Malus

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International Ornamental Crabapple Society

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On This Page. Glistening fruits of *Malus tschonoskii* at the Průhonice Park, Czech Republic.

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On This Page. Persistent fruits of *Malus* ‘Wintergold’ offering visual splendor, and precious food for wild animals during Czech Republic’s stark winters.

From The President

Dear Friends,

Where are we heading with our crabapple breeding programs? I ponder this question each time when I try to delve deeper with each new cultivar that is being registered. Crabapples, with their veritable versatility, can surely be bred for more than just their ornamental and fleeting beauty? With space programs heating up between the superpowers of the world, will we soon be seeing a breakthrough 'aha' moment where we would have developed a crabapple cultivar that can be a source of food, medicine, clothing material and pure visual joy that can be grown in Martian gardens? Scientists at NASA have stated that "if we are able to grow plants in Martian regolith, we can do it anywhere on earth." With science knowing what the bacteria *Deinococcus radiodurans* and *Thermococcus gammatolerans* can do to protect humans (and possibly plants) against immense amount of radiation in space, we are one step closer to achieving this goal and I look forward earnestly to the introduction of this celestial crabapple cultivar.

Racing towards the future without considering our past and what our forebears have accomplished has many hazards. To this end, we are very blessed indeed that our Editor-in-Chief, Martin Siaw, who served as a technical consultant at the Paris Olympics 2024, was willing and able to take time off his tight schedule in France to consult, collect and compile materials on apples (and crabapples, of course!) at the Bibliothèque nationale de France in Paris. The wealth of information he was able to uncover has already begun to help our colleagues at the Malus Registration gain insights and knowledge of crabapples outside of Anglo-Saxon linguistic territories and traditions. On behalf of the IOCS and the Registration teams, I would like to convey our immense gratitude to the librarians at the Bibliothèque.

While dreaming of the future and examining the past, the Malus Registration team is also trying to address the very present issue of helping industry stakeholders appreciate and adopt accurate naming practices to ensure a responsible future for the horticulture industry. I would like to invite you to share your thoughts, concerns, suggestions, issues, confusion and solutions on accurate naming with us. I can be reached at guoling@chnbg.cn, and I look forward to hearing from you.

Sincerely yours,

Guo Ling
President
International Ornamental Crabapple Society

UNCULTIVATED

Andy Brennan

What conclusions can we make about growing good cider apples? I hope by now we all agree that there is no universal conclusion. In fact, the answer we're looking for is exactly opposite from the universal: Look to every single location and every single variety. Pomophiles have been saying something similar throughout American history when they've claimed (as they always have) that wild apples are superior for cider. Even as large grafted orchards began to dominate in the 1800s, they all agreed on this — from John Chapman, to William Coxe, to Andrew Downing, to H. D. Thoreau, to S. A. Beach — all the way up through recent accounts in cider country where mill operators claim wild apples are simply synonymous with cider apples; so needless to say, wild apples ought to serve as the greatest models on how cider apples should be grown as well. That means: no one type of soil, no one type of agriculture, no one type of variety; diversity, diversity, diversity- that's your cider apple.

"In all fields, our cultural perspective is limited by a parallel proclivity. It's not just agriculture: we all must fight tendencies toward specialization, efficiency, linear thought, and predetermined growth. We have cultivated those tendencies at the exclusion of nature's full range. If Uncultivated is about faith in nature, and the power it has to deliver us from our own mistakes, then wild apple trees have already shown us the way."

Margo Baldwin

Upright Beauty

Ge Hongjuan, Huang Yue, Ma Rongqun, Sun Jilu, Sha Guangli

A new crabapple cultivar ‘Datang Tingmei’ was selected from the descendants of ‘Qingzhen 1 Hao’ × ‘Maypole’. In spring 2003, hybridization was carried out at Qingdao Academy of Agricultural Sciences, China, and approximately 2,000 hybrid seeds were harvested in autumn the same year. In January 2004, the seeds were stratified to obtain close to 1,800 seedlings. An individual plant numbered “03QM1” was selected through preliminary screening. This plant has a columnar tree shape, leathery leaves with luster, and excellent ornamental value. It was selected as an outstanding individual plant. In 2005, its scions were top-grafted onto 3-year-old rootstock of *Malus hupehensis*. In 2007, the top-grafted trees bloomed. In 2009, the seed parent trees began to bloom. The characteristics of the grafted trees are consistent with those of the seed parent trees. In 2016, it passed the expert review organized by the National Forestry and Grassland Administration’s New Plant Variety Committee and was named ‘Datang Tingmei’. In 2017, it obtained the certificate of new plant variety protection rights from the National Forestry and Grassland Administration (20170019).

A columnar shaped tree with leathery lusterous leaves.

