The blooming time of Lithuanian gladiolus (*Gladiolus* L.) cultivars

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Researchers of the Botanical Garden, Department of Floriculture, have been investigating, collecting and preserving the gladioli (*Gladiolus* L.) cultivars created by Lithuanian flower plant breeders. At present in the collection of Botanical Garden there are 180 gladiolus cultivars of both foreign and Lithuanian origin. The aim of our research was to determine blooming time of gladioli cultivars created by Lithuanian flower breeders. 100 gladiolus cultivars grown in the Botanical Garden (in Kairėnai) were used for the study. The study was carried out from April to October 1998–2000 in a field trial.

Key words: *Gladiolus* L., Lithuanian flower breeders, cultivars, blooming time

INTRODUCTION

The breeders of Lithuanian flower cultivars have created priceless national wealth – flower cultivars and hybrids. Unfortunately, they are not protected from disappearance, not studied, not accumulated and even not legalized [1].

The gladiolus (*Gladiolus* L.) is a flower suitable for both gardens and cutting [2, 3]. Gladioli are sensitive to soil, warmth, moisture, illumination and environmental pollution. Lithuanian flower plant breeders have been trying to create very ornamental, disease and pest resistant gladioli cultivars, which could bloom as earlier in summer as possible [4].

Phenological observations in floriculture are meaningful as their data can be used for the improvement of ornamental features of various plants, creation of long-blooming and impressive green plantations [5, 6].

MATERIALS AND METHODS

One hundred cultivars (the diameter of the first faction corms was more that 3.2 cm) of gladioli were used in the study. Thirty corms of each cultivar were planted. The cultivars were divided into four groups (according to the size of blossom). The study was carried out in 1998–2000. Atmospheric conditions in the gladioli vegetation period are presented in Table 1.

So far, there is no unified methodology herbaceous decorative plant evaluation, research, description and account for the whole country. The study, its description and evaluation of Lithuanian gladiolus cultivars have been carried out using the unified methodology prepared by the authors of this article. This methodology has been developed according to the requirements of the International Union for the Protection of New Varieties of Plants (UPOV), met-

Table 1. **Atmospheric conditions in gladiolus vegetation periods (1998–2000)**

Indices	Years	Months						Total
		April	May	June	July	August	September	
Sum of active temperatures, °C	1998[1]		401	511	513	453	356	2234
Precipitation, mm	1998		40	171	228	149	50	638
Sum of active temperatures, °C	1999[2]		317	590	635	507	410	2459
Precipitation, mm	1999		15	54	29	53	60	211
Sum of active temperatures, °C	2000[3]	76	410	455	489	484	307	2221
Precipitation, mm	2000	34	55	59	209	65	11	399

[1, 2] – date of gladiolus planting 1 May; [3] – date of gladiolus planting 27 April.

hodological directions and methodologies applied in the neighbouring countries [7, 8]. The cipher of blooming time indicates the average duration (number of days) from the planting day of corms to beginning of their blooming: VE – very early (<70 days); E – early (70–74 days); EM – early midseason (75–79 days); M – midseason (80–84 days); LM – late midseason (85–90 days); L – late (91–99 days); VL – very late (100 days and more).

RESULTS

As the results of 3 years show, the growing and development of gladiolus cultivars are different. In gladioli, the vegetation period starts from the moment of their planting. The plants are considered shooting when the shoots are already evident in the row. The duration of the period from planting till the appearance of the first shoot lasts 3–10 days, depending on the cultivar. Cold and rainy weather in the beginning of the vegetation period and late spring frosts reduced their growth and development in 1999. In May 1999, chilly weather with frequent frosts was prevailing. The following period from the appearance of the shoots till their budding is very long. It lasts 58–70 days. Anyway, according to the data of our study, this period is by 6–10 days shorter in the early blooming cultivars compared with the later blooming ones. It takes 8–10 days from the budding till the beginning of blooming. The duration of the blooming time can be different depending on the cultivar.

In this study the cultivars were divided into seven groups according to the beginning of blooming (Table 2). This allowed to compare the study results with the figures presented by the authors of the cultivars. The study data are similar to those presented in the literature [3, 9], though in some cultivars they differ. This may be explained by different growing and especially climatic conditions.

In 1999, 'Vešeta' (author V. Švilpienė, year of creation 1995, with small blossoms) and 'Poliot Mečty' (A. Zviaginceva, 1994, with large blossoms) started blooming very early. The above-mentioned cultivars and 'Zeniukas' (V. Švilpienė, 1995, with small blossoms) belong to VE group. In 2000, 'Poliot Mečty', 'Vešeta', 'Akademikas' (P. Balčikonis, 1985), 'Fiji' (A. Lukoševičius, 1996), 'Skudurinė Onutė' (L. Skibiniauskas, 1995) and 'Zeniukas' (V. Švilpienė, 1995) started blooming very early. On August 19 heavy showers and storms caused a lot of damage, because at that time many cultivars were blooming.

