SAVE e-News 2/2020
Safeguard for **A**gricultural **V**arieties in **E**urope
The quarterly electronic information service of the SAVE Foundation

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How Livestock Breeds serve Ecosystems

Vibrant landscape through traditional livestock breeds in Greece. Photo: SAVE

It is a central topic of the work of SAVE Foundation and its partners to consider the traditional livestock breeds and cultivated plant varieties in a holistic context. Traditional breeds and the corresponding local production systems are in constant interaction with their respective ecosystems. This has been the case since the Neolithic Revolution, when breeding by selection began. In the context of global food security, Gregoire Leroy et al. investigated the ecosystem services of about 8000 local and transboundary animal breeds and 40 species in different production systems. Not only grazing and land use were studied, but also food security, breed conservation and cultural impacts.

Livestock breeds have been bred for food security since ancient times. Today, the focus is on commercial breeds in industrial production systems. In remote regions, however, local livestock breeds often play a significant role in food security and health. This is especially true for developing countries, but also for remote regions in Europe. Traditionally, livestock breeds have been used for grazing in areas where plant production is hardly possible, such as alpine pastures and shallow karst soils. Accordingly, traditional breeds of such areas often have special adaptation characteristics. This adaptation to the ecosystem is usually not reflected in the market and plays only a minor role in

political decision-making processes. The recording and evaluation of ecosystem services provided by livestock breeds is also very difficult and a largely uncharted territory in science. But what do these breeds and the corresponding management systems achieve? Here is an overview:

Production Systems

Local breeds are primarily used to provide food, fibre and skin. The FAO found that in 2013, around 40% of global protein intake was of animal origin. With increasing prosperity, the consumption of animal products is growing. So far, there is a lack of research on the contribution of local breeds to food security at the global level.

Kempen sheep (NL) grazing for landscape protection. Photo SAVE

Certain breeds are linked to appropriate production systems: High-performance breeds are usually used to provide only one single product (milk, meat, eggs) in a "high input" industrial system and with feed that would be equally suitable for human consumption. This has given rise to an important debate about the relatively low efficiency of this production method.

More extensive production systems are based on the grazing of grassland. Worldwide, 1.26 billion hectares are currently used for grazing, which is unsuitable for crop production. This is about half of the world's land generally suitable for grazing. It also includes crop rotation areas that are temporarily not used for crop production.

Locally adapted breeds have special characteristics, such as good roughage utilisation or salt tolerance, which make it possible to keep animals even under unfavourable conditions.

Traction and Labour

According to FAO assumptions, around 20% of the world's agricultural land will still be farmed by traction and labour force of farm animals by 2030.

It is particularly important to be able to use robust, disease- and drought-resistant breeds. In southern and south-eastern Europe, working animals are also still frequently used and their keeping is apparently cheaper than keeping a machine - especially in economically difficult times. In inaccessible forest areas, workhorses and sometimes even oxen are increasingly being used again, causing less damage to the vegetation than machines would do.

Draught Horses or Donkeys are still common in Albania. Photo SAVE

Fertilizer

Manure: not only fertilizer, but also source for diversity. Photo SAVE

Animal manure accounted for about 60% of the fertilisers used for plant production in 2000. As a result of the trend towards specialisation and intensification, the number of livestock-free arable and vegetable farms has also increased significantly in organic farming in Europe. In order to ensure a stable nutrient content in the soil without the use of livestock manure, sophisticated crop rotations with legumes, "cut and carry" systems etc. are necessary. The energy of animal manure is used at least in Europe in biogas plants. In the countries of the global south, manure is often essential for cooking and heating.

Genetic Resources

Local breeds are an important gene pool for breeding today and in future. Genetic selection programmes have led to an increase in farm animal output of around 50% in recent decades. The value of global exports of live animals and bovine semen rose from less than USD 2 billion to around USD 6.5 billion between 2000 and 2012, i.e. in only two years!

