

Program ERASMUS+
STRATEGIC PARTNERSHIPS FOR ADULT EDUCATION

TRAINING MANUAL FOR THE ORGANIC FARMERS, NATURAL AND CULTURAL HERITAGE EXPERTS

**Conscious Use
of Natural Resources**



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Conscious Use of
Natural Resources

CONATURE

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infinity-progress z.s.

Infinity-progress z.s. is a non-government organization that is situated in the heart of the marvellous Beskydy Mountains of the Moravian-Silesian region.

The organization supports the enlightenment in the field of sustainable development principles and commitment. In this respect the organization implements educational programs, vocational lectures, seminars, workshops, conferences for all age categories of adult learners including trainers, lecturers, seniors, public.

The organization is trying to remedy mis-presented awareness of sustainable development so that these activities would be directed towards the muse and further acting which are in the conformity with the aims of sustainable life, the necessity to maintain the quality of environment without threatening the future of other generations.

The organization runs URSUS centre and Information Centre for the Protected Landscape Area of the Beskydy Mountains under Ministry of Environment. The aim of the centre is to increase the enlightenment in the field of environment, nature protection, natural and cultural heritage related to the Beskydy Mountains and region of Moravian-Silesia.

www.ursuscentrum.cz

www.dumprirody.cz

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Institut für Interdisziplinäre Bildung

IIB, Institute for interdisciplinary education, sees itself as a pool of ideas and concept developers in education and training, in order to increase opportunities in the education and labour market.

The business areas range from digital school development to international educational and labour market policy projects as well as individual research activities.

<http://www.i-i-b.eu/index.html>

COMUNE DI SCANDIANO

Italy



The Municipality of Scandiano has approx. 25.000 inhabitants and it is located close to Reggio Emilia. The municipality has the responsibility to manage public services in the fields of: pre-school education, social services, environmental services and city planning. The municipality counts more than 140 members of staff.

Scandiano is a center rich in economic, agricultural, commercial and industrial activities. It's twinned with the cities of Blansko (Czech Rep., since 1964), Tubize (Belgium, since 1976) and Almansa (Spain, since 1989) and has relations with various European cities (as project partners). It received two Flags of Honour from the Council of Europe, the Plaque of Honour and the Europe Award. Scandiano is a member of

the A.I.C.C.R.E. Emilia-Romagna (Association of Italian Regions and Municipalities of Europe) and founding member of the S.E.R.N. (Sweden Emilia-Romagna Network).

The Municipality of Scandiano has a strong experience in the field of EU international projects. As a matter of fact, Scandiano has always been committed to promoting European values and bringing the EU closer to its citizenship through a wide range of activities, and, in this regard, European citizens' meetings and lifelong learning projects have proven to be an effective strategy to pursue these goals. Along the years the Municipality's EU activity has been mainly focused on officers' training, improvement of quality standards, promotion of healthy nutrition, CO2 emission reduction and environmental sustainability, art and forms of self-expression, youth entrepreneurship, preschool education and many others.

<https://www.comune.scandiano.re.it/>

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Lithuania



VšĮ Žmogiškųjų išteklių stebėsenos ir plėtros biuras (ŽISPБ) is a non-governmental non-profit organization with 12 permanent staff members and great number of volunteers who help organizing activities implemented by the organisation. The Centre develops and

implements various projects, initiatives and interventions at both national-local and transnational level, in collaboration with formal and non-formal adult education providers, training centres, schools, public bodies, research centres, NGOs, social cooperatives, SMEs, business associations, etc.

<http://www.zispb.lt/>

PREFACE

Each of the world historic periods introduces different values, attitudes and perspectives. Pre-communist area was characterized by the extensive agricultural and forest management when acquiring vocational skills and competences belonged to the obvious and self-acting processes how to naturally master working activity. Humans esteemed local or regional natural resources as the most valuable and life-giving. The knowledge management was transferred to the descendants within the direct face-to-face working processes, who were later forced to leave the vocational development within oncoming historic periods, communism or global economy market that caused irreparable harms to allow the vocations to have vanished.

The key objective of the Cautious Use of Natural Resources is to develop such innovative tools with the support of digital technologies that enable the participants to acquire vocational skills and competences in the field of Environment & Organic Farming that apply and exploit in their proficiency. Participant being experienced within the direct working process are able in a more effortless way to transfer knowledge management to other descendants. Within the project implementation other objectives have been achieved, such as enhancement of intergenerational education, voluntarism, social cohesion, in/direct nature protection, preservation of Natural and Cultural Heritage Interpretation, promotion of EU citizenship and values.

Within the direct project activities there have been supported 108 participants from EU funding and in the indirect way around 3,500 participants during the dissemination process.

Project activities enabled the adult learners to have acquired new professional competencies, to deepen and innovate the ones already acquired or to learn and adopt new methods, technologies and trends.

During the two-year project implementation there were produced a

training manual and a training programme on Environment & Organic Farming consisting of a direct and virtual training processes combination, such as practical activities, sharing best practices on the one hand and e-learning form including up-to-date digital tools on the other hand. Last, but not least a web application on the environment and organic farming activities net was launched where the participants are able to acquire practically vocational knowledge in the proficiencies they need. To achieve the results there was implemented the methodology based on project team meetings on the international level, development and validation of innovative outputs, training program of blended mobilities, tools to be determined for project results disseminations. The project results all the partner's organizations achieve within collaborative works enable other oncoming participants to benefit from in the form of direct participation in the training program or acquiring the vocational knowledge, skills within practical and on-line activities or experience within the activities they are prepared by other farmers.

The training manual having been prepared by the project partners' experts is one of the key outputs of CONATURE project. Training manual consists of best practices, practical activities, methodology for the teachers and worksheets for the learners including tests.

Duration of the project: 26 months (25th September, 2017 – 24th November, 2019)

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June 2019, Mosty u Jablunkova
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SHEEP WOOL AS BIO-MATERIAL INSULATION

Annotation

Bio-material insulation is available in several forms. The common factor of the bio-material insulation is that all are derived from natural, plant- or animal-based products. A lot of forms of bio-material insulation have thermal conductivities on a par with mineral wool. Others have a higher conductivity yet are capable of bearing structural loads. All forms are non-irritant and offer a high level of fire protection, either naturally or in combination with chemical fire retardants. In most cases is bio-material resistant to rodents, pests and fungi attack provided

that suitable chemicals are added. Due to their hygroscopic properties, bio-based insulation products are frequently used as a key component of 'breathable' buildings. Bio-material products are available in a variety of formats, e.g. fleece, boards, slabs, structural, and material costs are generally comparable to the equivalent traditional construction products.

Sheep wool still belongs to a marginal way of insulating houses in most countries. In its nature, the sheep wool as a raw material is primarily an insulating material that has been proven and improved by the nature itself for thousands of years.

NATURWOOL

<https://www.naturwool.cz/>

is a company that produces insulation material for the constructions. The insulation material is produced from the cleaned sheep wool. The sheep wool is provided by the sheep from Valachia (Valašsko), the easternmost region of Moravia in the Czech Republic. The company produces insulation material for the constructions and insulation straps to caulk gaps and spaces in the wooden houses, such as log or timber houses.

The main advantage of sheep wool in relation to ecology is a fact, that its

production is favorable for nature and landscape mainly in the foothills where sheep graze unusable vegetation on non-cultivated areas. By grazing mountain and foothills areas, sheep maintain ecological balance in nature. Production of thermal insulating materials from sheep wool contributes to the sustainable development of the landscape.

