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Effect of drip irrigation and the load of inflorescences on the growth and development of parent vines

Abstract. The high yield of grafted grape seedlings and their quality depend on many factors, including the quality of the grafting and rootstock components, which is also determined by proper care of the parent grafted and rootstock vines. Their agricultural techniques should be aimed at better growth and maturation of shoots. The technological technique of breaking off the shoots is mandatory on parent vines, partial removal of inflorescences is not so common in the agrotechnics of parent vines, but it has a positive effect on the overall development of plants. Parent plantings should be irrigated, if possible, since insufficient moisture supply adversely affects the condition of vines throughout the growing season and wintering. This paper investigated the effect of partial removal of inflorescences (inflorescence load of 100%, 75%, and 50% of their total number) on parent vines and the effect of different irrigation regimes (pre-irrigation soil water levels of 90%, 80%, and 70% of the minimum water content) on the state of parent vines were investigated, specifically on physiological, biochemical, and biometric indicators of plants. It was shown that irrigation of vines and reducing the load of inflorescences to 50% and 75% of their total number stimulated the accumulation of chlorophyll in the leaves of parent plants, improved the watering of leaf tissues, and contributed to an increase in the intensity of respiration during active growth and development of grapes. A positive effect of irrigation and a reduction in the load of vines with inflorescences up to

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50% and 75% on the agrobiological indicators of parent vines was noted. The highest values of the total length of the shoots and the degree of their maturation were found in the vines of the variants with PSWL 90% MWRC 50% inflorescences, 80% MWRC 50% inflorescences, 70% MWRC 50% and 75% inflorescences. Therefore, effective irrigation regimes and reducing the load of vines with inflorescences contributed to the growth of medium and strong full-fledged shoots, which are more productive.

Keywords: grafted grape rootstocks; pre-irrigation soil water level; number of inflorescences; watering of leaf tissues; respiration intensity; pigment content; agrobiological indicators of vines

RELEVANCE

Viticulture is a promising area of agricultural production in Ukraine. Long-term fertile grape plantations ensure stable and full-fledged development of the industry. High-quality, certified grafted grape seedlings should be used for planting industrial vineyards. During their production, special attention is paid to the quality of grafting and rootstock components. Studies indicate that the prominent yield of grafted grape seedlings and their quality depend on many factors, including proper care of royal plantings of grafted and rootstock vines (Vlasov, 2015).

Rootstocks of grafted grape vines are specially created plantations of promising zoned table and technical varieties, the vines of which are used to produce grafted grape seedlings. Parent plantings should be distinguished by the purity of vines, the absence of diseases, elevated productivity and durability, and their agricultural technology should be aimed at better growth and maturation of shoots (Dikan, 2001). Usually, the size of the berry harvest on the mother grape bushes is regulated, preventing the bushes from being overloaded with the harvest. On such bushes, the technological method of breaking off the shoots, but not removing the inflorescences, is mandatory, as this requires additional labour costs (Mykytenko *et al.*, 1990). Studies indicate that normalizing the number of inflorescences per vine after establishing the optimal number of shoots contributes to a substantial increase in the leaf surface area of the vine and its overall development (Kozhukharenko, 2013). Considering the possibility of obtaining more high-quality grafting vines of grapes, the method of partial removal of inflorescences on parent vines is relevant and requires detailed investigation.

Parent plantings should be irrigated, if possible, since insufficient moisture supply adversely affects the condition of vines throughout the growing season and wintering. One of the main elements of irrigation technology is the irrigation regime – a combination of the amount, timing, and norms of irrigation, which substantially depends on the yield of plantations. The basis of forming the vineyard irrigation regime is the support of the optimal range of humidity in the soil layer, where the main part of the root system of plants is located. For industrial plantings of table and technical grape varieties, the National Standard of Ukraine defines irrigation regimes, according to which the level of pre-irrigation moisture of the root layer of the soil (PSWL), depending on the phase of development and water retention properties of the soil, should be 70-80% of the minimum water retention capacity (MWRC) for table grape varieties and 65-75% MWRC for technical varieties. It is recommended to carry out 7-12 waterings during the growing season of technical varieties, 10-15 waterings during the growing season of table varieties (DSTU 7595:2014, 2015). Since there are no practical results regarding the determination of optimal modes of drip irrigation on rootstocks of grafted vines, this issue requires further investigation.