Sardinian Cattle at conservation work of the countryside. Photo SAVE

The value of animal genetic resources lies not only in their current use in industrial agriculture, but also in their potential value for future use. Animal genetic resources offer options for meeting the challenges of climate change such as temperature, feed and water availability, extreme events and zoonoses (diseases transmissible to humans). The characterisation of genes and phenotypes has therefore become an important branch of research for the future. From this perspective, animal genetic resources are a public good.

The diversity of animal genetic resources is also a basis for technologies and innovations in many other areas of science and research, such as medicine and biology.

Regulation and Conservation

Mallorquin local pigs on a carob tree plantation. Photo: SAVE

The utilization of plant residues is a source of food that plays a major role in local systems. Local breeds are good at utilising food waste and plant residues. It has been proven, for example, that locally adapted pig breeds can digest fibre-rich food better than commercial breeds.

The adapted use of ecosystems also means regulation and conservation, which is usually difficult to quantify and evaluate. Traditional adapted grazing systems help to maintain and regulate natural ecosystems. Increasing scrub encroachment in the mountainous regions of Europe or the preservation of the Dehesa in Spain are obvious examples. Adapted grazing with traditional local breeds can also reduce invasive species.

A hitherto little known aspect is the regulation of diseases, also in humans: Low-intensity grazing, as it is common in traditional systems, reduces the incidence of spirochetes-infected ticks and thus the transmission of Lyme disease: a field study showed that fewer ticks occur on grazed land. The ticks apparently cannot transmit the pathogens to farm animals. Infected ticks lose their infectious load when they infect cattle, goats or sheep.

The direct interaction with the environment, grazing, can play an important role in preventing extreme events such as landslides or fire. In southern Europe, goats and sheep are increasingly being used again to maintain firebreaks and to protect roads from the recurring fires.

The grazing practices applied, the type of animals, animal density, activity etc., promote plant productivity and biodiversity, the water retention capacity of the soil, fertility and erosion control. This creates or maintains biologically diverse habitats and supports the life cycle of wild animals and plants. Furthermore, according to IPBES, there is a clear link between grazing and the functional diversity

of pollinators. Traditional extensive grazing systems increase pollinator diversity.

Emissions

Much is reported about the climate-damaging emissions from animal husbandry. However, this is a matter of intensive or industrial production - not of traditional grazing systems. Improved grazing management practices are urgently needed. The relatively new term "Holistic Grazing" describes adapted grazing to preserve the turf and thus prevent desertification. The increasing steppe formation and desertification of entire areas is not only a problem of the global South, but also a problem in rather arid regions of Europe. Experience shows that careful management stimulates the regrowth of the grass and can regenerate the root systems (almost rotational intensive grazing). The organic matter of the soil increases and provides more nutrients to the plants.

Cultural Services

Cachena Cattle at the Feiras Novas, Portugal. Photo: SAVE

Local livestock breeds embody a cultural heritage of the region where they were bred. The Kalofer goats provide a special carnival costume in the Kalofer region in Bulgaria. The Cachena cattle are an important part of the "Feiras Novas" in northern Portugal. Hérens cows compete in the traditional cow fights in Valais, Switzerland.

The cultural knowledge of the breeds, their care and grazing systems is increasingly endangered, because social and economic changes lead to the loss of traditions. This knowledge is often lost more quickly than a breed itself. Traditional live-stock breeds, which are part of the character of a landscape, are cultural heritage. In the areas of their origin they are understood as part of local traditions and identity. The diversity of livestock breeds in an area can also be seen as an indicator of cultural ecosystem services. However, such an indicator would only reflect the potential service, as the cultural value varies between breeds.

As these examples show, traditional livestock breeds provide a wide range of ecosystem services. They are therefore crucial for food security, our livelihoods and resilience. They are adapted to lean and harsh conditions, while at the same time promoting natural biodiversity. However, keeping traditional breeds also means knowing their specific needs and the demands of the landscape. Traditional breeds are not productive only at first glance: they use feed that is not suitable for human consumption. The conversion efficiency of this feed into human food is many times higher than that of high-performance breeds.

