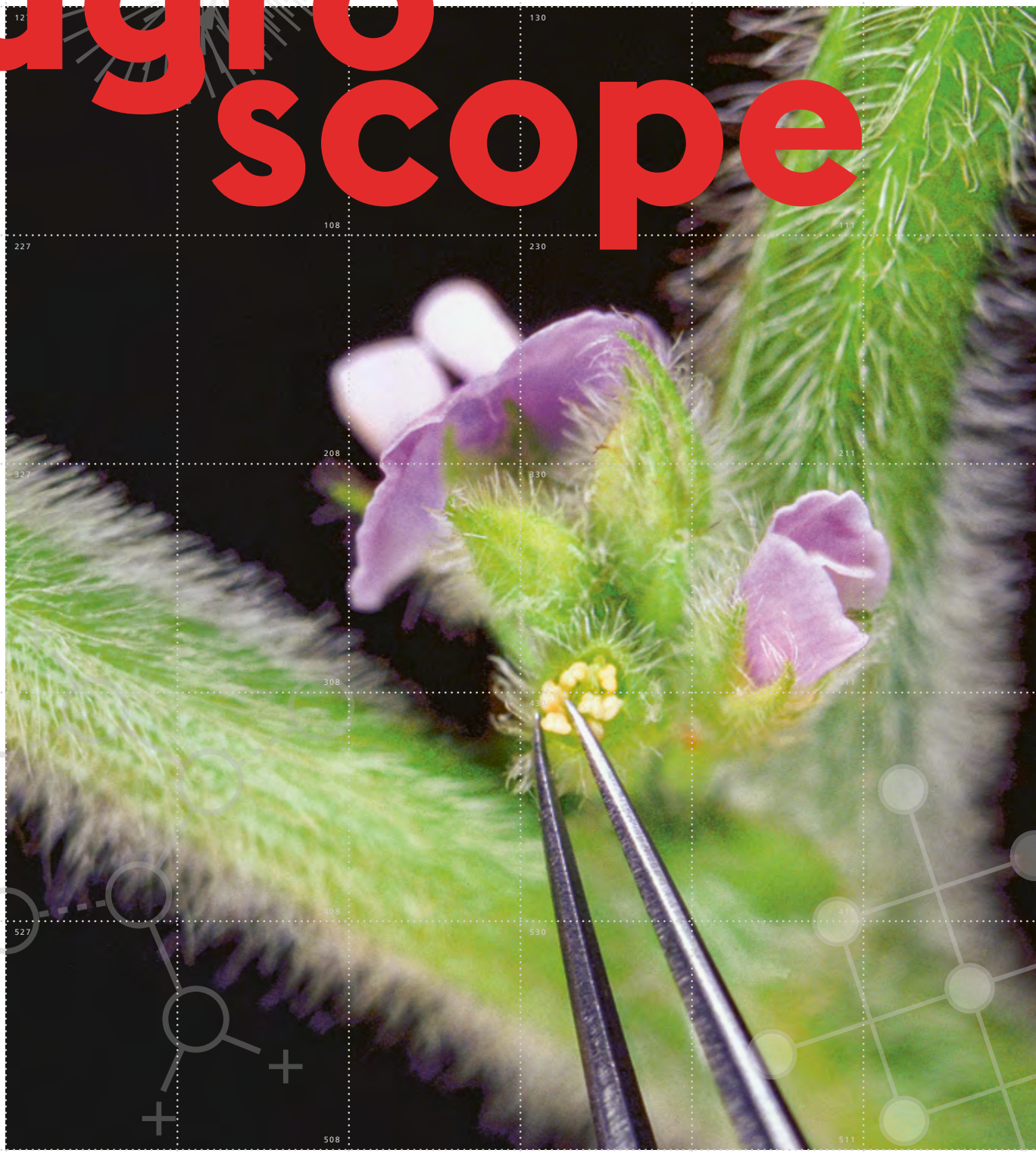
March 2025

agroscope



Agroscope good food, healthy environment

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of Economic Affairs,
Education and Research EAER
Agroscope

Agroscope's plant-breeding research supports the development of high-yielding, disease-resistant crops that ensure high product quality (see article on topic, pages 6 – 7).

Dear readers,

Plant breeding develops high-yielding, disease-resistant crops that ensure high product quality. This helps guarantee efficient plant production and food security, as well as reducing the use of plant-protection products. Adaptation to climate change is an additional challenge, and means that plant breeding needs to become faster and more precise. The use of molecular marker systems and genomic information already currently provides strong support to breeders. Thanks to new technologies such as genome editing or TEgenesis, plants can be improved even more rapidly and in a more targeted fashion. Read more on this subject on page 6 in the article 'Wheat from New Breeding Methods: Agroscope Searches for Fungal Resistances in Field Trials'.

