



**BOTANICAL GARDENS  
AS A PART OF EUROPEAN CULTURAL HERITAGE**

*HEMEROCALLIS*

**(DENIVKA, LILIWIEC, VIENDIENĖ, TAGLILIE)**

Methodology

2020

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**Erasmus+**



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Park der Gärten, Germany

## **B-Arden! Botanical Gardens as a Part of European Cultural Heritage**

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## TABLE OF CONTENTS

I. INTRODUCTION OF THE GENUS <i>HEMEROCALLIS</i> .....	7
Botanical Description .....	7
Origin and Extension of the Genus <i>Hemerocallis</i> .....	7
Taxonomy .....	7
History and Traditions of Growing Daylilies .....	10
The History of the Daylily in Europe .....	11
Morphology, Biology and Horticultural Characteristics of Daylilies .....	13
Daylily Breeding .....	13
Hybridizing Techniques (by Hanne Rupp) .....	16
B-Ardent! Breeding Workshop .....	18
Daylily Use .....	20
International Daylily Societies, Registration and Evaluation .....	21
American Hemerocallis Society (AHS).....	21
The Society of Perennial Friends, Germany .....	22
Description and Evaluation of Daylilies .....	23
II. DAYLILIES IN BOTANICAL GARDENS .....	25
Průhonice Botanic Garden, Czech Republic .....	25
History and Traditions of Growing Daylilies in the Czech Republic .....	25
Daylily Projects and Organizations in the Czech Republic .....	26
Introduction of a Daylily Assortment in Průhonice Botanic Garden .....	27
Czech national breeding development of daylilies .....	28
Maintenance of the Daylily Collection in Průhonice .....	31
University of Wrocław Botanical Garden, Poland .....	34
History and Traditions of Growing Daylilies in Poland and in the Botanical Garden of the University of Wrocław .....	34
Daylily Projects and Organisations in Poland .....	37
Introduction of the University of Wrocław Botanical Gardens Assortments of Daylilies .....	40

Polish National Breeding Development .....	48
Maintenance of The Daylily Collection in the Wrocław University Botanical Garden .....	53
Vilnius University Botanical Garden, Lithuania .....	57
History and Traditions of Growing Daylilies in Lithuania .....	57
Daylily Projects and Organizations in Lithuania .....	58
Introduction of the Daylily Assortment in the Vilnius University Botanical Garden .....	59
Lithuania National Breeding Development of Daylilies .....	62
Maintenance of the Daylily Collection in Vilnius University Botanical Garden .....	65
Park der Gärten, Germany .....	69
The History and Traditions of Growing Daylilies in Germany .....	69
The History of the Daylily-Rondelle at Park der Gärten .....	69
Daylily Projects and Organizations in Germany .....	70
Introduction of the Daylily-Rondelle at Park der Gärten .....	71
German National Breeding Development of Daylilies .....	77
Recommended Daylilies for Various Garden Situations .....	78
Maintenance of the Daylily Collection in Park der Gärten .....	82
III. RECOMMENDED GARDEN CULTIVARS OF DAYLILIES .....	84
IV. SUMMARY AND RECOMMENDATIONS OF GARDEN MAINTENANCE OF DAYLILIES .....	86
Table of Garden Maintenance of Daylilies .....	87





## HOW TO USE THIS METHODOLOGY

This methodology was created within the European Union's Erasmus + international program. It is the result of cooperation between European botanical gardens, namely: Průhonice Botanic garden (Institute of Botany, Czech Academy of Sciences), University of Wrocław Botanical Garden – Poland, Vilnius University Botanical gardens – Lithuania, Gartenkulturzentrum Niedersachsen Park der Gärten – Germany.

It aims to be an educational and informative guide for professionals and the general public as well as training material for young employees or students. It focuses on an innovative comparison of the gardens in search of similarities, inspiration and a mutual understanding of the historical, cultural, social, educational, economic and horticultural characteristics as well as practices of botanical gardens in different European countries.

Although the botanical gardens in Europe have similar historical, cultural and social roots, they also have country-specific conditions for their origin, mission and development. The botanical gardens located in different countries have a varying climate, depending on the country and specific locality, as well as soil, resources, maintenance, pests and diseases. However, they can indeed grow the same plants. There are many levels to working in a botanical garden and it can offer a multitude of opportunities for informal learning. Every botanical garden is a unique location for educating students, young people and the public.

This methodology dedicated to daylilies is one part from a set of four booklets created within the project. It shall be followed up by two publications focused on significant iris and peony plant genera, while one booklet is dedicated to the topic of botanical gardens as a part of European cultural heritage.

The booklet is divided into 4 chapters enabling the reader to learn about collections of daylilies in terms of their scientific and historical significance. The first part is dedicated to a botanical introduction of the genus *Hemerocallis* (daylily) as well as the history and traditions of cultivating daylilies. The second part of the booklet is about partner gardens and the items they have incorporated. It deals with history, science, culture, arts and education in the context of botanical gardens. The third part offers a list of recommended varieties of daylilies as a conclusion of information from all partner gardens from different countries. The publication also offers up examples of good practice in the basic garden maintenance of daylilies, which are both important and useful for the reader. They can serve as inspiration or educational material. The last part of the methodology offers a list of resources, along with links to websites or publications both in English and in the national languages of our partner countries.





Landscape planting of a yellow daylily *Hemerocallis lilioasphodelus* in Arboretum Wojstawice



# I. INTRODUCTION OF THE GENUS *HEMEROCALLIS*

## Botanical Description

The daylily is a perennial which grows in clumps. Fleshy strong roots, which can have spindle-like thickenings, grow from a short rhizome. The leaves form a fan and they are simple, whole, relatively long and folded along the central vein. The stems can be single-flowered, but are more often terminated by a scorpioid cyme of 1 - 6 flowers. The flowers are usually trimerous. The fruit is a trilateral capsule.

## Origin and Extension of the Genus *Hemerocallis*

There are twenty species in the *Hemerocallis* genus worldwide. In the European territory (Italy, Slovenia) a yellow daylily *Hemerocallis lilioasphodelus* with yellow flowers or elsewhere a tawny daylily *H. fulva*, which blooms in orange color are found. Neither species are native, with both being escaped from gardens. The other eighteen botanical species grow in SE Asia (China, Korea, Siberia, Japan) and bloom in orange or yellow. These include, for example, the lemon daylily *H. citrina*, Dumortier daylily *H. dumortieri*, small daylily *H. minor*, Amur daylily *H. middendorffii* and the late yellow daylily *H. thunbergii*.



Map showing the natural distribution of the genus *Hemerocallis*

## Taxonomy

Phylum (phylum): green plants (Viridophyta/Chlorobionta)

Division (divisio): flowering plants (Magnoliophyta)

Class (classis): monocotyledons (Monocotyledones)

Order (ordo): asparagoid lilies (Asparagales)

Family (familia): asphodelaceae (Asphodelaceae Jussieu, nom. cons.)

Subfamily (subfamilia): hemerocallidoideae (Hemerocallidoideae Lindley)

Genus (genus): daylily (*Hemerocallis*)

## Species overview (The Plant List, September 2013):

- *Hemerocallis citrina* Baroni
- *Hemerocallis darrowiana* S.Y.Hu
- *Hemerocallis dumortieri* E.Morren
- *Hemerocallis esculenta* Koidz.
- *Hemerocallis ×exilis* Satake
- *Hemerocallis ×fallaxlittoralis* Konta & S.Matsumoto
- *Hemerocallis forrestii* Diels
- *Hemerocallis fulva* (L.) L.
- *Hemerocallis hakuunensis* Nakai
- *Hemerocallis hongdoensis* M.G.Chung & S.S.Kang
- *Hemerocallis lilioasphodelus* L.
- *Hemerocallis littorea* Makino
- *Hemerocallis middendorffii* Trautv. & C.A.Mey.
- *Hemerocallis minor* Mill.
- *Hemerocallis multiflora* Stout
- *Hemerocallis nana* W.W.Sm. & Forrest
- *Hemerocallis plicata* Stapf
- *Hemerocallis taeenanensis* S.S.Kang & M.G.Chung
- *Hemerocallis thunbergii* Barr
- *Hemerocallis yezoensis* H. Hara



Prof. Dr. Otto Wilhelm Thomé Flora von Deutschland, Österreich und der Schweiz 1885, Gera, Germany (<https://commons.wikimedia.org>)

## Species Group

Some of the daylilies have common characteristics like flower color, flowering habits or the branching of stems or roots, which help to divide them into groups.

<b>Citrina group</b>		
<i>H. citrina</i>	flower colour:	mostly yellow
<i>H. lilioasphodelus</i>	flowering habits:	nocturnal
<i>H. minor</i>	branching:	branched
<i>H. thunbergii</i>	roots:	cord-like, sometimes with tuberous parts
<i>H. yezoensis</i>	others:	flowers are fragrant with long perianth tubes
<b>Fulva group</b>		
<i>H. fulva</i>	flower colour:	brownish-red (fulvous)
<i>H. littorea</i>	flowering habits:	diurnal
	branching:	branched
	roots:	spindle-like thickenings
	others:	- - -
<b>Middendorffii group</b>		
<i>H. dumortieri</i>	flower colour:	orange
<i>H. esculenta</i>	flowering habits:	diurnal
<i>H. hakuunensis</i>	branching:	not branched
<i>H. middendorffii</i>	roots:	fibrous - <i>H. middendorffii</i> without thickenings
	others:	bracts mainly short and broad, overlapping
<b>Nana group</b>		
<i>H. forrestii</i>	flower colour:	reddish-orange
<i>H. nana</i>	flowering habits:	diurnal
	branching:	- - -
	roots:	fleshy with globose tuberous part
	others:	not winter-hardy, scapes max. 50 cm long, perianth tube shorter than 1 cm
<b>Multiflora group</b>		
<i>H. multiflora</i>	flower colour:	orange, orange-yellow
<i>H. plicata</i>	flowering habits:	diurnal
	branching:	many branches
	roots:	fleshy with tuberous parts
	others:	flowers on short stalks, smaller than 7 cm, tubes less than 2 cm long
<b>Others (not associated to a group)</b>		
<i>H. darrowiana</i>		
<i>H. graminea</i>		
<i>H. hongdoensis</i>		
<i>H. taeanensis</i>		
<b>Hybrids and cultivars</b>		

Taxonomic and horticultural division of daylilies adjusted to Species Groups (Dr. Juerg Plodeck & Dr. Jianping Zhuang Plodeck, 2003)





## The History of the Daylily in Europe

Perhaps the first mention of the daylily can be found in the book *Stirpium adversaria nova* from 1570 written by Mathias de l'Obel (Lobel) and Pierre Pena under the name *Asphodelus luteus liliflorus*. The plant was also called *Asphodelus liliaceus* or *Lilium luteum*. It should be added that the term golden lily or *Hemerocallis* can be found as far back as in Matthioli's herbarium from 1562, where we can learn: "*Hemerocallis Autoris* was first brought from Constantinople and in June often provides many beautiful flowers on one stalk." However, during that period, some lilies were often referred to as *Hemerocallis*, and the accompanying illustrations in Matthioli's herbarium depict lilies, not daylilies. Daylilies are also described by Clusius in about 1590. Some resources credit a Belgian physician Rembert Dodoens with being the first one to mention a daylily under the name *Lilium luteum* in his elaborate *Cruydeboeck* (1554).

Two hundred years later, in 1753, the father of the binomial nomenclature, Carl von Linné, used the name *Hemerocallis Lilio-Asphodelus* in his book *Species Plantarum*. According to A. B. Stout (1934), he then simplified the name *Hemerocallis flava* in the second edition of *Species Plantarum* in 1762. Today the plant is called *Hemerocallis lilioasphodelus* or lemon daylily (syn. yellow daylily, lemon lily). Linne's genus name very aptly described the behavior of the flowers when he used the Greek words "hemera" - day and "kallos" - beauty, that is, *Hemerocallis*, a plant whose flower is beautiful for only one day. And hence some national names are derived from that model: Czech - denivka, Lithuanian - viendienė or German - Taglilie. However, the abundant inflorescence or high number of stems in a clump compensate for these short-lived flowers.

Another species that has been present in Europe for centuries is *Hemerocallis fulva* or tawny daylily (syn. orange corn lily, tiger daylily, fulvous daylily or ditch lily). This daylily was also first described by Lobel as *Liriosphodelus phoeniceus*. Carl von Linné first called this plant *Hemerocallis Lilio-Asphodelus* var. *fulvus*, later *Hemerocallis fulva*. However, the German pharmacist Basilius Besler calls it *Lilium fatuum* in his *Hortus Eystettensis* from 1613. An interesting feature of this plant is the very fact that what has been grown in Europe for centuries is a sterile clone that does not produce seeds and multiplies only vegetatively. So all these plants come from only the one. Since 1929, the name *H. fulva* 'Europa' (Stout, 1929) has been used for this triploid clone ( $3n = 3x = 33$ ). Daylilies were first brought to North America by early European immigrants. Today *H. fulva* is on the List of Invasive Plants according to the US Department of Agriculture, and, because it is common along roadsides, it is also called a ditch lily.





Botanical daylily species can be used in garden design, too.





## Morphology, Biology and Horticultural Characteristics of Daylilies

For the horticultural use of daylilies, some features are more important than others. For instance roots can produce underground runners, as a heritage from *Hemerocallis fulva*, or grow as a compact clump. A similar characteristic is the branching of the stem: *H. citrina* abounds in a prolific number of branches and a large number of flowers on one single stalk, but *H. minor* has only one or two flowers on its stem. Occasionally, some varieties set stem proliferation regularly. In general, daylily cultivars are genetic combinations of different species and for this they provide a wide range of alterations, such as plant dormancy which can be described as a foliage habit of daylilies.

Dormancy is a temporary suspension of visible growth. All daylilies, regardless of foliage habit, are capable of cold temperature dormancy in the technical sense where it gets cold enough to suspend growth. But the true dormant daylilies lose their foliage completely before or shortly after frost and over-winter with pointed foliage buds, usually just beneath the soil surface. They resume growth in spring.

Evergreen daylilies retain their foliage throughout the year. In cold winter climates, they over-winter as a mound of frozen pale green foliage. Evergreens may resume growth during a mid-winter thaw in mild climates. Evergreen daylilies do not set dormant buds.

The flower characteristics of daylilies are worth an individual booklet on their own. We can describe the flower focusing on flower segments (tepals) and their edges, midribs, throats, the surface or the number of tepals in a flower whorl (single or double flower). We also pay attention to colors, color combination and color patterns apart from the size of the segments, shape and structure or any unusual feature. For more information about daylily characteristics, read the chapter "International Daylily Societies, Registration and Evaluation" or visit the daylily dictionary of American Hemerocallis Society [https://www.daylilies.org/ahs\\_dictionary](https://www.daylilies.org/ahs_dictionary).

