Phenophases of blossoming and picking maturity and their relationships in twenty apricot genotypes for a period of six years

Z. VACHŮN

Mendel University of Agriculture and Forestry, Brno, Faculty of Horticulture, Lednice, Czech Republic

ABSTRACT: The phenophase course in a group of 20 apricot genotypes was evaluated in South Moravian conditions in Lednice, Czech Republic, from 1994 to 1999. The evaluated phases were as follows: "beginning of blossoming", "beginning of picking maturity" and "end of picking maturity". The aim was to evaluate the variability of these phenophases and their relationships. The amplitude of the phenophase "beginning of blossoming" did not exceed 9 days. The amplitude of phenophases between the different years was about three times higher than the average amplitude between the genotypes. The average amplitude of the factor "beginning of picking maturity" observed in all genotypes was 39 days, but a comparison between the years showed that the largest amplitude for a given genotype was only 16 days. No statistical correlation was found between the phenophases "beginning of blossoming" and "beginning of picking maturity" in any of the six observed years. The genotypes whose maturity occurs at the beginning or at the end of picking season showed higher year to year variability of the phenophase "beginning of picking maturity" than the genotypes maturing in the middle of the season. The rate of fruit development from blossoming to picking was considerably different depending on the apricot genotype. The number of days between the beginning of blossoming and the beginning of picking maturity was characteristic of each genotype. The variability of this interval for the six years was very low and the value of variation coefficients did not exceed 10%. This amplitude observed in the control variety Velkopavlovická LE-6/2 was on average 100 days. A very high statistically significant correlation ($r = 0.996^{++}$) was observed between the intervals from the "beginning of blossoming" to the "beginning of picking maturity" and to the "end of picking maturity".

Keywords: apricot (*Prunus armeniaca* L.); genotypes; phenophases of blossoming and maturity; relations; variability

Phenological phases (phenophases) are morphologically and functionally distinct development stages of the plant which repeat themselves in the growing season. The most important and very visible phenological phases in apricots are „beginning of blossoming", "beginning of picking maturity" and "end of picking maturity". Even though the different phenophases are influenced by the genetic nature of the plant, their course also depends on external conditions of the given year.

Many authors throughout the world have evaluated the phenophases of apricots. MEHLENBACHER et al. (1998/99) reported that in northern areas the differences between the blossoming phenophases of different genotypes, from the earliest to the latest blossoming ones, reach an amplitude a little higher than a week. These differences are a consequence of different reactions of genotypes to the rise of temperatures after dormancy. Having tested seven cultivars of the species *Prunus armeniaca* L., VACHŮN (1974) found out that the temperatures from 7° to 9°C determined the start of the phenophase "beginning of the budflush". However it does not exclude the influence of lower temperatures. BAŽANT et al. (1999) reported that the date of apricot blossoming was also influenced by the sum of active temperatures above 5.5°C.

The beginning of blossoming of the same cultivar from year to year can differ by 25 to 40 days depending on the cultivar and on the conditions of the year (VACHŮN 1986; KRŠKA 1994; BAŽANT et al. 1999; VACHŮN 2002). Even though the period of "beginning of blossoming" for the same cultivar differs from year to year, the classification of cultivars according to this phenophase shows that their rank is statistically significant to highly significant ($r = 0.4^{+}$ to 0.8^{++}) (VACHŮN 2002). However, according to literary sources published until now, the high relation between the beginning of blossoming and picking maturity of apricots has not been demonstrated yet. But it has been demonstrated that

The paper is an output of Research plan No. MSM 435100002 *Study of Biodiversity of Horticultural Plants in Relation to Quality and Optimization of Post-harvest Treatments and Procedures*, supported by the Ministry of Education, Youth and Sports of the Czech Republic, and of the Project *Conservation and Use of Plant Germplasm* solved by the Faculty of Agriculture of Mendel University of Agriculture and Forestry Brno, Faculty of Horticulture at Lednice and supported by the Ministry of Agriculture of the Czech Republic.

the date of the beginning of grapevine maturity is determined by their beginning of blossoming. This relation was expressed by the following correlation coefficient $r = 0.84$ (WOLFART et al. 1998).

The aim of this paper was to evaluate the course of different phenophases ("beginning of blossoming", "beginning of picking maturity" and "end of picking maturity") in a group of 20 apricot genotypes in order to determine the variability of these different phenophases and their relationships during a six-year period. The results of this 6-year evaluation will help complete and define pomological and production characteristics more precisely.

MATERIAL AND METHOD

A tested orchard was planted in Lednice, Southern Moravia, in spring 1991. In this region, the average temperature for the last eighty years was 9°C and the average annual precipitation was 516 mm. In these conditions, the most important cultivars, including the cultivar Velkopavlovická, break their dormancy as early as from the end of December to the first half of January, then they are able to start budding when temperatures exceed 7 to 8°C. However, such temperatures occur on a different date each year, which influences the beginning of other phenophases such as blossoming.