Sheep wool insulation is used practically throughout the building, serves for insulating floor, thermal insulation of walls and roof of wooden structures for which this material suits by its natural origin. It is also used for conventional brick houses, as insulation of roofs for example.

7 Key Benefits of Sheep Wool Insulation

1. Immense insulation material

The sheep themselves are the evidence of these insulation properties, since they were and are able to adapt to the worst climatic conditions and their wool is able to protect them against the extreme cold, heat or humidity.

Sheep wool is made of millions of fibers that due to their specific shape create air locks trapping warm air, thus insulate perfectly, protect the sheep body during cold periods, and on the contrary, keep sheep comfortably cool in high temperatures.

Thermal conductivity coefficient of this material ranges from 0.038 to 0.050 W/m depending on the density of the material. In this respect, the sheep wool carries out an excellent function as the insulator.

2. Still keeping the shape

Due to its specific shape and structure of fibers, the wool is highly flexible, its fibers do not break under any circumstances and are resistant against repeated tensioning and compression which makes it able to fill the insulated space completely after application.

Sheep wool insulation is available in strips or batts, seals well any gaps in timber houses and log cabins. Sheep wool is very workable and flexible. Due to these properties, the sheep wool seals very well over time as the wood begin to dry up and change shape.

3. Maintains optimal indoor humidity level

Sheep wool fibers have the ability to bind excess humidity from the interior without any affect to its insulation properties. When the air is dry, it will release it again, maintaining stable interior humidity.

4. Air purifier

Sheep wool binds pollutants from the air, purifies the air of dust, cigarette smoke and other undesirable substances that are created by for example computer electronics. Sheep wool can degrade formaldehyde contained in some bonded chipboard materials, carpets or adhesive and sealants. Sheep wool contains keratin that neutralizes formaldehyde.

5. Not harmful to health

Sheep wool is completely free of any harm to human health and a material suitable for allergic persons as well. It does not contain any sharp fibers that would irritate the respiratory tract or skin. For this reason, the handling of the wool itself is very pleasant.

6. Non-flammable

Sheep wool belongs to substances that burn very UNEasily, it is fire-retardant. The temperature of its self-ignition is about 560°C; for comparison spruce-wood self-ignites at 270°C. It needs higher concentrations of oxygen to burn. Toxic fumes do not release when burning and the wool self-extinguishes after removed from fire.

7. Recyclable / compostable after use

Compared to for example mineral wool insulation, there is no need for further expensive disposal of the insulation.



However, sheep wool insulation also carries one risk. Since it is natural, it attracts for example rodents or wasps who can build their nest in the insulation. Insulation space must be very well secured to prevent access of any live organisms.

When purchasing sheep wool insulation, it is also necessary to get informed how the material is treated against moths. For this purpose, a titanium-fluorine salt solution has been developed that does not dissolve in water and should therefore be permanent.

Note

Compared to mineral insulation, the production of sheep wool thermal insulation requires significantly less power with the difference up to 85%.

The biggest processors of sheep wool are Australia, China, USA, New Zealand, Argentina, Turkey, Iran and Great Britain.

Sources:

<https://www.naturwool.cz/>

<https://www.naturwool.cz/izolace-z-ovci-vlny/>

<https://www.denik.cz/stavba/vyhody-a-rizika-izolace-z-ovci-vlny-20171228.html>

<http://www.elios-ec.eu/sites/default/files/pdf/Case-Study-6-Bio-material-Insulation.pdf>

<https://www.thermafleece.com/uploads/Thermafleece-Case-Study-Crathie-Drive.pdf>





URBAN GARDENING

Annotation

Just like many species around the globe will have to adapt to the changing climate and altering ecosystems, humans must also respond to the dynamic conditions of our planet. One aspect of the climate change crisis is the question how to secure food for the humans and thus decrease urban poverty. Urban agriculture is a wise precautionary tool to help mitigate the risks of weakening food availability, access, and stability in urban environments vulnerable to extreme climate change repercussions.

Expanding Populations

Cities are the hub for mankind's existence; in 2009, about 3.4 billion people lived in urban areas and by 2050, that number is expected to increase to 6.3 billion people. In addition to the rapid urbanization and expanding populations of developing nations, cities are also at the root of the climate change calamity. Urban areas are both the cause and the effect of global warming. Cities produce roughly 70 percent of greenhouse gas emissions worldwide and about 90 percent of the prospective

growth in global emissions will be from cities in developing countries. Subsequently, cities will also suffer the most from climate change impacts. Urban areas are subject to the heat island effect (temperatures are abnormally warmer than surrounding rural areas), flooding and extreme weather events (low-lying cities), food supply problems, and 'water scarcity issues.

Food Insecurity

To alleviate the consequences of food insecurity in rural environments, cities in both developed and developing nations should adopt the precautionary principle of urban agriculture. The logic behind why cities should be proactive in their urban farming policies are outlined in the following Austrian model.

MORGENTAUGÄRTEN is Austria's largest urban farming project in Graz, Linz, Wels, Steyr, Enns, Leonding and Traun. On 20, 40 or 60m² plots you can grow and harvest your own regional organic vegetables in the densely built-up urban area.



15 Key Benefits of Urban Gardening

1. Health promotion and prevention
2. Food Quality: biological, seasonal, freshly harvested
3. Produce food yourself
4. Activating the protective factors of the body by containing vitamins in the vegetables
5. Meaningful leisure activity
6. Experience the path from seed to harvest with children (life cycle)
7. Communication: exchange methods, innovations, best practices with other people
8. Fields ensure good climatic conditions in the city and are home to rare animal and plant species
9. Ecological benefits - Co2 Free, Climate-friendly production
10. Therapeutic effects – recreation, improvement of mental health, depression values decrease
11. Horticultural work achieves the same results as exercise
12. Improvement of mental abilities
13. Improvement of learning performance / concentration of students – Learning by Doing
14. Social support - for each location, a garden plot of a social institution (kindergarten, shelter, facilities for people with disabilities, etc.) is provided.
15. Publicly accessible: all locations are easily accessible by public transport and you do not need a car!

More info available in German language:

<http://www.morgentaugaerten.at/>

<https://www.morgentaugaerten.at/>

<http://www.powerhousegrowers.com/urban-agriculture-wise-solution-food-insecurity/>



SOIL FERTILITY CONSERVATION IN SUSTAINABLE FARMING

Annotation

Healthy soil is primarily defined by its fertility, representing two essential components for farming. Soils are a living system of organisms reacting with organic and inorganic matter. Soil quality comprises a range of chemical, physical and biological factors which together affect the productive potential of the land.

A soil's physical properties determine how well a plant's roots grow and proliferate. Plant roots thrive in soil that has good aggregate stability (tilth), porosity, infiltration, drainage, water-holding capacity, bulk density, and resistance to crusting and compaction. An extensive root system that explores more soil volume naturally has access to more soil moisture and nutrients.

Agricola Prati al Sole

is a young agricultural company established in 2014 located in Pratissolo di Scandiano that produces vegetables, honey, wheat, grapes, bread, eggs, poultry, ect. They take care of the farm using only natural methods with the most respect for the fertility of the earth and of the people who sustain it.

