knowledge of other farmers cultivating similar crops.

If you answer 'yes', we will contact you with more detailed information about becoming part of the Network as the project progresses.

- ◎ Yes
- ◎ No
- ◎ Unsure

If you did not provide any means of contacting you in Section 1 of the survey, please leave your email address here:

3. Communication needs

Please complete this section to help us to communicate effectively with you and other stakeholders.

3.1 Which channels of communication do you prefer to use for your plant genetic resources conservation activities?

Please select all that apply

- ☐ Electronic newsletters (e-news) direct from the Farmer's Pride project
- ☐ E-news through my existing networks
- ☐ Twitter
- ☐ Facebook
- ☐ Paper documents
- ☐ Professional and trade journals
- ☐ Other specialist publications and newsletters
- ☐ National media (newspapers, websites, radio and TV)
- ☐ In person at workshops, conferences and other events

3.2 What type of information are you interested in receiving from the Farmer's Pride project?

Please select all that apply

- ☐ Information about the establishment of the European Network for In Situ Conservation of Plant Genetic Resources

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- [ ] Case studies of *in situ* plant genetic resources conservation
- [ ] Best practice management guidance and toolkits
- [ ] Academic journal papers
- [ ] Technical reports
- [ ] Inventory/map of *in situ* plant genetic resources conservation stakeholders/sites across Europe
- [ ] Policy briefings
- [ ] Newsletters
- [ ] Blogs
- [ ] Videos and infographics
- [ ] Leaflets for farmers
- [ ] None

3.3 What type of communications do you think should be a priority for the Farmer's Pride project to support *in situ* plant genetic resources conservation in Europe?

Please select all that apply

- [ ] Participatory workshops and conferences
- [ ] Open days and on-site or on-farm events for site managers
- [ ] Best practice management guidance and toolkits for farmers and gardeners
- [ ] Management guidance for nature conservation site managers who are not aware of plant genetic resources conservation needs
- [ ] Policy briefings and recommendations for politicians
- [ ] National media coverage to raise public awareness
- [ ] Publicly available knowledge of *in situ* populations and sites
- [ ] Coordinated networks of *in situ* plant genetic resources conservation sites and stakeholders
- [ ] Socioeconomic analysis of effective ways to support *in situ* plant genetic resources conservation

3.4 Which is your or your organization's national language?

- [ ] Albanian
- [ ] Belarusian
- [ ] Bosnian
- [ ] Bulgarian
- [ ] Croatian
- [ ] Czech
- [ ] Danish
- [ ] Dutch
- [ ] English
- [ ] Estonian
- [ ] Finnish
- [ ] French
- [ ] German
- [ ] Greek
- [ ] Hungarian
- [ ] Icelandic
- [ ] Irish
- [ ] Italian
- [ ] Latvian
- [ ] Lithuanian
- [ ] Macedonian
- [ ] Maltese
- [ ] Norwegian
- [ ] Polish
- [ ] Portuguese
- [ ] Romanian
- [ ] Russian
- [ ] Serbian
- [ ] Slovak
- [ ] Slovene
- [ ] Spanish
- [ ] Swedish
- [ ] Turkish
- [ ] Ukrainian
- [ ] *Other* (please specify below)

Other national language

3.5 Which other languages can you or your organization work with?

Please select all that apply.

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- [ ] Albanian
- [ ] Belarusian
- [ ] Bosnian
- [ ] Bulgarian
- [ ] Croatian
- [ ] Czech
- [ ] Danish
- [ ] Dutch
- [ ] English
- [ ] Estonian
- [ ] Finnish
- [ ] French
- [ ] German
- [ ] Greek
- [ ] Hungarian
- [ ] Icelandic
- [ ] Irish
- [ ] Italian
- [ ] Latvian
- [ ] Lithuanian
- [ ] Macedonian
- [ ] Maltese
- [ ] Norwegian
- [ ] Polish
- [ ] Portuguese
- [ ] Romanian
- [ ] Russian
- [ ] Serbian
- [ ] Slovak
- [ ] Slovene
- [ ] Spanish
- [ ] Swedish
- [ ] Turkish
- [ ] Ukrainian
- [ ] *Other* (please specify below)

Other language

Please use this space to provide any comments you may have related to this survey.

Thank you for completing the survey

We appreciate your participation and contributions. Your answers will be used to improve knowledge of stakeholders that are involved in *in situ* conservation in Europe to inform the development of a network of stakeholders and sites to improve the conservation of plant genetic resources for food, nutrition and economic security.

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ANNEX 2. Survey dissemination

The survey was launched on 03 May 2018 and closed on 01 April 2019. Although the original intention had been to keep the survey open to month 8 (June 2018), the project Steering Committee decided to keep the survey open for a longer period to maximize the opportunity to identify stakeholders from as wide a range of countries and stakeholder groups as possible. During this period, the survey was disseminated to a very large number of potentially interested stakeholders via the Farmer's Pride project partners who have been highly active in disseminating the survey (see Box 1), as well as via the project's Farmer's Pride Ambassadors (FPAs) and External Advisory Board (EAB), and the European Cooperative Programme for Plant Genetic Resources (ECPGR) On-farm Conservation and Management and Wild Species Conservation in Genetic Reserves Working Groups[12].