Rootstocks were grown from seeds (*Prunus armeniaca* L.) in an experimental field. Plants were set out in one long block. Each genotype was represented by five trees and each tree was individually evaluated as one replication. The original number of planted genotypes was much higher, but only the genotypes that were represented by a number of plants that did not decrease under three at the end of the experiment in 1999 were used for the final analysis. The genotypes that did not blossom in one of the observed years at all or those whose blossoming and maturity were not possible to observe on less than three out of five trees altogether were also eliminated. Consequently, only 20 genotypes that were fully evaluated during the whole experiment could be included in the final analysis. Even though the number of observed genotypes decreased a lot, good variability of evaluated criteria was still maintained, that means the remaining genotypes came from various regions and their blossoming and maturity periods were markedly different.

The most important portion of genotypes originated from the Czech Republic, but some came from Canada and Ukraine. The numbers indicated after the names of

Table 1. Dates of the phenophase "beginning of blossoming" observed in 20 apricot genotypes each year of the period 1994–1999 and the variability of this phenophase expressed by its variance

Genotypes	Year						Average date	Amplitude of days between years	Variance
	1994	1995	1996	1997	1998	1999			
Harlayne	3.4.	9.4.	24.4.	16.4.	3.4.	6.4.	10.4.	21	57.81
LE-392	1.4.	3.4.	24.4.	16.4.	28.3.	2.4.	7.4.	27	91.14
Priusadebnyj	31.3.	3.4.	24.4.	15.4.	30.3.	2.4.	7.4.	25	84.47
Sem. Bademerik	29.3.	5.4.	23.4.	16.4.	31.3.	5.4.	7.4.	25	78.47
LE-2267	3.4.	5.4.	24.4.	14.4.	1.4.	6.4.	8.4.	23	62.47
LE-390	30.3.	2.4.	24.4.	12.4.	27.3.	1.4.	5.4.	28	91.56
NJA-1	30.3.	5.4.	22.4.	11.4.	27.3.	3.4.	6.4.	26	73.33
Arzami aromatnyj	30.3.	2.4.	23.4.	10.4.	25.3.	2.4.	5.4.	29	87.33
Volšebnyj	31.3.	4.4.	23.4.	9.4.	30.3.	4.4.	6.4.	24	64.92
Vynoslivyj	3.4.	7.4.	23.4.	11.4.	1.4.	6.4.	8.4.	22	51.92
M-25	3.4.	11.4.	25.4.	16.4.	2.4.	6.4.	10.4.	23	64.92
Velkopavlovická LE-6/2	2.4.	8.4.	24.4.	17.4.	31.3.	5.4.	9.4.	24	72.56
Harogem	29.3.	4.4.	24.4.	10.4.	28.3.	2.4.	5.4.	27	84.14
LE-2185	2.4.	10.4.	23.4.	11.4.	31.3.	5.4.	8.4.	23	57.58
LE-1580	31.3.	6.4.	24.4.	13.4.	30.3.	4.4.	7.4.	25	74.22
LE-1453	1.4.	4.4.	23.4.	14.4.	27.3.	4.4.	7.4.	27	80.00
Lemeda (LE-962)	2.4.	8.4.	24.4.	15.4.	31.3.	5.4.	9.4.	24	68.00
LE-1321	30.3.	5.4.	23.4.	13.4.	29.3.	3.4.	6.4.	25	76.14
Lednická (M-90-A)	2.4.	10.4.	24.4.	17.4.	2.4.	5.4.	10.4.	22	66.33
LE-SEO-118	29.3.	5.4.	23.4.	11.4.	30.3.	1.4.	6.4.	25	75.47
Average	31.3.	5.4.	23.4.	13.4.	29.3.	3.4.	7.4.	25	73.14
Amplitude of days between genotypes	5	9	3	8	9	5	6		

the genotypes specify their clone or breeding number. Chosen hybrids are designated only by their working number, where letters LE and M indicate that the genotypes came from the Faculty of Horticulture, Mendel University of Agriculture and Forestry (MUAF) in Brno, Lednice. The control cultivar was Velkopavlovická, clone LE-6/2.

The phenophases were evaluated for the first time in 1994, when all genotypes blossomed and bore fruit. The phenophases were evaluated according to the methodology of VACHŮN et al. (1995). Practically it means that the day when 25% of blossoms burst in different parts of the crown was considered as the "beginning of blossoming", i.e. 25% of blossoms reached stage *F* according to the methodology of Fleckinger and Grisvard. The "beginning of picking maturity" was the day when 25% of fruits were good for picking, it means they had typical colour, typical taste and typical consistence of the genotypes. The "end of picking maturity" was the day when the last 25% of fruits reached maturity. The program UNISTAT was used for statistical evaluation.