Besides innovations in research and development, consumer awareness-raising and tools for promoting sustainable consumption are essential. Based on a representative survey, Agroscope researchers examined the following question: 'Sustainability Levies – Which Are Preferred?' (page 10).

In addition to plant breeding, farming also offers innovations such as modern agroforestry systems that combine the cultivation of arable crops with trees and include Smart Farming for good measure. This approach improves the water budget and promotes biodiversity whilst potentially increasing yield stability. Find out more on this topic from the interview with Sonja Kay and Felix Herzog on page 12.

But Agroscope also focuses on the end product, which should be healthy and tasty. The article 'The Highly Diverse, Nutrient-rich Inner Life of Sourdough Breads' (page 18) explains how the microbiological composition of sourdough in combination with certain types of flour and suitable baking processes can enhance the health-promoting qualities of bread.

Two highlights from livestock research round out this issue: from the 'sport and leisure animals' sector on page 20, 'The DNA of Franches-Montagnes Horses Reveals the Origins of the Breed'; and from the 'livestock fattening' sector, on page 22, 'Organic Pig Fattening Pays Off for Large Farms'.

In addition to these topics, you'll also find the State Accounts and the latest Key Figures from Agroscope in this issue.

Wishing you an interesting read,
Roland Peter

Head of 'Plant Breeding' Research Division

Other topics

Japanese Knotweeds Also Pose a Threat to Agriculture

The DNA of Franches-Montagnes Horses Reveals the Origins of the Breed

Organic Pig Fattening Pays Off for Large Farms

Agroscope is the Swiss Centre of Excellence for Agricultural Research, and is affiliated with the Federal Office for Agriculture (FOAG). Agroscope makes an important contribution to a sustainable agriculture and food sector as well as to an intact environment, thereby contributing to an improved quality of life.

Events

25 April – 4 May 2025
BEA Bern, 'Grünes Zentrum'

Agroscope is taking part in a special exhibition entitled 'Potatoes – Superfood Grown Locally'

8 – 9 May 2025
Agroscope, Bern-Liebefeld

53rd Annual conference of the Swiss Society for Agricultural Economics and Agricultural Sociology (SGA)

25 May 2025
Agroscope Steinobstzentrum Breitenhof

Agroscope Breitenhof Conference 2025

The meeting place for the stone-fruit sector

1 July 2025
Agroscope Reckenholz

Soup & Science

Event for the public

16 August 2025
Agroscope, Pilot and Training Plant Güttingen

Güttingen Day 2025

The meeting place für the pome-fruit sector

All Agroscope events that are open to the public are advertised on our website.

Japanese Knotweeds Also Pose a Threat to Agriculture

The 'Neobiota' Competence Centre in Cadenazzo (Canton of Ticino) has developed new findings to optimise the control of these problematic rhizomatous plants.

Together with the Swiss Federal Research Institute for Forest, Snow and Landscape WSL and other local partners, Antoine Jousson, a biologist at Agroscope and an employee of the 'Neobiota' Competence Centre in Cadenazzo (TI), studies Asian knotweeds. The focus is on the plants' underground parts (rhizomes and roots), to gain a better understanding of the physiology and distribution pattern of the plants. At the same time, the partners are studying different control methods. Below, researchers explain the advances made in the Canton of Ticino, which benefit the whole of Switzerland.

Why is it so important to learn more about the underground parts of Asian knotweeds?

Rhizomatous plants have extremely strong and resilient underground organs. Knowing about them is crucial for developing targeted control methods according to context. For example, it is very useful to be able to distinguish between the rhizomes, with their strong regenerative capacity, and the roots, in order to define the optimal intervention depth of the control measures.

Japanese knotweeds are invasive alien plants that represent a threat to agricultural production and biodiversity.

What new knowledge has been acquired in recent years?

The project has enabled the development of a reliable method for assessing the efficacy of treatments on rhizomes. From greenhouse experiments we have learned that rhizome regeneration varies according to stage of development, with the maximum regeneration being observed in young rhizomes, recognisable by their light pith. The proportion of new rhizomes and the colour of the pith, which is indicative of their vitality, should therefore be considered when optimising treatment methods.
Tested in field trials, the control methods have led inter alia to the development of a multi-stress approach. Because the efficacy of the treatments and the response of the plant vary, the factsheets created contain advice on the optimal timing of treatments, with the individual farm context and the anticipated investment being taken into account.

