



The Importance of Stimulators in Their Rooting in Propagation of Red Plants from Green Cuttings

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Abstract: The scientific article aims to study the effect of various stimulants on rooting in the conditions of Tashkent region in the reproduction of seedlings of Vlademirskiy, Red star, Helen varieties from green cuttings. It was found that Energen and Extra stimulants, which had a positive effect on the rooting of green cuttings of Vlademirskiy, Red star, Helen varieties, were highly effective in our experiments.

Keywords: Red plant, varieties, temperature, stem, cuttings, stimulant.

Enter. The importance of stimulators is also important in the propagation of fruit species, which are rare in the republic and have unique characteristics, in particular, in the vegetative cultivation of the seedlings of the red corn (*Cornus mas/L*) plant for a long time, in the vegetative reproduction of fruit plants, different types of stimulants affecting the rooting of cuttings have been used for different periods. Today, modern new types of stimulants that are widely used in smart agriculture are increasing.

Modern stimulants differ sharply from their predecessors and are highly effective. Modern stimulants in the cultivation of seedlings ensure not only the formation of callus in cuttings, good development of the root system, but also the resistance of cuttings and seedlings in the process of development to various adverse environmental factors. These stimulants play an important role in the vigorous development of the root system of young seedlings and intensive seedling preparation.

The main purpose of the experiment is to study the effect of stimulants on the rooting rate of the varieties of the red plant from green cuttings.

Subject of experience: Vlademirskiy, Red star, Helen

The objectives of the research are as follows: It is aimed at studying the effect of stimulator on the rooting of green cuttings in the vegetative reproduction of the crimson plant.

Conditions and method of research. Experiments were conducted according to the method developed in the Department of "Fruit and Viticulture". Field experiments were conducted in the open field at the scientific research institute of horticulture, viticulture and winemaking named after Akademik M. Mirzaev. During the conducted experiments, phenological observations, biometric measurements and statistical analyzes were carried out. Our experiments consist of four options and

four returns. Rooting processes and physiological processes of 150 green cuttings in each variant, 50 in each return, were observed.

Experimental methods “Methodology of calculation and phonological observations in conducting experiments with fruit and berry-bearing palnts” (2014), “Metodokiya uchetov I nablyudenyiy v opitax s plodovimi I yagodnimi kulturami” (1967) by V.F.Moiseychenko in accordance with the recommendations given in methodological literature and statistical processing of experimental data, dispersion analysis was carried out according to the method of B.A. Dospikhov (1985).

Research results. Although there are several factors that influence the propagation of fruit plants from cuttings, one of the most important are stimulators. Stimulators affect the activity of vegetative cuttings increases, and the wide range of regulators and adaptogenic substances in the stimulant composition increase the stress tolerance of cuttings.

Even after the cuttings take root, it always takes some time before they are transplanted. During this period, stimulators ensure the resistance of young rooted seedlings to stress conditions during the period before planting in a permanent place. With the help of modern stimulators, the resistance level of seedlings increases and tolerance to adverse conditions is ensured.

Kornevin-along with various fertilizers in intensive seedling cultivation, this stimulant is still widely used to promote the formation of cuttings and rapid growth of roots, as well as to increase the immune system of plants. Stimulants are not included in organic and mineral fertilizers. These are highly effective hormonal preparations that take an active part in the development of their root system when propagating fruit plants from cuttings. It is made on the basis of indolyl butyric acid (IMC) and is convenient for the assimilation process by plants. During the vegetative reproduction of plants, a lack of this substance is observed in the cuttings cut from the branches.

In this case, “Kornevin, SP” has a positive effect on the physiological processes taking place in the cuttings. It serves as an important tool for the formation of callus tissue in cuttings and acceleration of the rapid rooting process. At the same time, it penetrates into the plant and stimulates the tissues in the stem, thereby accelerating the division of new cells and ensuring the formation of tissues.

