SAVE e-News 4/2020
Safeguard for **A**gricultural **V**arieties in **E**urope
The quarterly electronic information service of the SAVE Foundation

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The Cross with the Donkeys

Free ranging Donkeys in Biokovo Nature Park, Croatia. Source: SAVE

For thousands of years, donkeys have been faithful companions to humankind. They play an important role in mythology and religion, especially at Christmas time. Yet, our faithful companion is endangered. The population numbers of donkeys in Europe—but also worldwide—continues to decline. It is estimated that there are still 50 million donkeys globally. The majority of the donkeys is domesticated and live as draught or pack animals in the countries of the global south. For example, in China, which has a 4,000-year history of donkey husbandry, there are more than 9 million of them, around 22% of the world's donkey population. The African wild donkey is with having only 200 individuals highly endangered. Asian wild donkeys are classified as vulnerable with a population of around 28,000 animals.

Donkey populations in Europe

Since 1997/1998, the SAVE Foundation is concerned with the donkey breeds in Europe. Origin, domestication, current distribution and use of the donkey breeds were studied and published on http://www.agrobiodiversity.net/topic_network/donkey/breedatlas_donkey.asp, which is freely accessible to the general public. 2007/2008, 58 donkey breeds were recorded in 24 European countries. In a further step, the use of them in Europe was examined. Currently, 70 breed occurrences in 30 European countries are mapped on the inter-

net platform mentioned above. However, it is essential to bear in mind that there is still a low differentiation into breeds. The “common donkey” respectively “commune” is still widespread. In 2020, SAVE did another Europe-wide survey. Although the number of registered breeds per country has remained constant, the data collected show that even in Europe the downward trend could not been stopped since 2008. The population numbers have been cut in half even though

Country	Pop 2008	Pop 2020	+/- in %
Albania	67600	55996	-17.20%
Austria	2000	2000	0%
Belgium	800	8010	+900%
Bosnia Herzegovina	180000	180000	0%
Bulgaria	185744	35000	-81.20%
Croatia	3800	2540	-34.30%
Cyprus (Greek)	2700	80	-97.10%
Denmark	5000	5000	0%
Finland	?	400	
France	40000	11996	-70.10%
Germany	7000	12092	+72.70%
Greece	21000	40	-99.81%
Hungary	3000	30	-99%
Ireland	2300	2300	0%
Italy	3000	4775	+59.10%
Luxembourg	413	303	-26.70%
Macedonia	?	47	
Malta	100	50	-50%
Montenegro	380	220	-42.20%
Netherlands	916	6210	+577.90%
Portugal	1284	813	-47.70%
Romania	40000	40000	0%
Serbia	1000	567	-43.30%
Slovenia	26	40	+53.8%%
Spain	7500	2572	-65.80%
Sweden	450	404	-11.30%
Switzerland	5000	5000	0%
Turkey	329475	126912	-61.5%
United Kingdom	8722	7000	-19.8%
Total	**919210**	**510397**	**-44.5%**

Donkey Populations in Europe in comparison 2008 and 2020. Source: SAVE

the conservation efforts have intensified in some countries. In addition, genetic testing concerning characterisation and diversity has been undertaken recently. Donkeys are as an animal species currently higher endangered than they were 12 years ago! In Turkey, the population numbers of donkeys have been halfed in the last ten years. In Bulgaria, the decrease even reached up to 90%! No amount of hobby farming can compensate for this decline.

Attention and usage of niches

The attention for the animal species donkey has increased in the northern and western European countries since it enjoys great prestige as a recreational animal. Nevertheless, the interest in breeding is still little. Appealing books and publications draw attention to the donkey as a faithful companion. The use of donkey milk as a medicinal or cosmetic product has become a growing market niche, particularly in the Balkans. Admittedly, there are major questions regarding husbandry and breeding strategies as this invariably requires the production of young animals. A more recent innovative product is the use of donkey manure (see SAVE eNews 02/2020) in combination with pigeon manure for viticulture or gardening.