Tree and Leaf. The tree is columnar in shape with a straight trunk and brown branches. The young leaves are red and without pubescence. As the leaves unfold, they turn green. The leaf shape index is large. The petiole is medium in length. The leaf margin has blunt serrations. The leaves are leathery, dark green, and the upper surface has a bright luster. Before falling, the leaves are reddish-brown.

Flower. The young buds are red. The flowers are large, shallow cup-shaped, with broad elliptical petals that are slightly overlapping and have obvious veins. The petals are pink, uniform in color, slightly lighter at the base, and the colors inside and outside the petals are the same. In the Qingdao, China, it blooms between mid to late April

Fruit. There are many fruits. The fruits are small and oblate. The calyx is shed, and the calyx scar is obvious. The fruit stalk is medium in length. In the early stage, the fruit is purplish-red with fruit powder and later turns red and shiny. The flesh is yellow. The fruit hangs on the tree for 5-6 months and generally falls off at the end of November. In the Qingdao, the leaves fall in mid-to-late November.

More than Meets the Eye

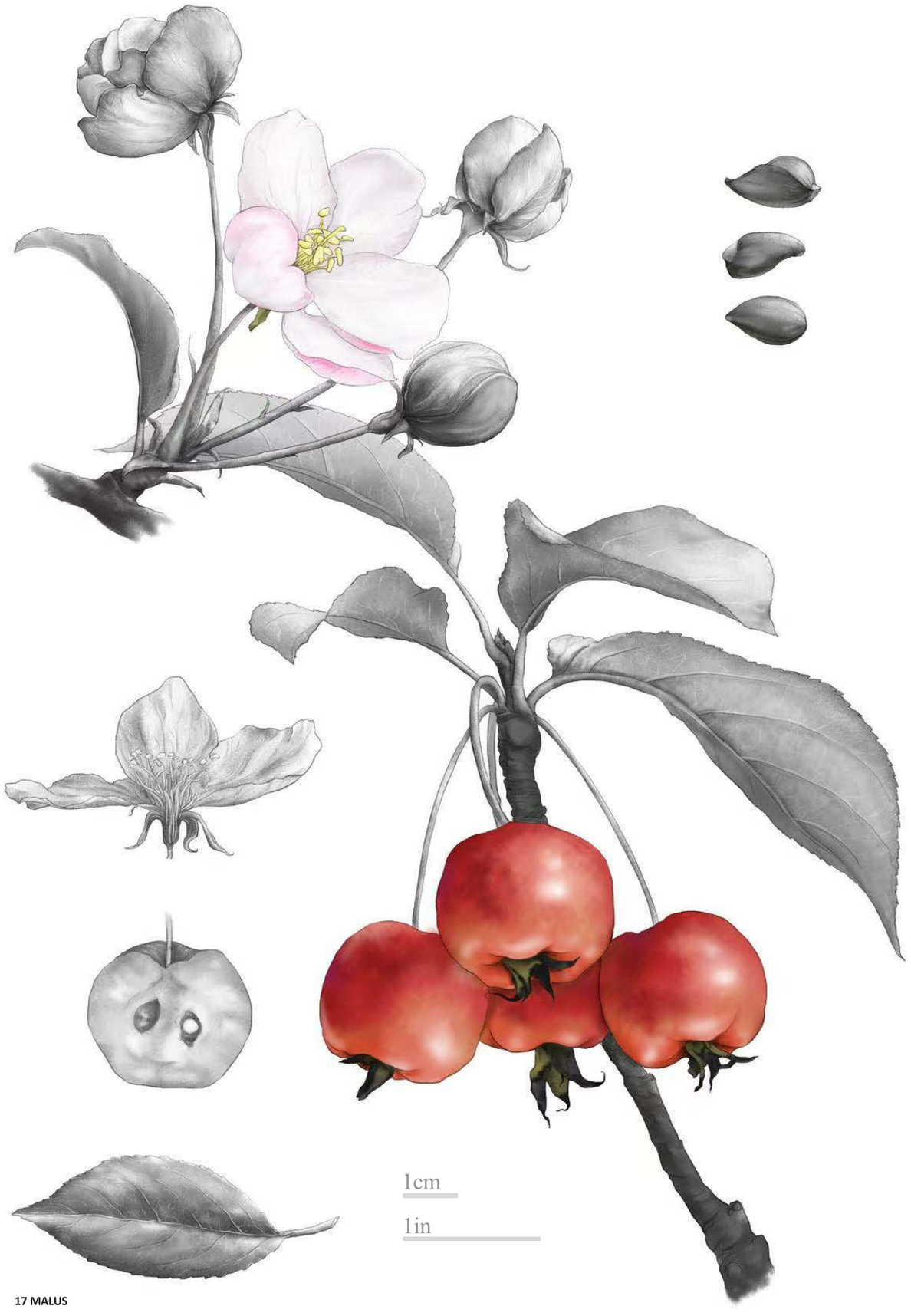
Text by Quan Jian and Shi Qingsong Illustration by Wang Yaling

The most popular of them all, is undoubtedly the vase topiary, where the top of the vase bursts forth with fragrant pinkish-white flowers in spring and glossy fruits in autumn.