Before getting acquainted with the instructions for the use of stimulators, it is necessary to determine the presence of useful substances for the plant in its composition. These include the following macro and microelements necessary for the natural growth and development of plants: phosphorus strengthens plant growth and immunity, increases resistance to adverse conditions and pests. Potassium increases the rate of nitrogen assimilation and the strength of plant tissues, protein formation, and reduces the availability of nitrates. Manganese is essential for rapid plant growth/ It ensures the processes of oxidation and reduction, respiration and photosynthesis, and increases the ability to hold water in plant tissues and accelerates development.

Extra is an artificially created analogue of a natural plant stimulant and is an adaptogenic drug with an anti-stress effect on plants. This stimulator helps plants to perform their protective functions, i.e. to increase immunity, to increase resistance to adverse climatic conditions, sudden changes in temperature, drought and cold. When cuttings are treated with this drug during the preparation of seedlings, the level of rooting of cuttings increases.

The main characteristics of the drug and its use:

- i. Significantly accelerates cell division in cuttings;
- ii. Accelerates the formation of callus tissue and rooting in cuttings;
- iii. Increases the efficiency of the development of the root system of seedlings;
- iv. Accelerates the formation of new shoots in seedlings;
- v. Protects seedlings from stress in adverse weather conditions (temperature changes, cold, heat, heavy precipitation, etc);
- vi. Creates immunity against diseases and pests in plants.

As can be seen in the instructions for use of stimulator, the spectrum of effects on plant organs is very wide and aimed at their full development. In our experiments, we studied the effect of these stimulators on the rooting of green cuttings of the scarlet plant and achieved certain results.

During our experiments, the green branches of the red plant were cut from the mother plants in May, cuttings of a certain size were prepared and treated with the help of these stimulators, cuttings were planted in a protected structure equipped with a water misting device, on a planting site made of river sand, in 4 options and 4 returns. We conducted our experiments based on the information provided in scientific sources and the recommendations of scientists who conducted research in this direction in the preparation of pens and ensuring the temperature and relative humidity in the structure [9; 4-20 p].

The experiments showed that the effects of the stimulants used in our experiments on the formation of the root system of cuttings and the development of cuttings were observed (Table 1).

Table 1 The method of applying stimulants to the rooting of red cuttings and the rate of rooting in % (2021-2023)

Varieties	Types of stimulants	Method of application, duration of putting green cuttings in the solution (hours), rooting rate %					
		10-12 (hour)		16-18 (hour)		22-24 (hour)	
		%	pcs	%	pcs	%	pcs
Vladimirsky variet	Kornevin (control)	75	38	78	39	78	39
	Fast root	77	39	80	40	82	41
	Extra	82	41	85	43	87	44
	Energen	80	40	82	41	83	42
Red-star variet	Kornevin (control)	74	37	78	39	78	39
	Fast root	77	39	80	40	80	40
	Extra	85	43	90	45	92	46
	Energen	83	42	86	43	88	44
Helen variet	Kornevin (control)	72	36	74	37	76	38
	Fast root	75	38	79	40	80	40
	Extra	79	40	81	41	82	41
	Energen	77	39	80	40	82	41
ЭКФ ₀₅		0.6		0.7		0.6	
Sx		3.40		0.12		0.1	

Note: in the experiment, a total of 600 green cuttings of 200 pieces of each variety were planted, and the degree of rooting of 50 cuttings of each variant was studied

In our experiments, a working solution of stimulators that affect the rooting of green cuttings of the Vladimirskiy variety of crimson was prepared, and the lower part of the green cuttings was placed in the solution for 10-12, 16-18, and 22-24 hours before planting. As we know from scientific sources, when growing fruit plants in green cuttings, when they are treated with the help of stimulants, the period of treatment in the working solution is also important for their rooting/ Therefore, in our experiments, we mainly used modern stimulants that affect the rooting of green sedges. In this case, Kornivin drug, which is widely used in horticulture today, was taken as a control. In our experiments, when the green cuttings of Vladimirsky, Red Star and Helen varieties of kizil were placed in Kornivin's working solution for 10-12 hours, rooting was recorded in them. 75% of Vladimirskiy variety, 74% of Red star variety and 72% of Helen variety were observed. In this experiment when we put cuttings in Kornevin's working solution for 16-18 hours, 78 % root formation was found in Vladimirskiy and Red Star varieties and 74 % in Helen variety. When the

cuttings were placed in this working solution for 22-24 hours, it was observed that the level of root formation was 78 % in the Vladimirskiy variet, 80 % in the Red star variet and 76 % in the Helen variet.

