

THE GROWTH AND DEVELOPMENT OF RASPBERRY CULTIVARS IN THE CONDITION OF UZBEKISTAN

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Abstract:

In the article during the growing season the occurrence of phenological phases, the buds formation, buds opening, the beginning of flowering, full flowering and the duration and the end of flowering, the time of flowering and the condition of the plants of the raspberry cultivars grown in Uzbekistan are evaluated in points. The results of research to study the beginning of fruit ripening, full ripening, the differences and quality indicators of fruits, the average and maximum weight of the fruit, acidity and sugar content of the fruit are given. Raspberry cultivars with high yields, depending on the ripening period of the fruit, are also recommended herein.

Keywords: Raspberry, cultivar, yield, bud germination, flowering rate, ripening, sugar content, fruit quality, chemical composition

INTRODUCTION:

Research and investigations are being carried out presently on the study of raspberry varieties with high yield, good biochemical composition, high commercial value of the fruit, universal, suitable for consumption and

processing, resistant to low temperature, heat, drought, adaptable to different soil and climatic conditions and the development of agricultural techniques in order to increase the efficiency of targeted research in the cultivation of raspberries in the world countries and high productivity in its production. There are not enough high-yielding raspberry cultivars resistant to various environmental factors and fungal diseases, with high marketability of fruits and universal processing characteristics in the range of raspberry cultivars grown in Uzbekistan. Enrichment of the range of raspberry varieties with such cultivars, their reproduction and development of intensive agro-technologies for raspberry cultivation is a topical issue in the agricultural sector of the Republic.

It is known that raspberries are very useful berries in providing the population with high-vitamin berries, as well as raw materials for the canning and confectionery industry. Variety selection is one of the decisive factors in the organization of raspberry croplands on the basis of profitable industry [2]. For the implementation of the tasks fixed in Presidential decree #4947 about "Actions strategy on five priority for the development of

th Republic of Uzbekistan in 2017-2021" dated February 7, 2017 and in relevant normative-legal documents, the research aimed at selecting varieties that meet all the requirements of modern horticulture is of great importance.

The healing properties of raspberries are known since ancient times. Its tincture from dried flowers was used as remedy when bitten by snakes and scorpions. The harmonious combination of sugars, organic acids, vitamins C, P, B₉ and hematogenous compounds in its content makes raspberry very useful in various diseases such as ulcers, anemia, impaired vascular permeability.

Raspberries are rich in antibiotics that have antiseptic effect on the upper respiratory tract and prevent colds. The fruit contains 5-10% of sugar, 0.5 to 2.5% of organic acids, vitamins B₁, B₂, B₆, B₉, B₁₂, C, D, E, PP, P, K, additives, dyes (up to 1.5%), phosphorus, iron, salts, pectin (0.5-0.9%) [1,4,6]. Fresh raspberry fruit is used in the preparation of jams, juices, jelly, compotes, syrups, etc.

MATERIALS AND METHODS:

The research is being conducted at the Andijan research and experimental station of the Research Institute of Horticulture, Viticulture and Wine-making named after Academician Makhmud Mirzaev.

The object of study is the following cultivars belonging to different ecological groups: "Progress (Russia)", "Malboro (USA)", "Vislukha (Russia)", "Barnaulskaya (Russia)", "Vladimir (Russia)", "Giant (Russia)".

Research on the evaluation of raspberry cultivars was conducted on the basis of "Methods and programs for the study of varieties of fruits, berries and nuts" (Orel 1999). Mathematical and statistical processing of research data was performed using Microsoft Excel according to the method recommended by B.A. Dospekhov (1985) [3,5].

RESULTS AND DISCUSSION:

According to the study, the beginning of the growing season of raspberry cultivars was observed on March 12 in the Progress (st) cultivar, while in Vislukha (March 10) and Vladimir (March 6) cultivars it was 2-6 days earlier. In Malboro (March 14), Barnaulskaya (March 14) and Gigant (March 16) varieties, it started 2-4 days later than the standard variety.