Baleng Crabapple (八棱海棠), a ubiquitous cultivar in northern China is cherished for its versatility as an ornamental, a source of food and medicine, and as an apple rootstock. Its Chinese name, Baleng, or eight ridges, is derived from its unusual fruit shape of multiple protuberant ridges.

When naturally grown without regular pruning, Baleng Crabapple has a widely oval crown tree shape. Its stately and elegant appearance has made it a popular tree of choice for public landscaping in many parts of northern China. To satisfy an ever-growing demand for crabapple related products, innovative nurserymen intertwined the highly malleable branches of Baleng to create a plethora of topiary sculptures. The most popular of them all, is undoubtedly the vase topiary, where the top of the vase bursts forth with fragrant white flowers in spring and glossy fruits in autumn.

Huailai County in Zhangjiakou City, Hebei Province, China, is the most notable area for planting Baleng Crabapple in the country. The local cultivation history dates back more than 600 years, and there was once a complete industry for fruit planting, harvesting, processing and marketing. Currently, there are still large areas of Baleng orchards, and since 2008, Huailai has held a Crabapple Flower Festival annually.



Flowering Period: Late April to early May (in Northern China).

Flowers Per Stalk: 4 to 5

Flower Color: Start off pale pink and turn white when fully bloomed.

Flower Fragrance: Warm, delicate and sweet.

Fruit Shape: Flat and spherical with a diameter of about 2cm. Fruit's outline is not round and has 5 to 8 protuberant ridges.

Fruit Color: Fruit surface is glossy. By late summer and early autumn, the fruit's base color turns yellow with a touch of pale red, and by mid-autumn, the fruit ripens and turns completely red.

Fruit Flesh & Flavor: White and delicate flesh that is sweet and sour.

Fruit Persistence: Ripened fruits fall off easily, and the tree is usually completely devoid of any fruits by the end of autumn.

Fruit Harvest: Can be harvested twice a year. Yellowish-white fruits harvested in August are called "White Crabapples" and are processed into preserved or canned fruits. The bright red fruits harvested in October are called "Red Crabapples" and can be eaten fresh, dried, or pressed into juice.

Fruit Storage: Can be stored until May of the following year and does not bruise during transportation.

Folk Usage: Fruit flesh becomes softer with time, and in Chinese folk tradition, they are made into jam, candied fruit peel, or "tanghulu" (糖葫芦) a traditional Chinese snack consisting of several rock sugar coated fruits on a bamboo skewer.

Propagation: Germination rate of over 85% after 40 to 50 days of stratification, making them easy to propagate.

Rootstock: Seedlings are an excellent rootstock for apples, with strong grafting ability and relatively fast growth. Grafted young seedlings have very high survival rate, strong environmental resistance, and are highly adaptable to a wide range of planting regions.

WHAT IS IN A NAME?

Part One

Will the real *Malus* × *robusta* please stand up.

Quan Jian

For many years, getting the scientific name right for ancient Chinese cultivars has been my professional endeavor. Of all the cultivars that were being researched, I found the ubiquitous Baleng Crabapple most intriguing. The tree, its fruits and their by-products can be commonly found in many parts of Northern China. However, no one is certain of its origins and parentage, let alone come to a consensus on its scientific name. And when I went searching, this was what I found…

Some Chinese scholars believed Baleng Crabapple is a hybrid between *Malus baccata* and *Malus spectabilis,* and should therefore be classified under *Malus micromalus*.

Japanese scholars on the other hand, considered Baleng an improved variety of *Malus baccata*.

Materials published in Chinese citing "*Malus* × *robusta*" refers (almost without exception) to Baleng Crabapple. In recent years, cultivars bred with Baleng Crabapple have also emerged in the local market and are given names that are evocative of their flavors and textures. Some of the most memorable ones include *Malus* × *robusta* 'Baleng Cui' (Cui refers to the fruit's crisp texture), *Malus* × *robusta* 'Leng' (Leng means cold, and refers to the fruits persistence in winter), and *Malus* × *robusta* 'Niu Mama' (Niu Mama literally means mommy cows and refers to the rich almost milky texture of the fruits).

In the 1980s, Changli Fruits Research Institute of Hebei Academy of Agriculture and Forestry Sciences in Northern China conducted a comprehensive traits analysis of Baleng Crabapple and arrived at the conclusion that it is most likely a natural hybrid between *Malus baccata* and *Malus prunifolia*, thus linking it to the scientific name *Malus* × *robusta*.

