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Dynamics of the development of introduced peach varieties

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Abstract
The article provides information on the growth dynamics of annual shoots of introduced varieties of peach plants. The study was carried out over the introduced varieties in the conditions of the Guba-Khachmaz economic region Melox 26, Melox 31, Melox 37, Netix 25, Netix 28, Netix 30, Netix 34, Redix 25, Redix 27, Redix 30, Redix 2-110, Malix 25, Malix 36, Malix 145, Guayox 30, Guayox 35, Gartairo and Gardeta. In the study, peach varieties were studied in order to study the agrobiological characteristics, development indicators of these varieties and their adaptation to the soil and climatic conditions of the region. In the course of the study, the characteristics of shoot development were compared with the use of the Fadai variety, taken as a control variety. The study of the dynamics of the development of peach shoots is important for determining the level of development of trees by varieties and features of their pruning, increasing productivity. During the years under study (2018-2020), as a result of studying the dynamics of the development of peach plant shoots, it was determined that the phenological phase of vegetative growth in the studied peach varieties lasts from the second half of April to the beginning of September, young shoots in early-flowering varieties are formed on April 20-25, and in late-flowering varieties on April 26-30. Intensive growth of annual shoots was 0.80-1.10 cm, depending on the variety. Stopping the growth of shoots in the studied varieties was observed on July 23-26 in the first Growth and September 4-6 in the second.

Keywords: introduction, peach, variety, dynamics of shoot growth, Guba-Khachmaz economic region

Introduction

The population's demand for food continues to grow, which requires an increase in the area under crops and production of agricultural products, the creation of varieties resistant to changing market demands and competition [Hasanov and Aliyev: 2011, p.409]. At present, 203666.5 hectares of agricultural lands of the country are orchards, of which 33.5 hectares are super-intensive, 482.3 hectares are intensive and 5215.4 hectares are traditional, and only 5731.2 hectares are peach orchards. There are more than 4,000 varieties of peaches and nectarines in the world, more than 1,000 of which are of Chinese origin. Many countries have different selection programs to obtain new varieties with different characteristics. We have determined that mixed shoots are the most common shoots in the peach plant, forming both vegetative and generative shoots. These shoots reach a height of 1.5 m, forming mixed shoots in the upper parts. In older trees, this type of shoots is weaker, growing to 30-40 cm. In such shoots, one of the three shoots grows tall, and the other two flower buds. Fruit twigs are usually 10-15 cm long, rarely 20 cm long, forming flower buds. One of the sprouts found in the peach plant is an abnormal sprout. These shoots are formed on the strong branches of the current year. In addition, haram sprouts are formed on this plant. These shoots are formed from dormant shoots. Occurs mainly on trunks and skeletal branches. This type of shoots is very strong, 1.5-2 m long and 2-2.5 cm thick. Such shoots form abnormal shoots on the upper part by forming flowers, which also have flower shoots [Bunchuk: 2016, p. 65] [3]. The development of shoots is associated with the development of plant roots, and it is possible to ensure the development of shoots by creating favorable conditions for root development. High agro-technical care ensures the development of regular shoots every year in the conditions of disease and pest control measures, which prolongs the life of the plant by creating high productivity and nutrient reserves [Shaytan: 1967, p. 26]. In the first year of the peach plant, 60-70 cm, in the next 2-3 years the shoots, which are a continuation of the skeletal branches, reach a length of 1.5 m. In 3-5 years, the average length of annual shoots reaches 40-70 cm, and some shoots reach 70-90 cm. The length of the lateral mixed shoots is more than 40-50 cm. From the second half of August, the shoots become woody and nutrients accumulate [Abdulhajiyeva: 2016, p. 12]. The growth of the peach plant is not always strong. Thus, in the absence of proper pruning, the length of shoots, which are a continuation of skeletal branches in 5-6-year-old trees, is 30 cm less than in other years. With proper pruning, the peach plant will produce 40 cm long shoots throughout its life. Young peach trees have many mixed branches. The development of shoots lasts mainly from the beginning of spring vegetation to the end of June. At this time all the branches develop. Then the development of weak branches stops. However, the development of strong shoots continues. However, the development of these branches also begins to weaken in July. SA Sokolova and BV Sokolov note that in the conditions of Moldova the development of shoots stops in mid-August. Sometimes

there are changes in the development of shoots depending on climatic conditions. Thus, when there is a severe drought, the development of shoots stops in July. when there is a lot of precipitation, the development period of the shoots is prolonged. Sometimes, after the drought, which causes the growth of the shoots to stop, the rains lead to the beginning of the second growth of the plant, which is delayed. During the second growth in the peach plant, the length of the shoots is 10-15 cm [Sokolova and Sokolov: 1987, p. 38-40].
Knowing the beginning of the developmental stages of fruit crops allows a number of agro-technical measures (pruning, irrigation, spraying, etc.) to regulate the onset and rate of plant development, to create better conditions for obtaining fruit crops [Giovannini *et al*. 2013 p.14]. The study of the development dynamics of peach plant seedlings is important in increasing productivity by determining the level of plant growth capacity and pruning characteristics of varieties.