As these breeds are mostly found in marginal areas, farmers are often not connected to marketing networks and have hardly any access to (political) decision-making processes. This endangers the survival of these adapted production systems worldwide in the long term.

There is still a great need for research in order to achieve effective social change and paradigm shift in policy. Research must integrate different disciplines. These include not only animal production and agronomy but also sociology, economics and traditional knowledge. The services rendered by livestock breeds to ecosystems must be better understood and quantified. Traditional breeds achieve far more than noble meat, special milk and interesting eggs. The diversity of breeds ensures appropriate management and, thus, supports the preservation of important ecosystems and their function in times of climate change.

Kalofer costumes in Plovdiv, Bulgaria

Literature: Leroy, G., Global Food Security (2018), https://doi.org/10.1016/j.gfs.2018.04.00

Diversity of an Ancient Culture: Olive

Bread dipped in olive oil, a glass of wine, sun - what more is needed to create holiday feelings and to dream of Mediterranean landscapes with ancient olive groves? But what about the diversity of olive varieties and the general condition of the olive groves?

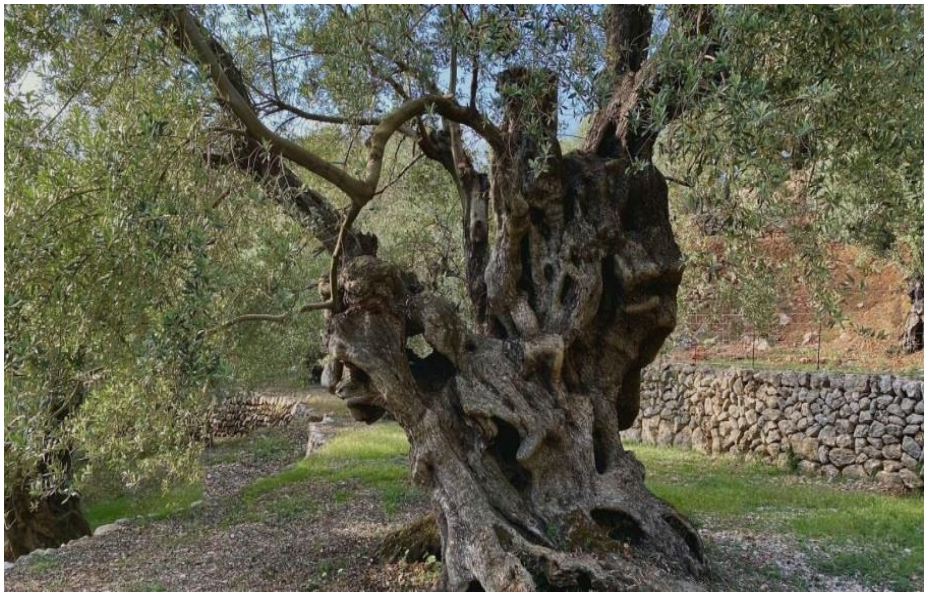
The olive or olive tree is one of the seven staple foods in the Bible (Dtn 8, 7-8) and has been cultivated in the Mediterranean for more than 6000 years. No wonder that 95% of the olive resources can be found here. One billion olive trees are grown worldwide on 10.5 million hectares and produce around 21 million tons of olives, 90% of which are used for oil production and only 10% are used as table olives.

Basically, the olive is a plant of arid areas. The productivity of classic olive trees per hectare is therefore limited. On the other hand, olive trees are centuries old. The increasing demand for olive oil means that olive plantations are being extended to less suitable areas.

Most olive growing areas use only one variety at a time. This is also the case in the old traditional olive groves. Modern planting methods are plantation-like hedge planting, in which the trees are kept small so that largely mechanical harvesting is possible. Selection of wild forms with larger and thus also oil-rich fruits took place thousands of years ago, as findings north of the Dead Sea show. Later, olives were propagated vegetatively. The olive, the vine, the fig and the date palm were the first fruits to be cultivated by humans. Local wild olives played a key role in the diversification of the varieties: wild forms of the olive are native to the entire Mediterranean region and have crossed with selected varieties. This genetic introgression brought great genetic variability and adaptations to various small-scale environmental conditions. A large diversity of population varieties developed. Conventional cultivation pays less attention to diversity. For example, only three varieties are grown on the olive groves in Spain (Picual, Arbequina and Hojiblanca), which are far from their traditional cultivation areas. But since there are still centuries-old olive groves, the diversity is still great.

