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Safeguard for **A**gricultural **V**arieties in **E**urope

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SAVE Projekt-Office

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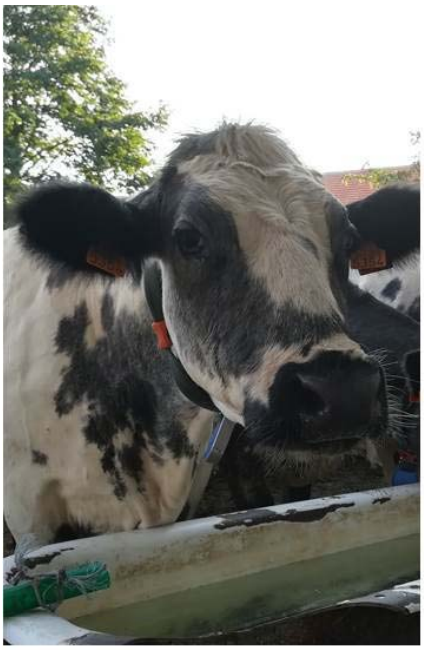
Expo, Ecology and Value Creation:

The SAVE Annual Meeting 2019



A varied program at the SAVE meeting 2019 in Belgium

The SAVE Annual Meeting 2019 in Belgium was opened on 25th August with a visit to the "Levend Erfgoed Expo" of Steunpunt Levend Erfgoed (SLE) in Wachtebeke. It was also the SLE who organized the annual conference on site. The SAVE partners also had the opportunity to participate in the 4th

Dialogue Forum of the Horizon 2020 Project IMAGE

at the Expo (see article below).

The 13th seminar on agrobiodiversity with an inspiring selection of presentations took place in the former monastery "La Foresta" in Leuven on 26th August. The president of the SLE, Jan Martens, presented the "Erfgoedhoflabel", for adding value creation to rare Belgian breeds (see SAVE eNews 4/2018 www.save-foundation.net/images/enews/2018-04-en.pdf). Prof. Dr. Ir. Bram Van de Poel, Head of the Crops Biotechnology Division of the University of Leuven, explained the breeding and conservation of new and old varieties of endives, a typical Belgian vegetable that enjoys great popularity all over Europe. The versatile activities of the Horizon 2020 project Dynaversity, where SAVE acts as a so-called SKEP partner, was presented by Matthias Lorimer, secretary of Let's Liberate Diversity, Italy. Last but not least, Alex Wieland reported on the "Most Sustainable Beer" in the Netherlands, "Het Patrijske", which received the Arca Deli Award 2017. The presentations can be downloaded at www.save-foundation.net/en/network/conferences.

The afternoon of this conference day was dedicated to the network partners: In "pitch talks" the partners introduced themselves and their projects 2018/2019. The “Nationale Boomgaardenstichting” was presented by its president Paul Van Laer.

Finally, the results of the ethics survey in the Horizon 2020 IMAGE project and the dialogue forums were reported to the Council of Co-operation Partners. Furthermore, it was discussed whether and how the "Dos and Don’ts" of the SAVE partner can be implemented in a kind of "Best Practice" for all partners. An exciting culinary city tour of Leuven concluded the day.

The world's largest banana gene bank in Leuven

The visits and excursions in 2019 were characterized by a balanced mix of topics on plant genetic resources as well as the conservation of the rare Belgian livestock breeds. In the fruit and biotechnology laboratory of the University of Leuven, with the "Bioversity International Musa Germplasm Transit Centre (ITC)", the world's largest banana gene bank, the participants were astonished to learn that the export ratio of dessert bananas (Musa × paradisiaca), despite their importance in the northern countries is small. The vast majority of bananas are consumed in the countries of origin themselves. It is a staple food in Southeast Asia, parts of Africa and South America. The plantain has a similar importance like potatoes. Another important topic was the ubiquitous Cavendish variety. The Cavendish suffers from a fungus called "Tropical Race 4", which triggers the Panama disease. This has already led to massive crop damage in Southeast Asia and South America. The seedless dessert bananas are not propagated by seeds, but via rootstock or their meristem ("tissue culture"). They are therefore clones. Presumably, this mutation took place 8,000 years ago and has continued to be cultivated ever since.

