

Old orchards – a valuable cultural landscape and a natural habitat site

Case study



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Nordplus

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Orchards of 80-100 years old or even older, growing in the territories of manors, monastery courtyards and other locations are valuable parts of their historic and cultural context and often have a high natural value. Orchards are an important element of Lithuanian cultural landscape and they are appreciated by the people, since many Lithuanians engage in planting trees and taking care of their gardens. Orchards are a place where people tend to spend their time and relax, thus historic orchards could be a place of recreation where the pomological heritage of local and foreign varieties is presented as well as the local history, cultural and culinary heritage.

Today, however, the historic orchards in Lithuania are underutilised, often abandoned and their value is not sufficiently appreciated. The potentially valuable orchard sites have no legal protection status. In this work we reveal a good practice example, how an orchard of a famous Lithuanian naturalist, professor Tadas Ivanauskas, is represented, protected, taken care of and valued.

Case study: “Tadas Ivanauskas *Obelynė* homestead - memorial museum” – significance, status, public representation

Prof. T. Ivanauskas “Obelynė” homestead is one of the most interesting parks in central Lithuania, located near Kaunas city. T. Ivanauskas was a prominent Lithuanian biologist, who, in addition to his academic, documentary and literary legacy also left to Lithuania this iconic homestead, which was started to build in 1920. The homestead park has an impressive dendrological collection, which consists of over 300 species of plants. The park-museum also boasts of a large apple orchard covering an area of more than 1 hectare (Navasaitis, 1980).



T. Ivanauskas “Obelynė” homestead – memorial museum

In the 80-year-old orchard around 30 apple varieties can be found. These are mostly foreign varieties, such as *Kaiser Wilhelm*, *Melba*, *Transparente de Croncels*, *Wealthy*, *Starking*, *Fameuse*, *Roter Eiserapfel*, *Gravensteiner*, *Baumann’s reinette* and several unidentified varieties. Varieties of local or regional origin are also present: *Panemunės baltasis* (Panemunes white), *Sierinka*, *Vytis* (a variety bred by T. Ivanauskas himself), *Beržininkų ananasinis* (Beržininkai pineapple), *Lietuvos pepinas* (Lithuanian pippin), *Paprastasis antaninis* (Antonovka), *Rudens dryžėtasis* (Autumn stripped), *Baltasis alyvinis* (White transparent), *Popierinis*. A few pear trees also grow in the orchard: *Clapp’s favourite*, *Minister Lucius*, and “*Ivanauskas red*”, which is another variety bred by T.



Prof. T. Ivanauskas. Source: wikipedia

Ivanauskas. This large fruit-plant collection has likely been even richer at the time of T. Ivanauskas, especially considering that only a part of the orchard that was originally planted remains today.

At the beginning, when the “Obelynė” homestead was being founded, one of the professor’s many activities was an establishment of a fruit-tree nursery. A surviving copy of T. Ivanauskas nursery stock catalogue from 1936 unveils an impressive assortment of varieties with the description of each variety provided. The apple and pear varieties offered originated from: Western Europe and England, North America continent, Russia and Baltic region and other locations. In total 31 apple and several varieties of pear, cherry, currant, gooseberry, raspberry, strawberry are listed. What is more, walnut seedlings were also offered. The 31 apple varieties with their official names according to the National Fruit collection database (NFC, 2019) are given in the table below. It is worth noting that most of these varieties originated and were first described in 19th century or earlier.

| Region of origin | Variety |
|--------------------------|---|
| England | King of Pippins, Blenheim Orange, Royal Jubilee, Gravenstein, Cox's Orange Pippin, London Pippin, Queen. |
| Western Europe | Boiken, Gelber Richard, Harberts Reinette, Kaiser Wilhelm, Transparente de Croucels, Reinette Coulon, Landsberger Reinette, Geflammt Weisser Cardinal, Prinzen apfel, Bohnapfel, Reinette de Champagne. |
| Baltic region and Russia | Antonovka, *Antonovka Kamenichka, *Babushkino, White Transparent, Duchess of Oldenburg, *Avenarijus, Glogerovka (Lithuanian Pippin), *Sierinka, *Suislepp. |
| North America continent | Fameuse, Ontario. |
| Scandinavia | Signe Tillisch |
| New Zealand | Bismarck |

* name according to other sources (Lietuvos pomologija, 1990, <https://pomiferous.com/>, Atlas Plodov, 1906).