## Daylily Breeding

It was not until the nineteenth century, when other daylily species were imported to Europe, in addition to the already domesticated *H. lilioasphodelus* and *H. fulva*, and occasionally grown *H. fulva* 'Kwanzo' (Kaempfer, 1712) and variegated *H. fulva* 'Kwanzo Variegata' (Thunberg, 1784).

The breeding of daylilies started in order to obtain something new and unusual. In Europe, the cultivar 'Apricot' (Yeld, 1893) was the first of the daylily cultivars. English teacher and enthusiastic breeder George Yeld (1845 - 1938) described it as a selection from the first generation of hybrid *H. flava* (syn. *H. lilioasphodelus*) × *H. middendorffii*. In the same year, it won an Award of Merit (AM) from the Royal

Horticultural Society, London. The cultivar 'Apricot' and his other work results 'Gold Dust' (1905), 'J.S.Gayner' (1928) and 'Radiant' (1931) are still present in gardens and daylily collections such as Průhonice Botanic Garden, Botanical Garden of the University of Wrocław – Arboretum Wojstawice or Park der Gärten.




'Apricot' (Yeld, 1893) is the oldest *Hemerocallis* cultivar

Breeding experiments were happening on the other side of the ocean too. In 1929, the director of the New York Botanical Garden, Arlow Burdette Stout (1876 - 1957), introduced the cultivar 'Mikado'. A.B. Stout himself said about the pedigree of this cultivar: "The plant has *H. aurantiaca* and *H. fulva* 'Europa' in its origins and was obtained after three generations of selective crosses." A.B. Stout was also the author of the first and perhaps still the most comprehensive work on daylilies from 1934: "Daylilies: The Wild Species and Garden Clones, Both Old and New, of Genus *Hemerocallis*". In his name, the American *Hemerocallis* Society (AHS) has annually awarded the "Stout Silver Medal" since 1950, which is the highest award that a daylily cultivar can receive. Examples of other high quality cultivars from Stout include 'Rajah' (1935), 'Brunette' (1941) or 'Caballero' (1941).

And thus the rise of new daylily varieties began to achieve a perfect metamorphosis of the botanical species into breathtaking new cultivars of recent years. In 2017, the American Daylily Society estimated the number of cultivars in the international register at about 84,500.

An important milestone in daily breeding was the artificial creation of tetraploids. Ordinary daylilies have 2 sets of chromosomes in the cell nucleus ( $2n = 2x = 22$ ; 2 sets of chromosomes by 11). Furthermore, triploid plants ( $3n = 3x = 33$ ) naturally occur, but plants with a double set of chromosomes ( $4n = 4x = 44$ ) were created by human hands. Tetraploid breeding began in the 1950s, when the alkaloid col-



chicine (from *Colchicum* - autumn crocus or meadow saffron), which was known to cause mutations, was used. However, the seeds of the colchicine plants did not germinate, but the first success was the germinating variety 'Crestwood Ann' (Fay-Griesbach, 1961).

The success of breeding tetraploid daylilies was confirmed much later. It was not until 1978 that a tetraploid yellow cultivar 'Mary Todd' (Fay, 1967) based on a cross (sdlg × 'Crestwood Ann') acquired the 'Stout Silver Medal'. The advantage of tetraploid plants are a larger cell nucleus, the cells have a stronger turgor, which allows for more robust growth and larger firm flowers. The advantage over diploid varieties: the flowers tend to be larger, have a more intense color, stronger scapes and a larger potential of colors and forms through the increased number of chromosomes. The substance of flower and foliage tend to be heavier. Diploids need less care and are smaller and much more fertile, which means more seed grains in the pods. Besides this, pollination by insects occurs more often. The reason for this is the shorter distance between the stamen and pistil than in tetraploid's flowers (herkogamie).



'Mary Todd' (Fay, 1967) was the first awarded tetraploid daylily and it is still an important item in the daylily collections of many botanical gardens

The systematic work of many breeders has greatly emphasized characteristics of the flowers, which were not very noticeable in botanical species or in the early hybrids. Thus, new colors and color patterns as well as various structures and shapes can be seen on flowers of the modern hybrids. The flower structures have been enriched with many innovative features.



The long way from the historical cultivar 'Brunette' (Stout, 1941) on the left to modern one 'The Band Played On' (Stamile, 2005) on the right shows how similar color schemes can change in the process of breeding.

### **Hybridizing Techniques (by Hanne Rupp)**

The first critical question is ploidy, since a tetraploid will only set seed with another tetraploid and vice versa by diploids. After this decision, the aim of the new crossing pursued has to be considered. Most breeding succeeds within similar flower categories but it could be a challenge to cross flowers from different groups. The result is often not very satisfying as experience has shown. The result is sometimes very surprising as the chromosomes in genes are dominant or recessive and not visible. If the same recessive genes of a new seedling come from both sides they can become dominant. For example two pink ones are crossed and then a cream-white seedling can be received if white ones occurred in both forefather generations.

The best weather condition for crossing is a temperature between 23°C and 25°C and for 3 hours below 32°C without rain. The simplest method is to begin by removing a stamen with ripe, powdery pollen, the male part, from one flower. The stamen is to be brushed onto the pistil of another flower, the female part. The stamen can be used for up to ten flowers for which crossing is desired. Recording the pod and pollen parents of crossing is important. The best method is a little tag directly under the flower and recording it in a document. Some hybridizers use little "protection hats" for the new pollinated pistil. Experience has shown that





free pollination does not occur very often when crossing tetraploids. About four to five days after pollination, the set flower will drop off. If pollination was successful, a very small green pod will be at the base of what was once the flower. The seed pod will slowly enlarge and will be ripe in 6 to 8 weeks. Frequent controls are necessary to prevent the grains from being scattered on the ground. When the pods become brown and are easy to crack open they should be harvested. The seeds are stored in a piece of paper towel and put in Ziploc bags for several weeks in the fridge vegetable compartment.

Then the seeds can be sown inside under light in a warm room at 21°C - 27°C. Germination usually takes place within two weeks. For planting outside in Germany, the best time is mid-May when the frost period is over. Once planted outside, plants will flower in the Northern part of Germany in the second or third year.



Mrs. Hanne Rupp demonstrates the breeding technique to the workshop participants



## B-Ardent! Breeding Workshop

One of the highlights of the project's meeting in Park der Gärten in Germany during summer 2019 was a breeding workshop held in the house garden of Hanne Rupp. In the autumn, all partners received seeds from their own crossings for the cultivation of new seedlings.



B-Ardent! participants attending a guided walk in Park der Gärten



The cultivar 'Marketa' (Rupp, 2019) was registered on the occasion of the B-Ardent breeding workshop in Germany.





Flowers with record materials prepared for hybridizing.



Multilingual welcome sign for B-Arden! Participants. Ammerland, July, 2019



Three-week old workshop seedlings, Průhonice, Feb 2020.



Flowers get an identification tag after pollination.



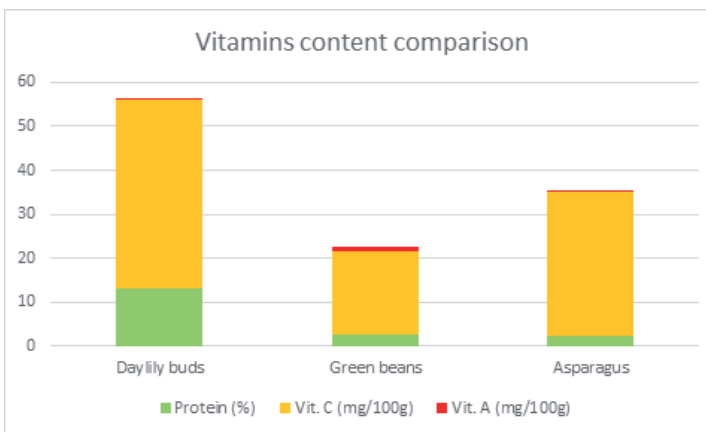
## Daylily Use

We know the daylilies mainly as ornamental plants. Their doubtless beauty and relatively low demands on conditions make them popular garden perennials. However, there are other ways of using this plant. In China, for example, *Hemerocallis fulva* was used to soothe mourners during funeral ceremonies.

Essentially the whole plant can be edible, but the most used part are the flower buds in oriental cuisine called golden needles. After drying, the golden needles are used as an ingredient in soups and other dishes. The buds are usually cooked, but they can also be pickled like cucumbers or eaten raw, as well as whole flowers, which are mainly used for decorating dishes and salads.



In Taiwan, collecting and drying flower buds is an important part of agriculture (Shutterstock, <https://commons.wikimedia.org>)



Vitamin content in daylily buds is comparable to asparagus with more protein





## International Daylily Societies, Registration and Evaluation

### American Hemerocallis Society (AHS)

It is also called American Daylily Society. It is a globally recognized authority and a holder of an international register for cultivars. They provide an on-line database of cultivars, where descriptions of all registered cultivars are available including photos in most cases. In January of 2019, there were 89,092 registered cultivars. AHS has created a dictionary of morphological terms and characteristics of the cultural varieties of the genus *Hemerocallis*. The Stout Silver Medal was established in 1950 in memory of, Arlow Burdette Stout (1876-1957), a pioneer of daylily breeding in the United States in the 1920s. So far, the distinction has been awarded to 70 daylily cultivars. The society gives the following awards annually:

**Stout Silver Medal** - the highest award a cultivar can receive, it can only be given to a cultivar that has first received the Award of Merit not less than two years previously.

**Award of Merit** – (AM0) this award is given to signify that a cultivar is not only distinctive and beautiful, but also performs well over a wide geographic area.

**Honorable Mention** – (HM) is the first official “stamp of approval” by the AHS, where good performance goes beyond the regional level.

The AHS Registration guidelines request the following descriptions for a new daylily cultivar:

The height of the scape in inches. Season of bloom. Diameter of the flower in inches as naturally standing. The average number of branches per scape. The average number of buds per scape. A brief description of the color and color pattern. Fragrance. Habit. Blooming habit (diurnal or nocturnal). Foliage habit (dormant, semi evergreen or evergreen). Ploidy (diploid or tetraploid). Flower form (single, double, unusual form or spider).

Their portal <https://www.daylilies.org/> provides a wide range of information starting from the Daylily Dictionary to journals, presentations, publications and registration rules and also including awards, database search, a list of display gardens or other resources.

In Europe, there are four AHS display gardens: Jarnin Keriel in France, Strictly Daylilies in Great Britain, Daylily Rondell in Park der Gärten in Germany and Botanical Garden of the University of Wrocław – Arboretum Wojstawice.



## The Society of Perennial Friends, Germany

(Gesellschaft der Staudenfreunde, Fachgruppe Hemerocallis (GdS). Societies section for *Hemerocallis* has more than 200 members and it holds European trials for daylilies and sets standards for the breeding and evaluation of daylily cultivars in Europe. The main aim of the group is to give knowledge about *Hemerocallis* culture. You can find them at <http://gds-hem-fachgruppe.homepage.t-online.de/>. The daylily trial is located within three gardens in different climatic conditions: Botanischer Garten Höxter (Germany), Cottbuser Gartenschau-Gesellschaft (Germany) and Arboretum Wojstawice (Poland). The system for testing new varieties of daylilies (the trial) is set for two years. During the first year evaluation, each plant gets points for flower form and color. During the second year and the final evaluation, points are given for color, number of buds, weather resistance (rain and hot sun) and habitus (flower stems clearly above the foliage).

A new type of daylilies called **landscaping cultivars** ("Landschaftssorten") is also judged in this system. These are represented by different qualities: Healthy leaves during the entire growing season. Mass and long distance effect of flower color. Flowers high above the foliage. Stems tough and upright. Floriferousness. Flowers resistant to weather impacts (rain and hot sun). Easy to propagate (underground runners aren't a disadvantage). Inconspicuous fading behavior. In contrast to this, special aspects of flower color, flower shape and flower size are of lower importance in this group.

**The European daylily of the year** is also chosen (Europäische Taglilie des Jahres)

The winners' plants, which are registered at AHS, get awards:

**Outstanding** Garden or Landscape Variety

**Recommended** or Landscape Garden Variety

**Valuable** Garden or Landscape Variety.



GdS 2019 awards (from left) 'Berliner Kontrapunkt' (Tamberg, 2017) Outstanding. 'Margitta Herm' (Beer-M., 2017) Recommended. KGardens Dancer (Krupka, 2020) as Sdlg. 06-08-01 Valuable (Photo Tomas Tamberg)



## Description and Evaluation of Daylilies

### Descriptor List for Daylilies by Průhonice Botanic Garden, Czech Republic

The Czech descriptor list consists of 80 descriptors in total: 65 morphological characteristics, which describe flowers, stems, leaves and roots and deal with size, color and arrangements. There are also 8 descriptors for biological characteristics like sprouting, dormancy and flowering time and 7 descriptors for utility features as resistance to diseases and pests or garden use.

The flower is described (42 descriptors) mostly in color characteristics and structures, but also in the size and texture of inner and outer tepals. It also includes 10 extra descriptors in case of new needs (new pests or diseases). It was created in 2017 and updated and published as a certified methodology in 2019. The descriptor list has been created for the needs of the National Programme on Conservation and Utilization of Plants, Animals and Microbial Genetic Resources Important for Nutrition and Agriculture.



The display of *Hemerocallis* in Průhonice is the garden's highlight in July

### Description of the Morphological and Decorative Characteristics of *Hemerocallis*, Lithuania

Issued by the Ministry of Environment of Lithuania, Plant Gene Bank, University of Vilnius Botanical Garden and Kaunas Botanical Garden of Vytautas Magnus University under the name: "Description of the morphological and decorative characteristics of *Hemerocallis* L. [methodological tool]". This methodology contains 28 descriptors in two groups – for the vegetative and generative part of the plant. Just like the Průhonice descriptor list, it focuses mainly on the characteristics of the flower, but it also describes features that are missing in the Czech version: roughness of the leaf surface, foliage stiffness, and stem posture, length of the perianth tube, flower firmness, throat size and shape, color of the filaments, pollen color or scent.





