

## EDIBLE FOREST REPORT FOR 2024

2024 was the 5<sup>th</sup> growing season for most of the plants in the Edible Forest, while there continue to be additions and some removals each year. The number of visitors appears to increase each year. We often hear very positive comments about the appearance of the orchard and the enjoyment of fruit that visitors are able to sample (limited sampling encouraged, harvesting is only for staff for NPBGS support sales at the Farmer's Market).

The orchard appearance does not improve by itself – that is largely due to excellent grounds-keeping by staff and volunteers. In 2024, among other work, the pine bark mulch was replenished around the plants and fall watering was done when rainfall proved insufficient, both actions that will help the plants look and perform better going forward. While some of the shrubs and caneberries have been producing heavily for a few years, none of the plants are mature yet, so there is a lot of plant development to anticipate in coming years.

In terms of quantity, seedless and wine grapes, currants, aronia berry, and Nelson blackberry production were the highlight in 2024. There was good production of blueberries in the raised bed and of mulberries. There were some lowlights in 2024 as well. The extremely wet spring resulted in a weeks-long period of saturated soils. It appears that this resulted in a loss of all of the arctic beauty kiwi plants, just when some were established to the point of potentially growing over the top of the kiwi pergola. The sunken blueberry bed had standing water for weeks, and the plants there either died or barely survived. Raspberry production suffered due to the saturated soils. Several new and replacement plants were added: three chokecherry selections, two small chestnut trees, a Viktor arctic beauty kiwi, and a Mars seedless grapevine.

There were three public and five private group guided tours of the Edible Forest, one of which was a first when three shifts of about 30 each of pre-K through 8<sup>th</sup> graders toured the Edible Forest and the Children's Garden. On May 4<sup>th</sup> there was a very popular demonstration of grapevine pruning by Greg Krieger – another first. In addition, the Edible Forest was the main topic of featured presentations at Gardening Saturday in Minot, ND in April and Midwest Outdoors in Moorhead, MN in November.

---

### **Fruit production in 2024:**

-2024 was the 5<sup>th</sup> growing season for many of the plants.

-Aronia berries, seedless grapes, and black currants were very productive again.

-Red and white currants, wine grapes, and Nelson blackberry were also very productive in 2024.

-Carmine Jewel dwarf sour cherry produced a large crop, but they were destroyed by spotted wing drosophila well before they were ripe enough for use.

-The blueberries set a lot of fruit for the size of the plants, but the plants are still relatively small – they produced enough fruit that a lot of people were able to sample them, and there were some very large berries.

-Trader mulberry produced a moderate crop in its second year of production, and many people tasted mulberries for the first time. The berries are still small (about ½ inch long), but larger than 2023 – the size will continue to increase.

-Honeyberry production was reduced in 2024, seemingly due to lack of sufficient pollination.

-Gooseberry production was likewise reduced, likely due to reduced plant vigor and bloom.

-A small crop of juneberries was produced for the first time on each plant as they reached production size.

-The red, yellow, black, and purple raspberries all produced fruit, but production was reduced, likely due to extended saturated soil in the spring. Wyoming purple raspberry produced its first fruit. The flavor was very good, and distinct from Amethyst purple raspberry.

-Doyle's blackberry production was much reduced from 2023. Arapaho blackberry increased production again, but the crop is still very small. Arapaho seems to be slowly increasing production as the plant produces larger diameter canes each year. Lawton blackberry bloomed for the first time and set fruit, but the berries were very, very small. Prime-Ark Freedom blackberry produced a few floricanes and primocane berries for the first time.

-There was a small hybrid hazelnut crop.

-For tree crops, there were a few Pembina and Bounty plums, a few Haralson, Norkent, Snowsweet, and Zestar apples, many Dolgo crabapples, and a few sour cherries and dwarf sour cherries besides the good Carmine Jewel production. The first fruit was produced on top-worked trees, a Chestnut crabapple.

-Excessive sampling of fruit by visitors continues. By the end of a day, there is no ripe fruit left, and the newly ripened fruit the next day is usually gone after the first couple of visitors. Visitors are picking fruit long before its ripe, essentially wasting it. Examples include the many apples and crabapples that are found on the ground after one or no bites are taken, blueberries and grapes picked when they are still green, and raspberries, blackberries, and honeyberries picked when they are still hard. Signs to ask for limited (for some fruits) or no (for other fruits) were posted in 2024, with little apparent effect. These actions don't hurt the orchard (except for improper apple picking, where grabbing an apple often removes fruit spurs and prevents future fruiting sites), but they do prevent many visitors from being able to sample ripe fruit as a way to learn to appreciate the flavor and help them decide what they might plant at their homes. Education seems to be the key but teaching people not to take more than one or two fruits of each kind for sampling is proving impossible.

### **Plantings and removals in 2024:**

-A dead Viktor arctic kiwi was replaced with a Viktor arctic kiwi (northwest corner of the kiwi pergola). The replacement plant was started from a cutting from a Viktor plant purchased from One Green World for planting in 2023. This female cultivar has very large berries.