As former desert dwellers, donkeys have a different metabolism than horses. Therefore, they are very good feed-users. As a result, they are increasingly finding a niche in nature and landscape conservation of dry steppe biotopes (see SAVE eNews 02/2019). Their character traits such as patience, endurance and sociability are making donkeys increasingly popular as therapy animals. At the hands of the uses in niche markets the reputation of the donkey as a loyal, helpful and useful animal is at least rising again. It remains to be hoped that with the usage of new niches the breeding and preservation will also be taken into consideration. In the survey 2020, it has been established that the donkey breeds which were already listed 10 years ago still exist.

A donkey is not a horse

Nonetheless, the knowledge about the features of the donkey is still limited: donkey are not horses with long ears! Due to its appearance alone, the donkeys can be easily distinguished from horses by their long ears, the lighter and shorter coat around the eyes and the mouth, the short standing mane and the tail that resembles a rod. Donkey do not have a protective underfur like horses. They are, therefore, more sensitive regarding wetness and coldness. Their hooves are more upright, smaller, resilient and elastic. Donkeys are also more sure-footed than horses. Moreover, they have one lumbar vertebra less. The jugular vein of the donkey is covered with a skin muscle in the middle third. This influences veterinary treatments as well as larger but fewer blood cells. Donkeys have 62 chromosomes whereas a horse has 64.

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Genetic studies
In recent years, scientific studies on the genetic diversity of donkeys have been carried out in individual countries. Thus, foundations have been laid for a valid conservation breeding of autochthonous donkey breeds in some countries of the Mediterranean region and in Asia. In this way, a study found that the Sicilian donkey breed Pantesco is genetically distinct from the Ragusano and Grigio Siciliano breeds. Hence, Pantesco definitely represents a breed of its own. The current conservation efforts are going to be directed accordingly. In this context it is also interesting that the scientific genetic research results correspond to the breeding history of the Ragusano and the Grigio Siciliano. Until 1950 a brown (Ragusano) and a grey (Grigio Siciliano) coat colour, morphologically the body size and geographically the breeding area were distinguished. The genetic testing has now proven that they are correspondingly different breeds. Nevertheless, there is a risk of inbreeding depression, which must be counteracted with a suitable breeding strategy.

Conservation of the donkey species
Structured conservation programmes are urgently needed. In recent years, significant progress has been made in France, Italy and Spain. However, the problem has not been taken seriously in other countries with traditional donkey husbandry up to this point. This is where the image of the donkey as a sign of poverty and backwardness is still deeply rooted. An international exchange about the experiences, possibilities and limits in the conservation of the long-eared donkeys would certainly be advisable. Donkeys are not domestic livestock by law. Ways must be found to subsidise the donkey husbandry similar to cattle or sheep. In order to pull together more, an exchange according to the three pillars of conservation work (holder – science – state) could help in individual countries or European regions. Last but not least, it is important to raise public awareness. In Central European countries, the donkey has become a lovingly cared for animal for recreation. In southern and southeastern Europe the donkey is still the "poor man's tractor".

There is much to do to ensure that the donkey does not become an abstract nativity scene figure or fairy being. Let us get to work on conservation so that our children and children's children can experience real donkeys and not only pictures and figures.

And why the donkey has a cross on the back?
Jesus Christ once rode into Jerusalem on a donkey. Popular belief says that the Savior gave the donkeys his sign of victory, the sign of the cross on the back, the eel line or cross line, as a thank you for the carrying service.

www.deutschlandfunkkultur.de

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Donkey populations in Europe:

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Gene refreshment for hybrid varieties of Maize

The famous seed vault in Spitsbergen and national gene banks retain hundreds of thousands of seed samples to preserve old varieties of crop plants and the genetic diversity associated with them. Are these seed banks gold mines or seed cemeteries?