There are many smaller collections, but the overall picture is difficult. As with many other types of fruit, reliable identification is also difficult with olives. The same names are used for many varieties (homonyms) or different local names (synonyms)

Spanish Olive Varieties. Photo: https://zefiro-japan.com/en/tipos-olivo-aceitunas/



Mallorca millenary tree – the eldest Spanish olive tree. Photo: www.oliveoiltimes.com

for the same variety. For example, in Morocco there is an important variety called Picholine Marrocaine, which is genetically exactly the same as the one that is called Caivano Blanco in Andalusia and Siwash in Algeria.

The Andalusian Institute for Agricultural and Fish Research and Training (IFAPA) operates a collection of more than 1000 olive varieties from 29 countries on the outskirts of Cordoba in Alameda del Obispo. From the small green arbequina to the white belica to the large and round Gordal olives, all shapes and colors are impressively represented.

In collaboration with the Spanish government, the FAO and the International Olive Council, the collection has been built up since 1972 and is now the largest olive field collection worldwide. A backup double of the collection is located in the province of Jaén in northeastern Andalusia. In addition, duplicate backups are usually stored in the Cordoba gene bank. Nevertheless: there are many more olive varieties: IFAPA estimates that there are a total of around 2000 varieties.

Breeding programs aim to develop new varieties with high productivity and high oil yield that are suitable for modern plantation cultivation systems.

Another focus of breeding is to produce disease-resistant varieties. The bacterium Xylella fastidiosa is the cause of the olive quick decline syndrome (OQDS), in which the trees die due to drying out, because the bacterium clogs the pores of the plant vessels and thus blocks the transport of water and nutrients. Infested olive trees ultimately die from lack of water. The economic losses are enormous. Another harmful organism is the Verticillium wilt, which is caused by a fungus. Here, too, the whole tree can die or the flowers and leaves can dry up. Hundreds of crosses and more than 8,000 genotypes have already been evaluated.

The question remains whether the cultivation systems should not be adapted to the properties of the plants rather than vice versa. We can discuss this question with good friends, for example with a bread dipped in olive oil and a glass of wine…

Olive varieties at the IFAPA in Cordoba. Photo: www.juntadeandalucia.es/

Sources

www.theolivecentre.com/World-Catalogue-of-Olive-Varieties.html
www.oliveoiltimes.com/topic/olive-varieties
https://www.mdpi.com/1424-2818/10/1/5

EU Biodiversity Strategy for 2030 – to be too good to be true?

Source: https://ec.europa.eu

Frans Timmermans, Executie Vice President of the European Commission, says: “The coronavirus crisis has shown how vulnerable we all are, and how important it is to restore the balance between human activity and nature. At the heart of the Green Deal the Biodiversity and Farm to Fork strategies point to a new and better balance of nature, food systems and biodiversity; to protect our people’s health and well-being, and at the same time to increase the EU’s competitiveness and resilience. These strategies are a crucial part of the great transition we are embarking upon.”

The "European Green Deal", which explains how Europe can become the first climate-neutral continent by 2050, is overriding. The way there is a new, sustainable and inclusive growth strategy that stimulates the economy, improves people's health and quality of life, protects nature and leaves no one behind. The "Farm to Fork" strategy is the centrepiece of the Green Deal. The biodiversity strategy is another main pillar of the "Green Deal". The strategy is also a key component of the Commission's agenda to achieve the United Nations Sustainable Development Goals (SDGs).