According to abundant material it was determined that in different groups the period from the planting till the beginning of blooming in Kairėnai (1998–2000) lasted 66 to 106 days. An average duration of the period was 89 days. Therefore, the greatest number of blooming gladioli was observed in August. The duration of blooming of separate cultivars such as 'Birutės Daina' (P. Balčikonis, 1995), 'Poliot Mečty' (A. Zviaginceva, 1994), 'Vešeta' (V. Švilpienė, 1995) and 'Zeniukas' (V. Švilpienė, 1995) was determined in the first decade of July and they belong to the very early group (VE). The late (L) blooming cultivars such as 'Juvelyro Radinys' (P. Ciplijauskas, 1994), 'Laisvės Rytas' (J. A. Liutkevičius, 1993), 'Norma' (A. Lukoševičius, 1991), 'Seryj Kardinal' (A. Zviaginceva, 1996) and 'Žarija' (P. Balčikonis, 1994) started blooming in the first decade of August. It was defined that the date of the beginning of the blooming period of the gladiolus cultivars not always coincided with the data presented by the authors. For instance, 'Kalvarijietis' (J. A. Liutkevičius, 1992) was noted as LM in the register, and in Kairėnai it started blooming late (L) in 1999 and very early in 1998. The deviation of the beginning of blooming to the later period was noticed in a lot of cases (different gladioli cultivars). It should be noted that the spikes of the 2nd (the diameter of the corms was 3.1–2.5 cm) and 3rd faction corms (the diameter 2.4–1.5 cm) began blooming later compared with the first one.

Table 2. **Ddistribution of the Lithuanian gladiolus, cultivars according to the size of blossom and beginning of blooming**

Group	Index of blossom size and colour	Number of cultivars	Number of cultivars according to beginning of blooming						
			VE	E	EM	M	LM	L	VL
Small	200	20	2	1	1	4	5	7	–
Medium	300	23	–	–	1	8	5	8	1
Large	400	37	1	–	2	6	5	22	1
Giant	500	20	–	1	2	1	2	11	3
Total		100	3	2	6	19	17	48	5

* Index of blossom size: 200 – blossom size 6.5–9 cm.; 300 – blossom size 9.1–11.5 cm.; 400 – blossom size 11.6–14 cm.; 500 – blossom size more than 14.1 cm.

It was defined that the differences of climatic conditions in 1998–2000 influenced the data of the study. Therefore, a direct relationship is drown between the duration of vegetation period (before blooming when the overground vegetative parts are intensively formed) and the sum of positive temperatures (during the vegetation period) necessary for the beginning of blooming.

The Lithuanian gladiolus cultivars were divided into seven groups according to the beginning of blooming. The most numerous group according to the beginning of blooming was group L (48% of all the cultivars studied) (Table 2). The next group, M, yielded 19%. The 3rd group, the last one of the bigger ones, is LM (17%). The rest four groups are not so numerous. (EM l6% and VL 5%). From all the groups studied, only 3% of the cultivars belonged to VE and 2% to E group (Table 2).

The period of the blooming of the first blossom till the final blossom in the spike lasts 12–25 or more days. The study showed that one blossom in a spike bloomed 3–4 days and the plant itself bloomed 12–22 days. More than 43% of cultivars bloomed 14–16 days. 'Solveiga' (A. Lukoševičius, 1994) was blooming longest (22 days) and 'Nu, Gromov, Pogodi!' (P. Ciplijauskas, 1991) was blooming 21 days.

Summarising these data, we found that most cultivars bloomed rather long. Table 2 and Fig. 1 show that plants from the 1st faction bloomed in different time. The cultivars having small blossoms were blooming shorter.

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LIETUVIŠKŲ KARDELIŲ (*GLADIOLUS* L.) VEISLIŲ ŽYDĖJIMO LAIKAS

S a n t r a u k a

VU Botanikos sode kardelių kolekciją sudaro 180 užsieninės ir lietuviškos kilmės veislių ir hibridų. 1998–1999 metais buvo tirtas ir stebėtas 100 lietuviškų kardelių veislių žydėjimas. Lietuvoje sukurtos kardelių veislės pasižymi skirtingu žydėjimo laiku ir trukme. 48% tirtų veislių yra vėlyvosios (pradeda žydėti praėjus 91–99 dienų po pasodinimo).