Researchers around the globe are investigating whether retained samples contain genes that have been lost through breeding which could be beneficial in counteracting climate change. A research team led by Chris-Carolin Schön, Professor of Plant Breeding at the TUM, is now presenting a solution to harness the genetic potential of old varieties, so-called landraces.

Have good plant characteristics been lost through breeding?

Since the 1960s, maize has been grown in Europe's fields mainly in the form of hybrid varieties. Hybrid varieties are developed through a specific breeding scheme and, for example are "trimmed" for high yield per hectare or low susceptibility to pests. In order to breed the best variety, a kit of characteristics is needed that could be relevant both today and in the future. Thus, genetic diversity is the basic prerequisite for breeding improved crop plants.

Hybrid varieties, however, carry only a small selection of traits compared to old varieties, the landraces. The question then is whether in addition to undesirable traits, beneficial traits have been lost in the course of many breeding generations. Therefore, the call for landraces has recently been revived, as they are characterized by high biodiversity and are considered a natural source of new genetic variation for breeding. Genetic variation reflects different variants of a gene and can be recognized by differences in the plant's appearance.

Cold-tolerant varieties: Are they the winners in times of climate change?

The early development of young plants is of particular importance in times of climate change. Drought and heat are the conditions most damaging to crops, such as maize, when they occur during flowering. When a plant can be cultivated early in the year because it can cope with cold, it has already left its flowering period behind when temperatures are particularly high in summer. This means that it is less damaged and yield losses can be avoided.

Professor Schön and her colleagues have been examining landrace varieties for cold tolerance characteristics. For this purpose, they have developed a genome-based method of identifying and making targeted use of beneficial gene resources. After a preliminary study, in which the researchers identified the genetic differences of individual varieties, the researchers selected three landraces for cultivation in different locations with varying climatic conditions within Europe.

Landraces provide advantageous genes

The research team focused on traits related to early plant development and also took into account the stability of the plant (How well does it withstand wind?) and the growth form (straight or bushy?). Using molecular methods that scan the entire genome, they were able to link the data from the field trials to genes relevant to the specific traits.

"We have shown how to find new genetic variation for important traits in agricultural production. The variation in these traits is determined by many genes and is not sufficiently available in current breeding material," says Manfred Mayer, lead author of the study. "This opens the door to the development of improved climate-adapted hybrid varieties." See: www.tum.de/nc/en/about-tum/news/press-releases/details/36306/

Inforama Wild Fruit

Wild fruit bushes before planting. Source: SAVE

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ders, roadsides, on meadows and moors are edible and commonly understood as wild fruits. Among these are elder, blueberry, lingonberry, blackberry, raspberry or wood strawberry.

However, the term encompasses much more: wild fruit are fruits, nuts or other plant components (such as the fruit axes of raisin trees) of fruit species which have not been cultivated by breeding or only to a limited extent. The transition between wild fruits and cultivated fruit is fluid concerning some species and can hardly be precisely defined in a scientific manner. Thus far, nobody has set out to list and describe wild fruits which are cultivated and used in any form in Europe. Admittedly, there are books and guides that deal with specific species and their features. Nevertheless, a comprehensive overview has been lacking up to the present.

At the beginning of the last century, wild fruits were already selected, bred and grafted because there were hardly any citrous fruits and other exotics due to political isolation in the Soviet Union and in the later states of the Eastern Bloc. The aim was to obtain robust, frost-resistant, large-fruited and sweet vitamin sources. Chokeberry, sorbaronia (rowan x chokeberry), breed hybrids of mountain ash and haw (Crataegus sanguinea) and many more were cultivated. Indigenous peoples used and use wild fruits traditionally worldwide.

SAVE has been working on the “Inforama Wild Fruits” project for more than three years now. In the first place, only about 50 species and perhaps 500 varieties were assumed to be cultivated in Europe. The project war formulated accordingly. However, the research showed a completely different picture. www.wildobst.info, an information platform, contains 286 species and lists 2,124 varieties. The species are particularly described as comprehensive as possible. In addition to botanical and horticultural features information on cultural history and traditions has been included, too. Recipes, tips and tricks were recorded wherever possible.