-Three chokecherry trees were planted. One was Johnson chokecherry (west tree), sourced from Bergeson Nursery. This is the only chokecherry cultivar selected in the USA. It is characterized by large berries in large clusters. Another of the plants was a yellow-fruited chokecherry that came from Mark Vining from Rookery Rock Winery (tentatively called Vining yellow chokecherry (middle tree)). The third plant was a selection that appears to be a semi-dwarf plant that is highly productive of berries good for fresh-eating (tentatively called Walla dwarf chokecherry (east tree)).

-A sickly (highly chlorotic with severe dieback) chestnut rootstock was removed and replaced, and one other chestnut was planted in the same vicinity. The plant that was removed (the furthest south of the chestnut trees) was planted as a grafted Szego hybrid chestnut, and it was replaced with a Szego seedling chestnut (chestnut seedlings grow quite true-to-type). The other was a root-grafted American X European chestnut, for which the scion is from a producing chestnut tree near LaMoure, ND named Dakota Resolute (planted between the Szego seedling to the south and the good rootstock to the north). The chestnuts are planted on mounds of soil so the root-crown is in relatively well-drained soil.

-A Mars seedless grapevine that died a few years ago was removed and replaced with a new Mars seedless grapevine (north row, east end).

### **Plant developments in 2024:**

The Edible Forest is a demonstration orchard, meant to display the range of quality fruits that can be grown in our region and some ways that they can be grown and cared for. In any orchard, especially with plants that haven't generally been grown in the area, we all learn new information - more was learned in 2024 than in other years. Some of the most important things learned are as follows.

-Blueberries were planted in two types of beds in 2020, one sunken and one raised. Both have been used successfully by others, but generally not in heavy clays like we have and not in as cold a climate as in Fargo. Our primary concern with the sunken bed was that the pH of the peat/pine bark potting mix would be more difficult to maintain at a proper low pH for blueberries because higher pH water could readily seep in from the sides of the bed. Our primary concern with the raised bed was whether the peat/pine bark potting mix would get too cold for the roots of the blueberries because the raised bed was more exposed to the cold. Once fertility needs were figured out, blueberries in both beds were growing well at first. Then the plants in the raised beds gradually started growing better than those in the sunken bed. In 2024, the plants in the sunken bed either died or grew very poorly. It appears that greater than

usual spring rains in 2023 and 2024 resulted in more potting mix saturation than the blueberries in the sunken bed could handle, while the excess water was able to drain away in the raised bed. Our concern with pH in the sunken bed was not a problem, but potting mix saturation was a limiting problem. Our concern with the roots getting too cold in the raised bed has not been a problem. We will continue to grow blueberries in the raised bed. The sunken bed was taken out and converted to a raised bed to grow other plants that require low pH.

-The arctic beauty kiwi plants all died, presumably due to an extended period of saturated soil. Going forward, we will grow the kiwis in slightly raised beds so the root crown will be in less saturated soil during wet springs.

-Wasps and hornets severely damaged the seedless grape crop in 2023. As a result, mesh bags were used to enclose many clusters of grapes in 2024 to protect them from insect damage. The bags were very effective for that purpose.

-Lawton blackberry was planted because it was the first widely cultivated blackberry cultivar in the USA and reputed to be hardy to USDA Plant Hardiness Zone 3. In the Edible Forest, it has died back to ground-level every year since planted in 2020. However, the winter of 2023-24 was quite mild, essentially a Zone 6 winter compared to our average of Zone 4b winters. That was the likely reason for Lawton blackberry not dying back to ground-level the following spring. Rather, there was only tip dieback of the 2023 canes. There was extensive blooming on the canes that survived. Unfortunately, the resulting fruit was very small, mostly consisting of one or two drupelets that were mostly filled with a large seed. Thus, Lawton finally fruited in 2024, but the fruit it produced was very low quality. If the plant does not produce better fruit in 2025, it will be removed and replaced with something that has better potential.

-Prime-Ark Freedom blackberry was planted in 2023. It is cold hardy only to zone 6, so canes will not usually survive winter. However, the root crown survives winter and sends up primocanes each spring. This cultivar is the only commercial-quality blackberry that produced berries on primocanes that ripen early enough for our area. The plant produces suckers, so it will spread. In order to limit the spread from crowding into other plants, an about 3 foot diameter ring of 18 inch deep Rootmaker fabric was placed around the plant. This is a new approach to limit spread of suckering plants, so it is a learning and demonstration opportunity. With the mild 2023/24 winter, the one floricanne survived and fruited in 2024, indicating that not pruning until spring growth starts could allow for floricanne production in some years.