The results reaffirmed the leanings of leading American horticulturist Alfred Rehder, who, in 1920, believed *Malus* × *robusta* should not be designated as a species, but rather, should consist of highly similar and almost indistinguishable group of cultivars with "*Malus baccata* × *Malus pruniifolia*" parentage under the scientific name "*Malus* × *robusta*".

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WHAT IS IN A NAME?

Part Two

Why Nomenclature Matters. To You.

Peter Button

It has been said time and time again that one of the keys to creating a responsible future for the horticulture industry requires accurate naming.

The Bard assured us, however, that “a rose by any other name would smell as sweet”. And nurserymen around the world have taken this adage to heart and generally ignored the need for good naming conventions when christening their new plant varieties. And suffering little or no consequence. Or so they think.

So why does it matter, to anyone, that every species, every cultivar should have accurate naming?

In our next issue, Mr. Peter Button, former Vice Secretary-General, International Union for the Protection of New Varieties of Plants (UPOV) walks us through, in great depth and with insightful infographics, the acronyms UPOV, POPV, PP, DUS, USPTO, amongst others, to help us connect the dots on why anyone and everyone should take accurate naming seriously. How to go about getting it right. And the impact accurate naming has on what matters most: financial returns based on plant breeders’ rights.

in search of

THE BEST

Guy E. Mecham

J. Frank Schmidt & Son Company (JFS) is an Oregon, USA based nursery, and we have been breeding and working with ornamental crabapples since the 1990s. The goal was to develop trees with improved ornamental characteristics and disease resistance for use in urban landscapes. That remains the pursuit of the company today.

When most people think of crabapples they automatically think of the flowers. While the quality of the flower is of course important, they are only present for a few weeks each year. The fruit is present for a much longer period and the leaves are present from spring to autumn. What good is a crabapple that has stunning flowers for two weeks a year but diseased ugly foliage for three months?! Before introducing a new crabapple to the public, it must clear a long list of hurdles, and it is no mystery that only a select few make it to the end of the rigorous selection process.

Controlled Breeding verses Open Pollinated Selection

Open Pollinated Selection has proved to be a valuable method of new cultivar introduction at JFS. It allows us to rapidly evaluate thousands of seedlings within a few years and identify new cultivars with the best potential for more detailed evaluation.

Each year between five to ten thousand seeds are collected from a pre-determined list of numbered crabapples in our breeding program. The fruits are cleaned, and the seeds are sown in outdoor seedbeds in the fall. Each seed lot is carefully labelled and separated.

After one year the seedlings are evaluated and a determination is made on how many seedlings should move forward to the next stage. At this stage we would typically keep about 50% of the seedlings. The seedlings that are kept are transplanted into a bed system on close spacing for a second year. They will then again be heavily graded throughout the year with 80% to 90% of them discarded in the process. This heavy grade out at a young age is necessary to keep the program manageable, otherwise the whole nursery risks turning into a giant evaluation plot!

Less than 2% of the cultivars are eventually selected and introduced to the public.

In our **Controlled Breeding** program, we begin each spring by drafting a list of crosses we wish to make from the trees in our breeding program. Flowers from the selected trees are collected and left to dry so that the pollen can be collected.

Before the collection of pollen, the branches are bagged with fine netting before the flowers open to prevent them from being pollinated by insects. Once the flowers open the netting is removed and the flowers on the branch are hand pollinated with the desired pollen. Each branch is properly labelled, and the netting is replaced and left in place until fall. Leaving the netting in place serves to stop the ripe fruit from falling to the ground or being eaten by wild animals before collection. We will generally make six to eight different crosses per parent tree.

The resulting seeds produced from these crosses are far more valuable to us than the open pollinated seeds. Therefore, they are not planted in a seedbed but stored until the following spring when after stratification, are sown in seed trays in a greenhouse. Our goal is to keep every seedling. After germination, the seedlings are transplanted into a liner pot and grown for one season in a greenhouse.

Our goal
is to keep every seedling.

Trial Row Planting – Group Evaluation
The following spring, all the seedlings from the controlled breeding program and the remaining 10% to 20% open pollinated seedlings are planted out into "Three Year Trial" rows. For the next three years no individual data will be collected but trees with superior characteristics will be marked with paint.

Different colored paint will be used to note different characteristics: Pink for flowers, Red for fruit and White for foliage. Over the three years the rows will be walked multiple times, and the best trees will collect more dashes of paint. At the end of the three years, it is easy to see which trees have been the best performers based on the number of paint dashes on their stems. During this period, any trees showing signs of disease such as fire blight, mildew or scab are immediately eliminated from the program. Typically, only 10 to 20 trees will move on from this stage of evaluation to the next.