Present collection in “Obelynė” homestead is unique in Lithuania, but it is highly possible that a variety collection as large could also be found elsewhere, e.g. in manor orchards. However, “Obelynė” is exceptional because of its legal protection status. Together with the orchard, the homestead is registered as a cultural heritage site, due to valuable architectural, historical and landscape elements and valuable greeneries. The museum orchard is open to the public and is maintained by museum workers, who mow the grass, prune tree branches and other maintenance work. Each fruit tree is presented with an information card, stating the variety, describing its qualities, origin, use. Furthermore, an information board is erected in the orchard where a plan of the homestead is shown. Visitors are even allowed to take fruit tree scions for grafting at home, provided they get a permission from the museum staff.



“Panemunės baltasis” growing in “Obelynė” orchard



Information board at Prof. T. Ivanauskas "Obelynė" museum with a garden plan.

Traditional orchards and the old varieties in Lithuania

In Lithuania, apple trees are the main culture in the traditional orchards. There is also an occasional pear as well as groups cherries, plums, some fruit shrubs and other fruit plants. Typical dwarfing apple rootstocks that we use today (from Malling and Malling-Merton breeding programmes) were started to be broadly used during the later part of 20th century. Until that time

seedling rootstock was the main choice, thus fruit trees of a full size were grown in the orchards. This means that domestic apple varieties were grafted onto wild apple (*Malus sylvestris*) seedlings or onto seedlings of hardy apple varieties. Whereas pears were grafted onto a wild pear (*Pyrus pyraeaster*) seedling. (Štaras, Venskutonis, 1959). Trees with such a rootstocks usually grow to a full-size tree 4-8 meters in height.



Cattle grazing in a traditional orchard of full size trees.

Due to the choice of full-size rootstock, the trees in the orchards were usually planted far apart, in a 8 by 8, 10 by 10 or 8 by 10 meter configuration. This gives 100 to 144 fruit trees per hectare. While the orchard age is still young, vegetables, cereal crops or sometimes even smaller fruit trees or shrubs were grown in between rows. Otherwise animals grazed in the orchards, which is very beneficial for the fruit trees and the orchard ecosystem.

Agronomo M. VIKTORAUSKO

MEDELYNAS Telefonas: 4 nr. per Žemiu geležink. stotį

KAINORAŠTIS

1934 — 1935 m.

Medelyne sodinimo sezona galima gauti šių vaismedžių ir vaiskrūmių:

| Eil. Nr. | Atmainos pavadinimas | Noksta ir išsilaiko | Eil. Nr. | Atmainos pavadinimas | Noksta ir išsilaiko |
|----------------|--------------------------|----------------------|--------------------------|---|----------------------|
| OBELYS: | | | 20 | Rojaus geltonieji | Rugsėjis - spalio |
| 1 | Alyviniai baltieji | Liepos - rugpjūtis | 21 | " raudonieji | Rugsėjis - spalio |
| 2 | Angių pepinai | Lapkritis - vasaris | 22 | Sierinka*) (Pilkieji, Stumliniai, Moliniai) | Lapkritis - sausis |
| 3 | (Antaniniai*) | Spaliu - kovas | 23 | Sniego kalvilis | Gruodis - balandis |
| 4 | " pusantrasvariai | Spaliu - kovas | 24 | Tulos (Titovka) | Rugsėjis - spalio |
| 5 | Aportai | Spaliu - gruodis | 25 | Zieminis aukso Parmenas | Lapkritis - vasaris |
| 6 | Beumano renetai | Gruodis - balandis | KRIAUSES: | | |
| 7 | Bismarko | Lapkritis - kovas | 1 | Dilio sviestinė | Lapkritis - gruodis |
| 8 | Borovinka (Charlamovsky) | Rugpjūtis - rugsėjis | 2 | Geroji pilkoji | Rugpjūtis - rugsėjis |
| 9 | Boskopo gražieji | Gruodis - balandis | 3 | Klipo miegamoji | Rugpjūtis - spalio |
| 10 | Celini | Spaliu - gruodis | 4 | Viliamso bonkrete | Rugsėjis |
| 11 | Cukal maglio renetai | Gruodis - kovas | VAISKRUMIAI: | | |
| 12 | Gravenšteino | Spaliu - gruodis | 1 | Agrastai: Amerikos kalnų; | |
| 13 | Koks Pomona | Spaliu - lapkritis | 2 | Serbantai: | |
| 14 | Landslargo renetai | Lapkritis - kovas | a) Olandijos raudonieji, | | |
| 15 | Lietuvos pepinai | Lapkritis - vasaris | b) Olandijos baltieji, | | |
| 16 | Princo | Rugsėjis - sausis | c) Bang-up juodieji, | | |
| 17 | Reino pupiniai | Sausio - birželis | d) Goliat juodieji; | | |
| 18 | Ribstono pepinai | Gruodis - balandis | 3 | Avietes: Marlboro. | |
| 19 | Ričardo geltonieji | Spaliu - sausis | | | |