The internet platform is part of the project. Two field collections where the species and varieties can be experienced directly form the second and equally important part.

SAVE succeeded in building up the largest collection of wild fruits species and their varieties in Europe with the field collections “Inforama Wild Fruits”.

cally demanding altitude of around 800 meters, around 250 species and around 1,200 vari-

Planting campaign field collection Mogelsberg. Source: SAVE

around 350 plants, especially for interested laymen, has been set up in cooperation with the horticultural office of the city of St. Gall, Switzerland. The visitors

can find descriptions about roughly 40 species at

Visitors discover the Inforama Wild Fruit. Source: SAVE

entries on the website with the aid of QR codes. The rows of varieties are only accessible during guided tours. Every interested layman can get an idea of the diversity of wild fruits as well as expert audience from agriculture and horticulture. The individual varieties in the field collections are provided with corresponding name tags. In this way, it is also possible to make variety comparisons for better characterisation of the varieties at a later date. The original claim to completeness could not be fulfilled in view of the abundance of species and varieties. Therefore, "Inforama Wild Fruits" is going to be continuously supplemented and elaborated both virtually and in the field. It is also becoming increasingly challenging to organise varieties that were previously only used in Eastern Europe. But especially these varieties are robust and adapted to harsh climates. As a result, they could become viable niche products. In 2021, a second project is going to start. The valorisation is going to be in the foreground.

Wild fruits also fell into oblivion in Central Europe because harvesting and processing is often time-consuming and labour-intensive for our modern understanding. Guided tours with tastings, workshops and brochures are intended to ensure that wild fruits once again find a place in the minds and stomachs of the visitors.

The "Inforama Wild Fruit" was designed in German. An English translation is planned for a later phase of the project.

Further information: www.wildobst.info, office@save-foundation.net

National versus Local: Fruit Exhibitions 2020 in Belgium

The conservation scene faced particular challenges in 2020. Many activities such as seed markets or livestock licenses could not take place at all or only in a small circle. One example is the Belgian National Boomgaardenstichting (NBS), whose activities SAVE partners were able to see on site during the 2019 SAVE meeting in Belgium. The annual national fruit exhibition had to be cancelled. Nevertheless, the NBS was able to organize some interesting activities such as a fruit walking day "Op Fraitstap" or a digital edition of "de KERS" and the "Keizel-Turnipdag".

As an alternative to the annual big national exhibition, a mini-exhibition was set up, not national but local. Since the beginning of November, 20 apple and pear varieties have been exhibited in the shop window of the secretariat on Leopold III Street in Vliermaal and exchanged with other varieties every other week. In this way, the great diversity of Belgian fruit varieties is conveyed to the viewer over a longer period of time.

This kind of exhibition has an effect: walkers, cyclists, villagers wait eagerly for the next varieties. Questions are often put to the secretariat: "Where do all these varieties come from? Are they also tasty? Did they all exist in the past? Which ones can I buy where? Which ones can I plant myself? "

In a very short time, this mini initiative had developed into a forum for discussion and information with passers-by. It corresponds perfectly to the Corona measures and offers a unique opportunity for consultation as well as contact and dialogue with the population. Thus, a virtue was made of necessity. The varieties on display are offered for sale outside in 1 kg bags — as long as they are in stock. The customers take the bag of their choice and put the money in the letterbox.

This mini "Watch-and-Buy Expo" offers interested people the opportunity to see, marvel at and taste the many local and regional varieties. Building on the success of this action, this form of exhibition will be continued and expanded in the coming years.

In Antwerp, in addition to an outdoor information stand, visitors had the opportunity to press their own fruit. Visitors could also have their varieties determined at the same time. As the activity took place on Wednesday afternoon, many families came by with their children after school. All in all, a

successful additional activity worth repeating!