Trial Block Planting – Individual Evaluation
It is at this stage (5 years on from when the fruit was collected) that individual evaluation of the trees begins. Each tree is given a code number when it is planted out into the long-term trial block. Evaluation notes are now made specifically about each tree. Growing and production trials begin.

Each year a row of *Malus* rootstocks in a production field is designated as a trial row. Trial plots of 10 to 15 rootstocks are budded with the numbered selections of crabapples from our trial plot.

All the trees in this trial row will receive exactly the same production treatments and care as the commercial cultivars already in production in that field.

These potential new cultivars are not only being compared against each other but also against cultivars that are currently in production.

A typical production crop of crabapples is in our fields for three to four years. Any potential new cultivar will go through this production cycle at least twice before any decision about introduction is made. In reality, most go through this process three or four times.

All this time, data and observational notes from these trees on production trials as well as the original tree in the long-term trial plot are meticulously gathered and regularly reviewed.

In developing new crabapple cultivars, what is JFS looking for?

Foliage

What is the foliage quality? Does is look good all year long.

What are the color, size and leaf shapes? Is there a preference in the market?

Is the leaf drop early or late?

Disease Resistance

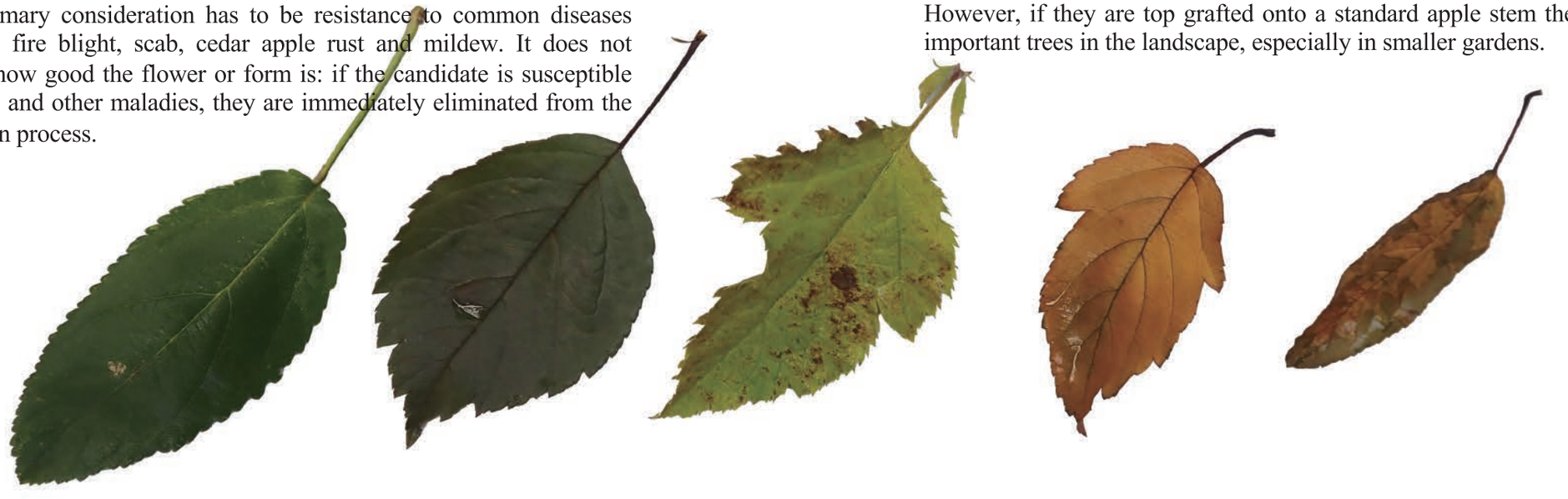
The primary consideration has to be resistance to common diseases such as fire blight, scab, cedar apple rust and mildew. It does not matter how good the flower or form is: if the candidate is susceptible to these and other maladies, they are immediately eliminated from the selection process.

Form

Shape and size: there is a place for all shapes and sizes of crabapples. However, they must have a uniform shape and size. There is little demand for trees with an irregular growth habit or shape.

Upright and columnar trees: there is now more demand for columnar crabapples allowing them to be used in smaller gardens and tighter spaces.

Dwarf or small trees: may not have commercial use if traditionally grown. However, if they are top grafted onto a standard apple stem they can become important trees in the landscape, especially in smaller gardens.



Flower
Does it flower early or late in the season?

Will the flowers be affected by spring frost?

Are the flowers alternate bearing? Crabapples prone to alternate bearing means there will only be a good flower display once every two years. A trait to be avoided!

What is the flower color?

Are the flowers single or double?

Do the flowers fall from the tree or persistently remain on the tree after blooming (looking withered and ugly)?