Nursery stock price list from the interwar period. 25 apple varieties are offered. Source: Agr. M. Viktorausko medelyno kainoraštis. Kaunas (1934).

80, 90 or a hundred-year-old apples, pears, sweet cherries can still be found near manors or in manor folwarks, small towns, villages. Usually, the oldest orchards are quite rich in varietal diversity, where it is possible to find “exotic” apple and pear varieties that today are no longer locally reproduced, but have an exceptional taste or other qualities.

According to the old nursery catalogues and lists (1925-1938) from the interwar period, there was a high diversity of varieties available. More than 85 unique apple varieties can be counted and around 30 pear varieties. This knowledge about varieties marketed in the past can greatly aid identifying varieties in the old orchards. The list of apple varieties available during the interwar period can be found here: <https://gzinstitutas.lt/85-obelu-veisles/>. However, a broader search for the historic nursery catalogues and other sources could probably increase this number even more.

Nurseries from that time also offered sour cherries, sweet cherries, plums, currants, gooseberries (from several to a dozen varieties). Besides sweet cherries, these plants are not very long lived and are rarely found in the oldest orchards still growing from the time when they were originally planted. Looking at an even older period, as many as 165 apple varieties are mentioned in the historical sources between 1820 and 1914 according to the recent publication by professor R. Laužikas (R. Laužikas, 2021). Some of these varieties are only mentioned once or twice. Perhaps due to their incompatibility with our climatic conditions, they did not become popular. Here are a few examples of historic varieties, that can be found in the old orchards in Lithuania:

English Gold Pearmain

It is believed that this variety originated in 16th century France and was widely cultivated in the western Europe. It is also known by the names: *King of Pippins*, *English Winter Gold Pearmain* or *Reine des Reinettes*. Gold pearmain apples were grown in Lithuania from as early as 19th century and trees were sold by the nurseries during the interwar period. Fruit trees of this wonderful tasting variety can still be found in the oldest orchards in Lithuania. The fruits are of average or below average size, they have a yellow skin with an orange-red flush and a slight russeting, especially closer to the stalk and the basin. The flesh is firm, medium juicy with a rich aroma.



English Gold Pearmain

Landsberger Reinette

The variety has originated in mid 19th century in the eastern part of Brandenburg province, Germany (present day Poland). It has been marketed by nurseries in Lithuania during the interwar period and can still be found in the old orchards. The fruit are average or above average in size, flat-round shaped. The skin is glossy and yellow with orange tones on the sun facing side. Overall, the apple has a very attractive appearance. The fruits keep well on the tree. They ripen in October and store for about 3 months. The flesh is soft, juicy and melting, the taste is sweet, winey and aromatic. Landsberger reinette apples can be eaten for dessert and used for making juice. Overall it is a wonderful tasting variety!



Landsberger reinette.

Lithuanian Pippin

The precise origin of Lithuanian Pippin is not known, but it may have originated in the Gardin Governorate or in the territory of present-day Ukraine. It has been described in the 19th century by several authors. By that time it was already widespread in our region and in the neighbouring

territories: present day Belarus, Poland and elsewhere. Lithuanian Pippin is sometimes called “*Glogerovka*” but in Lithuania it is most commonly known as “*Pepinka*”. Its fruits are of medium size, they are round conical in shape. The skin is pale yellow with pinkish-red flush on the sun facing side. The flesh is soft and very juicy. The taste is sweet-sour, refreshing and with a pleasant aroma. Fruits ripen in October and keep for 3-4 months in storage. The fruits of Lithuanian Pippin are very much liked and appreciated by Lithuanians, people often make juice out of it.