RESULTS AND DISCUSSION

In the group of twenty genotypes under study, the average amplitude between the earliest and latest genotype in the phenophase "beginning of blossoming" was relatively low. It varied from 3 to 9 days according to the year (6 days on average). When comparing the years, the differences in the "beginning of blossoming" were much larger. Depending on the genotype, the "beginning of blossoming" amplitude was from 21 to 29 days between the years. The average interval for the whole group of genotypes was 25 days (Table 1). Even though the differences between genotypes at the phenophase "beginning of blossoming" were small, the rank of blossoming was always significantly about the same. Close positive relations are expressed by correlation coefficients in Table 2. The correlation between the date of the phenophase "beginning of blossoming" and the amplitude of this phenophase observed in the years 1994–1999 was negative but rather low ($r = –0.49$). The correlation coefficient showed not to be significant because of the small number of values. We can only state that the later the start of the growing season, the shorter the blossoming period of apricots.

Table 2. Year to year correlations between the dates of the phenophase "beginning of blossoming" from 1994 to 1999 in 20 apricot genotypes. Relations expressed by coefficients of correlation

Years	1994	1995	1996	1997	1998
1995	0.67**				
1996	0.44*	0.32			
1997	0.46*	0.42	0.57**		
1998	0.67**	0.80**	0.44*	0.51**	
1999	0.79**	0.75**	0.21	0.41	0.77*

*significant correlation, **highly significant correlation

In the evaluated group of genotypes, the average picking amplitude of the phenophase "beginning of picking maturity" was 39 days (Table 3). For the phenophase "end of picking maturity" it was 40 days (Table 4). The comparison of the same group of genotypes showed that the amplitude of the phenophase "beginning of picking maturity" was more than six times higher than the

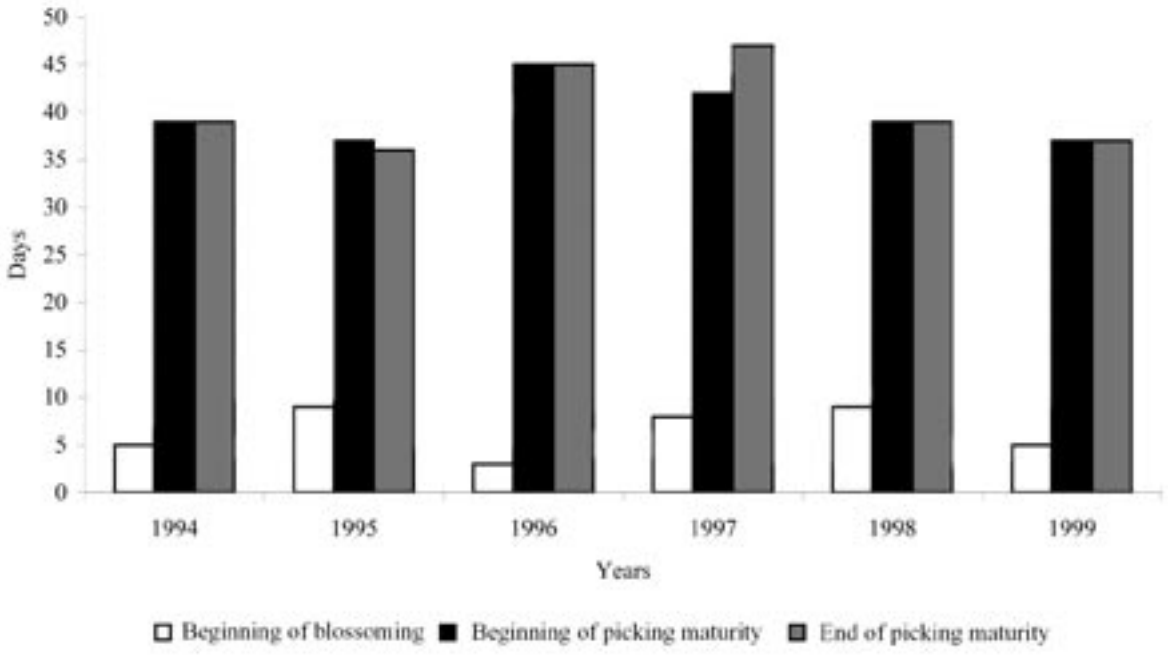

Fig. 1. Yearly average amplitude of days for the phenophases "beginning of blossoming", "beginning of picking maturity" and "end of picking maturity" observed in 20 apricot genotypes from 1994–1999

Table 3. Dates of the phenophase "beginning of picking maturity" observed in 20 apricot genotypes each year of the period 1994–1999 and the variability of this phenophase expressed by its variance