When the flowering period of the studied raspberry cultivars, in Progress (st) cultivar it started on April 3 and ended on May 16, while only Vislukha (April 1) variety started to flower 2 days earlier than the standard variety and ended on May 13. Among the cultivars, Malboro (April 12), Vladimir (April 11) cultivars were observed to flower 8-9 days later than the standard variety, while the end of flowering was noted in Malboro cultivar on May 19, in Vladimir cultivar on May 10. From the studied cultivars, Gigant (May 1) and Barnaulskaya (May 6) cultivars had the latest flowering stage, that is 28-33 days later than the standard variety, while the end of flowering was observed in Gigant cultivar on May 30, in Barnaulskaya cultivar on June 6. The duration of flowering stage varied from 29 days (Gigant) to 43 days (Progress (st)).

When the ripening period of fruit of raspberry cultivars was observed, it began on May 30 in Progress (st) and ended on July 3, while only in Vislukha (May 29) cultivar it occurred 1 day earlier than the standard variety, the end of maturation was observed on June 29 in this cultivar. Among the studied cultivars, the fruit ripening stage began too late in Gigant (June 22) and Barnaulskaya (June 28) cultivars, that is 23-29 days later than in standard variety, the end of fruit maturation was noted in Gigant cultivar on July 20, in Barnaulskaya cultivar on



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July 30. In all cultivars the duration of ripening varied from 25 to 34 days (Vladimir, Progress (st)) (table-1).

Table-1 Phonological phases of raspberry cultivars

cultivar	Beginning of vegetation		Plant condition, points	Flowering			Duration of flowering, day	Fruit ripening			Duration of ripening, day
	Bud formation	Bud opening		Beginning	Full flowering	ending		Beginning	Full maturation	Ending	
Progress (st)	12/III	20/III	3	03/IV	23/IV	16/V	43	30/V	18./VI	03/VII	34
Malboro	14/III	21/III	4	12/IV	29/IV	19/V	37	30/V	16/VI	28/VI	29
Vislukha	10/III	18/III	4	01/IV	21/IV	13/V	42	29/V	15/VI	29/VI	31
Barnaulskaya	14/III	22/III	3	06/V	30/V	08/VI	35	28/VI	16/VII	30/VII	32
Vladimir	06/III	17/III	4	11/IV	20/IV	10/V	31	31/V	13/VI	25/VI	25
Gigant	16/III	20/III	4	01/V	14/V	30/V	29	22/VI	07/VII	20/VII	29

According to a study on the quality indicators of fruits of raspberry varieties, the average weight of one fruit in the Progress (st) cultivar was 2.1 g, while the weight of the largest fruit was 3 g. Among the cultivars, the least weight of single fruit was noted to be 1.2 g in Barnaulskaya cultivar, the highest weight of a fruit was in Gigant cultivar 3,5 g. By the weight of the largest fruit, the cultivar Gigant

(8,0 g) showed the highest indicator compared to the remaining cultivars.

Another important factor determining fruit quality is the total sugar content, which, according to the results obtained, was 8.8% in the Progress (st) cultivar, while the highest sugar content among the varieties was recorded in the Gigant cultivar (10%). When the acidity of the fruit was studied, the lowest

indicator was observed in Vislukha and Vladimir cultivars, i.e. 0.23% (Table 2).

Table-2 Quality indicators of the fruits of raspberry cultivars

Cultivars and hybrids	Average weight of a fruit, g	The weight of the largest fruit, g	Acidity, %	Sugar content, %
Progress (st)	2,1	3,0	0,7	8,8
Malboro	2,0	3,1	0,26	6,3
Vislukha	1,5	2,5	0,23	7,5
Barnaulskaya	1,2	3,5	0,66	8,6
Vladimir	1,8	3,3	0,23	7,4
Gigant	3,5	8,0	1,1	10

CONCLUSION:

- 1) The ripening of raspberry varieties at different times, depending on the phenological phases, allows to meet the demand of the population for fresh fruit of raspberry for a long time.
- 2) Among the cultivars, Vislukha cultivar was found to be precocious (May 29) and the latest ripening cultivars were Gigant (June 22) and Barnaulskaya (June 28), and it is expedient to establish raspberry orchards from these cultivars.
- 3) Gigant cultivar of raspberry differed from other cultivars by its large size (8.0 g) fruits and high sugar content (10%).
- 4) Gigant cultivar of raspberry was found to have high indicators on an average fruit weight (3.5 g) and high acidity (1.1%) in comparison with other varieties.
- 5) The highest rate in the duration of flowering period in raspberry cultivars was 43 days in Progress (st), while the duration of ripening stage was 34 days, also in Progress (st).

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