What are the next stages of the project?

Owing to the increasing spread of propagules (stalk and rhizome fragments), knotweeds represent a growing problem in agriculture. The next priority will be to develop control strategies in the field. Moreover, viable seeds are increasingly being observed in nature, which will call for research on the effects of sexual propagation on the dynamics and genetic variation of these neophytes in Switzerland. —

Video
Neobiota Competence Centre

News from the Other Experimental Stations

Site-Specific Fertilisation Ensures Yields and Reduces Nitrogen Surpluses

Last year, intra-plot modulation of fertilisation produced good results in autumn wheat crops in the Cantons of Thurgau and Schaffhausen, with yields 9% higher than those achieved with the usual farm practices and nitrogen surpluses down by 27%. Dubbed 'Smart-N', the advisory project is conducted by the 'Smart Technologies in Agriculture' Experimental Station.

A Thumbs-up for Raw Milk Products

The knowledge and skills needed to produce safe, high-quality raw milk products already exist. A new Agroscope publication explains how. It summarises the key findings of the conference of the FACEnetwork, a European network of farmhouse and artisan cheese and dairy producers.

Further information on the experimental stations

Wheat from a New Breeding Method: Agroscope Searches for Fungal Resistances in Field Trial

Agroscope launched a field trial with winter wheat bred using a new method in autumn 2024. Researchers are hoping to find new disease resistances that are useful for further breeding.

Etienne Bucher, Susanne Brunner, Roland Peter

Plant breeding uses the natural genetic diversity within a plant species or in closely related species to breed improved varieties. The aim is to find new and useful traits for the cultivation and processing sectors as well as consumers. For decades, conventional breeding has used mutagenesis for this.

New method is a Swiss innovation

For this project, Agroscope used the new 'TEgenesis' mutagenesis method with the old Swiss winter-wheat variety 'Arina'. The method was developed at the University of Basel to speed up the natural adaptation process of plants. With TEgenesis, no foreign DNA from other organisms is added. The plants are treated with two substances and simultaneously subjected to stress, causing so-called transposons to become mobile. Transposons are DNA sequences that change their location within and/or add copies of themselves to the genome. As a result, new desirable traits can be created, or undesirable ones can be eliminated.

Wheat bred using the new TEgenesis technique.

Wheat from an EU research project

- The wheat used for the field trial was bred in an EU-funded research project at Agroscope. The head researcher is also the founder of epibreed, the company holding the exclusive patent rights for TEgenesis. However, the company is not involved in the trial and in fact ceased operations at the start of 2021. Since we are dealing with a research project here, the technique may be used freely by Agroscope (research privilege).

Wanted: natural defence mechanisms under field conditions

In TEgenesis wheat, researchers are looking for disease resistances that previously lay dormant in the genome. There is a particular focus on natural defence mechanisms against major fungal diseases such as Septoria, yellow rust, leaf rust and powdery mildew. Plants with increased resistance to mildew have already been identified in the greenhouse. Because such resistances seldom arise, however, researchers need to study a great many plants under conditions that are as natural as possible in field trials.

First field trial approved

All mutations caused by TEgenesis could also occur in nature, as they are triggered by a process inherent to the plant. Because the breeding method is new, however, the Swiss Federal Office for the Environment (FOEN) has classified plants created with TEgenesis as genetically modified organisms (GMOs). In order to conduct field trials despite this, Agroscope submitted the relevant release application to the FOEN, which was approved in autumn 2024. The winter wheat was sown just a few days after the decision on the Protected Site in Zurich-Reckenholz. —

'TEgenesis' – A New Mutagenesis Method

- The word 'mutagenesis' describes processes in which the DNA of a plant is altered without introducing additional genes. This occurs, for example, as a result of intensive UV radiation, radioactive radiation or exposure to certain chemical substances. Mutagenesis happens in nature due to stressors such as heat or drought. Transposons play a key role in this process. Nearly all living creatures have one or more transposons in their DNA. In wheat, they account for over 85% of the DNA. Normally, however, they are not very active. TEgenesis causes this blocade to be lifted briefly. The transposons become mobile and help the plant adapt to stress. Because it involves the activation of a natural mechanism in the plant, this gentle type of mutagenesis leads to fewer changes in the DNA than previous mutagenesis methods.