Fruit
In the United States, it is important that the fruits are small, hard and persistent. We have little demand for crabapples with large fruit.

In our program, we now aim for cultivars that have fruit that is no larger than 6mm in size.

Fruit should be brightly colored and remain on the tree as an ornamental factor after the leaves are gone.

Ease Of Production
Is the tree easy to grow? Does it have good nursery production characteristics?

Does it naturally produce and keep a central leader? A tree with central leader qualities is not only more profitable for the nursery producing it but will also more likely perform well in its final planted location be that a garden, park or city street.

Time and Patience

Developing new cultivars takes a lot of time and patience. The average amount of time that it takes JFS to evaluate and introduce a new crabapple cultivar is 15 to 18 years, from seed sowing to introduction. It is important that a new cultivar is not only better in some way than cultivars that already exists but that it has also been rigorously tested and stringently evaluated.

In the process of introducing the best of the best crabapples, tens of thousands of trees are grown, evaluated, disqualified and destroyed. Since the year 2000, an estimated 100,000 seedlings have gone through the JFS crabapple breeding program. Of those, 350 received a code number and were individually evaluated. Many of these 350 were excellent trees with numerous positive characteristics. However, JFS felt that only six of them merited introduction as a new cultivar. In numerical terms, less than 2% of the cultivars are eventually selected and introduced to the public.

The following are some of the crabapples JFS introduced to the market since 2000.

Malus ‘JFS KW214MX’
Ivory Spear® PP31076
Introduced in 2017
USDA Zone 4
One of our first two upright columnar crabapples. The deep pink buds open to white flowers on this tight narrow columnar tree with dark green clean foliage. In the fall the bright red fruits contrast well with the green leaves and persist well into autumn. The narrow form allows for use where a typical crabapple would not fit.

Malus ‘JFS-KW5’
Royal Raindrops® PP14375
Introduced in 2003
USDA Zone 4
This tree remains our most popular crabapple today. Bright pink flowers with deeply lobed purple leaves that holds its color well through the summer season. Upright form with good branching and density inherited from its Golden Raindrops® parent. Excellent disease resistance.

Malus ‘JFS-KW207’
Sparkling Sprite® PP27954
Introduced in 2015
USDA Zone 4
This tree was selected as a dwarf from our breeding program and is made available as a top grafted tree. The pink buds open to white flowers that smother the tree. The dark green foliage remains especially clean and disease-free for the entire growing season. The abundant golden yellow fruit is small and persists well into winter, turning from golden yellow to orange.

Malus ‘JFS KW213MX’
Raspberry Spear® PP31008
Introduced in 2017
USDA Zone 4
One of our first two upright columnar crabapples. Deep pink buds open to magenta pink flowers on this tightly columnar tree. The dark purple foliage holds up well through the heat of summer and the purple red fruits persist into early winter.

Esplanade Palatial

CCxA Landscape Architecture & Urban Design

The Esplanade du Palais des congrès de Montréal is a 2000 m² (0.5 acre) public square atop the Palais des congrès parking garage in Montréal, Canada.

Designed by Montréal-based landscape architecture firm CCxA founded by Claude Cormier (1960 – 2023), the creative force behind of some of Canada's most beloved, joyous, and critically acclaimed public spaces, the Esplanade serves as a vibrant gathering space for local residents, conference delegates, and tourists alike.

The biggest challenge for this project was building atop a parking garage without breaking the bank.