Europom® 2021 is scheduled to take place in Germany and will be organised by the Pomologen Verein in Hamburg. More information: http://www.boomgaardenstichting.be

Newsflash

To bulid and to run Community Seed Banks (CSBs)

As part of the EU Horizon project “DYNAmic seed networks for managing European diversity” (DYNAVERSITY), a very helpful series of technical manuals was developed that explain the establishment of and work with Community Seed Banks. The first two brochures are now available for download at http://dynaversity.eu. .

Manual 1 explains how Community Seed Banks (CSB) can best be set up and how they are run.

Manual 2 deals with documentation systems for data and information management.

The brochures are characterized by clear and short chapters and good visualization with graphics and high-quality images. In the past, communal seed banks were understood as a system to obtain seeds in local communities in the global south. But such local community seed banks have also developed in Europe. The brochures contain very good information about what CSBs are, how they are set up and executed, but also important topics such as setting up and running a good documentation system for the stored material. Such information is urgently needed and valued, especially for people and groups interested in conserving and distributing rare varieties in their community or region.

Greek Livestock Breeds – an hidden Treasure

Karystos Goat. Painting by Jason Roberts

Amalthia network in Greece. It is 240 pages thick with fully bilingual texts in Greek and English and contains many colour photos, paintings and sketches of autochthonous Greek livestock breeds. The book is aimed at both national and international audiences. Thoroughly researched informative texts and descriptions of little-known farm animal populations make it a travel guide with ancient breeds through Greece.

The pictures and sketches are made by Jason Roberts, an Australian animal painter of international renown who is specialized in farm animal breeds.

The conservation projects in Greece of the SAVE Foundation, Amalthia, government institutions and private individuals show the practical aspects of the conservation of native breeds.

The book is part of a larger sponsorship from the Niarchos Foundation several closely related projects. The written by Hape Grunenfelder, founder of the SAVE Foundation. He is very familiar with the Greek breeds.

More information: amalthia.org@gmail.com

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Payment into the Benefit Sharing Fund

The Dutch vegetable seed company Bejo Zaden B.V. operates in more than 30 countries. Recently Bejo Zaden made a payment to the Benefit Sharing Fund of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). Bejo has developed a commercialized product using material delivered to Bejo from the ITPGRFA multilateral system through the Centre for Genetic Resources in the Netherlands (CGN).

The ITPGRFA's Multilateral System (MLS) is a common pool of genetic resources comprising 64 important crops and animal feedstuff. Under certain conditions, those who use material from the MLS and develop products from it have to share a percentage of their net sales via the ITPGRFA's benefit sharing fund.

The benefit sharing fund supports farmers and scientists in developing countries in preserving the plants that guarantee our food supply. The benefit-sharing fund has already supported over 1 million people in 80 projects in 67 developing countries in four project cycles. The fourth round of these project cycles is currently running. Source:

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Ex situ gene banks and profitability for ANGR

Techniques related to the ex situ storage of genetic and reproductive material from animal genetic resources have made enormous progress in recent years and the collections in the gene banks are constantly growing. As part of the H2020 project IMAGE (www.imageh2020.eu), a "multi-period chance-constrained optimization" model was developed that allows collections to be effectively rationalized and thus avoid duplication. Collections are configured in the model by determining the most cost-effective optimal collection locations, the optimal time and the amount of material (sperm doses). In addition, a decision variable enables an "acceptable risk level" of the in-situ endangerment of breeds to be indicated. Using data from 18 gene banks, it shows how collections can be streamlined. Cost curves are derived that relate the marginal ex-situ collection costs and the accepted probability of in-situ extinction for the period 2018 to 2060.

Source: Rationalizing ex situ collection of reproductive materials for endangered livestock breed conservation.