Europe's biodiversity is to be put on the road to recovery by 2030 - for the benefit of people, the climate and the planet. This is the goal of the Biodiversity Strategy 2030. At the end of May, several Commission notifications were sent to the European Parliament. The "Green Deal", the "Farm-to-Fork" initiative and the "Biodiversity Strategy" will also have an impact on how we deal with agrobiodiversity. The loss of biodiversity affects not only wildlife, but also agrobiodiversity, livestock breeds and crops that have been domesticated to be used to produce food since the Neolithic Revolution 10,000 years ago. In the Notification on the Biodiversity Strategy, in point 2.2.2 "Restoring nature on agricultural land" explicitly is stated: "The decline in genetic diversity must also be reversed, among other things by facilitating the use of traditional varieties of crops and breeds. This would also lead to health benefits through a more varied and nutrient-rich diet. The Commission is considering revising the marketing rules for traditional crop varieties to help preserve and use them sustainably. The Commission will also take measures to simplify the registration of seed varieties, including for organic farming, and to facilitate market access for traditional and locally adapted varieties”.

The biodiversity strategy is expected to come into force in 2021. The Member States and the European Parliament must support the strategy before the 15th Conference of the Parties to the Convention on Biological Diversity. At this conference, a global framework for the protection and restoration of biological diversity is to be developed. The conference was originally planned for autumn 2020 and was

Traditional and agro-biodiverse vegetable garden in Slovenia. Photo: SAVE

postponed to 2021.

It remains to be hoped that the European Parliament will approve and launch the strategy. A suitable communication strategy is being prepared as part of the Horizon 2020 project Dynaversity (http://dynaversity.eu) in order to use the favour of the hour to make the importance of agrobiodiversity known to parliamentarians and the relevant EU bodies.

Sources:
https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/actions-being-taken-eu/farm-fork_en

https://ec.europa.eu/info/sites/info/files/communication-annex-eu-biodiversity-strategy-2030_en.pdf

The Global Crop Diversity Trust joins Forces with the Global Landscapes Forum

The Global Crop Diversity Trust (Crop Trust) will become the 29th member of the Global Landscapes Forum (GLF) charter, a global community of like-minded organizations such as the World Bank Group, WWF, the Global Environment Facility, the United Nations Environment Program and Conservation International in working towards achieving the sustainable development agenda.

Core of the Crop Trust's mission is the conservation of the world's rapidly disappearing crop diversity in genebanks. Founded in 2013, GLF is the world's largest knowledge-led platform on sustainable land use, dedicated to achieving the Sustainable Development Goals and Paris Climate Agreement. GLF has connected 5,100 organizations and 200,000 participants and reaches 830 million through social and global media from 185 countries.

"Ensuring the conservation and use of the world's crop diversity is critical and urgent, especially in the context of growing populations and the challenges of a rapidly changing climate," says Stefan Schmitz, Executive Director of Crop Trust. "These issues deserve far greater attention, and they need it now. That's why we are delighted to join GLF in working towards sustainable solutions to the daunting and urgent global challenges facing our food systems."

GLF and the Crop Trust will launch the partnership through a series of collaborative campaigns – ranging from sustainable gastronomy to promoting specialty crops like coffee to celebrating food's cultural significance. The campaigns will emphasize the critical importance of conserving and using the world's crop diversity to ensure healthy landscapes and sustainable food production.

"We are very pleased that the Crop Trust is becoming a GLF charter member, and look forward to an increased collaboration with them towards ensuring the diversity and future of the world's food crops," says Robert Nasi, Director General of the Center for International Forestry Research (CIFOR), a founding member of GLF. "Genetic diversity remains a foundation of sustainable agriculture and landscape restoration."

Both organizations are associated with CGIAR, a global research partnership that aims to reduce poverty, improve food and nutrition security and improve natural resources and ecosystem services.More information:

https://www.croptrust.org/
www.globallandscapesforum.org

Manure for the Vegetable Garden

In In recent years, AEPGA and Palombar - an organization for the conservation of nature and rural cultural heritage - have carried out a series of studies on how donkey manure can be used. For this purpose the feeding with hay and straw was optimized, and material such as leftovers and other organic waste as well as the rather nitrogen-poor but phosphorus and potassium-rich pigeon dung was added. This mixture is rich in organic matter, nitrogen, phosphorus and other micronutrients. The two fertilizers complement each other perfectly and are superior to fertilizers from cow, sheep, rabbit and pork.