Daylilies make a good impression in combination with other perennials



## II. DAYLILIES IN BOTANICAL GARDENS

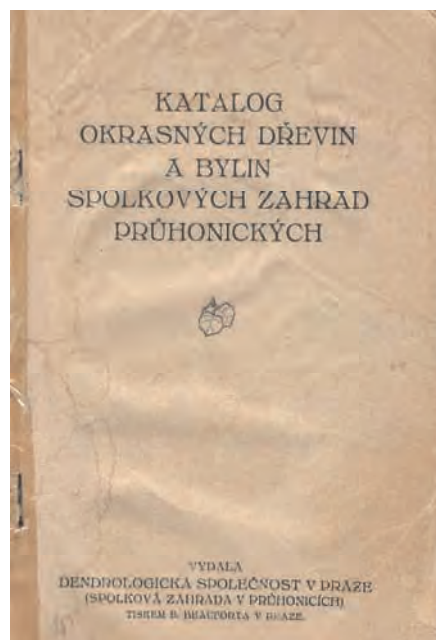
### Průhonice Botanic Garden, Czech Republic

#### History and Traditions of Growing Daylilies in the Czech Republic

Průhonice has been a part of Czechoslovak horticultural history for over a century due to the activities of the Czechoslovak Dendrological Society (existing from 1908-1954). Daylilies can be found on its list called the "Catalog of ornamental woody plants and herbs of the Průhonice Guild Gardens" in 1927. The following items were listed: "*H. aurantiaca* var. *major*, *H. flava*, *H. fulva*, *H. fulva* var. *kwanso*, *H. hybrida* 'Aureole', 'Orange Man', 'Sovereign', *H. Middendorffii* (*H.* 'Dr. Regel' Hort.), *H. Dumortierii* (*H. rutilans*), *H. luteola palensis*, *H. Thunbergii*, hyb. 'Apricot', 'Golden Bell', 'Queen of May', *H. ochroleuca* (*H. citrina* x *H. thunbergii*)."

Later in 1984, Milada Opatrná published a study called "Research of world assortments of perennials *Hemerocallis*", VUKOZ, Průhonice (today it is The Silva Tarouca Research Institute for Landscape and Ornamental Horticulture, a follower of Dendrological Society traditions). During a long-term cultivation experiment from the 1960s, research was aimed at the assortment's evaluation of 109 cultivars of daylilies. An assortment of 18 cultivars was recommended for the conditions of Czech gardens in the end. However, there is no mention of cultivars of Czech origin. Perhaps this is because daylily breeding is more of a hobby in the Czech Republic, while there are three nurseries specialized in daylilies: Nová zahrada, Denivková zahrada and Denivková farma Dolce.

In the Czech Republic, there are only two botanical gardens with extensive collections of daylilies. They are the Botanical Garden of the City of Prague (890 cultivars) and Průhonice Botanic Garden (630 cultivars). Other Czech botanical gardens have only smaller displays and they are mostly incorporated in the overall landscape design.



Front page of the Catalog of ornamental woody plants and herbs of the Průhonice Guild Gardens



## Daylily Projects and Organizations in the Czech Republic

The Průhonice Botanical Garden participates in the networks of the **Czech Botanical Gardens Union** and the National Program of Genetic Resources. It specializes in the conservation of ancient and historical varieties of ornamental plants (*Iris*, *Paeonia*, *Rosa*, *Hemerocallis*) and selected endangered species of domestic plants (*Iris pumila*, *Iris aphylla*, *Galanthus nivalis*, *Minuartia smejkalii*). We can call these collections a cultural heritage, a testament to the development of breeding, or a potential source of new breeding genes.

**The National Programme on Conservation and Utilization of Plants, Animals and Microbial Genetic Resources Important for Nutrition and Agriculture** was established by the Ministry of Agriculture in 1993 in order to ensure the preservation, availability and sustainable use of genetic resources for food and agriculture relevant to the Czech Republic. The Institute of Botany has participated in the National Program since 2006, initially with a collection of irises. Since 2015, collections of daylilies (*Hemerocallis*) and peonies (*Paeonia*) have also been included in the National Program. The collections include species and varieties that are important genetic resources or important milestones in breeding and also ancient varieties grown in the Czech Republic and cultivars of Czech origin. The condition of the National Program is to provide a description of plants with passport data (the origin of the plants) and by using a descriptor list that unmistakably uses morphological characters to describe a variety or species. Genetic resources are published in the GRIN Czech database: <https://grinczech.vurv.cz/gringlobal/search.aspx>

Another organization is **Gladiris**. It is a specialized core organization of the Czech Union of Allotment and Leisure Gardeners (Český zahrádkářský svaz, ČZS). They introduce themselves as follows: "It is here for all friends of gardens, lovers of fruit and vegetables and growers of beautiful flowers. It associates about 170,000 members from the whole Czech Republic, in 3,000 local organizations and 16 specialized ones. The Union guides its members to spend their free time pursuing their hobby, while there is great emphasis on the social use of the gardens and the raising of the young generation with a good relationship to nature." Gladiris gathers growers, breeders and admirers of sword lilies (*gladiolus*), irises, daylilies and other tuberous and bulbous garden plants. They publish a bulletin twice a year, hold exhibitions and flower shows and provide a database of varieties introduced locally (<http://www.gladiris.cz/evidencedenivek.htm>). The botanic garden cooperates with several breeders regarding plant exchange, donations of their varieties and attending the European *Hemerocallis* Trial.

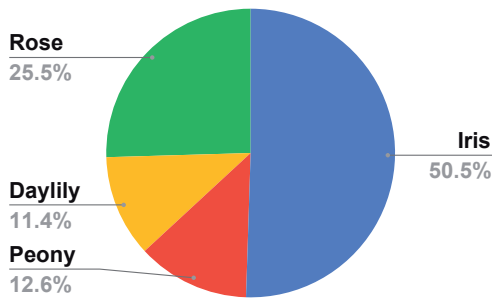


'Sluneční Třpyt' (Mimránek, 1994)  
An outstanding double variety  
donated to the Průhonice  
collection by its breeder

## Introduction of a Daylily Assortment in Průhonice Botanic Garden

### PRŮHONICE BOTANIC GARDEN

### Structure of Collections



### Daylily collection:

(Index Plantarum, 2019)

Together there are 641 items:

Botanical daylilies: 11 species

World breeding: 480 cultivars

Czech breeding: 150 cultivars

The Průhonice Botanical Garden at Chotobuz was founded in 1963. The concept of the collection, which in the timeline shows significant milestones in the breeding of the genus, from botanical species to the current breeding of varieties, is very unique within the botanical gardens of the Czech Republic. The collection of daylilies was founded in the 1970s by the garden's long-term leader, Milan Blažek. The collection was at first related to the research carried out by Milada Opatrná. But the core of the collection in the garden was donated by Mrs. Helen von Stein Zeppelin - the oldest German well known nursery (existing over 90 years), specialized in irises and daylilies. In 1995, a collection of 219 cultivars. The display of daylilies in the public part of the garden was established in 2009 and the cultivars are arranged in chronological order. In 2010, a new display bed with varieties of the Czech origin was incorporated into the collection. Today it is located at the Central Meadow and it is arranged by breeders. These plants were donated mostly by Florianus Gardening, Dolce Daylily Farm, Pavel Roubín, Petr Mimránek, and

Jiří Dudek. The plants were mostly exchanged or donated by different domestic and foreign sources. For example: Zdeněk Krupka, Lucon Bulbs, Botanical Garden of City of Prague, Botanical Garden of the University of Wrocław – Arboretum Wojstawice – Poland, Kwekerij Joosten – The Netherlands, Malgorzata Kralka – Poland, Vilnius University – Lithuania.



For a complete list of *Hemerocallis* in the Průhonice Botanic Garden see: <http://www.florius.cz>

Public events related to daylilies are not the key actions of the botanical garden. The garden's flagship is its iris collection and most of the events are related to irises. For daylilies, there are guided walks with the collection's curator.

## Czech National Breeding Development of Daylilies

Modern daylily cultivars are quite new to Czech gardening. In the 1970s and 1980s, the political situation made it difficult to get plants from abroad. The assortment of perennials was limited to a certain extent, but there were enthusiastic growers whose borders were not hindered. Among them Eduard Šťastný, who has been introducing a foreign assortment of daylilies to his private collection, exchanged plants and started breeding as his hobby. His son introduced most of the seedlings in 2002/2003 and they are easily identified by the acronym CZ in front of the cultivar's name e.g. 'CZ Prima' which is one of the earliest flowering varieties.



'CZ Spider' (Šťastný, 2003)



'CZ Prima' (Šťastný, 2003)





Today, the largest collection of daylilies in the Czech Republic belongs to Pavel Roubín, who has some fifteen hundred cultivars. None of the Czech botanical gardens have so many daylilies.



'Paron General Kotil' (Roubín, 2010)



'Paron Monika' (Roubín, 2010)

Another hobby gardener, Jiří Dudek, who also breeds irises and lilies, introduced many daylily varieties and elaborated the methodology for the registration of Czech daylilies for the Gladiris society.



'Josef Milich' (Dudek, 2010)



'Zafka' (Dudek, 2010)

Petr Mimránek focuses mostly on sword lilies (*gladiolus*), but his daylilies have received high scores at the European trial. In 2002, the dark red seedling 'Sb. 3/95' was nominated as the Recommended Garden Variety, while in 2019 his variety 'Petr Lebiš' (2019) was nominated as the Valuable Landscape Variety and 'Citronový Krystal' (2010) as the Recommended Landscape Variety. Unfortunately they are not registered with AHS and could not receive the award. Very interesting vivid red variety is 'Garden Park' (2014).



'Petr Lebiš' (Mimránek, 2019)



'Garden Park' (Mimránek, 2014)



Until 2017 the only registered cultivar with a Czech origin was 'Bohemian Child Band' (Ressel, 1995) introduced by Antonín Ressel. There is another one in the AHS register called 'Bohemian Garnet' (Ressel, 1995), but the latter variety has disappeared somewhere into the sinkhole of history. We know only its description from the database.

'Bohemian Child Band' (Ressel, 1995)

There are seven more other varieties from Ressel like 'Anre Margaret' in the Průhonice gene pool collection. German breeder Harald Juhr named one of his cultivars 'Anton Ressel' after his colleague (Juhr, 1996).

In 2019, there were nine more cultivars of Czech origin e.g. 'Hanakian Dance' (Aleksandr Naumenko, 2017) in the AHS database, all from this breeder. He is a professional horticulturist in the daylily breeding business with his company.



'Anre Margaret' (Ressel, 1991)



'Hanakian Dance' (Naumenko, 2018)

## Maintenance of the Daylily Collection in Průhonice

### Climatic Conditions

- Climate: humid continental (Köppen climate classification Dfb)
- Average annual temperature: 8.5°C
- Hardiness zone: 6b
- Average annual rainfall: around 570mm
- Altitude: 305m above sea level
- Soil types: modal brown soil, gleyed brown soil is present

### Basic Garden Maintenance of Daylilies in Průhonice

The display beds of daylilies are treated with weed control fabrics. For worldwide cultivars, the fabric is only between beds and covered with wood chip mulch, so it serves as a path. The fully grown foliage within dense planting (80 x 80cm) doesn't allow many weeds. Another way is to cover the whole display bed with the fabric and cut out openings for plants. The foliage can eventually hide the fabric. Automatic irrigation isn't present everywhere. In the local climatic conditions, mature daylily plants do not require additional irrigation. For new plantings, portable water pipes are used.



- Transplanting period - daylilies don't require regular transplanting.
- Winter treatment - it is recommended to cover weak or small plants for winter for frost protection.
- Spring cleaning - it is possible to cut down all foliage during autumn or clean and pick the already dry foliage in spring together with the first weed control. It depends on the weather during autumn. Fall cleaning helps against foliage fungal diseases and crown rot.
- Fertilizing - early spring application of a complete fertilizer Cererit (NPK (+MgO, +S) 8-13-11 (+2, +15) with B, Cu, Mo a Zn).
- Dead-heading - not performed, after all plants finish blooming and before seed pods are ripe, the stalks are removed. Seedlings from open pollination can degrade the high standards of gene pool collection and discredit the verification of species and cultivars.
- Pests - aphids are not significant to a certain extent, thrips can damage opening flowers as regards color and shape, gall midge - early cultivars can be damaged with flower buds becoming deformed. Insecticides Nurelle D (chlorpyrifos + cypermethrin) in combination with Mospilan (acetamiprid) are used twice in the season.
- Roe deer, hares, rabbits – merely a solid fence is effective.
- Diseases - leaf spot or leaf streak - not significant to a certain extent, no need for treatment, daylily rust - not present in CZ so far, crown rot and root rot - seldom.
- Weed control – after the early season cleaning of dry foliage, the first weeding follows along with soil cultivation and the application of pre-emergent herbicide (active substance Pendimethalin e.g. herbicide Stomp, Sharpen, Pendifin). Spot treatment of persistent weeds like couch grass (*Elytrigia repens*), dandelion (*Taraxacum officinale*) or purslane (*Portulaca oleracea*) is performed during the season with glyphosate.



Gall midge infestation causes flower buds deformations



Aerial view of the Arboretum Wojstawice – south-western panorama



## University of Wrocław Botanical Garden, Poland

### History and Traditions of Growing Daylilies in Poland and in the Botanical Garden of the University of Wrocław

It is difficult to determine when daylilies were firstly bred in Poland. The tawny daylily (*Hemerocallis fulva*) was an inseparable element of the nineteenth-century gardens all over Poland. Already in the 1920s, research was conducted whose aim was to analyse the cause of the formation of double-flowered plants and to explain the pollen formation in the plants in question.

Information on daylily species being offered for sale can be found in catalogues from Polish horticultural companies already in the 1930s ([http://www.liliowce.csl.pl/Historia\\_pl.html](http://www.liliowce.csl.pl/Historia_pl.html)). The first references regarding daylilies date back to the mid-twentieth century. Stefan Makowiecki (1860-1949), the editor of *Przegląd Ogrodniczy* (*Horticultural Review*) and an author of numerous publications on botany, horticulture and plant breeding, was probably the daylily breeding precursor. In 1947, in the June issue of the *Horticultural Review*, he presented his own observations on daylily species cross breeding. None of the varieties he bred have been preserved until now, and no variety was officially registered either.

A Jesuit monk, brother Stefan Franczak, was the first Pole to start registering hybrid cultivars with the American Hemerocallis Society (AHS). In 1979, he registered the following cultivars: 'Ewa' (Franczak, 1979), 'Jan Paweł' (Franczak, 1979) and others. In 1980, Antoni Koziorowski, registered his first and only cultivar – 'Helena' (Koziorowski, 1980). Nine years later, Artur Jasiński began to register his varieties – the first was 'Never Ending Story' (Jasiński, 1989).



'Ewa' (Franczak, 1979)



'Jan Paweł' (Franczak, 1979)

Daylily breeding became more and more popular in Poland at the beginning of the 21st century, along with the availability of species and cultivars which could be crossed, increasing significantly. New varieties have been registered by Jerzy

Byczyński since 2005. Then, Grażyna Świątkowska began registering varieties from 2010 and, from 2013, – Jerzy Bodalski, from 2014 – Stanisław Achramowicz, and in the same year Andrzej Celichowski. Later, from 2017, new varieties were created by Tadeusz Kosmus, as well as Tadeusz Kotula. In addition, Emil Gwizdała, along with the Lithuanian breeder Edvinas Misiukevičius, registered their own variety in 2018.