Materials and methodology
The research work is carried out on 18 peach and nectarine varieties planted in a 5x3m sowing scheme on an area of 0.17 ha, introduced from Spain in the Zardabi ETB of Scientific Research Institute of Fruit-growing and Tea-growing. Under observation Melox-26, Melox-31, Melox-37, Netix-25, Netix-28, Netix-30, Netix-34, Redix-25, Redix-27, Redix-30, Redix-2-110, Malix-25, Malix-36, Malix-145, Guayox-30, Guayox-35, Gartairo, Gardeta varieties.

The purpose of the study
It is the study of agrobiological features of newly introduced peach varieties in Guba-Khachmaz region, as well as the active development phases of varieties and selection of high-yielding varieties adapted to the soil and climatic conditions of the region.

Experimental part
During the research years (2018-2020), the development of the phenogram of peach plant varieties, as well as the dynamics of the development of shoots were carried out in 3 research trees allocated for each variety. In the umbrella of each tree, a total of 10 shoots were separated, with 5 shoots from the east and west, and their length was measured every 10 days. Measurements were performed on a total of 30 seedlings of each variety. In the conditions of Guba-Khachmaz region, the phenological phase of vegetative growth in peach trees covers the period from the second half of April to September. The formation of young shoots from overgrown vegetative shoots occurs in the second and third decade of April, depending on the variety. In fast-flowering varieties (Gardeta, Gartairo, Guayox 30, Malix-145 and Redix-25) shoots develop April 20-25, and in late-flowering varieties (Melox-31, Malix-36, Redix-30, Melox-26, Netix-34 and others) April 26-30. started on dates. The study of the growth dynamics of the formed shoots was started when their length was 1.0-2.3 cm and continued until the end of September. 20-30 days after the beginning of the development of the shoots, the annual shoots grow more intensively. For all varieties, this period lasts until the end of May and the end of June. In three years, on average, the maximum daily growth in most varieties was recorded between June 10-30, and the daily growth was 0.80-1.10 cm, depending on the varieties and periods. This increase was highest in the Malix-25 (1.10 cm) and Guayox-35 (1.07 cm) varieties on June 20-30, and in Gartairo (0.80 cm) in June 1020 and Netix-34 (June 20-30). 0.77 cm) was observed. In the following days, the daily growth of annual seedlings began to decrease, and the daily growth varied between 0.03-0.17 cm, depending on the variety. Thus, the development of shoots in varieties is considered to have stopped during the first period (Table 1). The opening of leaf shoots and the beginning of longitudinal growth of shoots were recorded in 3 years on average between 7.9˚C and 22.4˚C. Depending on the varieties and climatic conditions of the years, the average daily temperature of the vegetative growth phase was 14.6-17.7˚C. During strong growth, the relative humidity was 65-75% and the rainfall ranged from 5.6 mm to 51.8 mm, depending on the years of research. The most rain fell in 2018, and the least in 2020. During the research years, the soil moisture of the experimental area varied between 20.7-23.9% depending on the soil layers. Studies have shown that in all varieties observed in the second half of July and early August, growth processes are significantly reduced, and the second stage of the phenological phase of vegetative growth - the second growth period begins. In general, depending on the variety, the stunting period of the shoots is 30-40 days, and in early September, the shoots in the middle of the umbrella of most varieties form hill shoots (Table 2).