More than 1500 varieties are obtained in vitro in test tubes. To be on the safe side, there is also a duplicate collection in the French town of Montpellier. Variety diversity enables targeted breeding and research. It is not just about resistance to the mentioned fungal disease. Researchers are also working with partner countries in the southern hemisphere to investigate which banana variety would be ideal for a given region after global warming. Wild bananas are prone to large seeds, which significantly limits the eating pleasure. In other words, more sustainable or more suitable varieties for climate change would probably have to be processed so that the result is also suitable for the mass market. When asked about the choice of options, a discussion about the technical and conventional possibilities of breeding arose.

Good climate for late blooming peaches

The fruit collection of the Nationale Boomgaardenstichting near Nieuwrode was in a big contrast to the technical genebank. A monument with an apple tree of the apple variety "Küssnachter" commemorates since 2005 the car accident of Princess Astrid Sofia of Sweden, who died near Küssnacht, Switzerland, in 1935.

The 71- year-old Dirk Vanden Eynde takes care of the rare Belgian fruits of this collection. His specialty

is peaches. He searches all over the country for old peach varieties and plant them in the mild climate at Nieuwrode. A peculiarity is the Salway peach, whose fruits are ripe from beginning to end of October, later than other peach varieties. The late flowering makes the excellent fruit attractive for the cultivation in northern areas. Originally Salway peaches are probably from Italy, but today there are still trees mainly in France. The only tree in Belgium is in the care of Dirk Vanden Eynde.

Living heritage and landscape management

"Het Bolhuis" (http://www.bolhuis.be), an organic farm, is managed by Kurt Sannen in Molenstede, north-east of Leuven. It harbours one of the largest herds of the robust, climate-adapted Kempen cattle and the also very adapted Ardenne sheep. They are used in landscape conservation. The meat is marketed by Kurt Sannen himself and finds very good sales. Not only the animal husbandry in the nature reserve convinces the customers, but also the special organic quality of the finely marbled meat. Like many European countries, Belgium is currently experiencing a boom for organic food. The menu of the animals consists in the summer of the pasture grass and in the winter from farm-owned beets, hay and grain.

It is even possible to experience an adventure holiday around the farm: you will sleep in a safari tent and discover the surroundings by trekking with a donkey..

Bodybuilder without doping

The excursion day ended with a visit to the farm "In de Zon" (in the sun,

www.streekproduct.be/producenten/hoeve-de-zon) of Dirk and Anne Rummens in Vissenaken. Here, agriculture, ecology and fair trade are combined. The cattle breed with which landscape care is practiced here are the Belgian White-Blue (BWB), a heavy meat breed with large muscles. They occur in different colors, also black and white. A genetic mutation of the protein myostatin blocks the inhibition of muscle growth. At the same time it also hinders the growth of fat. The heavily muscled appearance is also called „Doppellender“. However, the „Doppellender“ gene can lead to calving problems. With the Rummen family, the cows almost always give birth naturally.

4. IMAGE Dialogue Forum: ABS

The 4th IMAGE Dialogue Forum which was held at the occasion of the "Levend Erfgoed Expo 2019" on 25. August in Wachtebeke, Belgium, concentrated on Access and Benefit Sharing (ABS) rules and the question “What does ABS mean for conservation, research and use of Animal Genetic Resources?”

The Nagoya Protocol on Access to Genetic Resources and the fair and equitable sharing of benefits arising from their use was set into force in October 2010, The EU adopted and entered it into force in 2014. It is the implementation of Art. 15 of CBD (Access to Genetic Resources).