In addition to using this high quality natural fertilizer for the kitchen garden and on pastures, its properties have caught the attention of growers who use the fertilizer for their vineyards in the Planalto Mirandês and in the municipality of Foz Côa in the Douro region in northeast Portugal.

This cooperation with other local communities is very fruitful in the truest sense of the word: The AEPGA, which is committed to the conservation of the Burro de Miranda donkey, provides an excellent natural fertilizer and the growers and vegetable farmers can work without artificial fertilizers.

www.aepga.pt/noticia/estrume-para-as-hortas/

Newsflash

SAVE Meeting 2020 postponed; Video Conference planned

SAVE foundation

SAVE network

Safeguard for Agricultural Varieties in Europe

As already announced on our website a physical SAVE Meeting 2020 had to be cancelled. This is the first (and hopefully the only) time since 1993 that a physical SAVE meeting cannot take place. In most European countries, cross-border travel is basically possible again, but the situation is still very fragile. We are clarifying whether the Central Agricultural Festival in Munich will be postponed to 2021. If this is not the case, we will be busy to find another at-tractive location for the SAVE meeting 2021!

At the moment the Network Office is checking whether or not a virtual SAVE meeting can take place. If possible, the SAVE partners will meet at a video conference on September 17th. Then presentations by participating organizations on 'in situ conservation of rare breeds and seeds, experiences and suggestions' to share will be presented as well as information and discussion about the state of the art. The SAVE partners are asked to give a message if they will participate or not by August 1st at the latest. Please contact Nonja Remijn: office@save-network.com.

We look forward to seeing you all healthy and well again in person by 2021 at the latest!

In the meantime we are happy to assist you in the SAVE network office (office@save-network.com) and in the SAVE project office (office@save-foundation.net). Please don't hesitate to contact us.

Your SAVE team

71st Annual Meeting of European Federation of Animal Science

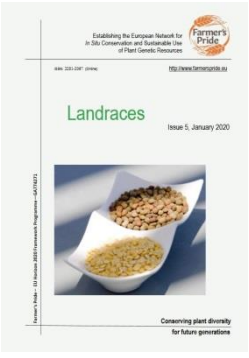
The onsite EAAP Porto Annual Meeting has been cancelled due to the COVID-19 pandemic, however the meeting will be hosted as a virtual event from the 1st to 4th of December!
Through the new virtual direction of the EAAP 2020 Annual Meeting every animal scientist can experience the best opportunity to participate and to share their research at the most updated and scientifically advanced animal science forum in the world.
In the next weeks, more information will be spread via the EAAP website, social Media, Newsletter and email notifications about how to register, present researches and simply how to contribute to the virtual event.
More information:
https://meetings.eaap.org/

FIBL Europe with new Presidium

The Research Institute of Organic Agriculture (FiBL) is one of the world's leading institutes in the field of organic agriculture. Its locations are situated in Switzerland, Germany, Austria, France and a representation in Brussels (Belgium) through FiBL Europe. FiBL's strengths lie in its interdisciplinary research, innovations developed jointly with farmers and the food industry, solution-oriented development projects and rapid knowledge transfer from research into practice.

In early July, Urs Niggli, the previous president of FiBL Europe, handed over management to Beate Huber. FiBL Europe was founded in 2017 to represent its five-member organizations at a European level. With the 'Farm to Fork' strategy and the goal of achieving 25 % organic farming the EU has set an important milestone for Europe. FiBL will contribute to the successful implementation of this strategy

Landraces Journal



In the frame of the H2020 project 'Farmer's Pride' (www.farmerspride.eu) an interesting issue of the magazine "Landraces" has been published.