Information on TEgenesis

Protected Site on Agroscope's Zurich-Reckenholz site

Echoes from Practice

We research for practice, but also with practice: farmers work together with Agroscope on a range of projects, making plots and data available, testing tools and techniques and sharing their experiences. The aim is to jointly develop solutions that work in the real world. On our website, we regularly introduce our partners and provide them with a forum to explain their work.

→ Information

Agroscope Launches WhatsApp Channel to Inform Practitioners

Aimed at agricultural practitioners, the information is shared on our WhatsApp channels 'Agroscope_fr' (French) and 'Agroscope_de' (German).

→ Channel

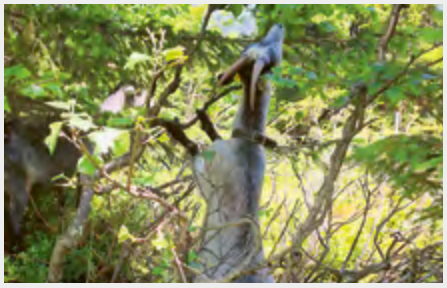
Interactive Berry-Scouting Database Now Online

Developed as a joint project between Agroscope and several partners, the new Berry-Scouting database is now online, enabling the first interactive comparison of raspberry and strawberry varieties using various parameters.

→ Database

Schweizer Orangenapfel: Swiss Fruit Variety of the Year 2025 bred by Agroscope

Juicy, refreshing flesh, a fine flavour and good keeping qualities are the hallmarks of the Schweizer Orangenapfel. Seventy years after the introduction of this orange pippin-style apple, it has been named Swiss Fruit Variety of the Year 2025.



Green Alder Encroachment Control: Combining Mechanical Clearing with Goat Grazing

The encroachment of green alder on summer pastures reduces biodiversity, forage quality, and landscape attractiveness. Goat grazing can help limit this process and restore pasture vegetation.

Feeding Pigs According to Their Nutrient Requirements Reduces Nutrient Losses

The protein and phosphorus requirements of pigs change according to life phase. Optimised phase feeding can improve nutrient efficiency and reduce the import of feedstuffs. New Agroscope factsheets highlight how this can be achieved and examine trade-offs.

12th Agroscope Sustainability Conference

Based on the topic 'Sustainability indicators for farm management and monitoring', the Agroscope Sustainability Conference took place on 23 January 2025. The presentations of the conference are online.

→ Presentations

How Does Soil Health Affect Plant Productivity?

A team of international researchers has conducted a pan-European study to investigate the links between soil health and plant productivity in woodlands, grasslands and croplands. The results show that soil health is a particularly important factor in agricultural land.

Initial Experiences of Wet-Rice Pioneers

Waterlogged land is a problem for agriculture in Switzerland. One solution could be wet-rice farming. In a video, agricultural practitioners with experience in wet-rice farming speak about this subject.

→ Video

Optimised Food Recipes through Artificial Intelligence

Agroscope played a leading role in developing a digital tool for optimising food recipes. The tool facilitates the development of high-quality, nutritious and environmentally friendly foods. The new platform supports the sustainable transformation of the food sector.

Viticulture Research in German-Speaking Switzerland: an Anniversary and New Projects

On the occasion of the 175th anniversary of grape breeder Hermann Müller-Thurgau's birth, Agroscope presents an anecdote and two current Agroscope projects.

→ Further news topics

Sustainability Levies: Which Are Preferred?

Steering levies can change consumer behaviour. An Agroscope study focusing on a sustainability levy on food showed that social sustainability and animal welfare levies are most likely to meet with acceptance.

Jeanine Ammann, Gabriele Mack, Nadja El Benni, Rita Saleh

Previous studies have investigated policy measures in general and sustainability labels in particular. Agroscope researchers have now tested the acceptance of sustainability levies, which are a specific type of tax. If the monies collected are used for specific purposes such as e. g. improving animal welfare, this can increase acceptance.

First levies exist, studies on them are lacking

Various sustainability levies already exist – for example, consumers can buy so-called 'fair Swiss milk' at a higher price. The price increase ensures that producers receive a break-even milk price. By the same token, in some supermarkets customers can offset their CO_2 footprint or donate money to climate funds. Because there are currently very few scientific studies on consumer acceptance or preference, however, Agroscope researchers have investigated precisely this topic.