In principle Genetic Resources are a matter of national sovereignty. The parties have to establish legislative, administrative and/or political measures with regard to access to genetic resources. In October 2015 the EU regulation 511/2014 entered into force. For a better understanding guidance documents on the scope of application and core obligations for the different sectors of genetic resources have been developed.

Some countries have established ABS rules. But it is rarely known in the public and within the Stakeholders what procedures have to run and what is in or out of the scope of the ABS rules. This is specially the case for animal genetic resources (AnGR).

AnGR material is a subject of store and use for different purposes: e.g. Breeders and Breeding organisations of both the commercial and the conservation sector and Science (commercial in companies and public at universities).

Genetic resource is material (vegetable, animal, microbial and other organisms) containing functional units (carriers of the hereditary units).

Information on ABS rules and their relevance for breeding, conservation and science are rarely known as the analysis of the state of play of implementation of the access and benefit sharing regulation in the frame of IMAGE showed. Therefore this Dialogue Forum was laid out as an information platform on Access and benefit sharing. A comprehensive introduction to Access and Benefit sharing in animal breeding, conservation and research was given by Elzbieta Maryniuk, Faculty of Animal Sciences, Department of Genetics and Animal Breeding at the Warsaw University of Life Science (SGGW).

The Policy Officer of the European Commission and EU ABS National Focal Point at the Department Global Sustainability, Trade & Multilateral Agreements, DG Environment Alicja Kozlowska explained obligations and rules within the EU and the rules for the exchange with other countries, the key provisions of the EU ABS regulation, user obligations like Due Diligence obligations and Due Diligence declarations and an explanation of the tools to use on internet.

It became clear that the ABS rules do not play a role in most of the cases of the exchange of material for breeding. But science is heavily affected by the ABS rules. The provider countries may draw up their own regulations. Therefore sometimes it seems to be impossible to get material for scientific issues. In general ABS in animal breeding is less relevant than in other sectors due sanitary measures in the EU, the limited import of animal material to the EU and mostly no legislation on animal breeding and ABS in the member states. But attention needs to be paid to the fact that new products are in the scope of the EU ABS rules.

A small survey to the participating NGOs before the meeting showed: Among the conservation NGOs it is known that there is an ABS regulation and if the countries signed the Nagoya Protocol. But the National competent authority for ABS is hardly known among NGOs. In the recognition of best practice examples the national or regional acting conservation NGOs are mostly not involved.

Detailed information including the most important web links to ABS are available here www.imageh2020.eu and here www.save-foundation.net/en/network/conferences.

„Giant Saber“ in the Organic Supermarket: From the Rediscovery of forgotten Vegetables

Alexandra Becker, VERN e.V.

There is a worrying decline of agrobiodiversity. A cooperation project is therefore investigating old forgotten varieties in order to offer (food) alternatives to farmers and consumers in the future.

“Round yellow”, “delicate yellow butter” or “giant saber” - behind the sonorous names may conceal the new trends in the future range of German vegetable trade. "These are radishes, summer savoy cabbage and peas, which will be offered for testing in Berlin's organic supermarkets by 2020," explains Josephine Lauterbach, a research associate at the Eberswalde University for Sustainable Development (HNEE). In cooperation with the Humboldt University of Berlin and the Association for the Conservation and Recultivation of Agricultural Crops (VERN e.V.), she is dedicated to the question of how old varieties can increase the diversity in the field, in the garden and in the kitchen. "It is important to consider the expectations of consumers as well. That's why I'm exploring how consumers can be enthusiastic about biodiversity and the purchase of old varieties. "Initial project results show that there is a great interest in old varieties and, that the taste and health aspects

are relevant.