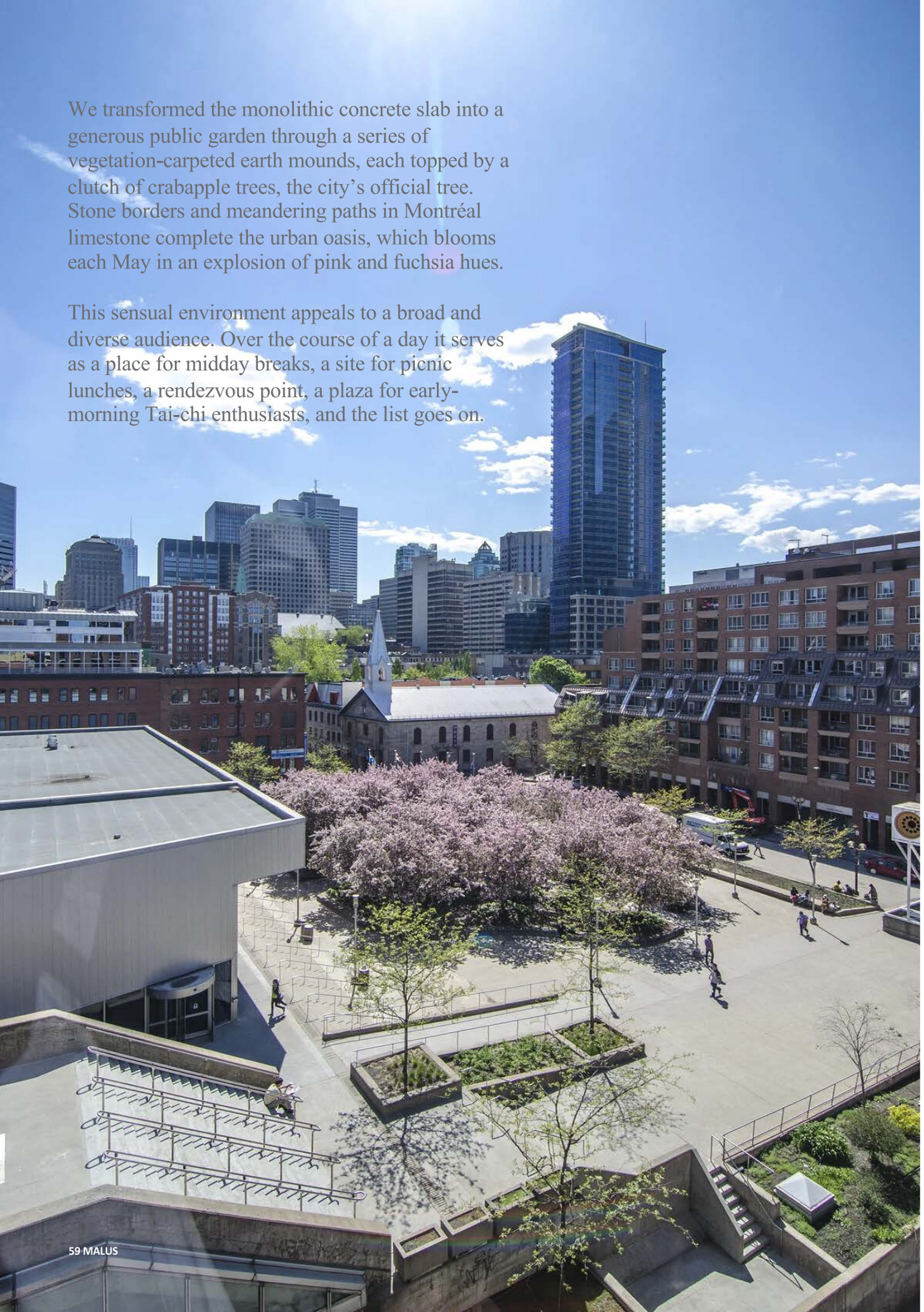

Each spring the blubbery buds bursts into a symphony of pinkish-white fragrant blossoms, and anyone walking into this urban forest will experience the otherworldly feeling of entering a gigantic bouquet of flowers.

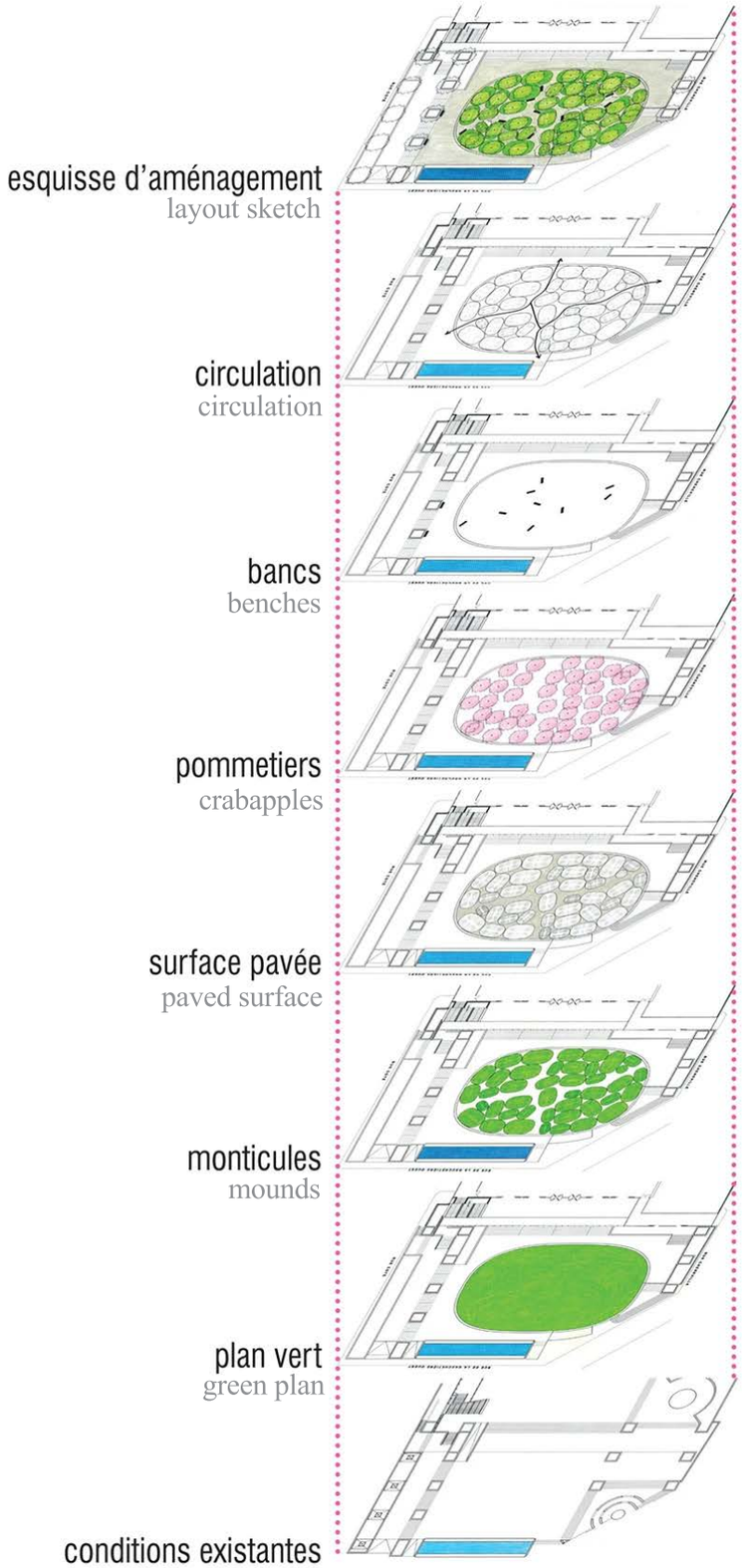
With the arrival of autumn, the crabapples' foliage becomes a kaleidoscope of colors.