As in the previous issues, 'Landraces' provides a medium to draw attention to information about the conservation, promotion and use of landraces in different contexts. This issue initially provides information concerning the progress of the 'Farmer's Pride' project with regard to landraces. Besides information of the H2020 project Farmer's Pride several articles inform about the state of the art concerning landraces of cultural plant varieties.

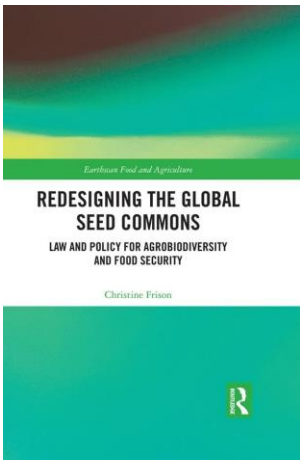
One article for example deals with the spanish approach of how to document, share and protect landrace traditional knowledge. Another two articles are outlining how landraces may be "reconstructed": in need of variable materials, locally disappeared in the form of true landraces, sustainable (organic) agriculture can take advantage of such materials.

Finally, a collection of case study landraces, mostly of neglected and under-utilised crops, reviewing where and how they are cultivated, how they are promoted and marketed, among other issues. They concern the apple (Germany), broccoli (Spain), great-headed garlic (Italy), the common bean (Romania), chicory (Czech Republic), horseradish (Finland) and the climbing herb Lathyrus clymenum L. (Greece) and on-farm maintained landraces. These case studies can be used as an evidence-base for developing similar activities for other crops and landraces across Europe. Source: https://more.bham.ac.uk/farmerspride/wp-content/uploads/sites/19/2020/02/Landraces-issue-5_final.pdf

Genetic Resources Journal

In the frame of the H2020 Project GenResBridge (www.genresbridge.eu) the new open access and peer-reviewed journal "Genetic Resources" was launched. The new Journal will publish original research, reviews and short communications on plant, animal and forest genetic resources, serving stakeholders within and across domains. It is a platform to share domain specific and interdisciplinary knowledge and tools used by the global community of practitioners involved in monitoring, collecting, maintaining, conserving, characterizing and using genetic resources for food, agriculture and forestry.
Have a look at: www.genresj.org.

Redesigning the Global Seed Commons

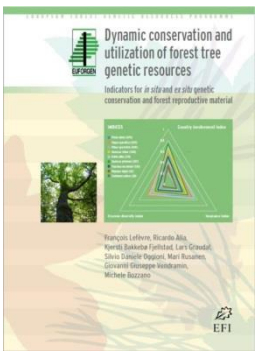


There is a controversy over whether the rights to seeds or plant genetic resources should be owned by the private sector or be common property (eNews 1/2020). This book addresses the legal and policy aspects of the multilateral seed management regime. First, it studies in detail the International Treaty on Plant Genetic Resources for Food and Agriculture (the Treaty) in order to understand and identify its dysfunctions. Second, it proposes solutions - using recent developments of the "theory of the commons" - to improve the collective seed management system of the Treaty, a necessary condition for its member states to reach the overall food security and sustainable agriculture goals. Redesigning the Global Seed Commons provides a significant contribution to the current political and academic debates on agrobiodiversity law and governance, and on food security and food sovereignty, by analysing key issues under the Treaty that affect the design and implementation of regulatory instruments managing seeds as a commons. It also examines the practical, legal, political and economic problems encountered in the attempt to implement these obligations in contemporary settings. In particular, it considers how to improve the Treaty implementation by pro-posing ways for Contracting Parties to better reach the Treaty's objectives taking a holistic view of the human-seed ecosystem.