Genotypes	Year						Average date	Amplitude of days between years	Variance
	1994	1995	1996	1997	1998	1999			
Harlayne	23.7.	28.7.	4.8.	4.8.	22.7.	23.7.	27.7.	13	30.56
LE-392	23.7.	25.7.	4.8.	2.8.	20.7.	20.7.	26.7.	15	35.33
Priusadebnyj	22.6.	28.6.	26.6.	28.6.	14.6.	20.6.	23.6.	14	25.00
Sem. Bademerik	19.7.	21.7.	4.8.	28.7.	14.7.	14.7.	21.7.	21	57.14
LE-2267	8.7.	13.7.	16.7.	12.7.	3.7.	6.7.	9.7.	13	19.56
LE-390	30.7.	2.8.	4.8.	4.8.	21.7.	27.7.	30.7.	14	24.81
NJA-1	14.7.	19.7.	23.7.	23.7.	10.7.	15.7.	17.7.	13	22.89
Arzami aromatnyj	24.7.	26.7.	1.8.	29.7.	15.7.	14.7.	23.7.	18	45.22
Volšebnyj	30.7.	3.8.	10.8.	3.8.	23.7.	22.7.	30.7.	19	43.89
Vynoslivyj	31.7.	4.8.	10.8.	9.8.	23.7.	22.7.	1.8.	19	56.00
M-25	17.7.	22.7.	27.7.	28.7.	11.7.	15.7.	20.7.	17	38.67
Velkopavlovická LE-6/2	14.7.	19.7.	26.7.	28.7.	13.7.	13.7.	18.7.	15	37.81
Harogem	23.7.	30.7.	5.8.	3.8.	16.7.	19.7.	26.7.	20	56.22
LE-2185	20.7.	24.7.	26.7.	31.7.	15.7.	15.7.	21.7.	16	33.81
LE-1580	12.7.	14.7.	19.7.	18.7.	3.7.	11.7.	12.7.	16	27.81
LE-1453	15.7.	25.7.	25.7.	25.7.	12.7.	15.7.	19.7.	13	31.25
Lemeda (LE-962)	7.7.	15.7.	18.7.	15.7.	3.7.	7.7.	10.7.	15	29.47
LE-1321	8.7.	14.7.	18.7.	11.7.	3.7.	11.7.	10.7.	15	21.81
Lednická (M-90-A)	16.7.	21.7.	25.7.	26.7.	13.7.	13.7.	19.7.	13	28.33
LE-SEO-118	14.7.	18.7.	3.8.	23.7.	8.7.	13.7.	18.7.	26	70.22
Average	17.7.	21.7.	27.7.	25.7.	11.7.	14.7.	19.7.	16	36.79
Amplitude of days between genotypes	39	37	45	42	39	37	39		

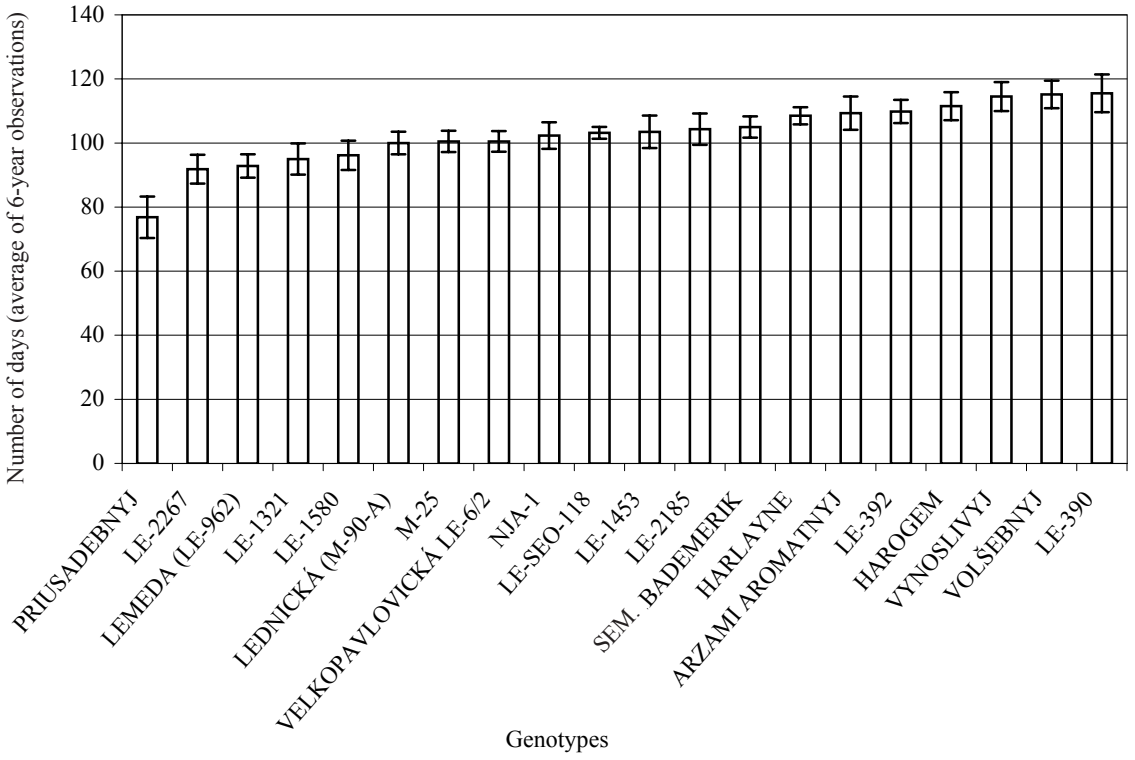

Fig. 2. Rank of apricots according to the number of days each genotypes needs from the "beginning of blossoming" and the "beginning of picking maturity". Average values for the 6-year period (from 1994 to 1999)