ANALYSIS OF RECENT STUDIES AND PUBLICATIONS

Today, for the cultivation of high-quality grafting material of grapes, it is generally accepted to use short pruning and to regulate the load of the vines with buds and shoots, which allows using the growth of the bushes to the maximum for harvesting grape stalks (Ursu, 1989). When determining the load of vines with shoots, their growth strength, soil and climatic conditions and the level of agrotechnics of plantings are considered (Perstnev, 2001; Feitosa *et al.*, 2018; Almanza-Merchán *et al.*, 2014). Other authors believe that the load of vines with shoots should be determined by the amount of annual growth of vines for the previous year or by the amount of phytomass of growth of one-year shoots per vine (Chulkov, Mukhortova, 2018; Kumar *et al.*, 2017). The practice of partial removal of inflorescences on parent vines is not so common in the agrotechnics of parent vines. However, it was established that vines, in which the inflorescences were completely or partially removed in the previous 1-2 years, develop better, become more uniform in growth strength, store a larger amount plastic substance (Ursu, 1989).

As for the irrigation of vineyards, different methods of irrigation are used in Ukraine and the world, but it is drip irrigation that keeps the optimal moisture regime in the local soil layer, reduces water consumption, and increases the yield of grapes (Shevchenko, 2019).

It was confirmed that watering grape plantations while maintaining soil moisture within 80-90% MWRC in the period after the end of flowering and before the beginning of ripening of berries creates favourable conditions for increasing the volume of the root system, the development of leaf and productive mass of plants (Kudryasheva, 2006). Using the example of the technical grape variety Aligoté, it is shown that with drip irrigation of plantings and their load of 110 thousand shoots/ha, the total water consumption is 5,070 m^3/ha, provided that the humidity in the metre layer of the soil is kept at 100-85% MWRC (4-7 irrigations rate of 110-130 m^3/ha, the irrigated rate was 460-900 m^3/ha). Under such conditions, the optimal parameters of winter resistance of cells, development of the root system and one-year growth, fertility of shoots, size of berries and clusters were obtained (Kyrychenko, 2003).

It was established that, depending on the phase of development, table grape varieties should be irrigated at the rate of 90 m^3/ha (phase of bud break – flowering), 120-130 m^3/ha (phase of berry growth – ripening of berries), 150 m^3/ha (period of the greatest biomass increment) (Pavelkivska, 2013). There is information that during drip irrigation of parent plantations of table grapes of the Rannii Magarach variety with different loads of vines with buds and shoots, soil moisture was kept within 70-100% MWRC, the irrigated rate, including moisture-charging irrigations, averaged 630-800 m^3/ha per year (Mykytenko *et al.*, 1990).

The purpose of this study was to develop effective modes of drip irrigation and load rates of parent vines with inflorescences to obtain high-quality graft components based on physiological, biochemical, and biometric indicators of growth and development of parent vines.

MATERIALS AND METHODS

The work was carried out in the department of nursery and propagation of grapes of the NSC "V.Ye. Tairov Institute of Viticulture and Winemaking" during 2017-2020. The research was conducted on the early ripening Augustyn table grape variety, the vines of which were planted according to the scheme of 2.0×2.5 m in the spring of 2010. The formation of the vines is a horizontal two-stem border with a stem height of 70 cm, the load of shoots is 26-28 shoots per vine. The soil of the experimental site is southern medium-loamy chernozem.

Three experiments were included in the research scheme, which differed in PSWL and the load of vines with inflorescences. Experiment 1 – PSWL 90% MWRC during the entire vegetation period of plants; experiment 2 – PSWL 80% MWRC during the entire vegetation period of plants; experiment 3 – PSWL 70% MWRC during the entire vegetation period of the plants. In

each experiment, there were 3 variants in which a different number of inflorescences were left on the vines. Variants 1.1, 2.1, 3.1 – 100% load of vines with inflorescences (30-33 inflorescences/vine); variants 1.2, 2.2, 3.2 – 75% load of vines with inflorescences (24-25 inflorescences/vine); variants 1.3, 2.3, 3.3 – 50% load of vines with inflorescences (15-16 inflorescences/vine). The control variants were those where soil moisture was natural, the load of vines with inflorescences was comparable to the experimental variants (variants 4.1, 4.2, 4.3). In each variant, there were 5 accounting vines in 4 repetitions.