The most popular sustainability levy

A total of 525 people, 50 % of them women, were interviewed in an online survey conducted in German-speaking Switzerland. As part of an online experiment, the participants were presented with the following scenario:

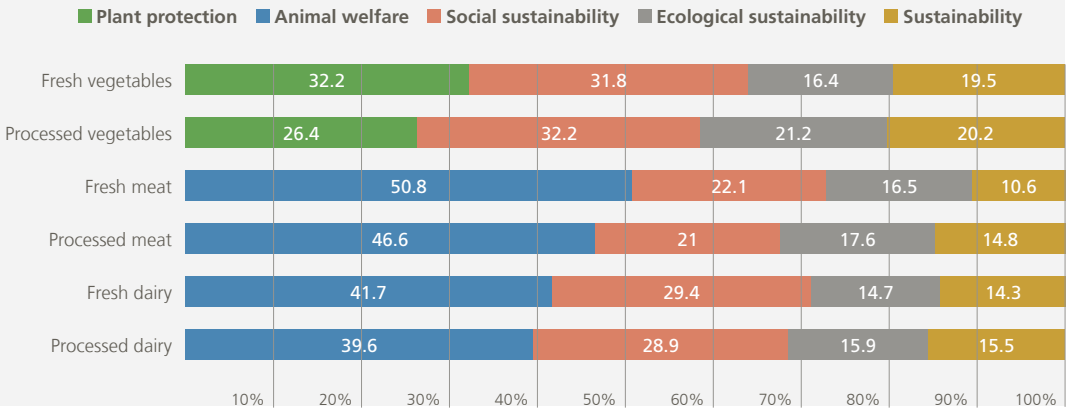
"Imagine that in the supermarket where you shop most often, part of the retail price of a particular product is earmarked for sustainability projects. Afterwards you see a product category and four possible versions of the product, all of which cost the same. Please choose the product which you would be most likely to purchase."

Sustainability levies for social sustainability and animal welfare are most likely to be met with acceptance in the context of food purchase.

Figure 1:
Experimental design for the different products and sustainability levies, with all product options costing the same.

Sustainability Levy	Fresh / processed vegetables	Fresh / processed dairy	Fresh / processed meat
A	Reduce risk of plant protection products	Improve animal welfare	Improve animal welfare
B	Support local farmers	Support local farmers	Support local farmers
C	Promote projects for reducing ecological footprint (e.g. CO_2)	Promote projects for reducing ecological footprint (e.g. CO_2)	Promote projects for reducing ecological footprint (e.g. CO_2)
D	Sustainability	Sustainability	Sustainability

Figure 2:
Preferences across the four sustainability levies and the six products, including a group comparison between fresh and processed products.



The participants were then to decide on one of the four sustainability levies for each of the six products, *see Figure 1*.

For meat and dairy products, participants most frequently chose sustainability levy A for animal welfare, followed by option B for social sustainability, *see Figure 2*. Moreover, social sustainability seemed to play a more important role for vegetables than for animal products. The willingness to earmark part (approx. 22 %) of the product price for the support of local farmers – i. e. for the sake of social sustainability – was lower for meat products than for vegetables (approx. 32 %) and dairy products (approx. 29 %).

Scientific publication:
Sustainable Production and Consumption, 53, 99-108, 2025

Conclusions

- For plant products, consumers prefer a levy for social sustainability and the reduction of risks from plant-protection products.
- For animal products, a sustainability levy for animal welfare and social sustainability is preferred.
- The least attractive options were the steering levies for ecological sustainability and general sustainability.
- The perception of farmers is a driving factor for preferring a sustainability level to support local farmers.

Safeguarding Yields and Protecting Resources with Agroforestry Systems

Agroforestry systems have existed in Switzerland for centuries in the form of wooded pastures or grazed orchards. Modern systems also combine woody species and farming on the same land. Sonja Kay and Felix Herzog have incorporated their research findings in the recently published book 'Agroforstpraxis in der Schweiz' ('Agroforestry Practice in Switzerland').

What's new about modern agroforestry systems?

Felix Herzog: Traditional systems require a lot of manual labour. By contrast, modern systems are planned so that they can be managed with the current machinery.

How does one successfully switch to agroforestry?

Sonja Kay: An optimal synergy between "What grows on the site?" and "What does the farm need?" is important. Cherry trees, for example, dislike waterlogging, whilst alders are better able to take it in their stride. Or a livestock farm may want to expand its feed supply, whilst a field-crop farm is more likely to have erosion protection in mind.

What makes agroforestry systems economically attractive?

SK: Agroforestry systems provide marketable products (fruit, timber, feed), often expand the product range of the farms and can reduce costs for irrigation and fertilisation once the trees are grown.

What are the main ecological effects?

SK: They are, for example, protection of the soil against erosion, the provision of shade for livestock or the creation of new habitats for wild animals such as birds and pollinating insects. Long-term, however, it's also a matter of water and climate protection.