Table 4. Dates of the phenophase "end of pickling maturity" observed in 20 apricot genotypes each year of the period 1994–1999 and the variability of this phenophase expressed by its variance

Genotypes	Year						Average date	Amplitude of days between years	Variance
	1994	1995	1996	1997	1998	1999			
Harlayne	29.7.	4.8.	10.8.	9.8.	27.7.	29.7.	2.8.	14	30.58
LE-392	29.7.	1.8.	10.8.	6.8.	25.7.	26.7.	31.7.	16	33.22
Priusadebnyj	27.6.	5.7.	2.7.	30.6.	19.6.	26.6.	28.6.	16	25.81
Sem. Bademerik	24.7.	27.7.	10.8.	30.7.	19.7.	19.7.	26.7.	22	56.89
LE-2267	13.7.	19.7.	22.7.	14.7.	8.7.	11.7.	14.7.	14	22.25
LE-390	5.8.	7.8.	10.8.	8.8.	26.7.	2.8.	4.8.	15	24.25
NJA-1	19.7.	25.7.	29.7.	25.7.	15.7.	21.7.	22.7.	14	20.89
Arzami aromatnyj	29.7.	1.8.	7.8.	5.8.	20.7.	20.7.	29.7.	18	50.14
Volšebnyj	5.8.	9.8.	16.8.	13.8.	28.7.	28.7.	6.8.	19	53.47
Vynoslivyj	5.8.	10.8.	16.8.	16.8.	27.7.	28.7.	6.8.	20	65.89
M-25	22.7.	28.7.	3.8.	5.8.	11.7.	21.7.	25.7.	25	71.89
Velkopavlovická LE-6/2	20.7.	25.7.	1.8.	3.8.	18.7.	19.7.	24.7.	16	39.89
Harogem	29.7.	5.8.	11.8.	9.8.	21.7.	25.7.	1.8.	21	59.81
LE-2185	25.7.	30.7.	1.8.	3.8.	20.7.	20.7.	26.7.	14	30.81
LE-1580	18.7.	20.7.	25.7.	22.7.	8.7.	17.7.	18.7.	17	28.22
LE-1453	21.7.	31.7.	1.8.	29.7.	17.7.	21.7.	25.7.	15	32.81
Lemeda (le-962)	12.7.	21.7.	24.7.	17.7.	8.7.	12.7.	15.7.	16	30.89
LE-1321	13.7.	20.7.	25.7.	13.7.	8.7.	17.7.	16.7.	17	30.00
Lednická (M-90-A)	21.7.	27.7.	1.8.	3.8.	18.7.	19.7.	25.7.	16	39.14
LE-SEO-118	19.7.	24.7.	9.8.	24.7.	12.7.	19.7.	23.7.	28	74.00
Average	22.7.	27.7.	2.8.	29.7.	16.7.	20.7.	24.7.	17	41.04
Amplitude of days between genotypes	39	36	45	47	39	37	40		

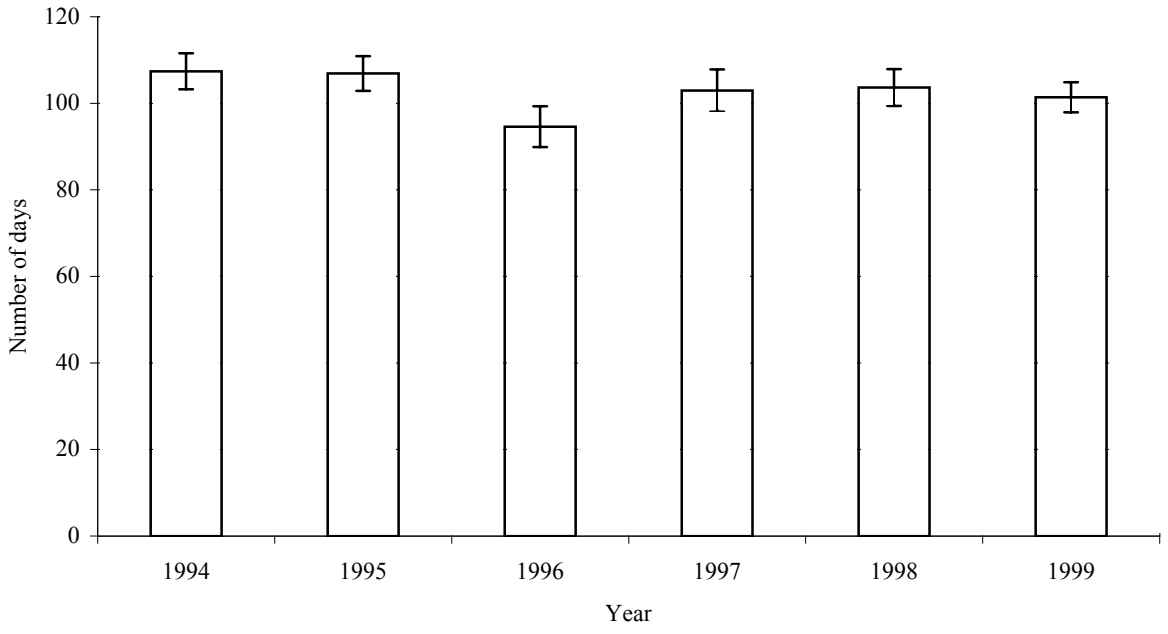

Fig. 3. Average number of days from the "beginning of blossoming" to the "beginning of picking maturity" observed in 20 apricot genotypes from 1994 to 1999