Table 1: Daily growth of peach varieties, cm (average in 2018-2020)

Variety	Daily increase, cm												
	30/IV-10/V	10/V-20/V	20/V-30/V	30/V-10/VI	10/VI-20/VI	20/VI-30/VI	30/VI-10/VII	10/VII-20/VII	20/VII-30/VII	30/VII-10/VIII	10/VIII-20/VIII	20/VIII-30/VIII	30/VIII-10/IX
1. Fadai (n)	0,14	0,35	0,57	0,74	0,91	0,90	0,68	0,27	0,03	0,04	0,21	0,50	0,02
2. Melox 26	0,12	0,25	0,48	0,57	0,85	0,83	0,71	0,16	0,08	0,04	0,16	0,42	0,12
3. Netix 25	0,17	0,37	0,66	0,77	0,95	0,88	0,75	0,29	0,05	0,16	0,38	0,69	0,15
4. Redix 25	0,18	0,34	0,79	0,74	0,92	0,91	0,77	0,29	0,07	0,06	0,30	0,57	0,17
5. Malix 25	0,13	0,33	0,49	0,72	0,82	1,10	0,62	0,26	0,05	0,03	0,19	0,43	0,08
6. Redix 27	0,18	0,29	0,53	0,66	0,82	0,87	0,69	0,42	0,09	0,03	0,18	0,27	0,10

7. Netix 28	0,13	0,29	0,49	0,70	0,85	0,80	0,73	0,28	0,05	0,04	0,19	0,57	0,10
8. Netix 30	0,18	0,35	0,70	0,79	0,87	0,84	0,79	0,26	0,17	0,09	0,42	0,61	0,18
9. Guayox 30	0,13	0,27	0,42	0,69	0,85	0,95	0,73	0,36	0,05	0,07	0,21	0,26	0,12
10. Redix 30	0,17	0,26	0,41	0,68	0,88	0,81	0,79	0,32	0,04	0,05	0,19	0,43	0,04
11. Malix 145	0,16	0,25	0,36	0,63	0,83	0,81	0,72	0,19	0,05	0,07	0,07	0,30	0,11
12. Melox 31	0,21	0,36	0,60	0,90	0,94	0,74	0,76	0,29	0,04	0,05	0,11	0,61	0,35
13. Melox 37	0,11	0,34	0,49	0,63	0,86	0,88	0,79	0,19	0,05	0,04	0,20	0,53	0,14
14. Redix 2-110	0,13	0,35	0,45	0,59	0,98	0,89	0,65	0,29	0,04	0,05	0,16	0,42	0,12
15. Netix 34	0,14	0,35	0,44	0,63	0,90	0,77	0,70	0,25	0,04	0,05	0,20	0,53	0,13
16. Malix 36	0,16	0,37	0,45	0,72	0,88	0,90	0,72	0,44	0,03	0,05	0,19	0,48	0,08
17. Guayox 35	0,18	0,38	0,66	0,70	0,96	1,07	0,68	0,31	0,10	0,10	0,30	0,64	0,14
18. Gartairo	0,14	0,33	0,52	0,68	0,80	0,85	0,68	0,29	0,05	0,04	0,18	0,43	0,12
19. Gardeta	0,17	0,38	0,58	0,75	0,94	0,89	0,80	0,37	0,06	0,07	0,20	0,65	0,11

Table 2: Annual development dynamics of unitary shoots of introduced peach plant varieties, cm (2018-2020)

