The influence of organo-mineral fertilizers on the growth of evening apple varieties throughout the year

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Abstract. The article describes the research of the apple varieties grown in the areas in the Yangikurgan district of the Namangan region and proper use of apple fruit production and post-harvest activities in the region. "Iskavot" districts "Nazirjon Ilkhomjon Arabboy" farm in the apple orchards of semirenko, golden delicacies, starcrimson, (five stars), local variety (boyken) 4 types, i.e. N_{120} P_{100} K_{30}, N_{50} P_{30} K_{10} organic$_{1000}$, N_{25} P_{20} Phenological and biometric evaluations of K_5 Organomineral$_{500}$, Organomineral$_{1000}$ fertilizers were studied. Apple cultivars were studied at the beginning of vegetation, beginning of flowering, end of flowering, end of branch growth, beginning and end of autumn, the periods of watering the field, the periods of spraying pesticides, the periods of spraying herbicides.

1 Introduction

Providing the population with fast, high-quality and cheap, natural, clean, nutritious food rich in vitamins remains the main issue. More than 14,628,000 fruit tree seedlings and 7.3 million apple seedlings were delivered to more than 40,000 fruit and vegetable farms in our republic for the establishment of new gardens and vineyards, reconstruction of existing ones, new plantings on 14,600 hectares gardens were created [1].

This is according to the decision of the President of the Republic of Uzbekistan No. PF-5853 of October 23, 2019 "On approval of the strategy of the development of agriculture of the Republic of Uzbekistan for 2020-2030" and the President of the Republic of Uzbekistan 11.01.2021 PD-4941- No. "On measures for the development of fruit and vegetable growing and viticulture in Kosonsoy, Chortoq and Yangigurgan districts of Namangan region" the measures for further improvement of the field of fruit and vegetable growing and viticulture are determined [2].

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Table 1. Indicators of horticulture specialization in Kosonsoy, Chortoq and Yangikurgan districts of Namangan region in 2021-2022.

№	Specialized area name	Total specialized land area	specialization gardening	Gardening				
				Field specializing in gardening	from this, the available garden area	building a new garden	from this	
1.	Kosonsoy region	2 785	Gardening	1 999	1 149	850	463	387
2.	Chortoq region	3 835	Gardening	2 539	2 139	400	220	180
3.	Yangiqo‘rg`on region	8 600	Gardening	6 021	5 421	600	330	270
	Total	15 220	Gardening	10 559	8 709	1 850	1 013	837

It can be seen from the above information, the apple fruits grown in our republic today, the correct implementation of the fertilization system of the apple varieties, the application of organic and organomineral fertilizers and the effectiveness of the apple varieties Researches in this area are of great importance.

2 Materials and methods

One of the tasks of the research carried out by us is to compare late apple varieties Starkrimson (five stars), Renet Simirenko, Golden delicacies and Boyken varieties grown on the farm "Nazirjon Ilkhomjon Arabboy" in Iskovot village, Yangikurgan district, Namangan region [3] A number of organomineral fertilizers are related to the study and analysis of the effect of organic mineral fertilizers [4-10] obtained on the basis of local raw materials and nitrogen-fixing microorganisms on apple varieties through phenological and biometric observations.

In the analysis of the composition of apple fruits, the methodology developed by Ye.P.Shirokov and V.I.Polegaev for evaluating the quality of fruits and vegetables and the penetrometer designed to measure the structure or pressure of the flesh of fruits and in the determination of the content (sugar and acidity) Refractometric o It was carried out on the basis of measuring methods and organoleptic analyses [11].

3 Results and discussions

From our side, the climate of Namangan region belongs to hot regions. Winter is mild and average minimum temperature is 12-13^{0}C. Since the climate is sharply continental, the temperature rises from +44 ^{0}C in summer to -19^{0}C in winter. Hot days average 210-230 days a year, the annual sum of air temperature is 2250-2700^{0}C, and the amount of precipitation is 180-300 mm. Precipitation falls mostly on winter and spring months [12]. The average relative humidity of the air during the growing season of plants is around 48-53%. In the farm "Nazirjon Ilkhomjon Arabboy" located in this area, the fertilization system of existing apple orchards was studied (Figure 1, 2).

Fig. 1. Apple orchards on the farm " Nazirjon Ilkhomjon Arabboy " of "Iskavot" district, Yangikurgan district.

Fig. 2. Apple orchards on the farm " Iskavot " district " Nazirjon Ilkhomjon Arabboy " of Yangikurgan district.

As it can be seen from the above pictures, it became known that our conducted researches were carried out with fertilizers during the period of initial flowering and fruiting in apple orchards. At the same time, this region has its own climatic conditions, and according to the studied data, apple varieties grown in Yangikogon district of Namangan region and their status are listed in Table 2.

Table 2. Apple varieties grown in Yangikogon district of Namangan region and their condition.