-Two grafted chestnuts that were most likely to be best for our area (Szego, Luvall's Monster) were planted in 2020 and 2021. The scions of both plants eventually died, likely because grafted chestnuts are less hardy than seedlings, but the rootstocks survived. The rootstock of one of those plants has been growing very well the last three years, with excellent vigor and foliage color. It appears to have great potential to both handle our soils and our climate. As a result of trying these plants in the Edible Forest, this could be an excellent new chestnut genotype for our region. Possible success from apparent failure.

-Sour cherries are generally very susceptible to severe damage by spotted wing drosophila (swd). There have been no reports of cherry cultivars that are resistant to swd. In 2024, our Northstar sour cherries were ripe and without apparent swd damage when all our other sour cherries were severely damaged by swd. The same was observed at another site in northeastern ND, providing some support for the observation. Based on one year's observations at two sites, it appears that Northstar cherries have some useful resistance to swd, possibly via not allowing swd eggs to hatch or develop until the fruit is over-ripe. If this holds true in additional observations, it will be a major new development in growing sour cherries.

-The Norkent apple tree that is being espaliered (pruned to two-dimensional form) had a permanent support structure installed to replace the temporary bamboo stake supports. Substantial pruning was done to get the tree closer to being two-dimensional, but some work remains because removals had already exceeded the guideline limit of about 20% removal of the crown in any one year. A diamond shape is being formed in the center of the tree, with plans to graft the top of the diamond together in 2025.

-The Northern Gem peach and the Murray seedling apricot base tree were girdled by voles in the winter of 2022/23. The peach was girdled above the graft union. The trees were allowed to grow out in 2023. A portion of the sprouts were removed in 2024, but several were left in place to limit excessive growth of remaining sprouts. Both trees are developing well. Additional sprouts will be removed in 2025 and 2026, with an expectation that the trees will be back to having a single trunk for the 2026 growing season.

-The Bounty plum tree was planted as a base on which to top-work multiple plum and other stone fruits. Bounty plum was selected because it is reported to not sucker like many other plum rootstocks. The tree is suckering badly, possibly because it could be a Bounty plum seedling rather than a clone. The suckering goes well beyond the drip-line of the tree, so would be a long-term problem. With that, the tree was girdled at the base in 2023 so the carbohydrate reserve in the roots would be depleted over time, resulting in reduced suckering. It will be removed in spring, 2025 and replaced with a tree that can better serve as a multi-variety plum base tree.

-The Brookcot apricot has been standing as a dead trunk for three years as we try to get a replacement. Apricots have extremely limited availability in recent years, and we have not been able to get Brookcot as a replacement. With that, the dead trunk will be removed in spring, 2025 and a Murray apricot seedling will be planted there for future graft conversion to Brookcot apricot.

- Additional apple and pear cultivars were top-worked onto the apple and pear base trees, respectively. There are now 7 cultivars top-worked onto the Dolgo crabapple base tree. One of those, Chestnut crabapple, produced the first fruit of any top-worked branch in 2024. There are now 4 cultivars top-worked onto the Mountain-Frost pear base tree. One of those is the newly

released Asian hybrid pear, Juicy Jewel. Additional top-work grafting will be done in 2025, as well as pruning to properly form the trees for long-term success of the top-worked branches.

-The hickory, pecan, hican, persimmon, Cornelian cherries, and dwarf shipova trees grew well, but have a few years to go before producing fruit.

### **Some plans for 2025:**

-Three additional arctic beauty kiwi cultivars, including Nahodka arctic beauty kiwi and a male cultivar, will be planted in slightly raised beds around the kiwi pergola.

-Cold-hardy huckleberry and lingonberry selections will be planted in a raised bed. These plants require a low pH, similar to that of blueberries, so they will be planted in potting mix of peat and pine bark, with a pH of about 4.5.

-A Murray seedling apricot tree will be planted in place of the dead Brookcot apricot trunk. The Murray seedling apricot tree will be converted to a Brookcot apricot by grafting of scions starting the following year.

-A Murray seedling apricot tree will be planted in place of the girdled Bounty plum. Apricots do not sucker, but are graft compatible with plum, so a plum interstock will be put in place and then top-worked with plums and other stone fruits in future years.

-Three early-ripening grafted pawpaw cultivars will be planted, with removal of the Rabina edible mountain-ash that was girdled below the graft union in 2023.

-If a Reliance grapevine can be obtained, the unknown, seeded grapevine mistakenly labeled Reliance will be removed and replaced.

-Additional top-work grafting of the multi-variety apple and pear tree.

-Maintenance pruning of all trees and shrubs.

-Guided tours for the public (at least one each in June, July, August) and private groups (by arrangement) will be led in 2025.

-Possible demonstrations include top-work grafting of fruit trees, espalier pruning/grafting, and summer pruning of grapevines.

-At least two presentations with an introduction to the Northern Plains Botanic Garden and primarily about the Edible Forest will be made. One is for the ND Nursery, Greenhouse, and Landscape Association in January in Fargo, ND. Another is for the Beltrami County Master Gardeners Garden Party in April in Bemidji, MN.