Rafael De Oliveira Silva, OscarCortes Gardyn, Sipke-JoostHiemstra, Joao G.Oliveira Marques, MichèleTixier-Boichard, Dominic Moran

https://doi.org/10.1016/j.ecolecon.2020.106916

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Grain: Comic strip edition on Factory Farming

Grain is an international non-profit organisation that works to support small farmers and social movements in their struggles concerning community-controlled and biodiversity-based food systems. Recently, they published a lovely comic strip edition titled "What does factory farming have to do with the climate crisis?" Grain explains the idea of the comic: ”The pandemic has turned life on its head and has made us question a whole host of matters, including industrial livestock and the issue of factory farming. This is why we are sharing this comic strip. It offers a simple and clear explanation of why producing livestock in factory farms can be devastating for our planet’s climate It is worth looking at and discovering a new argument or two:

www.grain.org/en/article/6577-what-does-factory-farming-have-to-do-with-the-climate-crisis-comic-strip-edition The comic is available in English, French and Spanish.

Melons in the Arctic

The Vavilov Russian Institute of Plant Genetic Resources managed to grow melons and watermelons in the high latitudes. The experiment was carried out at a polar station in Apatity in greenhouses without additional heating, lighting, or fertilizers. The same varieties were grown in the Krasnodar Territory at the same time.

“We thought that certain genotypes would respond well to the polar day conditions and would be able to bear fruit. Our expectations were confirmed: the long polar day helped us choose several well-studied varieties to recommend for the high latitudes in the North. Melons and watermelons are the most interesting results. The quality of fruit at the polar station is quite good. Analysis shows that the fruit weighs almost as much as those grown at the Kuban station,” Yulia Ukhatova noted.

The fruit at the Kuban and Arctic stations were plucked on the same day, September 10th, and sent to St. Petersburg. A commission of 14 members tasted them and sent samples for biochemical tests. The Surprise variety of watermelon, with the yellow skin, proved to be the best.

“Surprise variety watermelons grown at the polar station were almost the same as the watermelon from the Kuban station both in taste and in biochemical composition. This means that this variety is well suited to Arctic conditions, while other varieties did not pass the selection process for the North,” Ukhatova added.

In the future, scientists plan to start experimenting with kiwi. They are also reviewing the possibility of growing grapes.

“I hope that soon we will be able to start this experiment and will be happy to share the results. The idea is the same as with the northern melon plantation: we simply want to provide high quality foodstuffs for consumers to grow in their own gardens,” Ukhatova noted.

The experimental polar station was founded by botanist Nikolai Vavilov in 1923. The scientist’s activities helped start agriculture on the Kola Peninsula. Over the years, many plant varieties have been adapted to the conditions in the high North and have been selected for use.

Source:
https://arctic.ru/news/20201014/984448.html

Seeds 4 All starts a new Web-Platform

Seed saving organizations from 31 European countries are represented on a new web platform. Seeds4All is dedicated to the diversity of seeds and aims to "give visibility to all European organizations that collect, enrich, produce, distribute and sustainably use traditional and new varieties of freely reproducible and non-genetically modified seeds".

The platform brings together NGOs, citizens' initiatives, companies, formal and informal networks and at the same time shows the work of these initiatives. The aim is to help these organizations and initiatives to exchange ideas and of course seeds together. Almost 24,000 varieties are already listed on the platform.

The platform's entries cover all of Europe: from the Irish Seed Savers in the west to the Finnish Maatiainen Landrace Association in the east. EU and non-EU countries are welcome. The EC-LLD (European Coordination of Let's Liberate Diversity) coordinates the platform.

Seeds4All aims to grow independently through the work of the seed conservation and distribution organizations by bringing as many relevant initiatives on board as possible. Organizations in Europe (not only in the EU) that are committed to promoting agrobiodiversity via public domain (open source,

non-proprietary) materials can participate on the website.

ARc2020 and EC-LLD are involved in Seeds4all. The greatest challenge is to promote and develop the dynamic management of the diversity of cultivated plants in farms and gardens.