№	**Farm apple orchards named Iskavot district "Nazirjon Ilkhomjon Arabboy**				
	Apple sort	**"Star krimson"**	**"Golden deleshes"**	**"Renet Simirenko"**	**"Boyken"**
1	The height of the territory from the sea satkhi is m.	978			
2	Area of existing apple orchards	5	2	5	8
3	Yield of apple orchards tonn	14	11	8	16

	Condition of apple trees				
4	Disease transmission	Not infected with the disease	Not infected with the disease	Not infected with the disease	Not infected with the disease
5	Form given	Given the form	Given the form	Given the form	Given the form
6	Fertilizing with Organomeniral fertilizers	Fertilized	Fertilized	Fertilized	Fertilized

According to the information presented in the table, the farm named "Nazirjon Ilkhomjon Arabboy" Iskavot, Yangikurgan district, the area where apple orchards are located is located 978 meters above sea level. , from 5 ha to 8 ha, productivity, 8-16 tons per hectare, according to the health of the trees, it was determined that they were not diseased, they were given shape, and that the apple trees were fertilized with organic fertilizers.

Semirenko, golden delicacies, starcrimson (five stars), local variety (boyken) apple varieties were taken as the object of research, and a series of application processes of the apples with organomineral fertilizers and mineral fertilizers are shown in Table 3. given.

Table 3. Experience system.

Options	**Fertilization norm, kg / to, t / to**
1	$N_{120}\,P_{100}\,K_{30}$
2	$N_{50}\,P_{30}\,K_{10}$ organic$_{1000}$
3	$N_{25}\,P_{20}\,K_{5}$ Organomineral$_{500}$
4	Organomineral$_{1000}$

One-year phenological and biometric observations of apples were studied at the rates of fertilizer used in the experiment (Table 4).

Table 4. The result of phenological observations on the apple variety under study (Renet Simirenko) (2021).

Name of observations	**Day/month/years**								
	10%	**30%**	**50%**	**80%**	**100%**	**Spill**			
Bud recording is the beginning of vegetation	27.03	1.04	4.04	9.04	-	-		-	
Beginning of blossoming	11.04	15.04	18.04	22.04	24.04	-		-	
Compleating of blossoming	24.04	-	30.04	-	4.05	-		-	
End of branch growth	15.05		7.08		10.09	-		-	
Beginning and end of khazonrezgilik	10.09	30.10	15.11	24.11	30.11	-		-	
Field irrigation periods .	1	2	3	4	5	6	7	8	9
	25.04	10.05	20.05	30.05	9.06	21.06	25.06	9.07	20.07
Pesticide spraying times	22.04	10.05	14.06	16.07	26.11	-		-	
Tie (if any)	-	-	-	-	-	-		-	
Periods, number of spraying of herbicide	1	2	3	4	5	-		-	

Name of chimicates.		Skor	Nitrofe n	Nurel skor gumiy	Agrafo st	Iso	-	-
That there were biological struggles			-	-	-	-	-	-
That there were biological struggles What kind of organic fertilizer is given in what quantities		15.04	20.05	10.07	11.11	-	-	-
Fertilizers	1	N_{120} P_{100} K_{30}	N_{120} P_{100} K_{30}	N_{120} P_{100} K_{30}	N_{120} P_{100} K_{30}	-	-	-
	2	N_{50} P_{30} K_{10} orga nic_{1000}	N_{50} P_{30} K_{10} organic $_{1000}$	N_{50} P_{30} K_{10} organic $_{1000}$	N_{50} P_{30} K_{10} organic $_{1000}$	-	-	-
	3	N_{25} P_{20} K_5 Orga nomi neral $_{500}$	N_{25} P_{20} K_5 Organo mineral $_{500}$	N_{25} P_{20} K_5 Organo mineral $_{500}$	N_{25} P_{20} K_5 Organo mineral $_{500}$	-	-	-
	4	Orga nomi neral $_{1000}$	Organo mineral $_{1000}$	Organo mineral $_{1000}$	Organo mineral $_{1000}$	-	-	-

In Table 4, the prohibitions of the phenological observations of the Renet Simirenko variety show that from 01.01.2021 to 01.01.2022, bud recording, the beginning of vegetation, the beginning of flowering, the end of flowering, the end of branch growth, the beginning and end of flowering, The dates of irrigation of the field, the dates of pesticide spraying, the dates of spraying herbicides, the number, biological control were studied, and how much and what type of organic fertilizer was given, and the information on them was obtained, and in what period and in what amount and in which type of use experiments were conducted.

In the above experiment Renet Simirenko variety was used in different ratios of N_{120} P_{100} $K_{30,}$ N_{50} P_{30} K_{10} $organic_{1000,}$ N_{25} P_{20} K_5 $Organomineral_{500}$, $Organomineral_{1000}$ and their effect on biometric indicators was observed in Table 5.

Table 5. The result of biometric tests on the apple under study (Renet Simirenko).