'Helena' (Koziorowski, 1980)



'Słowik' (Franczak, 1979)

### **The beginnings of daylily collection at the University of Wrocław Botanical Garden**

The first varieties of daylilies were brought to the University of Wrocław Botanical Garden in 1965. As a result of the efforts of Dr. Zofia Gumińska, 20 hybrid daylily cultivars were purchased from an American company Gilbert H. Wild & Son. They included the varieties: 'Aglow' (Hall-D.F., 1955) from D.F. Hall's breeding, 'Crimson Glory' (Carpenter, 1950) from C. Carpenter, 'Brunette' (Stout, 1941) – one of the oldest American cultivars, 'Kindly Light' (Bechtold, 1950), bred by J. Bechtold and others. In 1987, Dr. Jolanta Kozłowska-Kalisz became responsible for the Ground Plants Department. The daylily collection was steadily increasing as a result of exchanges with other botanical gardens and hobbyists. Kazimiera Więckowska, from Łódź, offered the Botanical Garden the first Polish cultivar of the daylily 'Słowik' (Franczak, 1979). In 1996, as a result of the efforts of Dr. Kozłowska-Kalisz, Stefan Franczak's new cultivars were presented in the Botanical Garden in Wrocław. It was then possible to enlarge the collection by over a dozen new Polish daylily varieties. Over the ensuing years, brother Franczak was successively offering his cultivars to the Garden in Wrocław. Altogether, the Botanical Garden received 101 of them. At the end of the 20th century, the Botanical Garden started cooperation with Jerzy Byczyński, a passionate daylily breeder, who shared cultivars imported from American nurseries with the Botanical Garden. In 2002, the Wrocław daylily

collection included 300 species and cultivars, and there was no room for further enlargement due to the limited space. In 1988, the Arboretum Wojstawice became a branch of the Botanical Garden of the University of Wrocław. It was the idea and initiative of Dr. Tomasz Nowak, to create a collection of these long lasting perennials at the Arboretum. Mgr inż. Hanna Grzeszczak-Nowak and Dr. Jolanta Kozłowska-Kalisz were the collection founders. In 2003, fragments of daylily parent plants were brought to Wojstawice from Wrocław. Then the collection was enriched with a number of cultivars offered by Jerzy Byczyński from his garden. In 2005, the area of the Arboretum was enlarged to 62 hectares, which created favorable conditions for gathering daylily cultivars. Polish breeders' cultivars were successively acquired and the collection was expanding. Also cultivars from German and Czech breeders were acquired.



Collection of daylilies at the Arboretum Wojstawice

**The impulse behind the creation of the daylily collection:** In the 1990s, the Arboretum Wojstawice attracted visitors mainly at the rhododendron flowering time. In order to extend the period of garden attractiveness, it was necessary to create new plant collections, attracting visitors in other months. Having analysed the situation, a decision was made on creating a daylily (not that popular at that period) collection in 2002. Before the Second World War, the Arboretum had an extensive collection of perennials, among other things peonies, iris and rock plants. Only a few of them remained, including an Asian tawny or orange daylily (*Hemerocallis fulva*), which survived, cuddled next to a tiny stone wall. It was therefore concluded that the Arboretum offered favorable conditions for growing plants of the genus *Hemerocallis* and for creating the collection. The decision was also influenced by the following characteristics of these plants:



- longevity, resistance to diseases and pests,
- no need to replant frequently and easy to grow,
- low habitat requirements and resistance to drought ,
- very long blooming period – up to 4 months, beginning after rhododendrons,
- abundant blooming – some cultivars produce up to 700 flowers per season,
- unusual variety of colours, sizes and shapes of the flowers,
- decorative leaves,
- easy vegetative propagation.

## Daylily Projects and Organisations in Poland

### National Collections

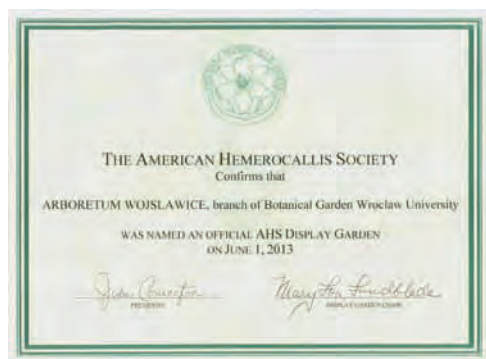
Since 2007, a certification program for botanical collections has been operating in Poland. It certifies the richest plant collections, run in a professional way, within a defined systematic group. It was the Polish Botanical Gardens Society that was first responsible for the process of registration. Currently, the program is implemented under the aegis of the Polish Dendrological Society.

A committee composed of three members performs the registration. The owner of the National Collection receives a certificate, a board describing the collection and the right to use the name and logo of the National Collection. Owning such a collection is a distinction for the owner and gives an indication of the uniqueness of their collection on a national scale. There are currently 25 National Collections in Poland ([www.ptd.pl/?page\\_id=1347](http://www.ptd.pl/?page_id=1347)).

On 6th September 2011, Arboretum Wojsławice was certified by the Polish Botanical Gardens Society, acknowledging that it is the holder of the Genus *Hemerocallis* National Collection.



Certificate of the Genus *Hemerocallis* National Collection



AHS Display Garden Certificate





Daylilies can be presented in a mass display (Arboretum Wojstawice)



## The American Daylily Society, also known as the American Hemerocallis Society (AHS)

In 2013, as a consequence of Artur Jasiński's recommendation and help, the Arboretum Wojstawice of the University of Wrocław Botanical Garden became a member of the American Hemerocallis Society (AHS), the largest and the most prestigious global gardening association ([www.daylilies.org](http://www.daylilies.org)). The same year, the AHS granted the Wojstawice daylily collection the status of an AHS display garden. There are currently only 260 AHS display gardens, mainly in the United States and Canada. In Europe, only four gardens have met the criteria necessary to obtain the certificate (daylily collections have to be properly labelled, well maintained, open to the general public, should contain at least 50 historical cultivars, and, as far as possible, should present different cultivar groups ([www.daylilies.org/daylilies/display-gardens](http://www.daylilies.org/daylilies/display-gardens))). The first display garden was the Park der Gärten in Bad Zwischenahn in Germany, and the second one is the Wojstawice Arboretum.



Collection of daylilies at the Arboretum Wojstawice

### Evaluation of daylily cultivars, Hemerocallis Trial

In 2014, at the initiative of Thomas Tamberg, Wojstawice Arboretum, one of the three Daylily Variety Assessment Stations of the Society of Perennials Enthusiasts, was established – a daylily Section (Gesellschaft der Staudenfreunde – Fachgruppe Hemerocallis), in which daylily seedlings, sent by European breeders, mainly from Germany, Czech Republic and Poland are tested.

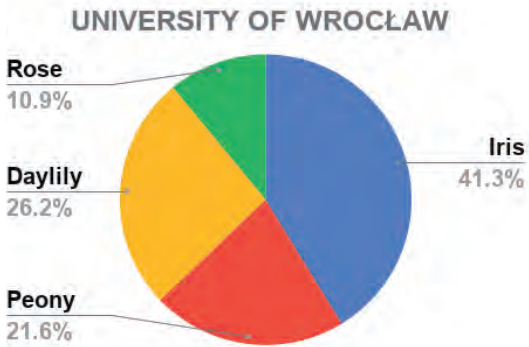
**The Hemerocallis Club** is the only daylily breeders' and daylily enthusiasts' organisation in Poland of this kind. It was established at the initiative of Professor Jerzy Bodalski. The club is an informal association of people interested in running and promoting creative daylily cultivation in Poland. It's aim is to register Polish varieties at international institutions. Club Regulations and Information about the members and meetings can be found on the website: [www.liliowce.net/hemerocallis-club](http://www.liliowce.net/hemerocallis-club).



## Introduction of the University of Wrocław Botanical Gardens Assortments of Daylilies

University of Wrocław has two botanical gardens in two locations. They are the Botanical Garden in Wrocław and Arboretum Wojsławice in Niemcza.

### Botanical Garden in Wrocław

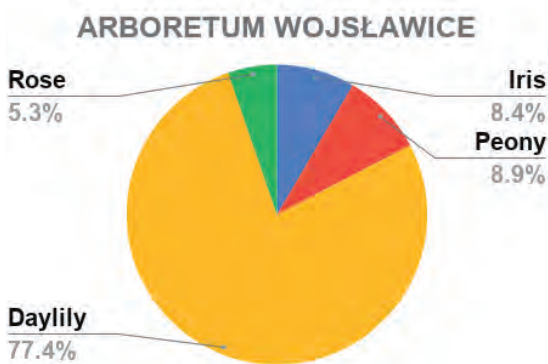


#### Structure of Collections

In the Botanical Garden in Wrocław, due to limited space, the daylily collection currently includes 14 botanical species and cultivars, and 249 hybrid cultivars.

All species and their botanical cultivars are planted on the flowerbed at the Department of Plant Systematics. Hybrid varieties grow at the Department of Ground Decorative Plants. The great majority of them are cultivars of Polish breeders and historical cultivars (registered before 1980).

### Arboretum Wojsławice



#### Structure of Collections

At the Arboretum Wojsławice, the daylily collection includes 20 species and their botanical cultivars and 3550 hybrid cultivars.

The collection is the largest one in Poland and one of the largest in Europe.

The first obtained daylily cultivars were planted in large, homogeneous groups, in the vicinity of trees and shrubs or as bedding rings. As the collection was expand-

ing, the plants started to be arranged and the theme-based bedding was created. One of the first was the flower bed on which the varieties of Stefan Franczak were planted in alphabetical order in 2004. A year later, miniature cultivars of small flowers, as well as so-called spiders – flowers that are very long and have narrow petals, were arranged.




Large group 'Brunnette' (Stout, 1941) in the Arboretum Wojslawice



Flower bed of daylilies and irises in the Botanical Garden in Wrocław

The beds were created with doubles and a fragrance flower cultivar later on. In the ensuing years, a section was established which presented species of daylilies which can grow in Polish gardens, and which gathered the oldest daylily cultivars, often forgotten and rarely grown, which still had scientific and historical significance. In addition, flower beds were created for cultivars with flowers with an eye, unusual form cultivars (the so-called UFO) and landscape cultivars. Cultivars awarded with the Stout Silver Medal are presented on a separate flower bed. There was also a section devoted to Polish cultivars, and another section with cultivars created by renowned American breeders. With the help of Thomas Tamberg and Hanne Rupp, a flower bed with a German daylily cultivar was created. In the same year, 17 flower beds with perennial plants presenting different daylily arrangements, together with other interesting perennials in various colour tones, such as white, orange or red, were created. They were designed by landscape architects and students, invited for cooperation. In 2017, with the support



of Markéta Macháčková from the Institute of Botany of The Czech Academy of Sciences, a flower bed originating from the cultivars of Czech breeders was made. Polish nurseries offered a significant number of cultivars to the collection of the Botanical Garden of the University of Wrocław free of charge.

### Sections of daylily collection

- **Miniature cultivars** – flower size is less than 7.6 cm (3 inches). The following cultivars, among others, belong to them: 'Mini Stella' (Jablonski, 1983), 'Bumble Bee' (Williamson, 1964), 'Coyote Moon' (Kirchhoff-D., 1994), and others.
- **Spiders** – the flowers have exceptionally long and narrow petals (the ratio of the petal length to its width is at least 4:1). The following cultivars can be identified, among others: 'Planet Max' (Reed, 1996), 'Tigereye Spider' (Reed, 1994), 'Spinnaker' (Stamile, 2004).



'Planet Max' (Reed, 1996)



'Tigereye Spider' (Reed, 1994)

- **Doubles** – with more than six petals in a flower. Full-flower varieties found in nature, such as *Hemerocallis fulva* 'Kwanso' (Kaempfer, 1712) and *H. fulva* 'Flore Pleno' (Stout, 1917), were sterile and could not be used for breeding new hybrid cultivars. The first full-flower cultivars were bred in the 1960s. These were, among others, 'Zelda Stout' (Stout, 1960), 'Arlow Stout' (Stout, 1960) and 'Double Challenge' (Kraus-Childs, 1962). Among the most recent full-flower cultivars, the following can be listed: 'Double Almond' (Childs-F., 1976), 'Forty Second Street' (Kirchhoff-D., 1991), 'Spotted Fever' (Brown-Oakes, 1995).





'Double Almond' (Childs-F., 1976)



'Spotted Fever' (Brown-Oakes, 1995)

- **Fragrant cultivars** – flowers which have a beautiful fragrance. They include, among others: 'Frozen Jade' (Sellers, 1975), 'Golden Scroll' (Guidry, 1983) and 'Lavender Blue Baby' (Carpenter, 1996).



The display bed with fragrant daylilies in combination with purple sedum is a favorite among visitors

- **Historical cultivars** – registered before 1980. The Arboretum collection has the following cultivars: *Hemerocallis fulva* 'Kwanso Variegata' (Thunberg, 1784), 'Apricot' (Yeld, 1893), 'Amos Perry' (Perry, 1905), 'Ribbonette' (Lenington-G., 1951), and others.
- **Eyed cultivars** – flowers have an eyelet – the pattern appearing on the petals in the zone between the throat and the upper part of the petal. Eyelets can vary, both in terms of the size, shape, colour and the number of colours. They

may be distinct, of contrasting colour, or poorly marked, only slightly lighter than petals. The following cultivars can be listed: 'Key to My Heart' (Carr, 1999), 'Black Eyed Bully' (Miner, 2006) or 'Bold One' (Lenington-G., 1964).



'Ribbonette' (Lenington-G., 1951)



'Key to My Heart' (Carr, 1999)

- **Ufo cultivars** (Unusual Forms) – very original cultivars which can't be classified in any of the previous groups. They have a unique structure and/or a unique shape of external or internal petals. In these daylilies, the length/width ratio of the petals is less than 4:1. One of the earliest cultivars is 'Asterisk' (Lambert, 1985). Other cultivars are as follows: 'Mighty Highy Tightly' (Cobb-K., 1987), John Karl Seager' (Hanson-C., 1996), 'Shanghai Beauty' (Plodeck, 2009) and others.



'Mighty Highy Tightly' (Cobb-K., 1987)



'Autumn Minaret' (Stout, 1951)

- **Landscape cultivars** – in addition to abundant blooming, they also have leaves with a beautiful and interesting form and appearance. In the case of



landscape cultivars, the beauty of the whole plant accounts for more than of a single flower. The following cultivars, among others, belong to the group: 'Citralt' (Tamberg, 2001), 'Autumn Minaret' (Stout, 1951) and 'Better Late than Never' (J.P. Murphy, 2005).