Source: www.arc2020.eu and www.seeds4all.eu

Petition against patent monopolies on seeds

The member organizations of NO PATENTS ON SEEDS! see a great danger in the increasing number of patents on plants, seeds and livestock and their impact on farmers, breeders, innovation and biodiversity.

Such patents are an abuse of patent rights and endanger access to basic resources in agriculture and food production.

No patents on seeds therefore calls for a fundamental change in European patent law for biotechnology and plant breeding.

Conventional processes for breeding, breeding material, animals, plants and the foodstuffs obtained from them must be excluded from patentability through clear regulations.

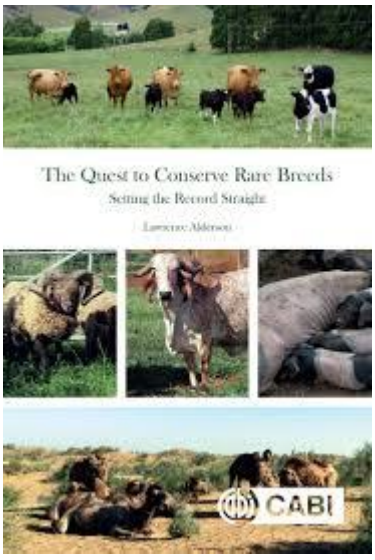
Although the EPO (European Patent Office) has finally decided to ban the patenting of conventionally bred plants and animals after years of controversy, patents are still being granted on random mutation breeding. Several hundred conventionally bred varieties in Europe are already covered by patents.

According to European law, patents on “essentially biological processes for breeding” are prohibited. However, there is no clear and legally unambiguous limit to patentable genetic engineering processes. Legal clarity must be created by a resolution of the Administrative Council of the EPO, which decides on the interpretation of the patent laws and to which the governments of the 38 member countries belong.

The necessary decisions have to be made as quickly as possible in order to prevent the seed market from coming ever further under the control of large corporations. If the EPO member countries need more time for discussions, a moratorium on patents on plants and animals must now be enacted.

In this context, a petition against patent monopolies for seeds was recently submitted. More information at: https://www.no-patents-on-seeds.org/en/activities/petition.

The Quest to conserve Rare Breeds



Since the middle of the twentieth century the world has witnessed a succession of political and social disruptions. Globalisation, technological advancement, climate change, human migration, war and conflict - all have caused major worldwide upheavals.
In this light, it's unsurprising that conservation of rare breed animals has been neglected. Yet the preservation of these genetic resources - this biological diversity - is an essential ingredient of sustainable life on Earth, and not something we can afford to lose.
This book challenges often repeated 'facts' about livestock farming, straight from the horse's mouth. In it, rare breeds expert Lawrence Alderson CBE argues for a reasoned and evidence-based approach from political and public circles. Correcting misconceptions as he goes, he recounts the creation and development of the rare breed conservation movement, addresses extinctions and genetic safe-guarding measures, and considers where we go from here. Challenged as we are by climate change, sustainability and feeding the world, perhaps it is these endangered animals that hold the answer - perhaps with them, we can adapt to our changing environment and see a way forward to a more certain future
Source:
www.cabi.org/bookshop/book/9781789247114/

Last but not least

Ananas form the Lost Gardens of Heligan

Just in time for the festive season there is still an extraordinary idea: Since we will hardly be traveling this year, we can afford something culinary. How about a pineapple from the "Lost Gardens of Heligan" – the only place in Europe where pineapples grow outside a greenhouse. The "Lost Gardens" are in Cornwall in Great Britain. This is where the “Smooth Ca-yenne” variety, which is believed to have first been brought to Great Britain around 1819, is grown. The pineapples grow in specially designed whitewashed pits that are equipped with compost and a heating system. There is only a harvest around every two years. The pineapple is only fertilized with horse urine. That should give her a special resilience. A single fruit is said to cost up to £ 1000 – excluding shipping costs, of course. Source: www.heligan.com

We wish you delightful and relaxing holidays
Your SAVE team