Variety	a y l a r																
	April		May			June			July			August			September		
	20	30	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30
1. Fadai (n)	1,4	2,8	4,2	7,7	13,4	20,8	29,9	38,0	44,8	47,5	47,8	48,2	50,3	55,3	56,2	56,4	56,4±0,34
2. Melox 26	1,2	2,3	3,5	6,0	11,2	16,9	25,4	33,7	40,8	42,6	43,4	43,8	45,4	50,3	51,5	51,7	51,7±0,41
3. Netix 25	1,9	3,2	4,9	8,6	15,2	22,9	32,4	41,2	48,7	51,6	52,1	52,7	56,5	63,2	64,7	64,8	64,8±0,60
4. Redix 25	2,0	3,4	5,2	8,6	15,9	23,3	32,5	41,6	49,3	52,2	52,9	53,5	56,5	62,2	63,9	64,1	64,1±0,46
5. Malix 25	1,3	2,4	3,7	7,0	11,9	19,1	27,3	38,3	44,5	47,1	47,6	47,9	49,8	54,1	54,9	55,0	55,0±0,48
6. Redix 27	1,3	2,6	4,4	7,3	12,6	19,2	28,4	37,1	44,0	48,2	49,1	49,4	51,2	53,9	54,9	55,0	55,0±0,59
7. Netix 28	1,3	2,7	4,0	6,9	11,1	18,1	26,6	34,6	41,9	44,7	45,2	45,6	47,5	53,1	54,1	54,2	54,2±0,44
8. Netix 30	2,2	3,5	5,3	8,8	15,8	23,7	32,4	40,8	48,7	51,3	53,0	53,9	58,1	64,2	66,0	66,1	66,1±0,51
9. Guayox 30	1,2	2,4	4,0	6,7	10,9	17,8	25,9	35,4	42,7	46,3	46,8	47,5	49,6	52,2	53,4	53,6	53,6±0,46
10. Redix 30	1,2	2,5	4,2	6,8	10,9	17,7	26,5	34,6	42,5	45,7	46,1	46,6	48,5	52,8	53,2	53,4	53,4±0,37
11. Malix 145	1,0	2,2	3,6	6,1	9,7	17,0	25,3	33,4	40,6	42,5	43,0	43,7	44,4	47,4	48,5	48,6	48,6±0,44
12. Melox 31	2,3	3,5	5,6	9,2	15,2	24,2	33,6	41,0	48,6	51,5	51,9	52,4	53,5	59,6	63,1	63,3	63,3±0,68
13. Melox 37	1,5	2,8	3,9	7,3	12,2	18,5	27,1	35,9	43,4	45,3	45,8	46,2	48,2	53,3	54,7	54,8	54,8±0,43
14. Redix 2-110	1,3	2,5	3,8	7,3	11,8	17,7	27,5	36,4	42,9	45,8	46,2	46,7	48,3	52,5	53,7	53,9	53,9±0,59
15. Netix 34	1,2	2,4	3,8	7,3	11,7	18,0	27,0	35,3	42,3	44,8	45,2	45,7	47,5	52,8	54,1	54,3	54,3±0,41
16. Malix 36	1,1	2,2	3,8	7,5	12,0	19,2	28,0	37,0	44,2	46,6	46,9	47,4	49,3	54,2	55,0	55,1	55,1±0,43
17. Guayox 35	1,9	3,4	5,2	9,0	15,6	22,6	32,2	42,9	49,7	52,8	53,8	54,8	57,8	64,2	65,6	65,8	65,8±0,44
18. Gartairo	1,3	2,6	4,0	7,3	12,5	19,3	27,3	35,8	42,6	45,4	45,9	46,3	48,1	52,4	53,6	53,9	53,9±0,53
19. Gardeta	2,2	3,7	5,4	9,2	15,0	22,5	31,9	40,8	48,8	52,5	53,1	53,8	55,8	62,3	63,4	63,6	63,6±0,57

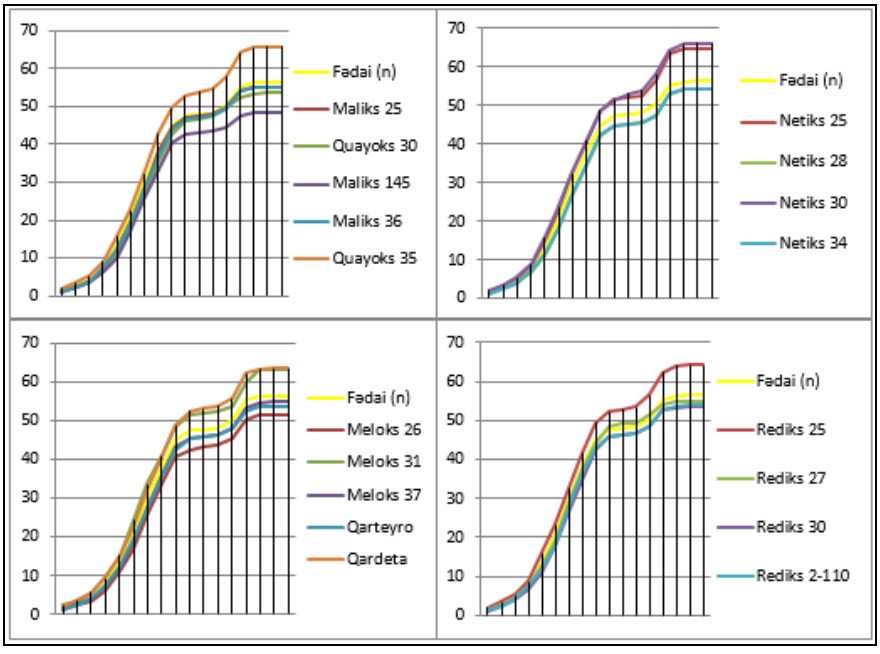

Fig 1: Dynamics of development of shoots belonging to the introduced peach varieties

As a result of the research, among the peach varieties introduced in the soil and climatic conditions of Guba-Khachmaz economic region, varieties with relatively high performance compared to Fadai (n) variety were selected for the dynamics of development of shoots. Thus, the average length of shoots on the introduced peach varieties does not vary between 48.6-66.1 cm. Melox-31, Netix-25, Netix-30, Redix-25, Quayoks-35 and Gardeta varieties with a average length of 63.3-66.1 cm shoots are relatively high compared to Fadai (56.4 cm) variety, while other varieties It had relatively low values of 48.6-55.1 cm. According to this indicator, Netix-30 variety had the highest score with 66.1 cm and Maliks-145 variety had the lowest score with 48.6 cm.