Lithuanian pippin

Beržininkai Avietinis

In 1906 a famous Lithuanian pomologist Adomas Hrebnickis first described an apple cultivar bearing attractive large size apples that he noted near Dūkštas (present day Lithuania). Apples had a sweet-sour, winery taste and a strong raspberry and wild strawberry flavour. From the appearance these apples somewhat resembled *Avenarius* variety, except that they ripened at the end of September - much later than *Avenarius*. A. Hrebnickis mentions that large trees of this cultivar, as old as 100 years, were already growing near Dūkštas and in the neighbouring villages. After having thoroughly investigated this cultivar A. Hrebnickis named it “*Beržininkų Avietinis*” (Beržininkai raspberry-like) (Tuinyla, 1990). Unfortunately today, no trees of this cultivar are publicly known or are not identified. It is highly possible that it still grows in A. Hrebnickis orchard territory, in the region of Dūkštas or in Beržininkai vilage. Today it is essential to re-discover this variety, spread the grafting material among the growers and preserve it for the future generations.



Beržininkai avietinis apple variety was first described by Prof. A. Hrebnickis. Illustration: "Atlas Plodov", 1906.

Old orchards – a habitat for a diversity of species

Orchards are valuable mosaic habitats that have the elements of woodland, pasture and grassland. Young and old trees of various sizes, hedges, solitary shrubs or groups of shrubs, small trees growing at the edges of an orchard, short and tall grass and other features can support a wide range of species, especially when present together. Hollows in the ancient fruit tree stems and branches, rotholes, large dead branches and dead wood – these are not the signs indicating that a tree has reached the end of its life and should be removed. On the contrary, these features naturally appear as the tree develops and ages and becomes valuable from the nature's standpoint. A tree (no matter what is its age) that has one or several of these features can be considered a veteran tree (PTES, 2017). In many cases these old trees still continue to produce fruit. A veteran fruit tree is a habitat for many creatures, including birds, small mammals, bats, various insects, invertebrates, fungi, lichen, moss, etc.



A hollow tree with holes.

The hollowing out of the main stem is a characteristic of old full sized apple trees (grown on seedling rootstock) and it helps the tree to remain upright and deform instead of break e.g. under heavy wind. Wood decay is unavoidable part of the tree ageing. Rotting wood in a tree hollow turns into porous saproxylic humus that accumulates and provides a shelter with stable conditions for

birds, small mammals and wood-decaying invertebrates. It is a good idea to cover some of these rotholes and hollows to protect the dry deadwood habitats. Over the years these hollows fill in with animal excrements, feathers and other detritus. Trees then can establish internal roots into this rich substrate and live even longer.

Dead branches as well as log piles are both valuable sources of dead and decaying wood. In order to maintain the biological diversity in the orchard, it is recommended not to remove the standing dead wood (thick branches). While branches that have fallen to the ground can be piled up in shaded locations. The laying dead wood can become food for insect larvae and shelter for many other species, which in turn will attract other species like birds of prey.

The soil in many old orchards has not been disturbed for a long time and it is very likely that chemical fertilisers and pesticides have not been applied heavily for a while. As a result, natural soil structure prevails and a complex world of underground life as well as extensive fungal networks thrive. In sites where the orchard is grazed by livestock or at least the grass is mown, the conditions are especially beneficial for some rare species of plants. A properly maintained orchard will provide food and habitat for a wide range of pollinator insects including solitary bees. In the last few decades, a steady decline of solitary bees is observed (European Parliament, 2019), thus it is extremely important to protect their habitats.



A rare species of fungus – orchard toothcrust (Sarcodontia crocea) that mainly inhabits the apple trees.

