

The Phases of Growth and Development of Kiwi Varieties Introduced in Uzbekistan

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Abstract: *In this scientific article was given experimental material, devoted to the exploration of development phases of Kiwi varieties such as Hayward, Monty, Ellison and Matua, introduced in Uzbekistan.*

It was defined by the experiments that from tested Kiwi type In Matua sort possessing by male type of flower, bud opening phase came for 2-3 days later. Late bud opening was observed in Hayward Kiwi variety on March 20-23.

Matua variety, forming only male type flowers in a bush, was distinguished by strong development of vegetative organ from all explored Kiwi varieties. General development of aerial part in bush of this species was higher for 1.2 times, in comparison with other varieties. The coming of picking technical maturity of fruits on experimented sorts practically independent from plants' initial vegetation phase passing. The earliest coming of fruit technical maturity of Kiwi varieties was observed in Monty kind on November 1-6, in Hayward and Ellison varieties for 10-13 days later.

Keywords: *kiwi, varieties, introduction, growth, development, buds, leaf, shoot, merithallus, flowers, fruit, maturity.*

1. INTRODUCTION:

In recent years the new methods have been introduced from foreign countries to the cultivation of kiwi in Uzbekistan. Unfortunately, most attempts of farmers for the cultivation of kiwi finished unsuccessfully. The reason of this is a poor study of biological features of the culture of the kiwi in the condition of harsh continental climate of the republic. In winter the temperature lows to -15°C -17°C, in summer rises to +40°C and above. Another restraining factor in culture introduction in kiwi production is absence of the technology, the knowledge on the selection biology of the plant, including the cultivation of seedlings as well [1, 4].

Kiwi – it is the name of one of actinides types and the fruits of this species, particularly, Chinese actinides (*Actinidia chinensis*) or delicacy actinides (*Actinidia deliciosa*). Chinese actinides or kiwi - is a large wood liana type from China, therefore, kiwi is also called «chinese gooseberry» or «chinese peach». The name of the fruits of this plant was given in New Zealand in honor of flightless apterous lurid bird «Kiwi- Kiwi» which resembles to this fruit [2, 5].

Kiwi fruits can incinerate fat which lead to arterial problems and can decrease the risk of blood clot organization.

In medicine kiwi is used for improving digestion, for preventing rheumatic diseases, stone appearance in kidneys, for reducing nervousness and preventing poliosis of hair. This fruit has antineoplastic and antioxidant effect, and also improves physical labor efficiency, protects the organism from infection and strengthens immune system. In combination with magnesium and vitamin C it supports heart function. Besides, magnesium regulates cellular change and supports resistance of organism under stress.

2. MATERIALS AND METHODS:

The research was conducted in practical experimental plot of Tashkent state agrarian university in 2016-2018 with introduced varieties of kiwi Hayward, Monty and Matua from New Zealand. The experiments were carried out in row plots with 10 m length and the distance between the plants made 2,0 m. In each variant of experiment five plants were used for quality testing. Number of replications in experiment was triple [3].

During the period of conducted research, the growth and development of sorted plant underwent under the following phenological observations and biological recordings: bud breaking and flowering, shoot growth, the number of shoots in a branch, fruitfulness of seedlings, leaf formation, the length between merithallus and other features of the plant.

3. RESULTS AND DISCUSSION:

The research conducted by us showed that in an annual cycle the development of kiwi as a deciduous plant, is divided into two periods – hibernation period and the period of active growth and development of plant.

In seasonal development of under-soil part of sorted kiwi plant we have determined the following main phases of development (Table 1).

Table 1: Characteristics of main phenological phases of the development of kiwi varieties, in 2017-2018

Varieties	Gender	Development phases of the plant			
		Breaking of buds, date	Beginning of flowering, date	Maturity stage of fruits, date	Beginning of economic maturity, days
Hayword- control	Female	20-22.03	22-24.05	14-16.11	18-23
Monty	Female	15-17.03	20-22.05	1-6.11	12-18
Ellison	Female	14-16.03	15-18.05	11-16.11	8-15
Matua	Male	16-18.03	19-22.05	-	-

According to experimental data presented in Table 1 on investigated varieties of kiwi plants the earliest bud breaking in experiment was observed in kiwi varieties Ellison and Monty – on March 14-17, in Matua variety on March 16-18. Hayword variety differs from the latest beginning of flow of sap and bud breaking – on March 20-23, that is, for 4-5 days later than in Monty and Ellison varieties.

Beginning of flowering phase in investigated kiwi sorts the earliest was observed in Ellison sort – on May 15-18, in remaining three varieties it started almost in similar periods – on May 19-24.

Precocity of kiwi varieties - the beginning of technological maturity stage had its particular features and factual independence from the beginning phase of vegetation of plants. The earliest beginning of technological maturity in investigated varieties of kiwi under the experiment was observed y in Monty variety - on November 1-6, in Hayword and Ellison varieties was noted 10-13 days later.

The beginning of economic maturity or physiological maturity at the ripening of picked fruits occurred 8-15 days earlier in Ellison variety, in Monty and Hayword varieties for 18-23 days.

The development of under-soil parts of the plant in connection with sort features had a certain difference. Matua variety had functional male flowers and as per all development indications of under-soil development it showed the highest indications.

As per the number of formed shoots in a branch at vegetation, including the branches with generative buds in a seedling the varieties like Monty and Ellison were differentiated.

Monty and Hayword varieties were differentiated by the most quantity of formed leaves in a branch and assimilated surface. Ellison variety in comparison with other all tested varieties had mean indications by this development feature [Table 2].

Table 2: The indications of development of under-soil parts of kiwi plant in three-aged stage, in 2016-2018.

Varieties	Yearly growth of seedling, cm	Quantity of shoots in branch, pieces	Fruitful branches, pieces	Length of merithallus, cm	Leaf formation in branch pcs/branch	Leaf-area, cm ² / branch
Hayword control	185	22	12	9,8	96	170
Monty	183	29	26	8,3	74	210
Ellison	197	20	25	6,3	71	141
Matua	222	31	-	10,8	109	205

4. CONCLUSION:

- Ellison and Monty varieties were differentiated with their earliest bud breaking feature from other tested kiwi varieties, their bud breaking phase started in spring on March 14-17, while in Matua variety which had male flower types it occurred 2-3 days later. The latest bud breaking in the experiment was observed in control variety of kiwi “Hayword” – March 20-23.

- Out of all tested varieties of kiwi the strongest development of vegetative organs were differentiated in Matua variety, which formed only male flowers in branches. The development of underground parts of this variety increased by 1,2 times compared to other varieties.
- The beginning of technological maturation of fruits in tested varieties practically didn't depend on the occurrence of beginning phase of vegetation of plants. The earliest technological maturity of fruits by varieties of kiwi was observed in Monty on November 1-6, in Hayword and Ellison varieties it occurred 10-13 days later.

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