Box 1. Examples of activities to disseminate the stakeholder survey at national level by Farmer's Pride partners

Austria
Protected site managers (national parks, nature conservation areas), seed-saver organizations, the public gene bank, breeders, relevant ministries and policy-makers, were contacted via email. Contacts who were also relevant for other surveys (Tasks 1.2 and 3.2) were contacted by telephone and reminded to also complete the stakeholder survey. The survey was also promoted by an ARCN newsletter, homepage and social media to ARCN members (including 400 landrace seed guardians) and the general public.

Denmark
The invitation to complete the survey was translated to Danish and sent to the Ministry of Agriculture PGR Board and an agro-genetic resources newsletter, posted as news on the Danish Seed Savers website and disseminated among participants in the Farmer's Pride workshop, 'Networks for Diversity Seeds in Denmark', 09 June 2018.

Finland
Participants of the Nordic Heritage Cereal Conference (65), fruit and berry PGR researchers in Nordic and Baltic countries (49), landrace cereals Facebook group (> 100), and the National Advisory Board for Genetic Resources.

Greece
Potential stakeholders from the breeding and conservation sector, relevant NGOs, ministries and policy-makers, protected sites managers, universities and technological institutes, public research institutes including members of DIMITRA, farmers' networks and associations etc. The hard copy of the survey was actively disseminated through individual interviews among farmers (during on open day at the end of August) and the link with the Greek translation has been disseminated to a large number of potential interested stakeholders in Greece and Cyprus with a short text for the FP project and the survey, and the request to complete it and distribute it further. It was also distributed via a big mailing list from the Ministry of Rural Development and Food.

Hungary
By mail to OMKI partners, representatives of the ministries and policy-makers, breeding sector, universities, advocacy organizations, stakeholder associations; direct mail, telephone and personal meetings with farmers, CSB members, NGO members and national gene bank employees; in person during meetings and workshops (Hungarian networking workshop 21 June, Ecovillage meeting 12 August); via the OMKI website and in social media.

Italy
Farmers' trade associations, national park contacts, officers in charge of PGR conservation of the 20 Italian Regions, and researchers affiliated to the Italian Society of Agricultural Genetics.

[12] www.ecpgr.cgiar.org/working-groups/on-farm-conservation/; www.ecpgr.cgiar.org/working-groups/wild-species-conservation/

Nordic region (Denmark, Finland, Iceland, Norway and Sweden)
29 Nordic CWR stakeholders and 36 members of NordGen Working Groups.

Portugal
Potential stakeholders from the conservation sector, NGOs, ministries and policy-makers, universities and technological institutes, public research institutes, farmers' associations, as well as several fora related to genetic resources conservation.

Spain
64 potential interested stakeholders (11 farmers and gardeners and their organizations, 22 from the breeding/seed sector, 17 from the PGR conservation sector, 11 from the environment conservation sector, and three policy-makers), as well as through social networks (Facebook and Twitter) and two large mailing lists (AEET – Spanish Association of Terrestrial Ecology, and SEBiCoP – Spanish Society of Plant Conservation Biology).

Switzerland
The survey was sent to the 50 member organizations of the Swiss Commission for the Conservation of Cultivated Plants (www.cpc-skek.ch/) and a newsletter was circulated to selected seed-savers with a request to complete the survey.

Turkey
Dissemination via letter, and /or email and/or personal communications to: 82 potential public stakeholders and 1004 Directorate of Provincial/District of Agriculture and Forestry (MAF); 46 agricultural research institutes involved in plant breeding studies; 37 State Farms; Public national parks/Nature protection Department/Directorate of Sensitive Areas of MAF; 171 universities (public and private); 185 Turkish seed associations and private seed companies; 13 botanical gardens; 58 NGOs to disseminate among their members; 37 mailing lists via personal communication provided by the FPA of Turkey from different potential stakeholders; mailing list (58) provided from Conservation of Landraces Workshop held by AARI; farmers' mailing list (41) sent by Agricultural Extension and in-service Training Centre; social networks (Facebook) for disseminating the survey to farmers; personal communication to TaTuTa "Eco-Agro Tourism and Voluntary Knowledge and Skills Exchange on Organic Farms project for disseminating the survey to the project farmers (90 farms).

United Kingdom
The Farmer's Pride Project Coordinator gave a briefing on Farmer's Pride at a meeting of the UK Plant Genetic Resources Group—a government advisory committee involving stakeholders from the breeding and conservation sectors, NGOs, ministries and policy-makers, protected site managers, universities and technological institutes, and public research institutes. Members were encouraged to complete the survey at this briefing and by subsequent email communication.