Prati al Sole is a small family farm, farmers use a variety of hand-made tools for the cultivation of vegetables and carry out the work entirely by hand, to avoid the use of heavy vehicles that press the soil and restructures its natural vitality. Moreover, no fuel is used on this farm, only renewable – solar energy. Pesticides or synthetic fertilizers are forbidden on this farm.



Based on the North American - Canadian model of agriculture, Prati al Sole follows the method of cultivating as many products as it is possible in the small areas. Fastly growing amounts of people in the world demand for growing more food on the limited surface of the earth.

The production of healthy and high-quality food, environmental sustainability, the appreciation of surroundings and the need to create the network helping to get out of the absurd schemes of large retailers, factors, avoid disadvantages of logistics are some of the principles that outline our work and our "formula" of production and sales. These are some of the many reasons for joining the CSA (Community-Supported Agriculture) network.

CSA - is a system that connects the producer and consumers within the food system more closely by allowing the consumer to subscribe to the harvest of a certain farm or group of farms. Based on the agreement between the farmer and the consumer, the farmer commits to grow production and consumer commits to buy it regularly. It is an alternative model of agriculture and food distribution that allows the producer and consumer to share the risks of farming as well as keep small farms active in rapidly emptying country-side. Community-supported agriculture systems reduce waste to 7% against 55% of large retailers.



ORGANIC VEGETABLE BOXES FROM FARM TO YOUR TABLE

Annotation

From one man and a wheelbarrow to an award-winning organic delivery company.

About Riverford

Taken over by the Watson family in the 1950s, the farm operated using conventional farming methods until the mid '80s. By the end of the '80s Guy Watson had converted part of the farm to organic methods and the Riverford box scheme was born.

Starting by delivering organic vegetables locally to 30 friends in Devon, the company now delivers to over 40,000 organic vegetable boxes a week to homes around the UK from its regional farms.

The weekly boxes come with a newsletter explaining both the content of the box and giving farm news from Riverford. It also includes recipes and tips relating to the vegetables that week. The result is a large, yet personal method of shopping with the bulk of customers having been found by word of mouth, and small-scale, local advertising.

Like many of Devon's businesses Riverford are highly decorated. In 2012 Guy was awarded BBC Farmer of the Year, and in 2013 the company won Best Organic Retailer at the Natural and Organic Awards and Best Retailer at the Observer Awards.

Food waste

Selling directly to the customer means that every vegetable already has a home in Riverford vegetable boxes before it is even planted.

Grade-out system

There are occasions when a batch of fruit or veg simply can't go into the boxes since it may be too large, too ripe, or partly

damaged. Whatever the reason, Riverford has a system in place to make sure it does not go to waste.

Charity donations: Every week, local charities collect grade-out veg for use in children's centres, soup kitchens and refuges.

Free veg for staff: Staff members get grade-out fruit and vegetables.

The Riverford Dairy herd: Cows enjoy the vegetables too! Beetroot makes their milk pink, while onions and garlic taint the flavour.

Flexibility

If any of Riverford's crops produces more than expected, the policy is to accommodate the surplus in the veg boxes. Often it means that customers get larger portions for free!

Gleaning

Riverford works with the Gleaning Network UK in case there are crops in the field that can't be harvest in time.

<https://www.riverford.co.uk/>







LIVE LIFE ON THE VEG

We can use this box 10 times
if you leave it out for us!

RIVERFORD
ORGANIC FARMERS

Wash before use

time



Events & Farm Visits

Group and school visits

Schools and Colleges are encouraged to visit Riverford to learn more about farming and food.

A typical visit lasts 2 hours and will include a walking tour of the farm and for Primary and Secondary school visits the option of an organic seasonal meal prepared by our award winning Field Kitchen. The tour takes in the vegetable fields, clover leys, pasture, hedgerows and superb views of the surrounding countryside. Children record their journey on a map of the farm, encouraging cross curricular learning.

Topics include; Map work, wildlife, plant and cloud identification, crop growth, usage and rotation, the farming year, water cycle, the history and geography of the local area and discussing the nutritional values of each crop, offering children a chance to pick and taste some of the produce.

Advanced educational visits

The farm offers advanced guided tours suitable for Colleges or Universities looking for a deeper insight into methods of farming or certain aspects relating to each

farming qualification. They typically last 2 hours and will be tailored to meet the objectives of the group interest.

Farm tours and walks

Participants' are offered a walk and Self-guided or guided farm tours on the farms in Devon and Peterborough and able to pick and taste some of produce straight from the ground while taking in the beautiful scenes and variety of wildlife. On the tour visitor will see vegetables growing, clover leys and pasture, while hearing about the thriving variety of hedgerow wildlife supported in organic fields.

Master veg classes

These two-hour, hands-on cooking classes offers, people of all abilities, ample veg inspiration turning a brimming box of veg, fresh from the farm, into an inspirational organic feast. The classes are kept small to give plenty of chance for questions and individual guidance in order for the participants to learn lots of essential skills and leave inspired to cook with a veg box at home.



EXTENSIVE CATTLE BREEDING

Anotation

Extensive farming or extensive agriculture (as opposed to intensive farming) is an agricultural production system that uses small inputs of labor and fertilizers relative to the land area being farmed as well as small number of animals per land unit.

Extensive farming most commonly refers to sheep and cattle farming in areas with low agricultural productivity, but can also refer to a large-scale growing of wheat, barley, cooking oils and other grain crops.

In discussions around land use, impacts of livestock can be seen very differently. On the one hand, all land use by livestock can be seen as po-tentially problematic in view of current anticipated growth in livestock production, since by using a growing area of land, livestock usually need more land than plants. However, another way of viewing the impact of livestock on land is by considering what types and qualities of land they use. Are they making use of prime arable land? Or are they using land that is unsuited to arable crop production? Livestock managed to enhance the quality

of the land and to maintain the carbon storage properties of the land then they are

not overstocked. Moreover, extensive grazing usually contributes to protecting other vulnerable animal and plant species.

To sum up, animals living in extensive systems modify the landscapes they inhabit, representing a fundamental force for landscape management and conservation, for example through weed control, revegetation, nutrient cycling and creation of fire breaks.

What is the difference between intensive and extensive cattle breeding?

Beef cattle are usually kept in either 'extensive' grazing-based systems where they are mainly kept in fields and may be housed for part of the year (depending on the climate) or 'intensive' indoor systems where, in some cases, they may be housed throughout their lives. Extensive farming usually require no additional feeding but the grass and hay, intensively breeding cattle are being feeded additionally with supplements, silage, compound feeds, cereal – based feeds, etc. Furhermore, the time required for production and the amounts of production is different in extensive and intensive livestock systems. Extensive farm produces less milk and the milk is lower in fat than in full balanced diet. In meat production, it takes 0,5 – 1 year longer to rise a cattle in extensive farm suitable for meat production. On the other hand, the quality of production in extensive farm and its benefits outweigh disadvantages.



Benefits of Extensive Technologies

- Lower density of animals result in decrease of illness and the use of medicine in livestock production, no GMO, better meat and milk quality
- Animal welfare
- Cultivation of low quality grassland – peat-bogs, scrubland, etc.
- Symbiosis between species - protection of animals and birds breeding in grasslands
- Conservation of soil, preventing degradation

Biodiversity and extensive farming systems:
Aquatic Warbler (*Acrocephalus paludicola*)
Singing male of Aquatic Warbler (© <https://meldine.lt/meldine-nendrinuke/bukle/>)



There are species closely related to human activity which, paradoxically, have been facing difficulties because of the human activity. Aquatic Warbler – one of the most endangered species in the world – has been breeding in the meadows for ages, but now the numbers of individuals decrease rapidly. On one hand, people started to cultivate land intensively – ploughing and mowing grasslands during breeding season, on the other hand, low-quality land was abandoned, and now is covered with shrubs, bushes and poor quality forest. Now it is obvious, that the only way to save this species is cultivate land extensively – graze small amounts of mammals (cattle, sheep or goats) or mow it only once a year when juveniles of Aquatic Warbler are already flying (late July – August) and prevent meadows from shrubs.