Fruits that ripen in the orchards are a rejoice not only for a man but also for larger mammals (roe deer, boars), birds, smaller mammals (hedgehogs, rabbits), butterflies, bugs, wasps and other insects, that are predatory and may also help control pests. Furthermore, orchards, similarly to a forest, can act as wildlife corridors that are very important in a modern fragmented landscape. Wildlife corridors help species to migrate, spread, interact, reproduce and survive. Maintaining a habitat network is critical for the long-term protection of species richness and populations. Actually, the two main reasons for the species loss and population decline is loss of habitats and their fragmentation (PTES, 2020).

Here are a few tips on how to support and encourage biological diversity in an orchard and maintain the habitat continuity for the future (PTES, 2017):

- Planting young trees in the orchard (to eventually replace the old trees) will help to ensure habitat continuity.
- When selecting young trees, it is recommended to choose full-size rootstock (preferably a resistant seedling) that are then grafted with a variety that already grows in the orchard and may no longer remain if an old tree dies.
- Preserving standing dead and decaying wood on the trees. This includes larger dead branches and hollow trunks.
- Preserving laying dead and decaying wood. It is a good idea to make piles of logs or larger branches that will serve as a shelter for various animals.
- Leaving a some of the fallen fruit for the wild animals.
- Mowing the grass in several steps, as the varying structure of the undergrowth with areas of both short and tall grass will be favourable for higher diversity of insects, small mammals, birds, amphibians, etc. For example, initially mowing 1/3 of an orchard area, then 1/3 after 2 weeks leaving the rest unmown until late in the season.

- Mowing time can be adjusted according to the seed ripening times of certain species of plants.
- Preserving smaller or larger shrub areas at the edges of the orchard, solitary small trees or their groups that will fill in the orchard landscape and may function as a wildlife shelter.
- Preserving mistletoe, climbing plants, moss and lichen will enrich the habitat diversity in the orchard.



A dog rose (Rosa canina) shrub at the edge of an old orchard – a source of food and shelter for the wildlife. Photo: Ž. Čekas.

Veteran fruit tree care

Based on their condition, some veteran fruit trees growing in the old orchards may require restoration and pruning work that is based on knowledge of a particular plant physiology, growth and development. Like we care for our elders, similarly we have to be cautious when working with veteran fruit trees. Fruit tree care principles applied to young and mature trees are not necessarily applicable for elder trees and mistakes made when pruning younger trees can be critical in the case of veteran trees. In order to avoid mistakes, it is essential to follow the principles of veteran fruit-tree restoration and care. Here are several of them:

- Trees are pruned before the onset of vegetation, after the harsher cold days have passed. Summer pruning can be performed on the current year growth in order to thin too densely growing shoots. Another reason to prune in the summer is to have a reduced growth response after pruning, but it may not be often desired in the case of veteran trees.
- If the elder tree was abandoned, it is pruned with a goal to thin and open up the canopy, remove diseased and some of the dead or dying branches and eventually to renew the canopy. A too dense tree structure does not let through enough light into the lower parts of the canopy, the air circulation is impeded thus the risk of diseases is higher. What is more, too many downward facing branches with a large number of low quality fruit spurs weakens the tree over time.
- When pruning an ancient fruit tree, it is essential not to remove more than 20% of the canopy in a year, not counting the dead branches (The Orchard Project, 2017).
- A year after pruning, the growth response is evaluated and additional measures are applied if needed (e.g. mulching the tree with woodchips).
- Large scaffold branches are preserved as much as possible. They are removed or headed only if there is a risk of breakage and ideally there should be a sufficient growth response at the place of a planned cut (Poinzer, 2020)

Common veteran tree care mistakes or problems caused due to abandonment:

- Heavy fertilisation with chemical fertilisers.
- Over pruning.
- Topping and removing of scaffold branches.
- Digging, ploughing or anyhow cultivating the soil at the root zone, except the necessary tree care work performed by specialists.
- Soil compaction due to heavy machinery or high movement of people or animals at the root zone.
- Tying branches with a rope, a metal wire or similar (e.g. rope for laundry or for tying dogs) that over several years will be overgrown by the expanding tree tissues as it grows.
- Intentional or unintentional damage to the tree: by light or heavy machinery, improper animal placement, human impact (e.g. climbing children) or vandalism.