Opera tions name	**fruit diametric cm**	**cm height,**	**Color**	**and its variations fruit shape**	**and variati on weight of 1**	**Apple grain G nitrate**	**apple content hardness (ripening)**	**dry matter quantity**
7.06.21								
N_{120} P_{100} K_{30}	33.4	30.7	Green	Round	41	30	6.5	-

N_{50} P_{30} K_{10} organic $_{1000}$	31.2	30.1	Green	Round	39	30	6.1	-
N_{25} P_{20} K_5 Organo minera l_{500}	36.2	34.2	Green	Round	43	30	6.3	-
Organo minera l_{1000}	37.2	33.9	Green	Round	51	30	6.6	-
8.07.21								
N_{120} P_{100} K_{30}	41.5	34.4	Blue green	Round	61	30	6.8	-
N_{50} P_{30} K_{10} organic $_{1000}$	41.1	34.0	Blue green	Round	59	30	6.9	-
N_{25} P_{20} K_5 Organo minera l_{500}	44.2	35.1	Blue green	Round	63	30	6.8	-
Organo minera l_{1000}	46.1	35.9	Blue green	Round	71	30	7.2	-
9.08								
N_{120} P_{100} K_{30}	70.1	56.4	Blue green	Round	126	30	8.8	12.6
N_{50} P_{30} K_{10} organic $_{1000}$	69.2	56.2	Blue green	Round	121	30	8.5	11.3
N_{25} P_{20} K_5 Organo minera l_{500}	71.1	57.4	Blue green	Round	132	30	9.1	14.2
Organo minera l_{1000}	72.9	58.7	Blue green	Round	144	30	9.4	14.4
14.09								
N_{120} P_{100} K_{30}	72.2	56.9	Green blond	Round	186	30	9.5	17.2
N_{50} P_{30} K_{10} organic $_{1000}$	70.5	56.7	Green blond	Round	171	30	9.4	18.1
N_{25} P_{20} K_5 Organo minera l_{500}	72.8	58.2	Green blond	Round	192	30	9	17.7
Organo minera l_{1000}	73.3	59.1	Green blond	Round	214	30	10.1	18.1

According to the data in the table, biometric observations were carried out on the Renet Simirenko variety of apple. More than 10 samples were averaged to determine each indicator. Above, we observed that the 4 types of fertilizers had an effect on the biometric indicators of the apple variety during the year. possible Diametric cm, Height, cm, Color of the selected 4 types, i.e. N_{120} P_{100} $K_{30,}$ N_{50} P_{30} K_{10} organic$_{1000,}$ N_{25} P_{20} K_5 Organomineral$_{500}$, Organomineral$_{1000}$ fertilizers and its change, fruit shape and change, weight of 1 apple in g, nitrate content, firmness (ripening), dry matter content, etc. In the first observations on June 7, 2021, the parameters of the 1st type of $N_{120}P_{100}K_{30}$ fertilizer were 33.4 cm, 30.7 cm, green, round, 41g, 30, 6.5, respectively. When using type 2 $N_{50}P_{30}K_{10}$ organic $_{1000}$ fertilizers the indicators were 31.2 cm, 30.1 cm, green, round, 39g, 30, 6.1, respectively. When using N_{25} $P_{20}K_5$ Organomineral $_{500}$ fertilizer of the 3rd type the indicators were equal to 36.2 cm, 34.1 cm, green, round, 43 g, 30, 6.3, respectively. When using the 4th type Organomineral $_{1000}$ fertilizer the indicators were 37.2 cm, 33.9 cm, green, round, 51 g, 30, 6.6, respectively.

In observations on 14.09.21, the parameters of type 1 $N_{120}P_{100}K_{30,\ used}$ in fertilizer, are 72.2 cm, 56.9 cm, green-yellow, round, 186g, 30, 9.5 and 17.2%, respectively. it happened. When using type 2 $N_{50}P_{30}K_{10}$ organic$_{1000}$ fertilizers indicators were 70.5 cm, 56.7 cm, green-yellow, round, 171 g, 30, 9.4 and 18.1%, respectively. When using $N_{25}P_{20}K_5$ Organomineral $_{500}$ fertilizer of the 3rd type the indicators were 72.8 cm, 58.2 cm, green-yellow, round, 192 g, 30, 9 and 17.7%, respectively. When using the 4th type Organomineral$_{1000}$ fertilizer indicators were 73.3 cm, 59.1 cm, green-yellow, round, 214 g, 30, 10.1 and 18.1 %, respectively.

4 Conclusion

Decreasing nitrogen fertilizer standards, increasing potassium fertilizer standards, and using organic and organomineral fertilizers together with mineral fertilizers will increase the quality and shelf life of apple fruits. . According to the results of the conducted research, the apple varieties selected for our research should be grown in sufficient areas in the Yangigurgon district of Namangan region, and the activities of the apple fruits in the region during the cultivation and post-harvest periods should be properly organized. In the apple orchards of "Iskavot" district " *Nazirjon Ilkhomjon Arabboy* " apple orchards, there are 4 varieties of semirenko, golden delicacies, starcrimson, (five stars), local variety (boyken), i.e. N_{120} P_{100} $K_{30,}$ N_{50} P_{30} K_{10} organic$_{1000,}$ N_{25} P_{20} K_5 Organomineral$_{500}$, Organomineral $_{1000}$ fertilizers phenological and biometric evaluations were carried out. We can observe that our selected fertilizers have a positive effect on various quality indicators of apple products, which is reflected in the 5th tables below.

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