What do agroforestry systems achieve in the social sphere?

SK: We hear from the agroforestry farms that they receive largely positive feedback on the beauty of the landscape, which motivates many farms.

FH: Some also simply wanted to create a more pleasant workplace for themselves.

Do agroforestry systems benefit from Smart Farming?

FH: Navigation systems should make farming easier. And if the machines drive autonomously in the future, it will no longer matter if the management work takes a little longer.

Sonja Kay and Felix Herzog conduct research into traditional and modern agroforestry systems.

How important will agroforestry systems be in the future?

FH: Agroforestry systems help buffer against climate extremes. They also increase overall productivity since trees and catch crops complement each other in their use of light, water and nutrients. Moreover, agroforestry systems lower the risk of crop failures and shortfalls. That's why I think the current trend of expanding agroforestry systems will continue. —

Link to the book:
Agroforstpraxis in der Schweiz

IMPRESSIONS

Impressions of current applied-research projects for the agriculture and food sector.

1 Agroscope conducts research for alpine and mountain agriculture.
2 Standard mixtures optimise yields and quality in forage production.
3 Innovation Swiss rice: wet-rice harvest in Gampelen, Canton of Bern.


1


2

3

Archive photo: feed storage

1 Experimental fields in Posieux. | 2 Milking machinery – part of the everyday life of farmers.
3 Cheesemaking on the Jeninser Alp. | 4 Milk production is an important pillar of alpine and mountain farming.
5 Drained areas on agricultural land. | 6 Sugar-beet harvest.
7 Humus content is vital for the soil water budget.

4

5

6

7

The Highly Diverse and Nutrient-Rich Inner Life of Sourdough Bread

The microbial composition of the sourdough culture defines the character of the bread baked from it. A sourdough can increase the health-promoting characteristics of bread when combined with specific types of flour and suitable processing parameters.

Hans-Peter Bachmann, Maria Theresia Stergiou-Gekenidis

The ancient craft of baking bread has changed considerably over its ten-thousand-year history. While leavened bread was originally made with a naturally occurring microbiota, nowadays the fermentation process is very strictly controlled in most cases. However, sourdough bread has seen a resurgence in popularity in recent times. It has a better flavour, better structure, longer shelf life and higher nutritional value than conventional yeasted breads.

Every sourdough has its own community

Sourdough cultures consist of microbial communities of bacteria and yeasts whose complexity varies enormously depending on the raw materials and process control systems. However, the general physical and chemical characteristics of the sourdough mean that these communities are ultimately dominated by lactic acid bacteria and yeasts. Mature sourdough starters can therefore be used to make highly safe sourdough products.

Spontaneous and starter culture-initiated sourdough

There are basically two main types of sourdough. Type 1 sourdoughs are colonised spontaneously by bacteria and yeasts present in the flour and the environment, are continually refreshed with flour and water for up to 15 days and are normally kept at room temperature. In contrast, type 2 sourdoughs are produced by inoculating a flour-and-water mixture containing selected bacteria and/or yeasts and are normally fermented at higher temperatures. Regardless of the method, sourdoughs can develop a high level of diversity over time. Their composition is influenced in particular by the type of flour, hydration, temperature, time and frequency of replenishment with flour and water.

The secret lies in the diversity of sourdough communities

Cereal products are staple foods that have long been a key component of the human diet. However, their popularity, especially in industrialised countries, is declining as they contain gluten proteins and other constituents (e. g. amylase trypsin inhibitors) which can cause bowel inflammation and other gastrointestinal symptoms in some con-

Valaisian rye bread AOP is made with a sourdough starter.

sumers. The use of sourdough in bread production can largely break down the gluten network and reduce other undesirable constituents. Acidification by lactic acid bacteria and yeasts is key to sourdough fermentation. However, very little is known about the precise role played by the microorganisms. Some studies have demonstrated that specific strains perform a certain function, but more research is needed to better understand the role of the diverse sourdough communities. —

Scientific publication:
Swiss Agricultural Research 15, 294-303, 2024

Conclusions

- Microbial sourdough communities can be simple or complex.
- Spontaneous fermentation leads to more complex systems, while the addition of pre-selected starter cultures creates simpler microbial systems.
- The microbial composition of a sourdough is mainly influenced by flour type, hydration, temperature, time and frequency of replenishment with flour and water.
- The use of sourdough can increase the digestibility of cereal products. More knowledge about the role of specific microorganisms would enable optimal results to be obtained through their targeted use.