It should be emphasised that these tips for veteran tree care provided in this text are an addition to common pruning principles and are non-exhaustive. These are not pruning instructions but general guidelines that need additional detailed explanation and practical demonstration. There is a number of other veteran fruit tree care principles, that are provided in a specialised literature.

This part seeks to broaden the awareness that veteran tree care requires much knowledge and experience. Thus, it is important that fruit tree care is performed by qualified specialists. State institutions that make public procurements for the management of green spaces should not mainly rely on the price criterion, as unqualified work can result in “butchering” of veteran trees. It is important to understand the high added value that the elder trees create in the landscape and make responsible decisions.

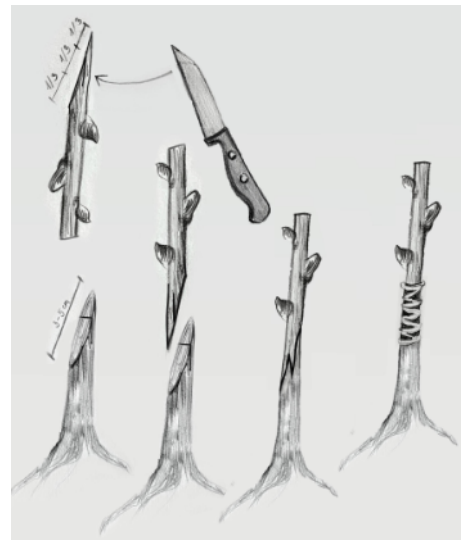


Elder apple tree with trunk circumference > 200 cm. (Alytus district)

Propagation

No matter how much we try to preserve elder fruit trees, they will eventually reach the end of their life due to various reasons. Valuable fruit plant varieties can be preserved by grafting or other forms of vegetative plant propagation or in rare cases – by seed. Apples and pears are always grafted, while plums and cherries can be both grafted or propagated by root suckers or grafting to own root (if the tree is with its own roots, not grafted onto a rootstock). In rare cases stone-fruit can be propagated by seed. Apples, pears and sweet cherries are the longest-living trees of the traditional orchard. Sour cherries, plums, other fruit trees and shrubs have a shorter lifespan. They should be „renewed“ more often if we want to preserve a variety.

The main methods of grafting are whip and tongue grafting, bark grafting, chip budding. Bark grafting is exclusively performed when the rootstock is out of dormancy in a phase of active growth and its bark is slipping. Usually, it is applied



Whip and tongue grafting illustration

when the rootstock is of larger diameter than the scion, while whip and tongue is performed when that diameter is roughly the same. Chip budding technique can be used on both dormant and non-dormant rootstock. Fruit shrubs, on the other hand, can be reproduced by layering or by rooting cuttings. Guidance for reproducing fruit plants can be found in the „Growing seed savers in museums“ project videos and their descriptions here. <https://growingseedsavers.org/>.

Historical orchard documentation



Documenting approximately 100 year old orchard, Jurbarkas district, autumn of 2021 m. Photo: Ž. Čekas.

The first step in preserving old orchards is to prepare their inventory. This work could begin with an analysis of old maps from pre-war, World War I, interwar periods by checking the territories of manors and other historically important places that might have had an orchard. The orchards indicated in the old maps should be checked if they are still present. This could be done by looking up modern orthophotographical photos. Some orchards may still be present while some will no longer be there. At times the orchard can be overgrown with self-sown trees, and its primary structure may not be visible from orthophotographical photos. If so, the situation will only become clear when the place is visited. Perhaps some of the original orchard trees are still there? It is best to visit at the time of harvest, when the fruit are ripening and the varieties can be identified.

After inspecting the site, assessing its condition, analysing some of the historical and cultural context, identifying the varieties, the potential of the orchard will be seen. It is also very important to contact the owners of the orchard, as it will very much depend on them whether the orchard can be preserved. Perhaps it could be the role of a municipality cultural heritage department, ethnographical or open-air museums to restore and preserve the orchard. In case the site has an important historical and cultural context, perhaps it can be developed for the public to visit and protected as a historical/cultural heritage object.

Historic orchards are potential sites for local community gatherings and events, outdoor workshops and teaching outdoor crafts. Here collective orchard care work can be organised. People can gather for traditional celebrations or can just spend their time, share well-being and presence.

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