- **Stout Silver Medal Winners** – the highest, oldest and most prestigious horticultural distinction, awarded annually by The American Hemerocallis Society (AHS) to one new daylily cultivar. So far the distinction has been awarded to 70 daylily cultivars ([www.daylilies.org/awards/stout-silver-metal](http://www.daylilies.org/awards/stout-silver-metal)). The Arboretum possesses 35 awarded varieties: 'Bertie Ferris' (Winniford, 1969), 'Bill Norris' (Kirchhoff-D., 1993), 'Fooled Me' (Reilly-Hein, 1990) and others.



'Bill Norris' (Kirchhoff-D., 1993)



'Fooled Me' (Reilly-Hein, 1990)



'Bertie Ferris' (Winniford, 1969)

- **Polish breeding cultivars** – in total, 1,104 cultivars have been collected on the premises of the Arboretum Wojslawice: Jerzy Byczyński – 285 cultivars, Grażyna Świątkowska – 282, Leopold Kurek – 138, Tadeusz Kotula – 120, Jesuit monk Stefan Franczak – 117, Stanisław Achramowicz – 90, Adam Łopyta – 24, Tadeusz Kosmus – 23, Artur Jasiński – 19, Józef Nieściór – 3, Elżbieta and Zbigniew Bilscy – 1, Antoni Koziorowski – 1 and Janina Białobłocka – 1 a variety. Some of them were not registered with AHS.
- **American breeding cultivars** – both single cultivars, such as Stout, Salter or Trimmer and whole series are collected:
  - Chicago cultivar series – includes 74 very vigorous cultivars with stiff leaves, thick shoots and fleshy flowers. James Marsh, an amateur breeder from Chicago, a painter by profession, created them in the 1960s and 1970s of



the twentieth century. His 34 cultivars belonging to this series form a part of the Arboretum collection.

- Siloam cultivar series – bred in Siloam Spring – an American nursery in Arkansas, by Paulina Henry (1908-2000) – leader in the breeding of cultivars with tiny and small flowers. 474 siloam daylilies have been registered. The Arboretum staff has managed to acquire 68 cultivars.
- Series of Broadway cultivars – includes 52 cultivars of miniature and small flowers, full flowers and with eyelets, bred by Grace Stamile. The Arboretum possesses 16 cultivars from this series.



'Chicago Heirloom' (Marsh-Klehm, 1980)



'Siloam Candy Girl' (Henry-P., 1980)

- **German breeding cultivars** – it includes cultivars offered by the following breeders: Werner Reinermann, Tomas Tamberg, Margitta Herr, Gerald Hohls and Harald Jühr donated.
- **Czech breeding cultivars** – the collection includes cultivars which come from the following breeders: Jiří Dudek, Antonín Ressel, Jiří Šfastný, Petr Mimránek and Pavel Roubín.
- **Species and varieties** – the great majority of them were given by Dr. Jürg Plo-deck, a Swiss collector, who collects species also originating from natural sites or by Artur Jasiński. So far a total of 20 cultivars have been collected. The following ones have been acquired: *Hemerocallis citrina*, *H. dumortieri*, *H. esculenta*, *H. fulva*, *H. hookunensis*, *H. lilioasphodelus*, *H. littorea*, *H. middendorffii*, *H. minor*, *H. multiflora*, *H. thunbergii*, *H. yezoensis* and others.

All plants in the Botanical Garden of the University of Wrocław are given a label containing basic information. More detailed information is stored in a regularly updated electronic database. In addition, thematic educational boards are placed on flower beds dedicated to individual daylily sections.



The list of all daylilies in the Arboretum Wojslawice can be found at the website:

<http://arboretumwojslawice.pl/wp-content/uploads/2013/02/2020-Index-Plantarum-LILLIOWCE-.pdf>

## Hemeromania

For the last 15 years, during the full blooming period of the daylilies, usually in the second week of July, the Arboretum Wojslawice has been organising a daylily enthusiasts meeting – HEMEROMania – with the participation of daylily cultivation and breeding specialists from Poland and Europe. Interesting lectures on daylilies are given, floral shows and exhibitions of the most beautiful cultivars of these plants take place. A specific group of daylilies is usually chosen as the main theme of the meetings. As a way of example, the following ones can be listed: eyed daylilies, double-flowered or landscape daylilies. For those who might be interested, guided tours are also organised and the Wojsławice daylily collection is presented. A vote is also organised during the event, with the aim of selecting the most beautiful daylily from a Polish breeding. Voting is open to everyone who visits the Arboretum Wojslawice on the day of the event. More information available: (<http://arboretumWojstawice.pl/hemeromania>)



HEMEROMania 2018 from left: Tomasz Dymny, a lady from Gesellschaft der Staudenfreunde – Fachgruppe Hemerocallis, Tomas Tamberg, Jolanta Kozłowska-Kalisz, Markéta Macháčková, Hanna Grzeczak-Nowak, Gert Oellermann, Magdalena Mularczyk



Exhibition of daylily varieties – July 2019



Daylily flowers in the competition – July 2018

## Polish National Breeding Development

Over the last few years, daylilies have been more and more willingly planted in gardens, therefore daylily breeding in Poland is steadily developing and every year new hybrid cultivars, which can compete with the most beautiful in the world, are registered. Unfortunately, not every breeder registers their cultivar, which makes it impossible to define a precise number of daylily breeders in Poland.

### Polish Breeders

- Stanisław Achramowicz registered 51 daylily cultivars with AHS, 30 of which he registered together with Hanna Grzeszczak-Nowak. In order to promote Lower Silesia, the place he comes from, he named his tetraploid cultivars "Sudetic" and diploid varieties "Foresudetic"
- Janina Białobłocka (died in 2014) – the Arboretum collection has only one of her cultivars – an unregistered 'Stanisław'.
- Elżbieta and Zbigniew Bilscy – 'Krasnaja Zwiezda' is the only cultivar, unregistered, at the Arboretum premises, coming from their breeding.
- Jerzy Bodalski – in the years 2013-2018 he registered as many as 190 cultivars with AHS. He focuses his breeding on the morphological the variability of daylily flowers, variability of graphics and eyes colours, the sculpting of smooth petal surfaces, and the adaptation of new cultivars to grow in our climatic conditions.





'Sudetic First Violin' (Achramowicz & Grzeszczak-Nowak, 2014)



'Sudetic Kingdom' (Achramowicz, 2014)

- Jerzy Byczyński – his breeding goal is to obtain daylilies of large pastel-coloured flowers with contrasting eyes. In the years 2005-2019 he registered a total of 301 varieties, 219 of which he registered together with Dr. Tomasz Nowak.



'Filip' (Byczynski-Nowak, 2010)



'Marylka' (Byczyński, 2006)

- Andrzej Celichowski – in 2014-2018 he registered 24 daylily cultivars with AHS. He focuses on cultivars particularly well adapted to our climatic conditions.
- Stefan Franczak (1917-2009) – a Jesuit monk, famous for his bred daylilies, and also clematis (*Clematis*) and Iris (*Iris*). Between 1979 and 1995 he registered a total of 95 daylily cultivars. His cultivars are characterized by large, usually single-coloured flowers with saturated, vivid colours.
- Emil Gwizdała – in 2018 he registered 1 daylily cultivar with AHS.
- Artur Jasiński – he aim of his breeding passion is to obtain cultivars of large flowers with a long blooming period and adapted to the climate of Poland. In 1989 and from 2000-2013 he registered 21 daylily cultivars.



'Jan Kiepura' (Franczak, 1989)



'Mini Polka' (Jasinski-Treder, 2012)

- Tadeusz Kosmus – in 2017 and 2019 he registered a total of 6 daylily cultivars. He has also bred several dozen lily cultivars.
- Tadeusz Kotula – between 2017 and 2020 he registered a total of 179 daylily varieties, 50 of which together with Hanna Grzeszczak-Nowak and 4 with the University of Wrocław. His hybrids – with ruffled edges and serrated petals and with multi-coloured eyes have been winning the competition of the most beautiful daylily flower of Polish breeding for several years, which takes place during the HEMEROMania at the Arboretum Wojstawice.



'Maravilla Sunshine' (Kotula, 2018)



'Maravilla Avatar' (Kotula, 2019)

- Antoni Koziorowski (1924-2006) – he worked together with S. Franczak. In 1980 he registered 1 daylily cultivar with AHS.
- Leopold Kurek – he started breeding daylilies in the beginning of the 1980s. He aims to obtain cultivars of large flowers, with an unusual combination of colours, resistant to rain and sun.

- Adam Łopyta – he has been crossing daylilies using the process of mutagenesis in breeding. His aim is to obtain plants of patterned flowers and decorative leaves, adapted to the climate in Poland.



'Zamieć na Turni' (Kurek, 2007)



'Babka Cytrynowa' (Łopyta, not registered)

- Józef Nieścior – he started breeding daylilies in the 1970s. The Arboretum collection has 3 of his unregistered cultivars.
- Grażyna Świątkowska – the aim of her breeding is to obtain cultivars of large flowers with frilly petal edges, adapted to Polish conditions. In 2010, 2012 and 2017 she registered 7 cultivars.



Flower beds of blooming daylilies in July – Arboretum Wojstawice



## Recommended Polish Cultivars

- 'Sudetic Flower' (Achramowicz, 2017) – a unique cultivar, due to the shape of the flower, that looks more like an iris than a daylily.
- 'Foresudetic Morning Bells' (Achramowicz, 2017) – a cultivar of small, bell-shaped flowers up to 7 cm across, cream-coloured, with a pink eye, blooming abundantly.



'Sudetic Flower' (Achramowicz, 2017)

'Forsudetic Morning Bells' Achramowicz, 2017)

- 'Grom' (Byczyński, 2016) – a variety with a striking purple-violet eye. In 2016 it obtained a certificate of the Valuable Garden Variety, among European cultivars tested in the gardens of Höxter, Cottbus and Arboretum Wojstawice
- 'Hipolit Cegielski' (Byczyński-Nowak, 2016) – orange flowers with a red eye variety. Just like the cultivar 'Grom', in 2016 it received the Valuable Garden Variety certificate.
- 'Genowefa' (Franczak, 1994) – a cultivar with intense red flowers, abundant and very long blooming.
- 'Chopin' (Franczak, 1980) – a cultivar with golden yellow flowers, very resistant and abundantly blooming.



'Hipolit Cegielski'  
(Byczyński-Nowak, 2016)

'Genowefa' (Franczak, 1994)

'Chopin' (Franczak, 1980)

- 'Miasto Niemcza' (Kotula-University of Wrocław, 2020) – the cultivar received a silver medal in a competition for the most beautiful daylily flower from a Polish breeder. It was named after the town in whose administrative boundaries the Arboretum is located. The variety bred by Tadeusz Kotula and registered in 2020 by the University of Wrocław.
- 'Jubileusz AW' (Kotula & Grzeszczak-Nowak, 2018) – violet flowers with a black violet and lighter violet eyezone, a ruffled black violet edge and green throat. The name was given to commemorate the 30th anniversary of the incorporation of the Arboretum Wojstawice as Botanical Garden of the University of Wrocław.
- 'Polish Truffle' (Jasiński, 2009) – an exceptional variety with orange and amber, full flowers with a pastel red eye and narrow picotee and small teeth on the margins.
- 'Masuria Wonder' (Świątkowska, 2017) – a variety of very large (diameter approx. 20cm across), light yellow flowers with carved petal surface and more intense edges, extremely ruffled.



'Miasto Niemcza' (Kotula-University of Wrocław, 2020)



'Polish Truffle' (Jasiński, 2009)

## Maintenance of The Daylily Collection in the Wrocław University Botanical Garden

### Climatic Conditions

Climate temperate oceanic (Köppen climate classification Cfb)

Altitude:

- Arboretum Wojstawice 213 to 320m above sea level (valley, on the northern slopes of the Oak Hills)
- BG in Wrocław 116 to 120m above sea level (Silesian Lowland)

Average annual temperature:

- Arboretum Wojstawice 8°C, BG in Wrocław 8.4°C

Hardiness zone: Arboretum Wojstawice 6B, BG in Wrocław 7A

Average annual rainfall:

- Arboretum Wojstawice – around 571 mm
- BG in Wrocław – around 551 mm

Soil types:

- Arboretum Wojstawice – acidic brown soil is dominant (pH 3.8-4.7)
- BG in Wrocław – largely changed – artificially imported, alluvial



Diversity of daylilies in the Arboretum Wojstawice

### Basic Garden Maintenance of Daylilies

All beds of daylily are covered with weed protection fabrics, which also limits the excessive growth of daylilies. The holes in it are fired, which limits the destruction of the fabric at the places of the cut. Fully grown foliage hide the fabric.

- Depending on the size of the flower bed, daylilies are planted at a distance of 70-100 cm.
- Irrigation – the soil has excellent water storage capacity – daylilies don't require watering.
- Transplanting period – daylilies don't require regular transplanting.



- Winter treatment – daylilies aren't protected from frost.
- Cleaning leaves – it is possible to cut down all foliage during autumn or clean and pick the already dry foliage in spring along with the first weed control. It depends on the weather during autumn. Fall cleaning helps against foliage fungal diseases and crown rot.
- Fertilizing – the soil is very fertile, when preparing new flower beds, we feed the soil with manure, therefore it is necessary to fertilize only plants that grow more than 10 years in the same place. Fertilization takes place in early spring and complete fertilizers such as: Azofoska (N-P-K 10 – 5.5 - 8), Polyfoska (NPK (+MgO, +S) 5-18-20 (+ 7, + 9) are used.
- Dead-heading – not performed, after all plants finish blooming and before seed pods are ripe, stalks are removed.
- Pests – gall midge – hand-picking infected flower buds is usually sufficient.
- Roe deer, hares, rabbits – no damage due to the fence.
- Diseases – leaf spots appear rarely – generally no need for treatment.
- Weed control – all flower beds are with fabrics – weed control only by hand.



Arboretum Wojstawice offers a nice view of the hills nearby.



Daylily 'Arctic Lace' (Stamile, 2003)





## Vilnius University Botanical Garden, Lithuania

### History and Traditions of Growing Daylilies in Lithuania

The Floriculture Department of the Vilnius University Botanical Garden was established in 1992. Its main goals are the introduction of herbaceous decorative plants (field flowers), the accumulation of plants for collections, their care, conservation, and the creation of the plant exposition.




Daylily display in Vilnius University botanical garden

In recent years, daylilies (*Hemerocallis* L.) have been gaining in popularity. The number of daylilies registered by the American Hemerocallis Society (AHS) is very good evidence of this. The prospects of daylilies in Lithuania are very positive, especially once the newly bred cultivars start to spread. The color of their blossoms ranges from almost white to almost black. These long-life plants, which do not require any special care, will certainly find a space in many Lithuanian homesteads. The exotic form of the blossoms will fascinate even a choosy flower grower.