The overall objective of the project “Breeding and utilization of plant genetic resources through on-farm / in-situ conservation and positioning of products in organic food retailing (ZenPGR)” is to return old vegetable varieties that are no longer available on the European seed market. Currently, old varieties of vegetables are processed beetroot, carrots, radish, cabbage, sugar peas, broad beans and

bush beans. Genebank patterns of other vegetables such as endive, Brussels sprouts and cucumbers are investigated for reviving. "Variety selection is based on the breeding potential, the vulnerability status (see: https://pgrdeu.genres.de/rlist?lang=en) and the potential for cultivation and marketing of a variety”, Annika Grabau says, research associate at the Humboldt University in Berlin. The research team focuses on Plant Genetic Resources (PGR), which are currently not permitted under the Seed Marketing Act but are documented in historical sources. "A total of 15 varieties have been shortlisted so far and are currently being cultivated at vegetable farms of the “Saat-Gut-Erhalter-Netzwerk-Ost” and further audited. The results provide information on how the varieties have proven themselves in cultivation at various locations, in direct marketing and play an important role in preparing for the market launch in the organic supermarket”, says Alexandra Becker, coordinator of the Sustainability Network at VERN eV. So far, old varieties are only marketed directly. With the expansion of marketing to organic supermarkets, further customers are to be sensitized and won over to the value and significance of crop diversity.

A big challenge is to build up the value chain. On the one hand, varieties with acceptable cultivation and marketing characteristics are needed on the other hand, it requires the willingness of all parties involved, from cultivation to trade, to get involved in the peculiarities of the varieties. A good cooperation is the alpha and omega.

The Project

The project is funded by the German Federal Agency for Agriculture and Food within the framework of the federal program Organic Farming and other sustainable forms of agriculture.

Cooperation partners are the Humboldt-University Berlin (HU), the University for Sustainable Development Eberswalde (HNEE), the Association for the Conservation and Recultivation of Crops (VERN eV), the “Kultursaat eV”, the “Bundessortenamt”, the “SaatGut-Erhalter-Netzwerk-Ost” and the Bio Company.

Project Participation

In the “SaatGut-Erhalter-Netzwerk-Ost”, 23 seed-growing and vegetable-growing companies from Brandenburg, Saxony and Mecklenburg-Vorpommern are working together to bring old varieties back into use. The VERN e.V. coordinates the conservation breeding, seed multiplication and cooperation in the network. The seed-growing companies are of particular importance because they make the forgotten varieties fit for conservation-breeding and ensure that interested growers can get seeds again. The network is open to other farms in the area interested in growing or propagating old varieties. Interested parties can participate in continuing education workshops and field days as part of the project.

Contact

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More Information:

HNEE-Projektseite: www.hnee.de/zenPG

SaatGut-Erhalter-Netzwerk Ost www.saatgut-netzwerk.net

VERN e.V. www.vern.de

2020: International Year of Plant Health (IYPH)

Healthy plants are the foundation for all life, ecosystem functions and food security. They produce the oxygen we breathe, provide more than 80 percent of the food we eat and for nearly half of the earth's population, plants are a primary source of income. Plant pests and diseases damage crops, reducing the availability of food and increasing its cost. Sustaining plant health protects the environment, forests and biodiversity from plant pests, addresses the effects of climate change, and supports efforts to end hunger, malnutrition and poverty.

The UN General Assembly declared 2020 as the International Year of Plant Health (IYPH) and invited FAO together with the IPPC (International Plant Protection Convention) Secretariat, to serve as the lead agency to spearhead activities, and called on governments, civil society, and the private sector to engage at global, regional and national levels. An International Plant Health Conference will be among thousands of plant health events to be held globally throughout 2020.

At least since the Neolithic period, when the sedentariness and thus agriculture and livestock began, people have exchanged their goods, seeds and propagating material and brought it through migrations, for example, from the fertile crescent to Europe. Through international trade and increased human mobility, even unwanted organisms have been transported to regions where they have no natural enemies. Due to global warming, pest organisms in agriculture can settle far beyond their natural habitat. In the large monocultures of modern industrial production (also organic land corresponds to the industrial scale) harmful organisms can spread unhindered. The FAO estimates that corn caterpillars worldwide destroy about 4 percent of annual corn crops. In banana cultivation, the concentration on a single main variety takes its toll: the fungus Tropical Race 4 (TR4), the causative agent of panama disease, threatens the stocks of the Cavendish banana worldwide.