Table 5. Amplitude of days between the "beginning of blossoming" and the "beginning of picking maturity" for each of the 6 years from 1994 to 1999 observed in 20 apricot genotypes and the variability of this amplitude expressed by coefficient of variation (rank of genotypes according to their amplitude)

Rank	Genotype	Difference in days in						Average amplitude	Coefficient of variation
		1994	1995	1996	1997	1998	1999		
1	Priusadebnyj	83	86	63	74	76	79	77	9.6
2	LE-2267	96	99	83	89	93	91	92	5.6
3	Lemeda (Le-962)	96	98	85	91	94	93	93	4.5
4	LE-1321	100	100	86	89	96	99	95	5.8
5	LE-1580	103	99	86	96	95	98	96	5.4
6	Lednická (M-90-A)	105	102	92	100	102	99	100	4.0
7	M-25	105	102	93	103	100	100	101	3.8
8	Velkopavlovická LE-6/2	103	102	93	102	104	99	101	3.7
9	NJA-1	106	105	92	103	105	103	102	4.6
10	LE-SEO-118	107	104	102	103	100	103	103	2.0
11	LE-1453	105	112	93	102	107	102	104	5.6
12	LE-2185	109	105	94	111	106	101	104	5.4
13	Sem. Bademerik	112	107	103	103	105	100	105	3.6
14	Harlayne	111	110	102	110	110	108	109	2.8
15	Arzami aromatnyj	116	115	100	110	112	103	109	5.4
16	LE-392	113	113	102	108	114	109	110	3.8
17	Harogem	116	117	103	115	110	108	112	4.5
18	Vynoslivyj	119	119	109	120	113	107	115	4.5
19	Volšebnyj	121	121	109	116	115	109	115	4.3
20	LE-390	122	122	102	114	116	117	116	5.8
Average		107	107	95	103	104	101	103	4.7

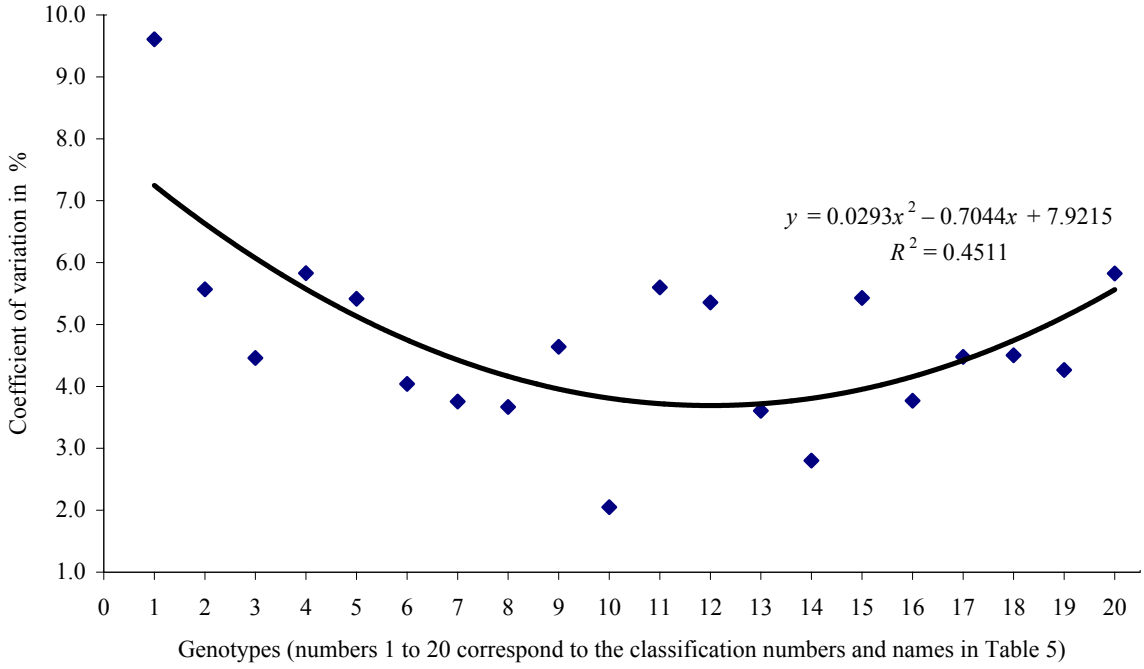

Fig. 4. Coefficients of variation of the amplitude of days necessary between the "beginning of blossoming" and the "beginning of picking maturity" calculated in each apricot genotype from 1994 to 1999