The DNA of Franches-Montagnes Horses Reveals the Origins of the Breed

The genotype information of over 1,000 horses reveals that the Franches-Montagnes can be distinguished from other historically introgressed breeds. Furthermore, it has been demonstrated that this type of information can also be applied to manage the inbreeding within the population.

Annik Imogen Gmel, Sofia Mikko, Anne Ricard, Brandon D. Velie, Vinzenz Gerber, Natasha Anne Hamilton, Markus Neuditschko

The Franches-Montagnes (FM) breed was established in Switzerland at the end of the 19th century by cross-breeding local mares with two Anglo-Norman stallions: Vaillant (1891) and Imprévu (1886). The FM studbook was officially released in 1921. Thereafter, periodic introgression of horses from other breeds was authorised to meet market demands, initially with draught horses for agricultural work and later with Shagya, Purebred Arabian, Nonius, Anglo-Norman, Selle Français and Swiss Warmblood stallions in order to breed a lighter type of horse for leisure riding and carriage driving. Some of these introgressions led to the formation of new sire lines. Currently, there are 11 sire lines, 6 of which are considered original and five of which arose from stallions of other European horse breeds.

The studbook was closed in 1997 to preserve the characteristics of the last Swiss horse breed, i. e. a foal resulting from cross-breeding after this cut-off year is not registered as an FM horse. FM horses born before 1950 are considered purebred, even if their pedigree includes ancestors from other breeds. Currently, the number of 'old-type' horses (no cross-breeding since 1950) is declining, resulting in an increase in inbreeding in this subpopulation. Currently, there is a preference for FM horses with a high admixture proportion, which threatens the integrity of the FM horse population as a native breed from both a genetic and phenotypic perspective.

Using genotype data to visualise fine-scale population structures

To accurately interpret the kinship and inbreeding of the FM breed, scientists genotyped over 1200 horses using the Affymetrix Axiom™ array, which allows for cost-effective exploration of the genetic variance of individual horse genomes. With over 600,000 markers (single nucleotide polymorphisms [SNPs]), this genotyping allows the characterisation of each horse genome and the study of genetic diversity among modern horse breeds: related horses have more markers in common than horses with different origins. Genomic data were also applied to assess the genetic relatedness and individual inbreeding of the horses.

The study compared the genotypes of 1268 horses: 522 FM horses (including 44 old-type), 514 Warmblood (including Noé, a stallion used for one of the last cross-breeding events in 1990), 136 Purebred Arabian, 32 Shagya,

and 64 Thoroughbreds (as some Warmblood stallions used for admixture with the FMs showed Thoroughbred origin in their pedigrees). The 11 sire lines of the FM breed were represented by 8–148 descendants.

To ascertain fine-scale population structures within the FM breed, researchers applied a novel three-step approach that combines the visualisation of the genetic relatedness of horses with admixture proportions and individual inbreeding. This approach also allows for the evaluation of the genetic diversity of the FM breed and old-type FMs compared to the other breeds.

The FM is clearly distinguishable from other breeds

The analyses clearly show that FMs and old-type FMs are distinguishable from the two Arabian breeds, as well as from the Warmblood and Thoroughbred breeds. The FM is therefore clearly distinguishable from other breeds historically introgressed since 1950.

Nevertheless, further substructures in the FM population were observed according to different genetic origins (old type). Furthermore, it was noted that the overrepresentation of the progeny of certain influential stallions caused additional substructures in the FM breed.

The Franches-Montagnes is the only horse breed of Swiss genetic origin.

Within the FM breed, admixed horses accounted for most of the genetic variance of the current breeding population, while old-type horses accounted for only a small proportion of the variance. Finally, the study revealed that some FM horses exhibit unexpectedly high Thoroughbred admixture levels.

On average, FM horses were less inbred compared to other closed-studbook breeds (except Warmblood horses), particularly owing to the admixtures, but certain data suggest a loss of diversity in the two FM subpopulations. To prevent inbreeding, the authors suggest including old-type FM horses in the FM breeding population and discouraging breeders from selecting for 'rare' coat colours in FM horses, such as black and grey.

Conclusions

- Established at the end of the 19th century in Switzerland, the Franches-Montagnes (FM) horse breed was subject to periodic admixtures of other breeds, including Shagya, Purebred Arabian, Nonius, Anglo-Norman, Selle Français and Swiss Warmblood.
- A study based on the genotypic data of 1268 horses, including FM, Warmblood, Purebred Arabian, Shagya, and Thoroughbred horses, shows that FM remains the only breed of Swiss origin.
- The study also shows that FM horses are, on average, less inbred compared to other European breeds, although a loss of diversity was observed due to the popularity of certain stallions.
- To prevent inbreeding, the authors suggest including old-type FM horses in the FM breeding population and encouraging breeders to select for characteristics other than coat colour.