Extensive farming might result in better protection of the environment, including soil, climate, water and humans as well. There is always a discussion if it is worth it or not, weighting and arguing, but the main argument is the attitude – if we are ready to take care of others before ourselves or not.

How can everyone contribute?

1. Support local farmers, who take nature and ecology into consideration
2. Do not spare money for better quality of food – better the less than low-quality
3. Avoid buying from supermarkets when the origin of the production is unknown
4. Think globally – avoid wasting food, take care of Your environment
5. Spread the knowledge on the importance of nature protection

https://fcrn.org.uk/sites/default/files/FCRN_int_vs_ext_livestock.pdf

<http://www.thecattlesite.com/articles/4349/extensive-farming-and-the-future-of-food-production/>

https://images.agriprofocus.nl/upload/post/1._Dr._Josh_Odhiambo_EXTENSIVE_LIVESTOCK_PRODUCTION_SYTEM1453472556.pdf

<https://meldine.lt/meldine-nendrinuke/bukle/>



SCYTHING WITH A MANUAL ERGONOMIC SCYTHER

Annotation

Management has been changing the landscape for centuries. The mosaic landscape that was formed by the pastures, field boundaries, fields, meadows, forests and villages was transformed by the humans into the industrial landscape during the communism, especially since 50s of 20th century. COMECONs confiscated and occupied fields and pastures of farmers. Fields were bordered, quantity of the crop yields was increased instead of quality, large-scale production was initiated even in the mountain areas. Fertile land was unified into large blocks. Strong changes in the landscape management effected the soil quality, water resources and diversity of the fauna and flora.

After the Velvet revolution the situation has got worse rapidly.

Grounds were sold to the unknown people, foreigners mostly, who had no relationship to the grounds, natural and cultural heritage in general. They started plundering the grounds with the aim to raise the capital of theirs in the form of natural resources and finances and thus to usurp as much as possible.

Excessive amount of chemicals have polluted water resources and worsened the soil quality enormously. The water deficit in the fertile grounds is increasing, food sovereignty in the Czech Republic was discarded and smashed.



Mosaic Scything



10 Benefits of Manual Scything on the Landscape

Grassland management is absolutely fundamental to maintain flower rich biodiverse meadows, orchards, gardens and grasslands.

1. Water retention and soil erosion prevention

Since the grass cutting is recommend being made twice a year, plants are able to ingrain, grow and bloom. Subsoil with the interweaved root system absorbs water and prevents the soil erosion. On the contrary, water flows away, soil gets dry and dehydrates.

2. Increase of fauna and flora diversity

The value of wild flower seeds is enhanced and thus the biodiversity is supported to be restored. Plants have time to bloom and support pollinators. Longer vegetation also provides more habitat for small wildlife. The biotope is preserved for the plants and animals (various species of meadow/river flowers, insects, little animals such as hares, mice, birds...), so is the ecosystem of theirs.

3. Less amount of pests

Versatile of fauna diversity means less amount of pests. The diversity of fauna increases the amount of pests' predators. Larvae of ladybug, for example, is able to eat up 5.000 aphids per its life; ladybug up 50 aphids per day.

4. Soil is not strained with heavy machinery

Heavy machinery strains the soil that is not able to retain water. Heavy machinery also kills the animals as they are not able to escape away.



Meadow attracts insects and meadow roots can absorb an enormous amount of water than the continuously cut grass

5. Making hay

Mowing with the scythe leaves the grass at their full length for drying into hay. Hay might be used either for domestic animals feed or for mulching.

6. Compost

Scythed grass is great organic matter to add into compost where humus is created.

7. Mulching

The benefits of mulching play important role nowadays. Mowing with the scythe leaves the grass at their full length for drying into hay. Free source of mulch is obtained that might be used on a large scale, from food for the domestic animals, prevent soil dehydration, weed suppression, soil moisture retention to build soil organic matter.

Mulching also helps preventing soil erosion that the soil does not wash away.

8. No noise

Mowing with the scythe is as quiet as it can be. You are not more frustrated and disturbed with the annoying engines of lawn mowers whether from you neighbours or your own household.

9. No pollution


Petrol mowers are a huge source of soil, water and air pollution. The fossil fuels pollution enormously destroys fauna and flora life in the soil and waters. Switch into emissions-free mowing with the scythe.

10. Well-being

The most important benefit is for you. Not only that you increase your physical conditions, but after the end of every scything you will be able to look back and say "Great job I've done for nature and its protection".

Other benefits

- Better human health
- Aesthetic value (diversity of fauna and flora = well-balanced psyche)
- Keeping the cultural heritage
- Transfer of tacit and explicit knowledge
- Time savings
(to mow the grass with a petrol mower twice a week demands a lot of time)



Flowers provide essential vitamins, minerals and other substances for domestic feed or compost



Domestic animals can serve as „nature“ mowing machines



Scything Manually

Aim of the Activity

To acquaint the participants with all the necessary activities that are connected with the scything, starting from the choice of the scythe and blade, setting up the scythe, hammering the blade, peening and honing. What's the most important, the participants learn why to use scythe, what benefits for the nature conservation, ecosystem and human health scything has.

- **Target group:** students, adults, seniors
- **No. of the participants:** max. 6 persons
- **Duration:** 2 days

1st day: choice of the scythe, set up the scythe, hammering, peening and honing, scything

2nd day: peening and honing, hammering, scything



Ovoid honing stone that is permanently soaked in a water-filled sheath.



Peening jig anvil

Blade is needed to be peened/hammered before the scything.

Procedure

1. When to Scythe?

- Scything is usually done twice a year after the flowers have bloomed up.
- Had better to scythe early in the mornings when dew is still on or before the dark (after the hoarfrost).

2. What steps precede the scything?

- Chose the right scythe with the high quality steel blade
- Set up the scythe, snath and blade and grips to your height

- Peen the blade before the first use. Peen the blade each time before scything larger areas. After about 4 to 8 hours of scything you value the proper peening and honing. Peening is done to maintain and reshape the bevelled edge. Insert photo
- Hone the blade before each scything and frequently during the scything as well.

VERY IMPORTANT: Acquire the necessary skills from your family members / neighbours / farmers or in a course.

Scythe consists of a high quality steel blade, snath and grips.

The video-footage on the demonstrations of scything, hammering or peening is available on the following link: <http://ursuscentrum.cz/cz/03145-blog.html>

Sources:

<https://www.newsociety.com/blog/2016/9-Reasons-Why-You-Should-Start-Mowing-with-a-Scythe>

<https://wildseed.co.uk/page/scything>

<http://www.halonoviny.cz/articles/view/44826886>

USAGE AND DYEING OF SHEEP WOOL

Annotation

Sheep wool has many positive properties and can be used in a wide variety of fields. Particularly interesting here are the latest research results regarding the effect of sheep wool on the room air. Sheep wool should therefore cause a detoxification and improvement of indoor air. This has been proven by laboratory tests. For example, sheep wool carpets, sheepskins, sheep wool blankets, etc. can reduce the pollution.