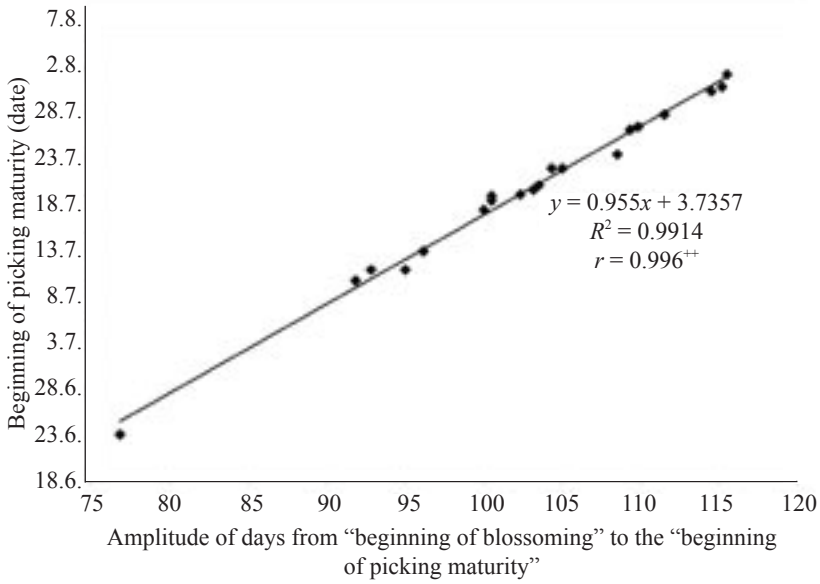

Fig. 5. Relation between the average "beginning of blossoming" and the average amplitude of "beginning of picking maturity" and "beginning of blossoming" observed in 20 apricot genotypes from 1994 to 1999

amplitude obtained when studying the phenophase "beginning of blossoming" (Fig. 1). The analysis of these observations shows that the apricot genotypes differ a lot from one another in the rate of fruit development from blossoming to picking. At the same time, differences between the years characterised by the amplitude of the period "beginning of blossoming" of the same species are smaller than the differences in "beginning of picking maturity" and "end of picking maturity" (Tables 1, 3 and 4).

The average between-years amplitude of the phenophase "beginning of blossoming" in 1994 to 1996 was 25 days and of the phenophase "beginning of picking maturity" 16 days. The differences between the values of amplitude were statistically highly significant (F 89.87**) (Tables 1 and 3). When classifying the genotypes according to the dates of both phenophases "beginning" and "end of picking maturity", it was found out that the ranks remained practically the same in all studied years. It is demonstrated by highly significant correlation coefficients from $r = 0.88^{++}$ to $r = 0.98^{++}$. Differences in the "beginning of picking maturity" of the different genotypes in a year with early start of vegetation (1998) and in a year with very late start of vegetation (1996) were statistically highly significant (F 24.25**) (Table 3). The number of days between the beginning and the end of picking maturity for genotypes was about the same each year (Tables 3 and 4).

The comparison between the phenophases "beginning of blossoming" and "beginning of picking maturity" showed no relevant relations in any of the six years of the evaluated period ($r = –0.01$ to $r = –0.24$). It is contradictory to what we expected, and also to the results obtained for example on grapevine (WOLFART et al. 1988). In grapevine, the larger amplitude between blossoming phenophases can explain these results. However the blossoming period of evaluated apricot genotypes is short and the differences in the rate of fruit development from fertilisation to picking are large. Although the average amplitude between the phenophases "beginning of blossoming" of the different genotypes was 6 days (at most 9 days), the interval of the phenophases "beginning of picking maturity" was on average 39 days in the same group of genotypes (at most 45 days) (Tables 1 and 3). The beginning of phenophases can influence quantity of fruits on trees and yield weight. This relationship was not evaluated in this paper work.

The number of days necessary for fruit development from the "beginning of blossoming" to the "beginning of picking maturity" is different and typical of each genotype. The confidence intervals (Fig. 2) show the conclusive demonstrativeness of the difference between pairs of genotypes.

The period from the "beginning of blossoming" to the "beginning of picking maturity" in the standard cultivar Velkopavlovická lasts on average 100 days. Early cultivars such as Priusadebnyj need 77 days from the "beginning of blossoming" to the "beginning of picking maturity". Late species such as Vynoslivyj or genotype LE-390 need 115 days for the same development. In some years these differences were statistically proved for the whole group of genotypes (for example between the years 1993 and 1996) (Table 5, Fig. 3).

In the year with very late start of blossoming (1996) it was shown that the average number of days necessary to the maturation of fruits for the whole group of genotypes was lower than in the years with earlier blossoming. The average value of variation coefficient for the amplitude of days between the "beginning of blossoming" and "beginning of picking maturity" for all genotypes in the whole six-year period was relatively low ($v = 4.7$) (Table 5). A regular relation expressed by the correlation coefficient $r = –0.55^{+}$ was found between the "beginning of picking maturity" and the variability of this factor in the six-year pe-

riod. When ranking the genotypes according to their period of maturity, it was evidently demonstrated that the variability of the phenophase "beginning of picking maturity" was higher in genotypes maturing at the beginning or at the end of picking season than in genotypes coming to maturity in the middle of picking season (Fig. 4). A highly significant correlation expressed by the correlation coefficient $r = 0.996^{++}$ was found out between the average "beginning of picking maturity" and the average amplitude between "beginning of blossoming" and "beginning of picking maturity" (Fig. 5).