In the 15th century, two wild species were brought from East Asia to Europe: a brownish daylily (*Hemerocallis fulva*) and a yellow daylily (*H. lilio-asphodelus*). They were grown in Lithuania starting in the 16th century. They grew in flower gardens; however, lilies were more popular. Daylilies grow better in moist, fertile, moderately loamy soil. They were not planted in flower beds, but rather near the walls of a house, along the fence of the flower garden, often outside the flower garden. Daylilies were usually planted near the well or at the yard gate. Moreover, they used to grow





near the crosses at crossroads, next to the roadside chapels. They are grown in Lithuanian flower gardens as decorative plants resistant to Lithuanian climate conditions. It is supposed that daylilies have been grown in the gardens of Lithuanian manor houses, monasteries and parsonages since the 16th century. Jurgis Pabrėža (1771–1849) physician, botanist and the first researcher of Lithuanian flora was the first one to give the daylily a name in the Lithuanian language.

## Daylily Projects and Organizations in Lithuania

Nowadays, botanical gardens have been seeking to play a key role in the conservation of the world's plant diversity. Many botanical gardens are working together or in collaboration with other institutions in order to coordinate and target their conservation activities. The biggest treasure of any botanical garden is its plant collections. In 2019, the *Hemerocallis* collection had 400 items compiled in a database, which is one of the largest collections in the Baltic States. At present, the genetic resources collections consist of 600 flower taxa developed by Lithuanian plant breeders.

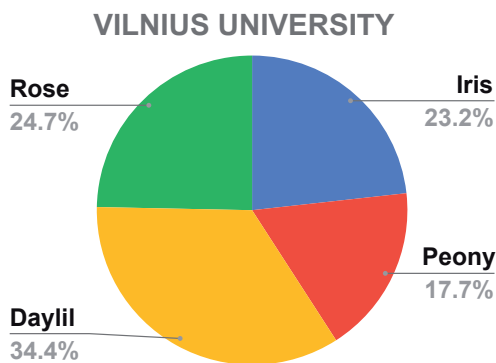
In 2001, the Parliament of the Republic of Lithuania adopted the Law on the National Genetic Resources of Plants, which regulates the accumulation, preservation and use of national genetic resources of plants and stipulates how to provide for a sparing use of these resources, protect them from devastation, extinction and complete destruction as well as to save the biological diversity. According to the provisions of this law, the genetic resources of plants, which have ecological, selective and economic value for the Republic of Lithuania, are selected and included into the central database of **National Genetic Resources of Plants**. This might be plant populations or their parts, single plants or their groups, or reproductive parts of plants (seeds, pollen, embryos, meristematic tissues, buds, sprouts). In accordance with the Joint Order of the Minister of Environment and the Minister of Education and Science, four science and study institutions, including Vilnius University, which coordinates accumulation, analysis and preservation of ornamental plants, are prescribed to perform the functions of the coordinative centres of genetic resources. The Plant Gene Bank with coordination centres of different plant groups (agricultural plants, forest trees, fruits and vegetables, medical plants and ornamental plants) has been established and is still operating. Characterization descriptors is one of the plant genetic resources documents that helps to distinguish different plant phenotypes easily and quickly. The mentioned descriptors indicate the features which are easily visible to the naked eye and appear uniformly under different environmental conditions. Morphological descriptions of species and biometric measurements of cultivars were carried out between May and July, when the plants were blooming massively.

Numerous collections of herbaceous ornamental plants have been accumulated in various Lithuanian institutions of science and studies as well as by private growers. Botanical gardens of Lithuania promote, collect, research and distribute daylilies. Valuable collections of daylilies are accumulated at the Vilnius University Botanical Gardens and Vytautas Magnus University (VMU). In the VMU Botanical Garden, daylilies have been growing for a very long time. Currently, the collection includes more than 100 species and cultivars of daylilies.

The **Lithuanian Horticultural Society** was founded in 1959. The founders of the Society were individual gardeners, florists and beekeepers. The Lithuanian Flower Breeders' Society, headed by agronomist P. Balčikonis was founded under the Society. The latter Society unites people interested in breeding, collection, propagation, distribution and other floriculture issues of flowers and other ornamental plants, who wish to promote their competence in this area and cooperate and contribute to the development of floriculture in Lithuania.

V. Vyšniauskienė and K. Vyšniauskas are the owners of one of the largest perennial flower farms in Lithuania, located in Gabšiai, close to Raseiniai.

## Introduction of the Daylily Assortment in the Vilnius University Botanical Garden



### Structure of Collections


Daylily collection in Vilnius University Botanical Garden:

Botanical daylilies: 10 species

World and Lithuanian breeding: 495 cultivars

Accumulation of the collection started in 1992. Most of the daylilies have been received from the VMU Botanical Garden (Lithuania), Salaspils (Latvia), Wrocław (Poland). Specification of the authors of the daylily cultivars, the year of breeding and identity was carried out according to the descriptions of the American Hemerocallis Society (AHS).

Lithuanian flower breeders have created not only cultivars of *Hemerocallis* but also *Dahlia*, *Gladiolus*, *Iris*, *Paeonia*, *Narcissus*, *Lilium*, *Tulipa*, *Primula*, *Clematis*,



*Crocus*, *Fritillaria*, *Lophospermum* and *Saintpaulia*. At present, genetic resources collections consist of 500 taxa from Lithuanian plant breeders. They are originals, adapted to the local climate conditions, and it is urgent to conserve, investigate and foster them as a part of the land's culture.

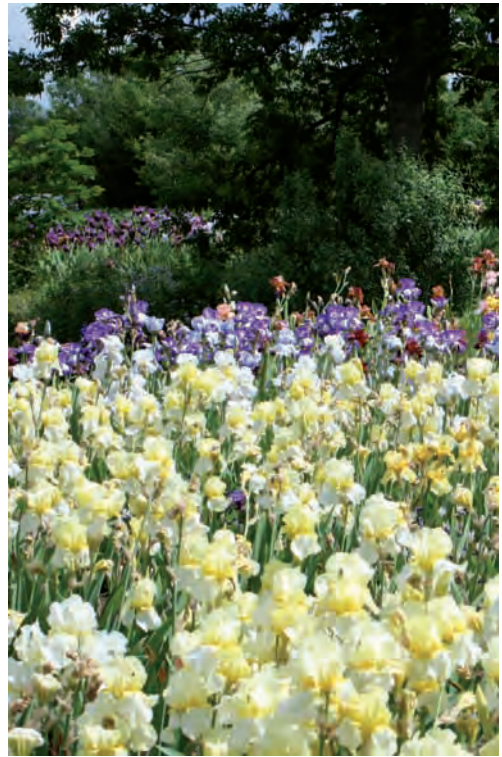
Flower cultivars created by Lithuanian plant breeders are introduced and grown in special collection nurseries in the Floriculture Department of the garden. The investigations, descriptions and evaluations of morphological and ornamental properties of ornamental plants are carried out according to the requirements of the International Union for the Protection of New Varieties of Plants (UPOV), Biodiversity International (BI) and methodologies used in neighboring countries.

A database containing information on all plant collections is used for the Vilnius University Botanical Garden collections and it is partly open to the public using QR codes, directing to <http://www.botsodas.lt/indexplantarum>. When used for educational purposes, the code is one of the simplest and convenient ways to provide various types of information about plants, it works really fast and today's youth enjoy it. Information is provided in Lithuanian and English.



Daylilies have a stunning mass effect in a garden landscape





Not only daylilies but also irises are included in the valuable collections of Vilnius University Botanical Garden

The expositions are designed and arranged not only to be decorative and convenient for collecting and providing scientific information to visitors of the Botanical Garden, but also for the simplified plant care. Every year, the expositions are supplemented with the most recent plant species and cultivars so that visitors can get acquainted with the achievements of Lithuanian and foreign breeders as well as the fashions and trends of flower selection.

The earliest daylilies – 'Daily Bread', 'Mai Konigin' – start blooming in late May or early June; whereas, the latest ones – 'Anna Wonderlang', 'Beloved Country' – start blooming in the second decade of July or later, depending on climatic conditions. In the area of the collection plants, mainly the cultivars created quite long ago (1950-70) are grown. About a tenth of the collection consists of newer cultivars, created from 1970 to 2006, the oldest cultivars are 'Nilbio' (1908), 'Hyperion' (1924), and the latest ones are 'Anna Warner', 'Dinkum Aussie', 'Hey There', 'Stella d'Oro' and others. Twenty-eight percent of the cultivated cultivars have received important awards.



Daylily flower show can accompany guided walks to introduce the collections

Every year, the Botanical Garden organizes the "Daylily" educational excursion which aims to introduce these plants to the general public and promote them in our country. The tour takes place when the collection has the most spectacular view - during mass flowering. During the educational tour, the plant taxonomy, the species and the cultivars growing in the Botanical garden are introduced, the variety of decorative features is shown and the Lithuanian cultivars and breeders are introduced. Information on planting, cultivation and care, most common diseases, pests and ways to fight them are also provided. All collections in the garden are used for various thematic educations. The collections included in the activity depends on the topic, e.g. "The Most Beautiful Garden Blossoms and Their Secrets" is conducted in May- September. Educational activity is more aimed for children, but it can also be adapted for adults. During this educational activity, the variety, colors and inflorescences of herbaceous plants are introduced and flower attendees are observed. Plants that bloom and do not bloom are introduced.

### **Lithuania National Breeding Development of Daylilies**

Interest in creating cultivars of daylilies began at the end of the last century when the cultivars of multi-colored daylilies were introduced in Europe (and in Lithuania). For the breeders of daylilies, breeding is not just a hobby but a difficult daily job as well. This involves research, discoveries and sometimes losses. The roads they take leading to breeding daylilies are also different.



A presentation of daylily cultivars can be in the form of a flower show as well

Lithuanian *Hemerocallis* breeders like Antanas Markevičius, Kęstutis Vyšniauskas and Viktorija Vyšniauskienė, Vitalijus Dereškevičius, Jonas Auksuolis Liutkevičius, Edvinas Misiukevičius, Pranciškus Puidokas and D. Žigarienė have created daylily hybrids and have grown their seedlings. We do expect that in the near future we will also have Lithuanian daylily cultivars which will be granted the Plant National Genetic Resource status. The International Union for the Protection of New Varieties of Plants or UPOV (French: Union Internationale pour la protection des Obtentions Végétales) uniting the states in which newly created cultivars are being researched, has developed the criteria for references to the description of plant cultivars; however, daylilies are not included. The Plant Gene Bank maintains the documentation of such plants in accordance with the requirements of Biodiversity International (BI).

Breeding of Lithuanian began in 1959, when the Lithuanian Horticultural Society was founded. The latter Society unites people interested in breeding, collection, propagation, distribution and other floriculture issues. As has already been mentioned, the brownish daylily (*Hemerocallis fulva* L.), the yellow daylily (*H. lilio-asphodelus* L.) together with the double daylily *H. fulva* 'Kwanzo' (Kaempfer, 1712) and variegated *H. fulva* 'Kwanzo Variegata' (Thunberg, 1784) have been grown in Lithuania for a very long time. Interest in creating cultivars of daylilies began at the end of the last century when multi-colored daylily cultivars were introduced in Europe (and Lithuania). More and more breeders became interested in them. Initially, G. Rumė, J.A. Liutkevičius, A. Gražys began creating cultivars of daylilies. Later, P. Puidokas,



D. Žigarienė, A. Markevičius, D. Žigarienė and E. Misiukevičius joined them. Co-operation with foreign breeders of daylilies (a Latvian Varis Bangieris, a German Gerald Hohls, an American Rebeca Blubaugh-Brown, a Canadian Mauren Strong, an American-Lithuanian Kay Yuodsnekis, a Ukrainian Svetlana Pikalova, a Czech Zdenek Krupka), began the exchange of experience, seedlings and plant material.



'Ziez mariu Vasara' (Puidokas, 2018)



'Danute Jadvyga Dainauskaite' (Puidokas, 2019)

Today, 27 cultivars with a Lithuanian origin are registered in the AHS.

- Cultivars of E. Misiukevičius:  
2020 registrations 'Lakelet Afterglow', 'Lakelet Balerina Tutu', 'Lakelet Cricket Song', 'Lakelet Devilish Kid', 'Lakelet Hold On', 'Lakelet Midnight Memories' (2020), 'Lakelet Subliminal Message' and older cultivars 'Lakelet Quick Jump' (2019), 'Lakelet Red Impact' (2019), 'Lakelet Reflecting Waters' (2018), 'Lakelet Sunshine' (2019), 'Lakelet Wild and Reckless' (2019), 'Mitsu' (2013)

'Biciu Duonele' (Liutkevicius-Misiukevicius, 2020)

'Lakelet Borrowed Blood' (Gwizdala-Misiukevicius, 2018)

- Cultivars of P. Puidokas:  
'Danutė Jadvyga Dainauskaitė' (2019), 2018 registrations 'Igno Pirmieji Dantys', 'Jadvygos Sapnas', 'Jurgos Svajone', 'Ziez mariu Jaunyste', 'Ziez mariu Vasara' and 'Luksiu Avietine' (2020), 'Ziez mariu Chameleonas' (2019) and 'Ziez mariu Zvaigzde' (2016)
- Cultivars of V. Vyšniauskiene:  
Introduction 2020 'Apatura Chestnut Fire' and 'Apatura Lavender Angel'
- Cultivars of K. Vyšniauskas:  
'Apatura Pastel Spider' (2020)



'Jurgos Svajone' (Puidokas, 2018)



'Jadvygos Sapnas' (Puidokas, 2018)



'Ziez mariu Vasara' (Puidokas, 2018)



'Geštančios Žvaigždės' (Markevičius, 2012)

## Maintenance of the Daylily Collection in Vilnius University Botanical Garden

### Climatic Conditions


- Climate: humid continental (Köppen climate classification Dfb)
- Average annual temperature: 6.4°C
- Hardiness zone: 6a
- Average annual rainfall: around 655mm
- Altitude: 112m above sea level
- Soil types – generally sand to sandy loam, the area of the collection is located on turfy, gleyic, loamy, light loamy soil, pH 5.6