The use of sheep's wool in knitting for clothing indicates that sheep's wool is temperature-balancing and promotes skin respiration. Sheep wool is also odour-inhibiting, crease-resistant and insensitive to dirt.

Anyone who has discovered sheep wool for themselves, would usually do without chemical and toxic dyeing. So it is best to dye the wool itself. This is also quite simple, but requires a certain amount of practice and composure, as the colour results are always different.

Aim of the activity

Participants learn how to dye wool or fabrics using naturals or organic materials

such as wild plants, forest fruit, nut shells. The key aim of the activity is to acquaint the participants with the negative impacts of the chemical usage on the environment, ecosystem and human health. Last, but not least how humans can contribute to conserve the nature when implementing the knowledge and skills of our ancestors who lived in synergy with the nature and who regarded to preserve the cultural and natural heritage for other generations as the most valuable and precious question.

- **Target group:**

students, adults, seniors

- **No. of the participants:** max. 12

- **When:** all year round

- **Duration:** 2 workshop days

1st day: collecting plants, cooking colours, preparing wool

2nd day: colouring wool

- **Equipment and other material:** stove for cooking, stainless steel pots, wooden spoons, vessels for storing the wool, alum from the pharmacy, vinegar



Procedure

1. First of all, it is necessary to collect plants, or rather plant parts, from which colors can be made.

- Dandelion / Tansy / Chamomile / Birchbark - yellow
- Privet berries - blue-gray
- Elderberries - deep purple
- Rose hips / Cherries - red
- Blueberries / Blackberries - purple
- Raspberry leaves / blackberry leaves / nettle - green
- Walnut shells – brown

2. After that, hard parts (tree bark, nut shells etc) have to be covered with water just once and pulled for about 24 hours and then cooked. Fruits just need to be squeezed out. And leaves have to be cooked long. To achieve good color strength, use very little water. However, there must be enough water available to immerse the wool in it.

3. However, before the wool can be dyed, it must be specially treated. This process is called pickling. This requires alum. This salt can be bought at the pharmacy. For 100 g of wool, heat 3 liters of low-calorie water in a stainless steel pot to about 40 degrees and dissolve 15 g for dark shades of alum with stirring for light shades. Now put the wet wool in the stain and heat it slowly to 90 degrees. After one hour, cool the wool in it, remove it and let it dry. Dann kann diese in das angerichtete kühle Farbwasser gelegt werden und wieder auf ca. 90 Grad erhitzt werden. Dies dauert ca. eine Stunde. Danach lässt man die Wolle mehrere Stunden auskühlen. Erst wenn die Wolle kalt ist, sieht man das Farbergebnis.

4. If the wool is cold, it will be rinsed until the water stays clear.

5. Now the color can be additionally fixed with vinegar.

6. Then the wool is hung up to dry.

These colours are not lightfast!



Further Uses of Sheep Wool

- Sheep wool as fertilizer in the garden
- Fight snails with sheep wool
- Weed protection with sheep wool
- Sheep wool as curative wool

Sources:

<http://www.kraeuterallerlei.de/wolle-farben-mit-naturfarben-so-wirds-gemacht/>

<http://waldweg-blog.de/anleitung-zum-faerben-mit-pflanzen/>

<https://haus-gartenblog.de/schafwolle-als-duenger-im-garten/#>

<https://www.lagerhaus.at/tipps-tricks/a/schnecken-bekampfen-und-unkrautschutz-mit-schafwolle>

<https://www.smarticular.net/heilwolle-anwendung-wirkung-und-kauf-tipps/>



COLLECTING HERBS, COMMON SELF-COOKED LUNCH AND SNACKS, PROCESSING OF HERBS

The training of wild herbs combined with meal preparation and tasting.

Aim of the activity

Participants learn the importance of the wild herbs picking, their usage in the culinary, facts on the herbs (typical biotope, characters, benefits for the health, usage in the culinary/pharmacy), other important information and facts on the wild herbs in the region.

- **Target group:** students, adults, seniors
- **Number of participants:** max. 18
- **When:** from early spring to late autumn
- **Duration:** 5-6 hours
- **Equipment and other material:**
 - Kitchen equipped with the proper utensils
 - Ingredients for the recipes, see below
 - Freshly picked herbs – stinging nettles, ground ivies, gold nettles, dandelion buds

Procedure

1. Make a terrain research in the local/ nearby meadow, field to show the participants the herbs they are about to pick.
2. When finding the herbs, explain to the

participants the following related to the herbs: features, characters, properties, precautions; usage, optional products that might be made of the herb.

3. Divide the participants into the teams of max. 6. Each team is stated what specific herb to gather.

4. Explain the participants to pick the specific herb in the indicated amount to be used for cooking:

a) the first team: a basket of dandelion buds
b) the second team: 2 baskets of stinging nettles

c) the third team: 2 handfuls of ground ivies and a small bag of gold nettles

5. Teams process the herbs when preparing common self-cooked lunch or snacks: i.e. nettle soup, quiche, baked potatoes with fresh herbs and sauceNM



Recipe Card

DANDELION DIP

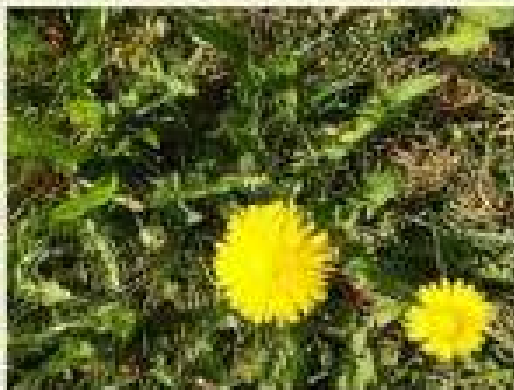
RECIPE NAME

AUSTRIAN

CUISINE

15-20 MIN.

TIME TO PREPARE



INGREDIENTS

2 CUPS DANDELION BUDS;
1 ONION;
1 TBSP BUTTER;
SOME SOUP;
1/14 L WHIPPED CREAM;
GARLIC, GOMASIO (SESAME
SALT), SOY SAUCE

PROCEDURE

WASH THE CLOSED
DANDELION BUDS BRIEFLY.
NOW ROAST THE ONION IN
BUTTER, ADD THE BUDS AND
ADD A LITTLE SOUP, LET IT
SIMMER BRIEFLY. SEASON
WITH GOMASIO AND SOY
SAUCE, SIMMER WITH FINELY
CHOPPED GARLIC. FINISH
WITH A GOOD SHOT OF
WHIPPED CREAM

Recipe Card

GROUND IVY-ICE

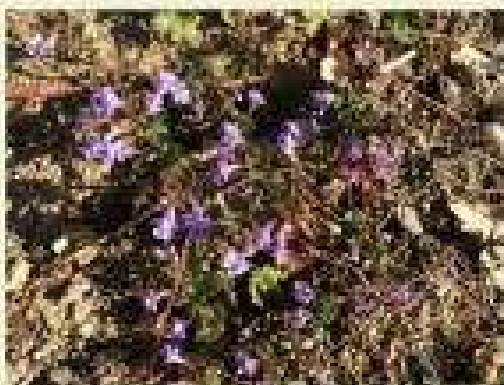
RECIPE NAME

AUSTRIAN

CUISINE

60 MIN.

TIME TO PREPARE



INGREDIENTS

1 BANANA;
1 LEMON;
1 ORANGE;
1 APPLE;
300 G WHIPPED CREAM;
5 - 10 GROUND IVY LEAVES;
WITH FLOWERS;
HONEY

PROCEDURE

PEEL THE BANANA AND APPLE AND CUT INTO PIECES. SQUEEZE OUT THE LEMON AND ORANGE AND DRIZZLE THE JUICE OVER THE FRUIT. WASH THE LEAVES AND PAT DRY. PUREE THE LEAVES TOGETHER WITH SOME WHIPPED CREAM AND THE FRUIT. BEAT THE REMAINING WHIPPED CREAM UNTIL STIFF AND FOLD UNDER THE PUREE TO TASTE WITH HONEY AS NEEDED. SPREAD THE MIXTURE FLAT ON A BAKING TRAY AND LET IT FREEZE FOR AT LEAST 1 HOUR.