The following results were obtained when these experiments were carried out in Fast root working solution. When green cuttings of Vladimirsky, Red-star and Helen varieties were placed in the Fast root working solution for 10-12 hours, 77% of Vladimirsky variety, 77 % of Red-star variety and 75 % of Helen variety of cuttings were observed. When cuttings were placed in Fast root working solution for 16-18 hours, 80 % rooting was observed in Vladimirsky and Red-star varieties, and 74 % in Helen variet. When the cuttiings were placed in this working solution for 22-24 hours, the level of rooting was observed in Vladimirsky variet 82 %, and in Red-star and Helen varieties 80 %.

During our experiments, the following results were achieved when using the drug Extra. When green cuttings of Vladimirsky, Red-star and Helen varieties were placed in the Extra working solution for 10-12 hours, 82 % of Vladimirsky variet 85 % of Red star variet and 79 % of Helen variet cuttings were observed. When cuttings were placed in Extra working solution for 16-18 hours, 85 % rooting was observed in Vladimirsky variet and 90 % in Red-star variet and 81 % in Helen variet. When the cuttings were placed in this working solution for 22-24 hours, the rate of rooting was observed in Vladimirsky variety 87 %, Red- star variet 90 %, and Helen variet 82 % rooting rate (Fig 1).



a)



b)



v)



S)

Figure 1: a) the process of preparing cuttings for planting the red mother plant from green shoots, b) preparing cuttings and placing them in stimulator working solutions, c) the process of planting cuttings on a sandy substrate, c) the process of conducting preliminary phenological observations.

During our scientific research, we also used the drug Energen. When green cuttings of Vlademirsky, Red-star and Helen varieties were placed in this working solution for 10-12 hours, 80% of Vlademirsky variet, 83% of Red- star variet and 77% Helen variety cuttings were observed. When cuttings were placed in the working solution of energen for 16-18 hours, 82% of Vlademirsky variety and 86% of Red-star variety, and 80% of Helen variety were found. When the cuttings were placed in this working solution for 22-24 hours, the level of rooting was observed in Vlademirsky variety 83 %, in Red-star variety 88% and in Helen variety 82%.

Experiments showed that when green cuttings were treated with certain stimulants for different periods of time before planting, the degree of rooting of cuttings was different. In this, it was found that our preparation, which showed the best results, was extra. During our experiments, it was found that the rooting rate of cuttings in this stimulator was 90-92 %, the highest in the Red-star variet. It was found that it gave a 12-14 % higer result compared to the control, i.e.

Kornevin drug. At the same time, it was found in our experiments that the optimal period of placing green cuttings in stimulants for a positive effect on rooting was 16-18 hours.

In our experiments, when we studied the effect of certain stimulants on the rooting of green cuttings in the cultivation of seedlings of red safflower varieties, it was observed that there are differences between varieties and that the types stimulants directly affect the level of root formation. In this case, we took the Kornevin stimulant as a control, and the working solutions of Fast root, Extra and Energen stimulants were used in the variants and the following result was achieved (Fig. 2)