International associations such as the IPPC and EPPO (European and Mediterranean Plant Protection Organization) are developing and strengthening control systems, early warning systems and international risk analysis. The EU phytosanitary regulation will enter into force after a transitional period in December 2019. Plant passports and phytosanitary certificates are then mandatory for the cross-border movement of goods - inside and outside the EU. This also applies to producers of traditional varieties. Will the exchange beyond today's (European) borders be made impossible by bureaucratic hurdles? Do preservers of old varieties and niche producers have to pay the bill for globalization and industrial production?

Plant conservation organizations should use the International Year of Plant Health to highlight the requirements and needs of niche production of traditional cultural plants and their varieties. Functional agro-biodiversity, the use of beneficial insects against pests in agriculture, must increasingly be introduced into discussions about crop protection. The diversity of landraces, more diversity in agriculture and traditional cultural landscape elements such as field margins and hedges promote beneficials and restrict pests.

Sources:

www.ippc.int/en/iyph

The Swiss Commission for the Conservation of Crop Diversity (CPC-SKEK) runs its annual conference under the topic "Danger for Diversity? Diversity of crops in the field of tension of the legislation. The confernece faces the new photosanitary regulations of EU and Switzerland and the consequences for added value of rare cultivated plants. Date: 14. November 9-16:00. Place: Bioschwand, Münsingen near Berne, Switzerland. Conference Languages: French and German. Registration and Information: www.cpc-skek.ch

www.ippc.int/en

www.eppo.int

Regulation (EU) 2016/2031

Goats as firefighters?


Photo: blickwinkel/B.Trapp

The forest fires in Portugal are getting worse every year. In the forested and mountainous region of Castelo Branco in July this year, 800 firefighters, 245 vehicles, including bulldozers, and 13 aircraft and helicopters fought against the fires. The Portuguese government is now relying on an unusual team to prevent the fires: goats.

As in other regions of Europe, the population in rural areas is decreasing. Dozens of sheep- and goatherds once lived near the villages, with numerous herds feeding on the thickets of the rugged countryside. As the population ages or moves away, the land, which is no longer farmed by herds, is transformed into thickets.

At the same time, temperatures have continued to rise worldwide as a symptom of climate change. For example, July 2019 was the hottest month in history. When Europe experiences heat waves, Portugal is particularly hard hit. Europe lost 1.2 million hectares of forest fires last year, most of it in Portugal. The fire season has been extended by 2 months compared to the last century. "The weather conditions and the characteristics of our forests make big fires inevitable," said Portuguese Interior Minister Eduardo Cabrita after the fires in Castelo Branco in July.

As a result, the Portuguese government is now providing 50 percent of its budget for fire-fighting prevention measures, compared to 20 percent in 2017. A very small part of the budget includes a program that encourages shepherds to graze their herds in rural areas.

Overgrown slopes are the main fuel for forest fires. In particular, a bushy plant, the strawberry tree, is covered with waxy leaves that easily ignites. Locals transform the plant into “Aguardente de Medronhos”, a fruit brandy. Goats, on the other hand, eat the leaves with cravings and like to climb to get them.

The return of goats to the land is a logical solution to help particularly remote villages to minimize fires. The only a few thousand euros expensive pilot program was developed by the forestry service of the country. Around 40 to 50 goatherds and nearly 11,000 goats are involved in the program. That's enough to graze around 2,500 hectares, but a lot more is needed - if they can get money. The shepherds involved receive only about three extra Euro per days and it is difficult to find shepherds for the hard work in the remote regions.

The program is by no means a perfect system. Some of the forest officials' wishes are contrary to the shepherd's logic. For example, the undergrowth on the roads and paths is usually not very valuable for goats. But there is still time to settle such inconsistencies.