More recipes at:

<http://www.conature-project.eu/blog-main/>

www.ursuscentrum.cz

<http://www.dumprirody.cz/informacni-stredisko-chko-beskydy/novinky/>

SOIL FERTILITY CONSERVATION IN SUSTAINABLE FARMING

Aim of the activity

To educate participants about some methods of soil fertility management and, generally, about preserving one of the most important agricultural factors: the organic matter content.

Consciousness about soil fertility within farmers communities is not so widespread. Therefore, they consider necessary to add synthetic fertilizers in order to improve the nutrients' content for growing plants, even though it results in a consequent loss of soil quality.

Soil - an unknown entity

Soil is the brown, breathing skin of our planet, the lumpy mass where plants put down their roots. Soil is where grown vegetation can be one metre or few centimetres thick, but no more than 10-30 cm of it are constituted by fertile humus. Our planet has a diameter of 12.600 km and the soil spread on this large sphere appears like a very thin veil. Nowadays, every inhabitant of the Earth has no more than 1 hectare of fertile soil at one's own disposition to satisfy one's needs; in the future we will probably have less.

It is evident that fertile soil is a very precious resource.

What is soil in a scientific perspective?

Soil is the result of many and varied interactions occurring between the atmosphere (regulated by climate and weather patterns), the biosphere (meaning

local vegetation and animal activities) the geosphere, the rocks and sediments constituting the few upper metres of the Earth's solid crust.

Soil experts define soil as “any loose material on the Earth surface that is capable of supporting life”.

What is soil made of?

Actually, soil consists of a complex mixture of mineral and organic particles, representing the outcome of weathering and biochemical processes that break down both local rocks and sediments into individual grains of increasingly smaller sizes, and also dead vegetation and organisms that fall on or lie in it.

Moreover, soil is composed by organic matter, nutrients, water and air in different percentages.



The soil in profile

Soil is the product of various environmental weathering processes operating on geological materials on the

Earth's surface over a period of time:

If we dig into the soil till about 1 or 2 metres depth and observe the vertical section shown, we can notice a number of roughly horizontal layers that look slightly different from one another. These layers are the result of the local environmental weathering processes. Their colour, physical structure and chemical characteristics significantly differ from those of the underlying rocks and sediments. Soil scientists call the layers 'soil horizons' and assign them letters of the alphabet to distinguish their different types.*

The sequence made by single horizons is called "*soil profile*" and it changes depending on geographical location, weather and anthropic activities on it.



Laboratory and Terrain Experience

Sensational Soil!

Aim of the activity

This type of activity can be useful in order to introduce a farming workshop or a naturalistic excursion, because it connects learners to the soil, conceived as a natural element from a sensitive point of view, and allows them to experience colour, smell and consistency through the senses.

- **Target group:** students, adults, seniors
- **No. of participants:** max. 12
- **Where:** everywhere (classroom, terrain)
- **When:** all year round if not the ground frozen
- **Duration:** 2 hours
- **Equipment and other material:** plastic containers, cardboard papers, water

Procedure

1. Each learner has to take a piece of soil (10x10 cm) directly from the first 10 cm of top soil and put it into the plastic container with some water.

2. Add water in order to make it wet and easily mouldable.

The trainer can stimulate learners to put their nose very close to the soil matter and smell intensively with closed eyes.

3. Invite the learners to touch wet soil and taste its stickiness, its softness, the sand grain and eventually the presence of objects like leaves, roots and rocks.

Learners can paint with wet soil and create a sort of artistic product on cardboard papers, feeling with fingers both sand grains, loam consistency and clay stickiness. The ability of the trainer is essential for the

success of the experience, in order to stimulate the emerging of good sensations, original and spontaneous thoughts, deep memories. Soil simply has the smell of forest.



Determination of Soil Texture

Aim of the activity

This activity method permits to easily define the relative quantities of sand, silt and clay and observe in an empirical way a very important soil quality, texture, a key concept in order to determine soil fertility.

- **Target group:** students, adults, seniors
- **No. of participants:** max. 12
- **Where:** everywhere (classroom, terrain)
- **When:** all year round if not the ground frozen
- **Duration:** 1 hour
- **Equipment and other material:** glass jars, water, soil

Content

An average soil sample is made of 45% minerals, 25% water, 25% air, and 4% organic matter. Mineral particles of different sizes, such as sand, silt and clay,

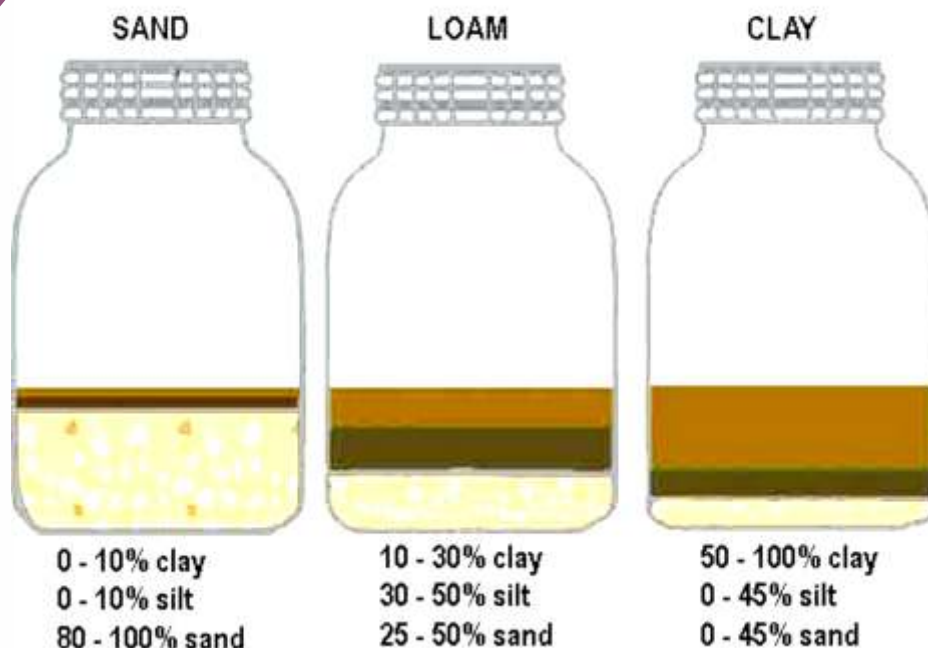
give soil an essential feature called texture. Different percentages of sand, silt and clay determine the quality of the soil with respect to its porosity, malleability and fertility.