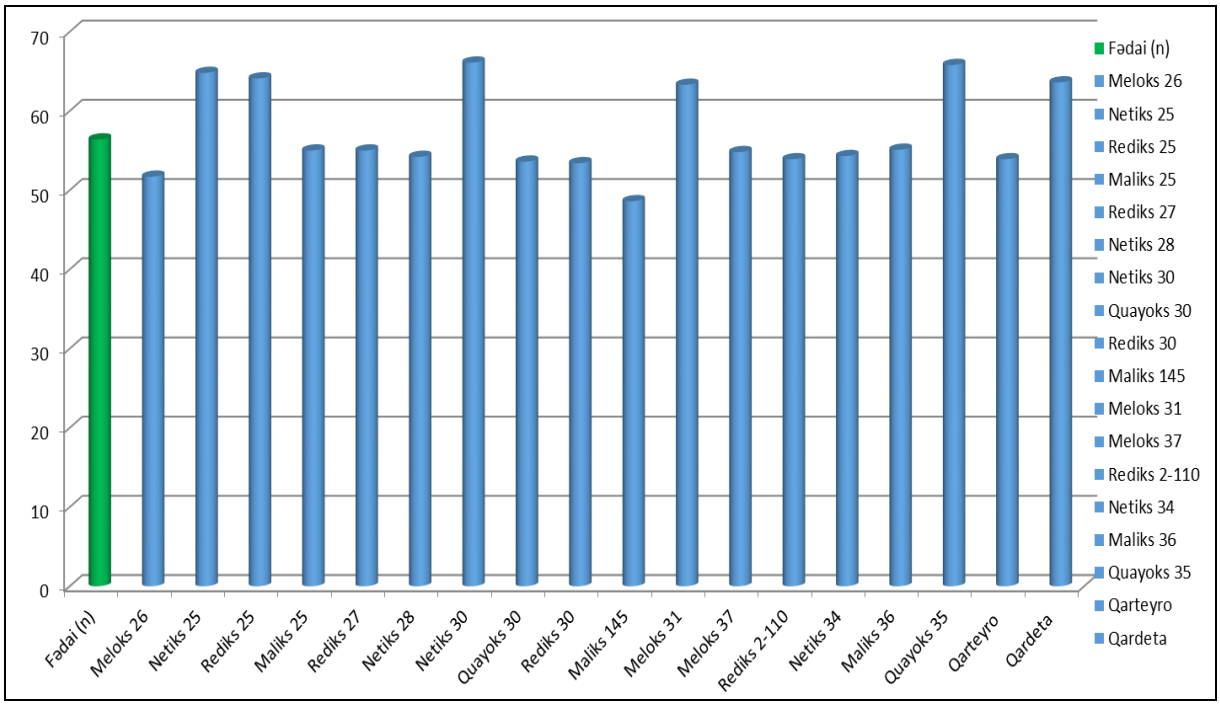

Fig 2: Comparison of the development of sprouts of introduced peach varieties

Fig 3

Fig 4

Conclusion

Agrobiological features of peach plant varieties introduced in Guba-Khachmaz region, as well as research on the dynamics of development of annual shoots in 2018-2020 were identified in the research work:

1. The phenological phase of vegetative growth in peach varieties covers the period from the second half of April to the beginning of September.
2. The formation of young shoots from vegetative shoots was recorded on April 20-25 in fast-flowering varieties and on April 26-30 in late-flowering varieties.
3. The most intensive growth in all varieties under study was recorded from 10 to 30 June, with an average daily height increase of 0.80-1.10 cm depending on the variety over three years.
4. The first stage of development of unitary shoots in the studied varieties (I size) was completed on July 23-26, and the second stage (II size) on September 04-06.
5. Depending on the variety, the average length of annual shoots varies from 48.6 to 66.1 cm on average in 3 years, the longest shoots are Netix 30 (66.11 cm), Quayoks 35 (65.8 cm) and Netix 25 (64, 8 cm), the shortest shoots were recorded in Maliks 145 (48.8 cm) varieties.

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