If this approach is effective, it is once again an example that traditional agriculture and transhumance systems must also have their place in the modern world.

Sources:

www.smithsonianmag.com/smart-news/could-goats-help-solve-portugals-wildfire-crisis-180972933/

www.dailymotion.com/video/x6vubjq

Climate-Resilient Potato Varieties

The International Potato Center (CIP) is using wild potatoes to breed resilient varieties that help

farmers cope with climate change.

Globally, late blight alone causes billions of dollars in losses for potato farmers, who spend more than USD 1 billion per year on fungicides to control the disease. The development of disease resistant potato varieties can substantially reduce production costs and help improve the incomes and diets of small-scale potato farmers.

Scientists spent the past four years evaluating wild – often inedible – potatoes stored at CIP's genebank in Lima, Peru, and crossing them with cultivated potatoes, with support from the Crop Trust and the Government of Norway. The CIP genebank safeguards one of the world's largest collections of the potato's wild relatives, some of which grow in areas with harsh climates or pest and disease pressure. Those plants evolved mechanisms to cope with extreme conditions, and breeders want to transfer those traits into cultivated varieties.

Because crop wild relatives are very different from cultivated species, using them for crop improvement requires a laborious pre-breeding process. A second phase of Crop Trust support will allow CIP scientists to continue pre-breeding for two more years while sharing potato clones that contain resistance genes from wild relatives with other crop improvement programs.

As the crossbred potatoes developed in phase one may not possess all the characteristics that consumers and farmers want, CIP and partners will work with smallholder farmers in Peru and Kenya to evaluate them and select the best ones. Kenya and Peru are excellent places to introduce climate-resilient potatoes, since potato provides livelihood and employment opportunities to more than three million people in the two countries.

"Bacterial wilt and late blight already cause significant economic losses, particularly to small-scale farmers in Africa, and they are expected to become more of a problem as a result of climate change," Mendes said. "Small-scale farmers can't always afford the fungicides needed to control late blight disease, which means they suffer most. And because the late blight pathogen is evolving rapidly, the effectiveness of fungicides diminishes over time. Crop wild relatives represent a new, valuable source of resistance."

"Crop wild relatives are a largely untapped resource for crop breeders to adapt our most important crops to climate change," said Dr. Benjamin Kilian, of the Crop Trust. "We are excited to help CIP use them to improve potato, a vital global staple."

This work is part of the initiative "Adapting Agriculture to Climate Change: Collecting, Protecting and Preparing Crop Wild Relatives" which is supported by the Government of Norway. The project is managed by the Global Crop Diversity Trust with the Millennium Seed Bank of the Royal Botanic Gardens, Kew UK and implemented in partnership with national and international genebanks and plant breeding institutes around the world. For further information, visit the project website: http://www.cwrdiversity.org/

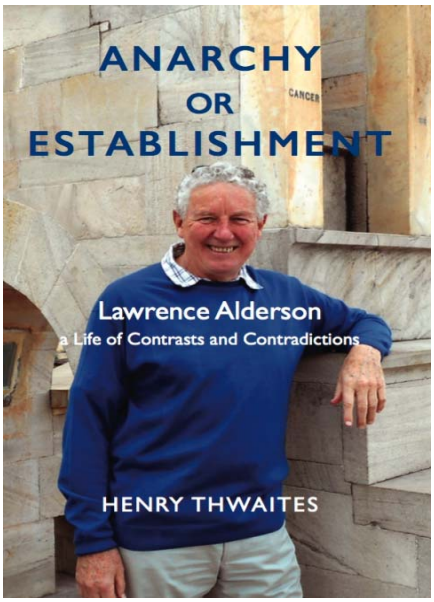
More Information: http://www.cwrdiversity.org/