For example, a clay soil (with a high percentage of clay in its texture) will be hard to work with, since it is heavy and soaked. Sandy soil is porous and easily malleable, though neither water nor nutrients are going to remain in its structure.

The best soil texture for farming use is the sandy-loamy one, where the presence of silt is balanced by a small percentage of sand and clay.

There are several methods in order to determine different quantities of clay, silt and sand. One of them is empirical and approximate, though still effective for those who don't need a precise measurement.

JAR TESTING FOR SOIL TYPE



Procedure

1. Take a soil sample without rocks and roots.

2. Put the soil into a glass jar and mix it with water until the soil is completely dissolved into the water. Wait. After some minutes sand, silt and clay will separate themselves according to their own weight (linked with their dimension). The first material that will deposit at the bottom of the jar is sand, then loam and finally clay that will remain on the upper level of the sequence.

The different thickness of the layers shows the different percentages of sand, loam and clay in the sample.

No-Tillage Method**Aim of the activity**

- learning methods for training courses about sustainable farming systems and, in particular, soil fertility and structure conservation

- disseminate environmental-friendly innovation in the agricultural system
- integrate theoretical lectures about fertility soil concept.

Target group: students, adults, seniors

No. of participants: max. 10

Where: farms

When: autumn, spring

Duration: 2 hours

Equipment and other material: broad-fork

Content

The relationship between soil health and tillage is a hot topic in the organic farming world. It is generally understood that ploughing, disking and harrowing, although so practical for soil preparation, also have their downsides. Deeply working the soil makes it more subject to erosion, disintegrates its structure and damages living organisms. Moreover, tillage is one of the longest and most expensive stages of the farming system, with the biggest use of fossil fuels and the highest working time, also requesting constant economical investments.

The general thrust behind the concept of no-till is that for soil improvement residue crops are better-off left on the soil surface than incorporated by the tillage.

Mulched organic matter is eventually incorporated by the action of worms, fungi and microbes, that thrive undisturbed into the soil.

This practice imitates the activities of forest floors, which do not require tillage and can sustain themselves for centuries, if not longer.

The farming system followed by the “Prati al Sole” farm used a minimum tillage method that involved only the surface layer of the soil, to soften the soil and create a comfortable bed for seeds and young plants, without compromising the pedologic profile.



Procedure**1st phase**

Teachers can organize a first phase with a theoretical lecture in the field using some printed images and some soil samples, which are very useful to explain texture, soil organisms and organic matter.

2nd phase

Gather people around the farmer and prepare them for the demonstration about the no-till method.

It is very useful to train people explaining the agronomic concept at the base of this farming system. First, explain that the soil contains thousands of living beings that are essential for its organic matter content, then dig a little and find some earthworms.

The observation of earthworms' behaviour explains the ecological role of these organisms and the importance of the no-till method for preserving the soil ecosystem.

It is interesting for the learners to put the no-till method into practice with the broad-fork, working by themselves with the soil. It will be easy to observe the good effect of this technique on the structure and fertility preservation of soil.

In this experience the teacher has the task to facilitate the interaction between the learners and farmers by integrating the transmission of contents with scientific and theoretical concepts.

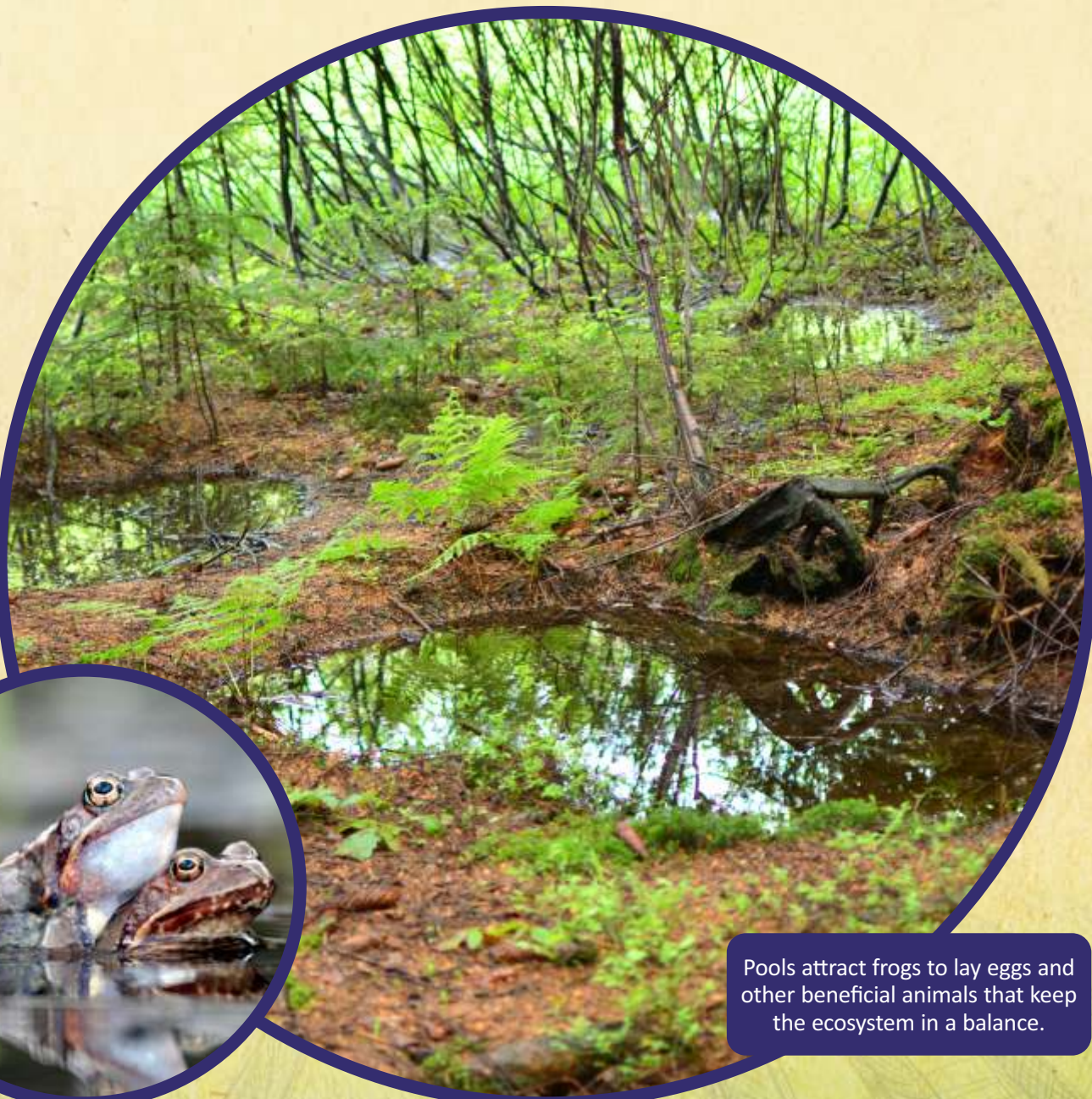


WATER RETENTION

Aim of the activity

Participants get acquainted with some methods how to retain water in the landscape, in their gardens, meadows, how to increase the amount of water in the soil and not to increase the amount of irrigation

doses. The global threat of lack of water is the key problem of the mankind. Due to the loss of the tacit and explicit knowledge transfer from the ancestors to other generations who lived in a very tight touch with nature, humans are facing unprecedented environmental crisis.