References

BAŽANT Z., SVOBODA A., LITSCHMAN T., 1999. Proměnlivost termínu plného květu a sklizňové zralosti u meruněk odrůdy Velkopavlovické a broskvoní odrůdy Redhaven v podmínkách Jižní Moravy. Věd. Práce Ovocn., VŠÚO Holovousy, s. r. o., *16*: 63–70.

KRŠKA B., 1994. Hodnocení fenofáze kvetení širšího genofondu meruněk. Zahradnictví, *21*: 241–248.

MEHLENBACHER A., COCIU V., HOUGH L.F., 1998/99. Apricots (*Prunus*). Genetic Resources of Temperate Fruit and Nut Crops. ISHS, Acta Hort., I, *290*: 63–107.

VACHŮN Z., 1974. Zjištění vegetačního prahu a nároků na sumu aktivních teplot u meruňkových odrůd. Acta Univ. Agric. (Brno), Fac. Agron., *XXII* (4): 683–688.

VACHŮN Z., 1986. Mrazy v období kvetení meruňky Velkopavlovické v letech 1949–1985 (37 let) v Lednici na Moravě ve vztahu k pěstitelské praxi a šlechtění meruněk. Acta Univ. Agric., VŠZ Brno, Řada B, Fac. Hort., *1*: 87–99.

VACHŮN Z., 2002. Variability of Phenophase of Blossoming and Differences Between Beginning of Fertile Period in Apricots (*Prunus armeniaca* L.). Acta Univ. Agric. et Silvic., Mendel. Brun., *L* (1): 21–32.

VACHŮN Z., KRŠKA B., SASKOVÁ H. et al., 1995. Metodika hodnocení fenologických, pomologických a pěstitelských znaků (vlastností) meruňkových odrůd a hybridů. MZLU Brno, ZF, Ústav ovocnictví a vinohradnictví, Lednice: 8.

WOLFART A., BOGENRIEDER A., BECKER N., 1988. Climat and Vine Phenology – Evaluation of Series of Long-term Observations at Three Sites near Freiburg in Breisgau/Baden. Mitt. – Rebe Wein Obstbau, *38*: 108–119.

Received for publication February 10, 2003
Accepted after corrections March 26, 2003

Fenofáze kvetení a sklizňové zralosti a jejich vzájemné vztahy u dvaceti meruňkových genotypů v období šesti let

ABSTRAKT: V letech 1994–1999 byl hodnocen v podmínkách jižní Moravy v Lednici v České republice u souboru 20 genotypů meruněk průběh fenofází „začátek kvetení", „začátek sklizňové zralosti" a „konec sklizňové zralosti". Cílem bylo vyhodnotit variabilitu těchto fenofází a vztahy mezi nimi. Rozpětí fenofáze „začátek kvetení" nepřesahovalo 9 dnů. Průměrné meziroční rozpětí této fenofáze bylo asi třikrát delší než průměrné rozpětí mezi odrůdami. Průměrné rozpětí fenofáze „začátek sklizňové zralosti" mezi genotypy bylo 39 dnů, ale meziročně pouze 16 dnů. Mezi fenofází „začátek kvetení" a „začátek sklizňové zralosti" nebyla zjištěna průkazná korelace ani v jednom ze šesti let hodnoceného období. Variabilita fenofáze „začátek sklizňové zralosti" byla meziročně vyšší u genotypů zrajících na okrajích sklizňového období než u genotypů zrajících uprostřed sklizňového období souboru. Jednotlivé genotypy meruněk se mezi sebou významně lišily rychlostí vývoje plodů od kvetení do sklizně. Počet dnů od začátku kvetení do začátku sklizňové zralosti byl pro jednotlivé genotypy charakteristický. Variabilita tohoto rozpětí za šestileté období byla nízká. Hodnota variačních koeficientů nepřesáhla 10 %. U kontrolní odrůdy Velkopavlovická LE-6/2 bylo toto rozpětí průměrně 100 dnů. Mezi rozpětím dnů od „začátku kvetení" do „začátku sklizňové zralosti" a „začátkem sklizňové zralosti" byla velmi vysoká těsnost závislosti ($r = 0{,}996^{++}$).

Klíčová slova: meruňka (*Prunus armeniaca* L.); genotypy; fenofáze kvetení a zrání; vztahy; variabilita

Corresponding author:

Prof. Ing. ZDENĚK VACHŮN, DrSc., Mendelova zemědělská a lesnická univerzita, Brno, Zahradnická fakulta, Ústav ovocnictví a vinohradnictví, Valtická 337, 691 44 Lednice, Česká republika
tel.: + 420 519 340 105, fax: + 420 519 340 159, e-mail: vachun@mendelu.cz