María Elena Lanatta, International Potato Center, m.lanatta(at)cgiar.org

Photo: https://smallfarmersjournal.com

Newsflash

Anarchy or Establishment



Lawrence Alderson has devoted much of his life to saving endangered breeds and maintaining biodiversity and was awarded the CBE (Order of the British Empire) for services to conservation. He matriculated in 1959 and lectured for four years after post-graduate studies before establishing an international consultancy for business management and animal breeding. In the latter capacity he has had a profound impact on global policies for genetic conservation and global warming. He was founder of Rare Breeds International and Rare Breeds Survival Trust (RBST) and is a leading world authority on saving endangered breeds from extinction. Since the foundation of the RBST no British farm animals have become extinct and many endangered farm breeds around the world have been saved from the brink of extinction. This biography traces his life from his boyhood on a remote moorland farm in northern England to his current eminent position. His family roots in the Pennines are evident even though he has travelled to regions around the world, often as an invited keynote speaker - a talent first seen in his school debating society. He was an active sportsman played rugby at a high level, but at Cambridge earned his Blue as a heavyweight boxer. His personality emerges as an irrepressible action man, with over-riding optimism and humour. The author, who clearly shares a Yorkshire heritage with his subject, writes with an easy flowing style, and the book is liberally illustrated with 144 colour and monochrome images.

Henry Thwaites: Anarchy or Establishment. Lawrence Alderson. A Life of contrasts and contradiction. ISBN: 978-1-910237-40-3 Hayloft Publishing (2019).

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Criteria for selection of accessions for Core Collections

So-called core collections (CCs) are a key instrument for the characterization and description of genetic resources. However, the criteria of such a collection are by no means standardized. When the institutions involved in the conservation of plant genetic resources decide to define a core collection, the accessions are usually selected not only according to strictly objective criteria, but also for expert knowledge such as popularity, prestige, role in the breeding history, presence of a phenotype or others special features. The aim of a study by the Swiss Agroscope, the Federal Competence Centre for Agricultural Research, was to evaluate approaches for a core collection that combine formal analysis methods and expert knowledge in the collection of pears from the Swiss National pear Inventory. The optimal collection should represent a maximum of genetic diversity, not exceed 150 accessions, and contain a priority set (SPPS) with 86 genotypes selected on the basis of expert knowledge. In total, nine strategies were evaluated, which resulted from the combination of the composition of the examined data set, sample sizes and methods. Mixed approaches that incorporate expert knowledge help to optimize collections, the study concludes: www.nature.com/articles/s41598-019-44871-3

Exemptions from swine fever?


Photo: SAVE

In Germany there are regulations to carry out protective measures for endangered breeds in the case of an outbreak of epidemics. But there are certain conditions to be met.

In the event of outbreaks of swine fever or African swine fever in establishments where pigs are kept for the purpose of keeping or protecting rare breeds of pigs, a derogation may be granted if the establishment, by virtue of their structure, size and function in relation to keeping, Care, disposal and feeding so completely separate from other farms with pig husbandry is that a spread of the epidemic can be excluded.

The mentioned facilities shall notify the competent authority, at least 3 months after their start-up, about the conditions and arrangements which may be the basis for a permit. Changes to conditions or advance arrangements must be notified to the competent authority without delay.

For breeders of rare and endangered pig breeds this means that the breeders contact the competent veterinary authorities. The veterinary authorities examine the respective attitude with regard to the requirements for biosafety.

Source: GENUVI Newsletter Güntherschulze August 2019

Useful information: www.oie.int/en/animal-health-in-the-world/animal-diseases/african-swine-fever/

Video: https://youtu.be/eyQ4t1wHl2M

It would be of interest, which rules and exemptions are in place in other countries. Please send your statement to office@save-foundation.net