## Basic Garden Maintenance of Daylilies in Vilnius University Botanical Garden

- Planting - the plants in the expositions are at a distance of 70 cm. Under Lithuanian climate conditions, it is best to plant daylilies in May (beginning of vegetation) and in August (end of blooming). The depth of the hole depends on the type of soil: deeper in lighter soils (about 60 cm) and shallower in heavier ones (about 30 cm). It is important that only 2-2.5 cm of the root collar is covered with soil. The width of the hole depends on the parameters of the root system. If the planting material is not fresh, it is recommended to soak it in water for several hours or in a weak aqueous solution of potassium permanganate ( $\text{KMnO}_4$ ), to shorten the foliage to 15 cm and the roots to 20-30 cm.
- Winter treatment – none.
- Spring cleaning – both spring and autumn cleaning is performed.
- Fertilizing – prior to planting daylilies, the soil was fertilized with bone meal (150 g/m<sup>2</sup>) and complex mineral fertilizers (50-70 g/m<sup>2</sup>). Fertilizers with very little or no nitrogen are used. It is recommended to use superphosphate in combination with wood ash. Additionally, compound fertilizers are applied from late April to early May because vegetative mass grows most intensively at that time. Afterwards, fertilization is not required until autumn. The main fertilization (end of August - beginning of September) has the greatest influence on blooming in the following year and helps to better prepare for wintering.
- Dead-heading – not – flower stalks are removed after blooming.
- Pests – currently the main pest is the midge (*Contarinia quinquenotata*) whose larvae develop in buds between May and July, damage them, and often the bud does not develop any further. This midge was first described in Europe in 1989. (Halstead, Harris, 1990). In Lithuania, the first isolated damages were observed in the collection of Kaunas Botanical Garden in 1995. This pest has not been observed in our collection. In long periods of rainy and humid weather, the leaves are gnawed by slugs and snails. Since 2002, the root damaging slug *Milax* sp. has been detected. The blossoms of daylilies are damaged by thrips (*Frankliniella hemerocallis*).
- Diseases – daylily is quite resistant to diseases.
- Weed control – a mulch layer (compost, peat, river sand, bark) should be spread around the plants in the first year of planting in autumn in a layer of 3 cm.
- Irrigation – The powerful root system of daylilies accumulates large amounts of water; therefore, they are drought tolerant plants. Certainly, if they lack humidity, their blossoms become smaller, some of them do not bloom at all, and later the leaves begin to turn yellow. Under Lithuanian climate conditions,





humidity is sufficient in spring, and drought often occurs in summer. Daylilies should be watered not frequently but abundantly. The frequency of watering depends on the mechanical composition of the soil: once a week is sufficient when growing the plants in heavier soils and twice a week for light soils. It is best to water in the evening and avoid watering on blossoms. It is especially important during the blooming period because if water drops stay on flower buds, then the blossom the next day will have spots.



*Hemerocallis fulva* growing in Trakai - Lithuanian historical village.



For the complete list of *Hemerocallis* collection in Vilnius University Botanical Garden visit:  
<http://www.botsodas.lt/indexplantarum>





The Daylily-Rondelle in Park der Gärten



## Park der Gärten, Germany

### The History and Traditions of Growing Daylilies in Germany

Daylily cultivars have not been very common in Germany. People mostly only knew the species *H. fulva* and it was often heard that: "This brownish red flowering perennial with its widely spreading rhizomes are only good for planting along railways". In English its nickname is "ditch lily". Recently, due to the great movement of hybridizing and due to display gardens, garden shows and botanical gardens, daylilies have gained a wide range of admirers.


### The History of the Daylily-Rondelle at Park der Gärten

Since the Niedersächsische Landesgartenschau garden exhibition in 2002 in Bad Zwischenahn, visitors have come to like the "new flowers" (daylilies) more and more. This was the reason why Karl and Hanne Rupp, as members of German and European daylily groups, wanted to show people the value and possibilities of daylilies in all their varieties first planted in a small arc display bed. The International Service Award 2003 for Hanne and Karl Rupp was given for this project from the American Hemerocallis Society (AHS). The AHS is the most important daylily society in the world with more than 5,000 members. In 2005, park managers Christian Wandscher and Björn Ehsen along with Karl and Hanne Rupp decided to



The new Daylily-Rondelle was planted in 2005





move the daylily display to another location. Hans-Joachim Adam, an excellent German landscape architect created the new project, the 1,200 square meter "Daylily Rondelle".

## Daylily Projects and Organizations in Germany

For over 90 years, the oldest well known German nursery Staudengärtnerei Gräfin von Zeppelin in Laufen, South-West of Germany, has specialized in irises and daylilies. In the Ammerland, the perennial nurseries Bremermann and Wichmann, both in Wiefelstede, have many varieties of daylilies, as well as rather new ones. Their *Hemerocallis* assortment is highly influenced by the Rondelle in the park. Apart from this, if the daylilies in the Rondelle become too large and have to be divided up, the surplus part goes to both nurseries free of charge.

**The German Perennial Plant Society** called Gesellschaft der Staudenfreunde ([www.gds-staudenfreunde.de](http://www.gds-staudenfreunde.de)) has about 4,800 members. It was founded as the "Iris Society" (Deutsche Irisgesellschaft") in 1950, later in 1960 it was renamed the German Iris and Lily Society ("Deutsche Iris- und Liliengesellschaft"), while in 1973 it was named "Gesellschaft der Staudenfreunde" (GdS). The GdS has many regional groups for perennials. Besides that, there are 13 specialized groups. For daylilies, it is the group called **Fachgruppe Hemerocallis** with more than 200 members. Christina and Tomas Tamberg have led this group for many years. The aim of the group is to provide knowledge about *Hemerocallis* culture and the breeding of daylilies. They hold annual meetings for daylily friends and create publications to make daylilies more popular. The annual seed exchange has encouraged many members to try and breed their own seedlings.

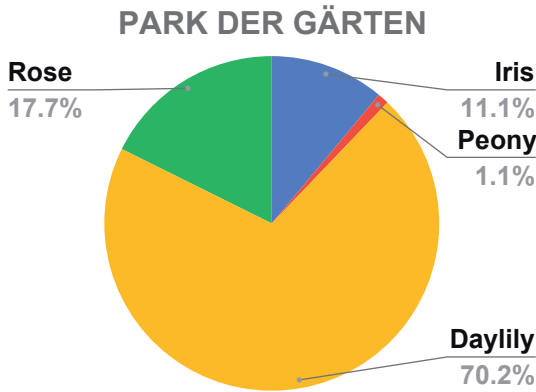
Three public daylily display gardens exist in Germany:

- Taglilien-Schaugarten Ulm  
The Ulm Botanical Garden features a myriad of plants in its perennial border with *Hemerocallis*, Hostas, Phlox paniculata, Platycodon, Miscanthus and others.
- Tagliliengarten im Stadtpark von Uerdingen  
The Stadtpark of Uerdingen is a spacious park for citizens with various playgrounds, ponds and perennial borders and an Arboretum. For some years, recently installed beds of daylilies mainly from regional breeders especially from Ulrich Kaiser have been shown.
- Daylily-Rondelle at Park der Gärten



The Daylily-Rondelle during the flowering period

## Introduction of the Daylily-Rondelle at Park der Gärten



Structure of Collections

With altogether 580 daylily species and cultivars (about 6% of all labeled plants at Park der Gärten), the daylily breeding is presented in chronological order.

It represents daylily breeding beginning with 25 *Hemerocallis* species and historical cultivars more than a hundred years old, which are planted in two rings divided by decades. It clearly shows the development of hybridizing, for example the conversion from diploid to tetraploid starting in the 1970s.

The daylily display beds provide an idea of the huge variety of modern daylilies:

- **Spiders and unusual forms, miniatures, lavender** near blue ones.
- **The hybridizer beds** were sponsored by German and Floridian breeders such as: Tina and Tomas Tamberg, Werner Reinermann, Harald Juhr, Ilse and Ulrich Kaiser, Dan Hansen, Florida, USA, Marc King, Italy
- **Roswitha Waterman Award Winner-bed:**  
The former daylily group “Hemerocallis Europa” sponsored the “Waterman Award” in 1997. It was named after Roswitha Waterman, the longstanding AHS International Membership chair. The annual winner was determined by members of the group of American cultivars with a tenure of at least 5 years, performing very well in Europe. Each member of the group had one vote. The last award was given in 2011 to the cultivar ‘Rock Solid’ (Stamile, 2002) winner of AM 2011 and HM 2008. After that time, “Hemerocallis Europa” ceased to exist.
- **Polish daylily bed:**  
The hybridizer of these cultivars are: Jasinski, Bycznski, Franczak and Achramowicz.  
On the other hand, several German cultivars went to Poland for the “German bed” in the collection of daylilies of Arboretum Wojstawice. A partnership was established between Arboretum Wojstawice and “Taglilien Rondell Park der Gärten, Bad Zwischenahn”.



A visit from Arboretum Wojstawice in 2015 initiated a partnership






Polish cultivars 'Chopin' (Franczak, 1980) on the left and 'Polish Cocktail' (Jasinski, 2002) are growing very well in Bad Zwischenahn.

In 2006, the Daylily Rondelle of Park der Gärten was the first display garden outside of North America. There are a few conditions for a display garden: It has to be open to the public. The responsible individuals must have belonged to AHS for at least 2 years. It is also required to grow a wide variety of daylilies, including newer introductions. The garden must be well maintained and all daylilies must be clearly labelled. Every year it has to be renewed (more information about the Display Garden regulations at [www.daylilies.org](http://www.daylilies.org)).



Signboard of a display garden of the American Hemerocallis Society (Photo A. Osterloh)



In 2007, the Rondelle got the award to be a “Hemerocallis Society Historic Display Garden” on account of its many old varieties. This means that a minimum of 50 historic cultivars and species need to be in the collection. Historical cultivars refers to those introduced before 1990, which is a rolling date, which changes by ten years every decade. In the Rondelle, the cultivars start after the species with the first recorded daylily 'Apricot' (Yeld, 1893).



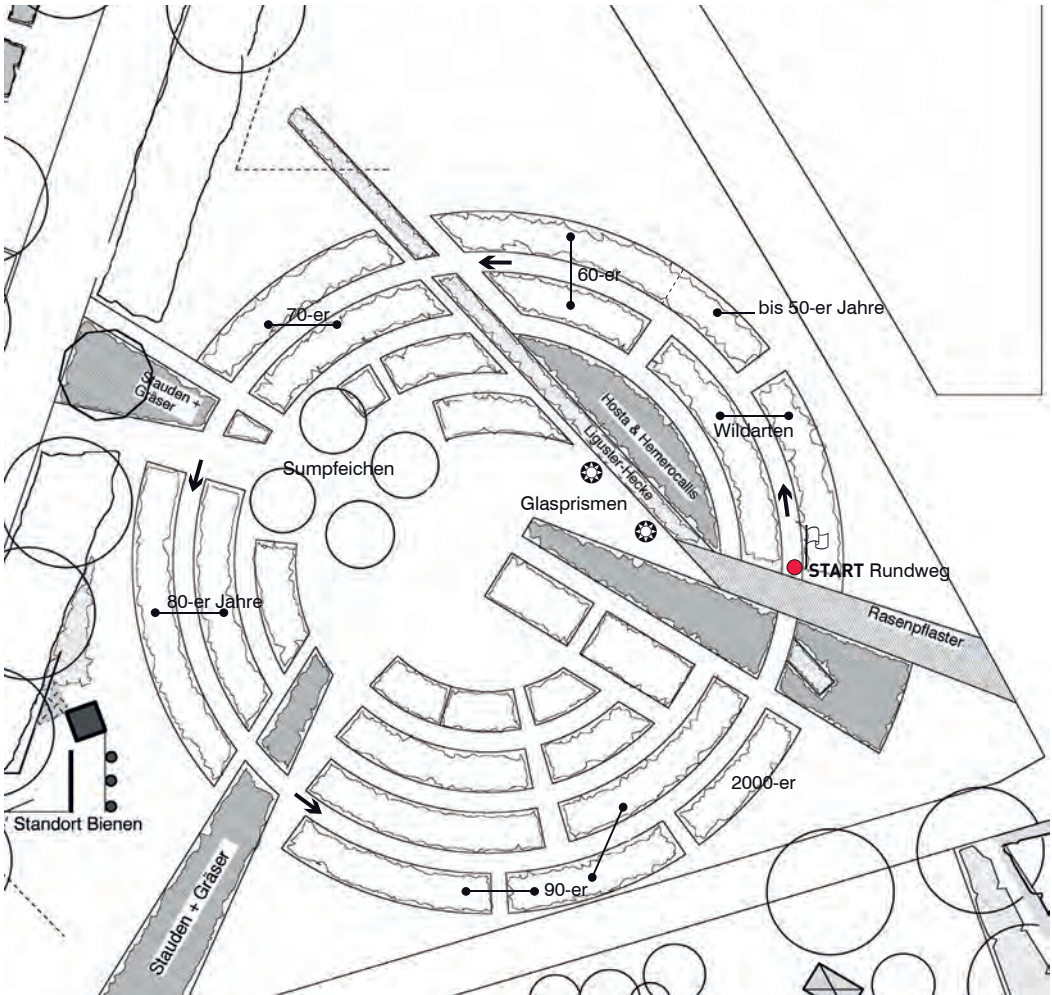
In order to also have flowers in May, many bulbs of camass *Camassia leichtlinii* subsp. *suksdorfii* Caerulea Group are planted between the *Hemerocallis*

The plants of the “Daylily Rondelle” were also donated by:

Karl and Hanne Rupp, Germany, Dr. Jürg Plodeck, Switzerland, Gerrit Snoek, The Netherlands, Jamie Vande, Germany, Gudrun Tillmann-Budde, Germanym, Gerd Oellermann, Germany, Ilse and Ulrich Kaiser, Germany, Katrin and Jens-Peter Frohreich, Germany, Eric Bijl, Netherland, Artur Jasinski, Poland, Lida and Be Lourens, The Netherlands.

Two works of glass art decorate the Rondelle. A listening station provides detailed information about the Daylily Rondelle by pushing a button.





Layout of Hemerocallis Rondell, representing the planting system



For a complete list of Daylilies in Park der Gärten visit their database:

[https://www.park-der-gaerten.de/fileadmin/user\\_upload/03\\_04\\_gaerten\\_pflanzen/pflanzensammlungen\\_sortimente/pdf/Pflanzenliste\\_Taglilienrondell\\_Oktober\\_2019.pdf](https://www.park-der-gaerten.de/fileadmin/user_upload/03_04_gaerten_pflanzen/pflanzensammlungen_sortimente/pdf/Pflanzenliste_Taglilienrondell_Oktober_2019.pdf)



## Daylily Day in Park der Gärten

This is an annual event which takes place each year in July, prepared by Hanne Rupp with the help of Björn Ehsen. The highlight of this day is the auctioning of brand new, high quality daylilies by Christian Wandscher.