In the winter months, the bare branches of the crabapples present a striking beauty and their remaining fruit provides food for wild animals during the coldest time of the year.

We transformed the monolithic concrete slab into a generous public garden through a series of vegetation-carpeted earth mounds, each topped by a clutch of crabapple trees, the city's official tree. Stone borders and meandering paths in Montréal limestone complete the urban oasis, which blooms each May in an explosion of pink and fuchsia hues.

This sensual environment appeals to a broad and diverse audience. Over the course of a day it serves as a place for midday breaks, a site for picnic lunches, a rendezvous point, a plaza for early-morning Tai-chi enthusiasts, and the list goes on.





Specifications

Client
Palais des congrès de Montréal
Société immobilière du Québec

Area
2000 m² (0.5 acre)

Year
1999 — 2002

Status
Built

Address
200 Rue de la Gauchetière O, Montréal, QC H2Z 1X7, Canada

Awards
2007 Canadian Society of Landscape Architects Regional Honour

Crabapple Cultivar
Malus ‘Makamik’
This cultivar was chosen for its hardiness, resistance to common crabapple diseases, high tolerance of pollutants, stunning display of fuschia colored flowers in spring, copper-tipped dark green foliage that turns golden-yellow in autumn, and clusters of dark red fruits that persists well into winter. An interesting plant through all seasons!

If a year was tucked inside of a clock,
then autumn would be the magic hour.

Victoria Erickson

On This Page. Autumn foliage of *Malus* ‘Golden Raindrops’

Merci beaucoup!

We are immensely grateful to the librarians at the Bibliothèque nationale de France for their assistance during our field research in the summer of 2024. In particular, we would like to convey our deepest appreciation to Jérôme Cohen-Tanugi for going over and above the call of duty to help us deftly navigate the Bibliothèque's vast collection. Merci beaucoup!

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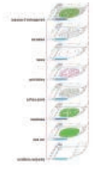
CCxA Landscape
Architecture & Urban Design


Zdeněk Kiesenbauer


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Jean-Francois Vézina


Raphaël Thibodeau


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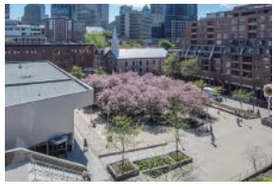
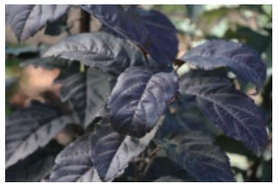
J. Frank Schmidt & Son Co.


Jean-Francois Vézina


Guillaume Paradis


Guillaume Paradis


Zdeněk Kiesenbauer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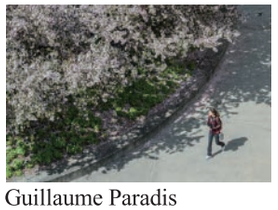
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Raphaël Thibodeau


Takuji Shimmura