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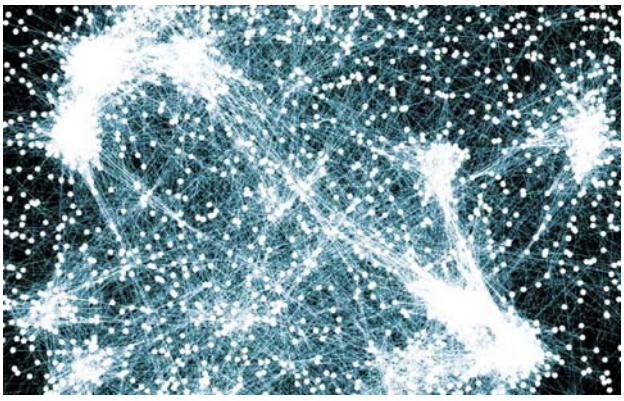
Traditional grazing systems in the Venetian Alps


Photo: Ulrich Wasem (WSL)

Livestock farming in large-scale pasture landscapes can fulfil the economic and ecological requirements for sustainable, biodiversity-friendly agriculture of the European Union (EU). However, little is known about the grazing systems that have maintained these pastures for centuries. The traditional grazing methods and their effects on the cattle behaviour were therefore studied at 23 mountain summer farms in the Asiago upland (north-eastern Italy). Traditional methods of free-ranging and herding were the only techniques adopted by farmers. Only environmental factors (size and perimeter length of the pastoral unit) were significantly associated with the grazing method used. Free-ranging was more often performed in small and homogeneous farms, while herding was done in large and heterogeneous farms. Herding led to a more homogeneous grazer distribution and better regulated the lengths of the cattle daily routes than free-ranging. The grazing direction and resting sites were almost exclusively affected by environmental factors. Cattle grazed predominantly in the direction from which the wind was blowing, and preferred resting at windy sites in the daytime (escaping from flies) and at open areas close to woods during the night (being protected against cold winds). Other traits shared between free-ranging and herding were: the seasonal organisation of grazing into periods and camps; re-grazing of the same surface within a few days; everyday use of different pasture types; and rhythms in the cattle daily activities. Even if they may have lower productivity compared to rotational stocking, the studied traditional grazing methods, especially

herding, have the advantages of respecting spontaneous cattle behaviour, producing more savoury cheeses, and better maintaining heterogeneous and biodiversity-rich landscapes. More attention should be paid to traditional grazing methods within measures aiming to conserve cultural heritage and agricultural biodiversity. Source: Scotton,Michele;Crestani, Davide: Traditional grazing systems in the Venetian Alps: Effects of grazing methods and environmental factors on cattle behaviour, Journal of Environmental Management, Elsevier. https://doi.org/10.1016/j.jenvman.2019.109480 .

Last but not least
Crispr / Cas becomes a multi- "gene scissors"



Scientists at ETH Zurich, Switzerland, have further developed the biotechnological Crispr-Cas method. Now not only single, but dozens of genes can be changed in one cell at once. With Crispr / Cas, individual genes can be removed, replaced or changed in cells relatively easily and quickly. At the same time, the activity of individual genes can be manipulated. The method has already changed basic research and the applied fields of plant breeding in a short time. So far, the researchers were able to change only one gene at a time, in rare cases, there were two or three genes simultaneously possible to change. The Department of Biosystems at ETH Zurich in Basel, Switzerland, has now developed an approach that can be used to simultaneously modify in a cell up to 25 digits of a genome. However, a further development is planned so that hundreds of genes can be changed simultaneously. The Crispr / Cas method requires an enzyme called Cas and a small RNA molecule. Its sequence of RNA building blocks serves as an "address label" for the enzyme to get to the right place. As the ETH states in its communication, the scientists have created a plasmid (ring-shaped DNA molecule) on which the construction information of Cas-Enzymes lie, as well as - in a row - the construction information of a large number of RNA-address molecules. For the technique, the scientists did not use the enzyme Cas9, which was previously used, but the enzyme Cas12a. Statements of the director of the institute Randall Platt as: "With our method we can change entire gene networks in one step" and: "Thanks to this new tool, we and other scientists can now implement what we used to dream of", have left many people with rather mixed feelings.
Source: https://ethz.ch/en/news-and-events/eth-news/news/2019/08/revolutionising-the-crispr-method.html