Pools attract frogs to lay eggs and other beneficial animals that keep the ecosystem in a balance.

Several Methods to Retain Water in the Garden

Mulching

WHEN TO MULCH?

1. Mulch in summer and winter

In summer, mulch helps your gardens retain moisture and keep the roots cool.

In winter, the mulch protects the plants from frost and help to keep the soil warm. Summer mulches will decay over time, but winter mulch should be removed in spring.

- Ideal summer mulches include leaf mulch, leaf mulch mixtures, and compost.
- Ideal winter mulches include pine needles, straw, and bark.

2. Remove old winter mulch

In spring when you start gardening again, remove the winter mulch that protected the gardens during colder weather. You can add the removed mulch to your compost pile where it adds more nutrients.

3. Pull out weeds

Before adding mulch to the garden, go around and pull out all the weeds you find in the bed. Otherwise, the mulch will protect the weeds and allow them to thrive. This will also create unwanted competition for the plants you're actually trying to grow.

4. Add several inches of mulch to your gardens

Apply the mulch after you have finished planting in spring, or when you finish preparing the garden for winter. Use a shovel or rake to spread a 5- to 15-cm layer of mulch over the garden bed:

- In shadier areas, use 5 to 8 cm of mulch
- In sunny areas, use 8 to 10 cm of mulch
- In really hot and sunny areas, use up to 15 cm of mulch

5. Make a well around the base of the plants

After you spread the mulch out over the garden bed, use your hand or a spade to pull the mulch away from the base of the plants. This is especially important in shady areas, because it will protect the plants from mould, rot, and insects.

Providing some distance between the plant and the mulch will also allow air to circulate the plant, providing ventilation that is essential for healthy growth.

Leave 2.5 to 5 cm of space between the mulch and the base of the plants, or enough room so the mulch is not touching the plants.





How to Make Mulch

1. Mulch in summer and winter

When using natural materials such as straw, leaves or crushed twigs and small branches as mulch, it helps the soil keep in moisture and therefore conserves water. Since the mulch decomposes it becomes an excellent source of food for the bacteria and organisms living in the soil and thus enhances the soil quality. What's more, mulch helps prevent weed growth, protects plants from pests and helps the soil maintain an even temperature and when used over time, it revitalizes soil and promotes better plant growth.

Target group: students, adults, seniors

Number of participants: max. 18, depending on the size of the garden and mulch amount

When: autumn, spring

Duration: 5-6 hours

Equipment and other material for part 1:

- rake, shovel, wheelbarrow
- lawnmower, hedge trimmer
- ventilated barrel or large bag with holes or tarp

Equipment and other material for part 2:

- wood chipper
- spade, pitchfork

Procedures

Part 1: Leaf mulch

1. Collect leaves

Many home gardens have leafy trees and plants that provide a great mulch source. Leaf mulch is an excellent all-purpose mulch for your garden. You can either gather leaves by raking up ones that fall in the autumn, or collect the leaves that you prune off plants.

Avoid using the leaves from walnut or eucalyptus trees as these might prevent other plants from growing.

Let some fallen leaves until spring as the leaves are homes for many insect and other animals species.

2. Rake the leaves into a pile

Use a rake to amass all your leaves into a large pile. Use a shovel and wheelbarrow to collect all the leaves and move it to the place where you pile the leaves on a flat section of lawn. Spread the leaves out into a layer that's no more than 5 cm thick.

3. Shred the leaves

Once the leaves are all piled together in a thin layer, use your mechanical lawnmower and mow over the pile a few times to chop the leaves into smaller pieces. Continue shredding until the pieces are dime-sized.

- Shredding the leaves will help them to decompose in the garden, and this will provide the soil with nutrients.
- Use hedge trimmers to manually shred the leaves if not having mechanical lawnmower or let the leaves dry in the sun and then walk the leaves until shredded into small pieces.

4. Use the mulch right away and store extras

Once the leaves have been shredded, they are ready to use as mulch in the garden. Extra mulch can be stored in a ventilated barrel, a large bag with air holes, or spread out on a tarp and covered from the elements.

Once the leaf mulch is ready, you can also combine it with other mulch materials from around the garden.

- **The longer the mulch is stored, the more nutrients it will lose.**
- **Mulch that is stored in low or no ventilation areas will begin to ferment and release high pH toxins, which are deadly to plants.**



PART 2: MULCH COMBINATIONS**1. Chop up tree branches, bark, and trimmings**

Wood also makes great mulch, and you can make wood or bark mulch from organic matter from around the garden. Go around your garden and collect fallen branches, bark, or tree trimmings that you pruned from your plants. Put on a safety place and process the gathered wood or bark through a wood chipper to make a mulch.

Bark and wood mulch can be used on its own or combined with leaf mulch.

Wood mulch is ideal for established gardens and plants, but shouldn't be used with young plants.

If you don't have your own wood chipper, you can rent it from a hardware store.

Wood decomposes more slowly than leaves, so this would be great mulch for long term use.

2. Collect grass clippings to add to the mulch

Grass clippings make an ideal addition to leaf mulch, although leaf mulch is not as effective when used alone. After mowing your lawn, rake up the grass clippings. Mix the clippings in with the leaf mulch and use a spade or pitchfork to mix them together.

If your mower has a bag to collect grass, simply pour the contents of the bag into the leaf mulch when you're done.

3. Rake up pine needles for your mulch

Like grass clippings, fallen coniferous needles can also be mixed with leaf mulch. Coniferous mulch is best used with acid-loving plants. Rake up needles from around the coniferous trees in your garden and combine them with the leaf mulch using a shovel or pitchfork.

Compost to Apply

To increase the overall fertility and organic matter in your soils, compost itself has an impressive water holding capacity as compared to topsoil. Before applying any amendment to your soil, it is important to know your key nutrient levels to be able to determine what kind and how much to apply. Just like any other soil amendment, there is such a thing as too much compost.



Tilling the Soil

Water retention is directly related to the porous space in a soil's structure: the more porous the soil, the more capacity it has to retain water. Tilling facilitates lots of temporary porous space in the top layer of soil, but also decimates any soil structure that was in place prior to tilling. Because tilling is achieved with heavy equipment, this repeated compaction actually leads to structural breakdown of soils resulting in a highly dense base soil layer topped by loose soil with no structure – thus, when heavy rains occur, water is more likely to runoff and result in erosion, nutrient loss, flooding, pollution, and, of course, less retained water for future potential drought conditions.

Many growers choose “low-till” production methods, which involve some precise and timely tillage in combination with cultivation to suppress weed pressure. In these cases, soil disturbance for the

purposes of cultivation can be done thoughtfully to avoid compromising the soil structure. Shallow, gentle cultivation of row crops, whether manual or mechanical, can successfully eliminate weed pressure while maintaining healthy soil structure and water retention capacity.

On a commercial scale, decreasing your tillage may be achieved by incorporating some no-till or low-till practices. Careful planning and dialing in the timing of your tillage can also help you decrease the number of times you must till to achieve ideal soil conditions. On a small scale for home gardeners or market gardeners, tillage may be eliminated all together by using innovative tools designed for the small scale like a broadfork or a tilter.

Scything

See the Best Practice “Scything with a Manual Ergonomic Scythe”.

<https://www.highmowingseeds.com/blog/5-water-retention-methods/>
<https://www.wikihow.com/Make-Mulch>





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