Annual auction of *Hemerocallis* seedlings by the park manager Christian Wandscher

The daylilies for auction are donated by Katrin and Peter Frohreich, Ilse and Ulrich Kaiser and Hanne Rupp. The Park der Gärten offers a second auction by Christian Wandscher for naming two seedlings which are worthy of being a cultivar. The new owner can give the name it wishes, according to the AHS registration rules. All rights connected to the plant go to the new owner. The new cultivar will be registered at AHS by Hanne Rupp, who also pays the registration fee.

The earnings from both auctions go fully to the Park.

Two guided walks, one by the daylily curator Hanne Rupp, provided an explanation and answers to questions about daylilies.

Near the Rondelle, a perennial nursery in Wiefelstede sells a wide range of daylilies from historical cultivars to rather new varieties through its team.



Hanne Rupp shows daylilies to visitors

## German National Breeding Development of Daylilies

In Germany, the breeding of *Hemerocallis* started rather late. The early German breeders often did not register their hybrids and from 1979 – 1986, there were only 46 German registrations. The European breeders normally have other professions and grow daylilies on an amateur basis, like Fritz Köhlein and Tomas Tamberg, who started breeding in the 1970s.

Tomas Tamberg from Berlin is the motor of German daylily hybridizing. His early cultivars like the nearly white 'Helle Berliner' (Tamberg, 1981) and the velvet red 'Berlin Red Velvet' (Tamberg, 1986) are still popular and widely grown in Germany and Europe. His ongoing work has focused on tetraploids in different colors, particularly clear yellows and red selfs. In 2010, he was honored with the Georg-Arends-Medaille for his outstanding breeding, with a total number of 103 cultivars, with the first being registered in 1979 and the last in 2014. For his work, he also received the International Service Award of the American Hemerocallis Society. Through his European Evaluation System, he encouraged several members of the GdS to breed daylilies with a good habitus, opening of flowers and winter hardiness.





The cultivar 'Park der Gärten' from Hanne and Karl Rupp was introduced in 2005

Another German hybridizer, Werner Reinermann started in the 1980s with some introduced varieties such as 'Tante Ju' (Reinermann, 1986) 'Maggie Fynboe' (Reinermann, 1993). He registered 65 cultivars from 1983 till 1996.

There are other breeders such as Harald Juhr with his cultivar prefix "Taunus" and Ulrich Kaiser with his prefix "Uerdinger" and many others of recent.

## **Recommended Daylilies for Various Garden Situations**

Daylilies are suitable for all types of gardens and planting situations. They generally love the sun but they also do very well in the half shade. In deep shade, they make only leaves and do not bloom, as is the experience in North-West Germany. A short list of recommended plants which do very well in the Park der Gärten can help with finding the right one.

### **A: For natural gardens**

The *Hemerocallis* species and old cultivars need almost no care, not much fertilizer and are often "self-cleaning". The cultivar 'Frans Hals' (Flory, 1955) is one of them.





The historical daylily 'Frans Hals' (Flory, 1955) is very suitable for natural gardens



The flowers of 'Springfield Clan' (Trimmer-J., 2001) cannot be missed

### **B: For landscaping on a larger scale**

It is important that they are clearly visible from a distance and have clear (light) colors. Modern taller spider variants could also be chosen and are good in combination with grasses. Recommended are the yellow 'Berlin multi' (Tamberg 1986), the bright red 'Springfield Clan' (Trimmer-J., 2001), the orange red 'Higher and Fire' (Tamberg, 2006) and the winner of the Landscaping Daylily category in 2005 'Trompetenkonzernt' (Tamberg, 2007).



'Higher and fire' (Tamberg, 2006) has a bright and clear color



'Janice Brown' (Brown-E.C., 1986), has a very significant eye



## C: For house gardens

Older good growing cultivars very suitable for private house gardens include:

Selfs: the cream 'Lauren Leah' (Pierce-C., 1983), the light pink 'Barbara Mitchell' (Pierce-C., 1984).

With eyes: the light pink 'Janice Brown' (Brown-E.C., 1986), the lavender purple with a darker eye 'Always Afternoon' (Morss, 1987).

The "Candies" from hybridizer Stamile are also good growers: 'Custard Candy' (Stamile, 1989), 'Strawberry Candy' (Stamile, 1989), 'Elegant Candy' (Stamile, 1995).



'Always Afternoon' is a well-growing hybrid with an eye



'Elegant Candy' (Stamile, 1995) is a well-growing hybrid

## D: More spectacular modern cultivars.

Bigger flowers with more substance need more fertilizer, more water and the set blossoms should be picked off:

Large flowers: 'Dan Mahony' (Trimmer, 1999), 'Taos' (Stamile, 1999), 'Betty Ford' (Kirchhoff-D., 2002), 'Broken Silence' (Abajian, 2002), 'Lavender Loveliness' (Carpenter-J., 2002), 'Park der Garten' (Rupp, 2008)

Early flowering: almost white 'Ballerina on Ice' (Santa Lucia, 1997), 'Fooled me' (Reilly-Hein, 1990)

Late flowering: 'Condilla' (Grooms, 1977), 'August Freude' (Tamberg, 1994)



'Betty Ford' (Kirchhoff-D., 2002) is a pure red and large flowering cultivar



'Ballerina on Ice' (Santa Lucia, 1997) flowers early

**E: For the front yard**

For limited space, smaller cultivars are recommended:

'Knickknack' (Hudson, 1983), 'Cosmopolitan' (Stamile-G., 1989)



'Condilla' (Grooms, 1977) flowers quite late



'Raspberries and Ice Cream' (Salter, 2012) has a spectacular eye and intensive edging

**F: Plants for the future**

There are novelties which shall be tested to see if they are worthy of the garden. In a bed planted in spring of 2019, there are brand new cultivars created after 2010 with specialties such as spectacular eyes and gold or darker edges, with teeth and "Angel Wings" (you can see a detailed description of flower features at [https://www.daylilies.org/ahs\\_dictionary/dictionary.html](https://www.daylilies.org/ahs_dictionary/dictionary.html)).





## Maintenance of the Daylily Collection in Park der Gärten

Daylilies are rather carefree and long lasting. In Park der Gärten, most of the plants have been in the same place for more than 12 years. The plants need to be supplied with sufficient water. This is important in spring for the foliage and to get enough scapes, as well as during the bloom season

### Climate Conditions

- Climate: Oceanic (Köppen climate classification Cfb)
- Average annual temperature: 8.8°C
- Hardiness zone: 7a
- Average annual rainfall: around 700 – 800mm
- Altitude: 7m above sea level
- Soil types – humic sand, very permeable, pH about 5

### Basic Garden Maintenance of Daylilies in Park der Gärten

- Fertilizing - When plants start growing in April, a good portion of a longer lasting complete fertilizer is given. Normally 30 g /m<sup>2</sup> NovaTec perfect 12-8-20 is used, which means 12% N, 8% P<sub>2</sub>O<sub>5</sub>, 20% K<sub>2</sub>O. The Hemerocallis also benefit from the occasional addition (5 cm) of a humus-rich substrate.
- Pest - Gall midge (*Contarinia quinquenotata*)
- Gall midges are tiny flies which deposit their eggs in newly forming flower buds, causing them to be deformed. The growing white tiny larvae feed on the developing flower bud. When flowers appear, gall midge affected buds have to be picked off by hand. The affected buds are mostly on the early yellow-flowering varieties.
- Daylily Rust: The fungus *Puccinia hemerocallidis* causes a yellow or orange powdery substance on the leaves in pustules. In Germany, it can occur in greenhouses, but outside it vanishes in a cooler climate during winter.
- *Xylella fastidiosa* - a bacterium from North- and South-America: it is infectious for many plants. This was the reason why the European Union has restricted the importing of daylilies from the USA to Europe since 2015.
- During the blossom season, 15 volunteers in groups remove only the spent flowers three times a week, (no dead heading) in order to give the Daylily - Rondelle the best appearance for the visitors of the Park.

- In August, when the flower period is finished and the foliage becomes less attractive, the old scapes will be cut together with the leaves to about 20 cm. After blooming, new foliage appears and it lasts for only a short time of about three weeks until all plants are freshly green, as experience has shown in Park der Gärten for several years.



Volunteers removing the spent flowers



Combination of *Hemerocallis* with light colored *Hosta* and *Alchemilla* for semi shade

### III. Recommended garden cultivars of daylilies

TOP 30 RECOMMENDED DAYLILY CULTIVARS			IBOT	UWr	VU	PdG
Cultivar name	Intr.	Breeder				
Adamas	2002	Stamile	X		X	
Always Afternoon	1987	Morss	X	X		X
Apricot	1893	Yeld	X			X
August Freude	1994	Tamberg		X		X
Barbara Mitchell	1984	Pierce-c.		X		X
Bill Norris	1993	Kirchhoff-d.		X		X
Black Eyed Susan	1983	Stevens d.	X		X	
Condilla	1977	Grooms	X	X		X
Corky	1959	Fischer-h.a.	X	X		X
Cosmopolitan	1989	Stamile-g.		X		X
Curly Cinnamon Windmill	1997	Crochet	X	X	X	
Custard Candy	1989	Stamile		X		X
Elegant Candy	1995	Stamile	X	X		X
Fooled Me	1990	Reilly-hein		X		X
Frances Fay	1957	Fay	X		X	
Frans Hals	1955	Flory	X	X		X
I See Stars	2001	Gossard		X		X
Luxury Lace	1959	Spalding	X		X	
Mitsu	2013	Misiukevicius	X		X	
Moonlit Masquerade	1992	Salter	X	X		X
Outrageous	1978	Stevens-d.	X	X		
Park der Gärten	2005	Rupp	X	X		X
Prague Spring	1985	Lambert	X	X		
Primal Scream	1994	Hanson-c.	X	X		X
Reinrosa Versuchung	2010	Tamberg	X			X
Ruby Moon	1999	Trimmer		X		X
Schnickel Fritz	1996	Kirchhoff-d.	X	X		
Strawberry Candy	1989	Stamile		X		X
The Band Played on	2006	Stamile	X		X	
Trompetenkonzert	2007	Tamberg		X		X



GARDEN'S CHOICES OF DAYLILIES				IBOT	UWr	VU	PdG
Cultivar name	Intr.	Breeder					
Autumn Red	1941	Ness	X				
Bohemian Child Band	1995	Ressel	X				
Earliana	1938	Betscher	X				
Jo Jo	1960	Fischer	X				
Sombrero Way	1973	Reckamp	X				
Double Bold One	1981	Miller-J.		X			
Forty Second Street	1991	Kirchhoff-D.		X			
Lady Neva	1970	Alexander-Moody		X			
Ruby Spider	1991	Stamile		X			
Stoplight	1953	Childs-F.		X			
DanuteJadvyga Dainauskaite	2020	Puidokas			X		
Jadvygos Sapnas	2018	Puidokas			X		
Jurgos Svajone	2018	Puidokas			X		
Ziez mariu Chameleonas	2019	Puidokas			X		
Ziez mariu Vasara	2018	Puidokas			X		
Betty Ford	2002	Kirchhoff					X
Isabell Maraffi	2001	Trimmer					X
Sir Francis Drake	2008	Stamile					X
Springfield Clan	2001	Trimmer					X
Taos	1999	Stamile					X



Cultivar 'Jo Jo' (Fishcher, 1960) excels in the number of smaller flowers

### Abbreviations:

**IBOT** – Institute of Botany, Czech Academy of Sciences, CR  
Průhonice Botanic Garden

**UWr** – University of Wrocław  
Botanical Garden, Poland

**VU** – Vilnius University  
Botanical Garden, Lithuania

**PdG** – Park der Gärten  
Germany

**Intr.** – Year of introduction

## IV. Summary and recommendations of garden maintenance of daylilies

The daylily is an undemanding, long-life (up to 8-20 years) ornamental plant that grows well in sunny or slightly shady places. It is quite often used in ornamental horticulture. The daylily blossom blooms only one day, with a new blossom emerging daily, and the entire inflorescence blooms for about a month. At present, there are certain cultivars that bloom for 16 hours or more. The daylily is attributed to geophytic plants. Such plants tend to be less dependent on external factors due to the accumulation of nutrients in the roots. Their shoots completely disappear during unfavorable vegetation, and the buds of regeneration concentrate at different depths of the soil. The buds of regeneration (*gemma innovations*) grow shoots after a shorter or longer dormant period. The main vital organ of the plant is a short, fleshy rhizome which grows longer as the plant grows. From the regenerative point of view, the most active part is the apical part of the rhizome from which two-row rosettes of leaves and generative organs grow. The natural habitats of daylilies are very different: some species grow in wet soils, in meadows near rivers, whereas others grow on mountain slopes or in dry soils.

According to Lithuanian breeder Vyšniauskas, it is recommended to enrich the sandy soil with compost, clay and organic fertilizers. Weak acid-alkaline reaction soil (pH 5.5-6.5) is suitable. The ideal soil is a fertile loam, rich in organic substances. In such soil they can be watered less frequently and no additional fertilization is required for at least the first two years. Daylilies do not like longer standing water and high-lying groundwater. In such areas as well as in heavy clay soils, they should be planted in raised beds (8-15 cm). Parts of the propagated daylilies and parts for replanting can be planted in the spring-autumn period.



*Hemerocallis fulva* grows where other perennials don't perform their best (here a small village in Armenia)

## Table of Garden Maintenance of Daylilies

	Průhonice BG	University of Wrocław BG	Vilnius University BG	Park der Gärten
Is foliage cut after blooming period?	NO	NO	NO	YES
Is dry foliage removed in autumn?	YES	YES	YES	YES
Is dry foliage removed in spring?	YES	YES	YES	YES
Do you hand-pick or cut flower stalks after blooming?	YES	YES	YES	YES
Do you transplant daylilies?	NO	NO	NO	NO
What kind of fertilizer do you use for daylilies? (Ratio N: P:K)	Cererit NPK (MgO, S) 8-13-11 (2, 15) + B, Cu, Mo a Zn	Azofoska, Polifoska, YaraMila Complex - only plants that grow more than 10 years in the same place	NPK: 18-9-12.	Nova tec perfect 12 - 8 - 20
When is the fertilising done?	Feb / Mar	Feb-Apr	Feb-Apr	April
Do you use organic fertilizing? What kind?	NO	manure only to prepare new flower bed	NO	Rich organic substrate (e.g. compost) 5 cm occasionally
What kind of (chemical) protection do you use against leaf spot?	None	NO (only in a crisis situation Topsin M 500 SC/ Signum 33 WG/ KHCO3)	None	None
What kind of (chemical) protection do you use against thrips?	Mospilan, Nurelle D	None	None	None
Do you use (chemical) protection against gall midge? What kind?	NO	NO (only in a crisis situation, with high pest intensity: Mospilan)	NO	NO
Do you hand-pick infected flower buds?	YES	YES	YES	YES





Daylily 'Constantina' (Mimránek, 2003)



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Park der Gärten. <https://www.park-der-gaerten.de>  
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