Frison, Christine: (2018) Redesigning the Global Seed Commons. Law and Policy for Agrobiodiversity and Food Security.

https://doi.org/10.4324/9780203733257

Dynamic Conservation and Utilization of Forest Tree Genetic Resources

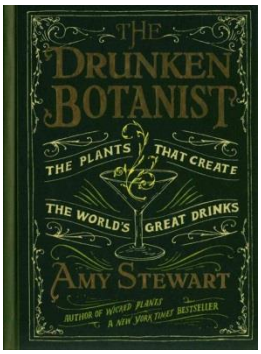


The report "Dynamic conservation and utilization of forest tree genetic resources: indicators for in situ and ex situ genetic conservation and forest reproductive material" offers a way to measure the conservation and use of the genetic diversity of forest trees across Europe in a standardized way. It is based on an agreed revision of a commonly adopted framework allows to measure and monitor this diversity, its conservation and utilization over time.

The Forest Europe process had adopted a general set of Criteria and Indicators for sustainable forest management as a tool to aid forest policy formulation and decision making, forest monitoring, and communication. Six criteria reflect complementary aspects of sustainable forest management in the pan-European region. These are currently being assessed by a set of 34 quantitative and 11 qualitative indicators.

Indicator 4.6 is a quantitative indicator which contributes to Criterion 4 (Maintenance, conservation and appropriate enhancement of biological diversity in forest ecosystems) by focusing on the conservation and use of genetic resources. It is this indicator that has been revised, because it was not very informative on the conservation of genetic diversity nor fully standardised across countries.Download: http://www.euforgen.org/publications/publication/dynamic-conservation-and-utilization-of-forest-tree-genetic-resources-indicators-for-in-situ/

The Drunken Botanist



Sake began with a grain of rice. Scotch emerged from barley, tequila from agave, rum from sugarcane, bourbon from corn. Thirsty yet? In The Drunken Botanist, Amy Stewart explores the dizzying array of herbs, flowers, trees, fruits, and fungi that humans have, through ingenuity, inspiration, and sheer desperation, contrived to transform into alcohol.

Of all the extraordinary and obscure plants that have been fermented and distilled, a few are dangerous, some are downright bizarre, and one is as ancient as dinosaurs--but each represents a unique cultural contribution to our global drinking traditions and our history.

This fascinating concoction of biology, chemistry, history, etymology, and mixology--with more than fifty drink recipes and growing tips for gardeners--will make you the most popular guest at any cocktail party.

The Drunken Botanist is available as a signed and inscribed copy from Amy's bookstore or via any bookstore in your country.

Steward, Amy: (2013) The Drunken Botanist. Timber Press, ISBN 978-1-60469-476-

Last but not least

Planting Hope

A fled Syrian Scientist is breeding Virus-Resistant Beans

While the plant virologist Dr. Safaa Kumari attended a conference in Addis Ababa, Ethiopia, she received a message that her family had to flee her home in Aleppo. She immediately organised her difficult journey back to Syria because she kept a valuable treasure in her sister's house for which she was risking her life: a bean variety that appeared to be resistant to the necrotic yellow virus of the fava beans (FBNYV). In times of climate change, FBNYV is becoming an ever-greater problem for the region's farmers. Climate-related viral epidemics that affect beans, lentils and chickpeas spread from Syria to Ethiopia and gradually destroy the livelihood of low-income groups. Dr. Safaa Kumari has been working on developing virus-resistant seeds for 10 years. Legumes, known as “poor man's meat”, are vital in large parts of the world for both income generation and food security. In order to save the bean seeds from the war, she travelled through the war zones via Damascus to Aleppo. After carrying the seeds on dangerous roads for two days, Kumari ended up in Lebanon, where she now works as a researcher at Icarda (International Center for Agricultural Research in Dry Areas) in the Bekaa Valley near the Syrian border.

Getting the seeds to safety was just the beginning. Kumari had to find a sustainable solution for the virus problem of the beans.

When crop production in the region collapsed, growers relied heavily on insecticides. These are sprayed on the fields without protective measures, and leads to massive health problems for farmers and field workers.

The first attempts at growing the saved bean seeds failed. Crossing with another variety that is more productive ultimately led to the goal of developing a bean variety that is productive and disease resistant.

Kumari is now planning to distribute her super seeds to the farmers free of charge. She has already rejected an offer from a large company that wanted to multiply the seeds and sell them. Source: www.theguardian.com