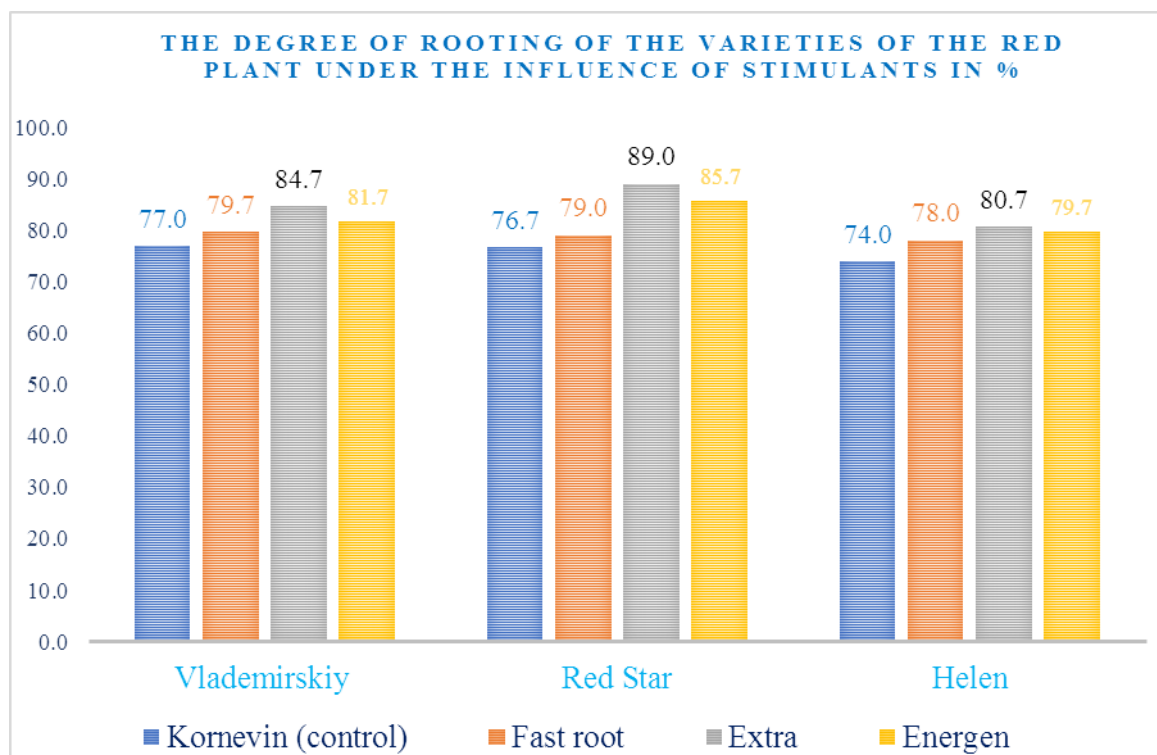


Figure 2: Effect of stimulants on the degree of rooting of green cuttings of sorghum cultivars

During the experiments, when the effect of stimulants on the green cuttings of the red plant varieties was studied, the rooting rate of the green cuttings of the Vlademirsky variet was 77,0 % in the Kornevin working solution, 79,7 % in the Fast root working solution, 84,7 % in the Extra working solution, and 81.7 % in the Energen working solution rooting rate was observed.

In our experiments, the rate of rooting of green cuttings of red star variety was 76,7 % in the Kornevin working solution, 79,0% in the Fast root working solution, 89,0% in the Extra working solution, and 85,7% in the Energen working solution.

When this experiment was carried out on the green cuttings of Helen variety, the rate of rooting was observed in Kornevin working solution 74.0%, Fast root working solution 78.0 %, Extra working solution 80.7%, energen working solution 79.7 %.

SUMMARY

In conclusion, with the help of modern stimulators, the level of resistance of seedlings increases and tolerance to adverse conditions is ensured. In our experiments, Kornevin, Fast root, Extra and Energen stimulators were applied to each of our varieties, in which the lower part of the cuttings was placed in the solution for 10-12, 16-18, and 22-24 hours before planting. As a result, the rate of rooting was 82%, 85% and 87% when soaking in the solution for 10-12, 16-18 and 22-24 hours using the Extra stimulant in the Vlademirsky variety. Among the stimulators applied to Red Star and Helen varieties, the Extra stimulator solution showed superior results compared to other stimulators.

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