Scientific Publication:
Genetics Selection Evolution 56, 53, 2024

Organic Pig Fattening Pays Off for Large Farms

Agroscope analysed the economic situation of organic fattening-pig production in Switzerland. The study shows that six of the ten farms examined – particularly the larger ones – can produce profitably.

Alain Bütler, Christian Gazzarin

Six of the ten organic farms can produce cost-effectively.

Pork is still the most popular meat in Switzerland, with around 20 kg consumed per person in 2023. The organic share of the retail market lies in the region of 3.5 %, which is equivalent to just under 47,000 organic fattening pigs sold per year.

Profitability of the Swiss organic meat market

As part of the 'BioPerform' project co-funded by Bio Suisse, Agroscope analysed the profitability of the organic meat market in Switzerland, focusing on the impact of the economic situation on the farm enterprise as well as the technical efficiency and production costs of organic meat production. The present study highights the revenue and cost structures for the farm enterprise 'fattening-pig production'. Working hours and productivity as well as further key production engineering figures for organic fattening-pig production were also compiled or calculated.

Direct costs are the most important factor for profitable pig fattening

The analysis shows clearly the degree to which direct costs influence the profitability of pig fattening. Expenditure on livestock purchase and feed costs has a major impact on the economic success of the farm enterprise. Efficient, cost-effective feeding paves the way to economic success.

Larger pig-fattening farms produce more efficiently

The larger a pig-fattening farm, the more labour-efficient it is. Major differences in terms of labour efficiency and profitability can be seen at individual-farm level. A comparison with the PEP farms shows that the production costs on the organic farms are almost twice as high, due in particular to the significantly higher costs for feeding and livestock purchase. These costs are, however, recouped with a better price which in 2022–23 stood at CHF 7.77/kg carcass weight, compared to CHF 3.79/kg for quality-label pork production according to IP-Suisse standards.

Despite the higher production costs, six of the ten organic farms can produce pork cost-effectively thanks to the higher price for organic meat. There are substantial differences in profitability at the level of the individual farms, with bigger farms being more cost-efficient.

Conclusions

- With under 5 % of the market share, organically reared pork plays a subordinate role; however, its low market volume makes it more likely to respond all the more sensitively to significant changes in supply and demand.
- The cost-efficiency of pig fattening is influenced by direct costs. Expenditure for livestock purchase and feed costs decisively influences economic success.
- Although organic farms have higher production costs than conventional farms, they can still remain economically competitive thanks to higher gross margins and better remuneration of labour.
- Although major differences exist between individual farms, the efficiency of organic pork production tends to increase along with farm size.

Scientific publication:
Swiss Agricultural Research 15, 322-329, 2024

		2023	2024	Divergence	Divergence %
Functional Earnings	CHF	24 091 030	22 512 764	– 1 578 266	– 6.6 %
Functional Expenditure	CHF	195 128 849	200 420 613	5 291 764	2.7 %
Statement of Investments					
Investment Income	CHF	– 8000	– 190 661	– 182 661	
Investment Expenditure	CHF	5 516 356	5 300 992	– 215 364	
Cost Coverage Ratio	%	12.0 %	11.0 %		
Third Party Funds	CHF	18 450 033	16 124 593	– 2 325 440	– 12.6 %

1504
publications, including **877** practice-oriented publications; **627** scientific publications

1659
lectures and posters

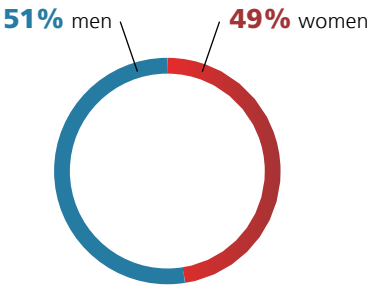
90
supervised dissertations

102
supervised semester, Bachelor and Master theses

1813
lessons (universities, technical colleges, vocational schools and courses)

956 full-time positions (FTE) with **1126** employees

34 internships
40 trainees
62 doctorates
52 postdocs



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‘Agroforestry systems help buffer against climate extremes and lower the risk of crop failures and shortfalls. That’s why I think the current trend of expanding agroforestry systems will continue.’

Felix Herzog, Head of 'Agricultural Landscape an Biodiversity' Research Group

▸ Interview, page 12