Drip tubes with a diameter of 16 mm with integrated water outlets every 45 cm and a water flow rate of 1.5 dm^3/h were used to irrigate the vineyards, which were suspended from the crop wire. Soil moisture was controlled according to the thermostatic weight method once a week in the 0-80 cm soil layer. The timing of irrigation and the duration of the inter-irrigation period were determined based on the dynamics of the moisture reserves of the root layer of the soil and the distribution of precipitation. The basis for maintaining PSWL 90% MWRC, 80% MWRC, 70% MWRC was the minimum soil water capacity, which was determined in undisturbed soil according to the method of flooding sites. The value of the irrigation rate was calculated according to the formula of O.M. Kostyakov. It was established that in the 0-80 cm layer, the MWRC is equal to 27.03% of the dry soil mass.

On average, over the years of studies in experiment 1, where the PSWL was kept at 90% of the MWRC, 5.3 irrigations were carried out (from 4 to 8 irrigations per season), the irrigation rate was 81.9 m^3/ha, the irrigated rate was 504.0 m^3/ha. In experiment 2 with PSWL 80% MWRC, the average number of waterings was 3.7 (from 2 to 5 waterings per season) with an irrigation rate of 91.3 m^3/ha, the irrigated rate was 414.0 m^3/ha. In experiment 3, with PSWL 70% MWRC, an average of 2 irrigations were carried out (from 1 to 4 irrigations per season), the irrigation rate was equal to 99.2 m^3/ha, and the irrigated rate was 157.5 m^3/ha. In the control, soil moisture was natural.

During the growing season (monthly, from June to September), the main physiological and biochemical indicators of plants were determined in leaf tissues (total moisture content, pigment content according to T.M. Godnev, respiration intensity according to the P. Boysen-Jensen method) (Tretyakov, 1990). At the end of the growing season, biometric indicators of plant development were measured (Avidzba, 2004). The obtained results were processed using the ANOVA program and the Microsoft Excel application package.

RESULTS

Sufficient soil moisture during the growing season has a positive effect on the development of the leaf apparatus, as evidenced by the intensive course of physiological processes. Physiological indicators of the water regime of grape plants most fully indicate their need for water, depending on particular environmental conditions (I. V. Shevchenko, 2019).

The change in the level of hydration of leaf tissues has a protective nature against the influence of adverse environmental factors during the growing season and tends to decrease from July to August (Stoev, 1984). This is also confirmed by the authors' studies. Thus, it was established that the water content in the leaves of irrigated grape plants ranged from 70.1% to 76.8%, reaching the highest values in June in the variants with PSWL 90 and 80% MWRC 75% inflorescences and in the version with PSWL 70% MWRC 50% inflorescence. In July, in all experimental variants with PSWL 70%, 80%, and 90% of MWRC, this indicator slightly decreased (67.5-75.5%). On the other hand, the water content in the leaves of the control plants was 64.9-71.1%. In September, with the beginning of the leaf ageing period, the water content of the leaf tissues decreased to 60.6-69.6%.

One of the key processes of living organisms is the respiration of their tissues, since it provides metabolic and energy processes, considerably affects the growth and accumulation of plant biomass (Keller, 2020). The conducted studies revealed that the intensity of leaf tissue

respiration in June was at 0.34-0.50 mg CO_2/g, in July it increased to 0.47-0.71 mg CO_2/g, in August it reached maximum values of 0.51-0.97 mg CO_2/g, in September it decreased to 0.34-0.46 mg CO_2/g (Fig. 1). In general, the most significant difference with the control according to this indicator was in July, at the beginning of the phase of ripening of berries – in the vines under irrigation with a load of 100% of the inflorescence, a decrease in the intensity of respiration by 18.3-33.8% was noted. If the load of inflorescences was reduced to 50-75%, the intensity of leaf respiration in vines during irrigation decreased by 20.3-26.9%.

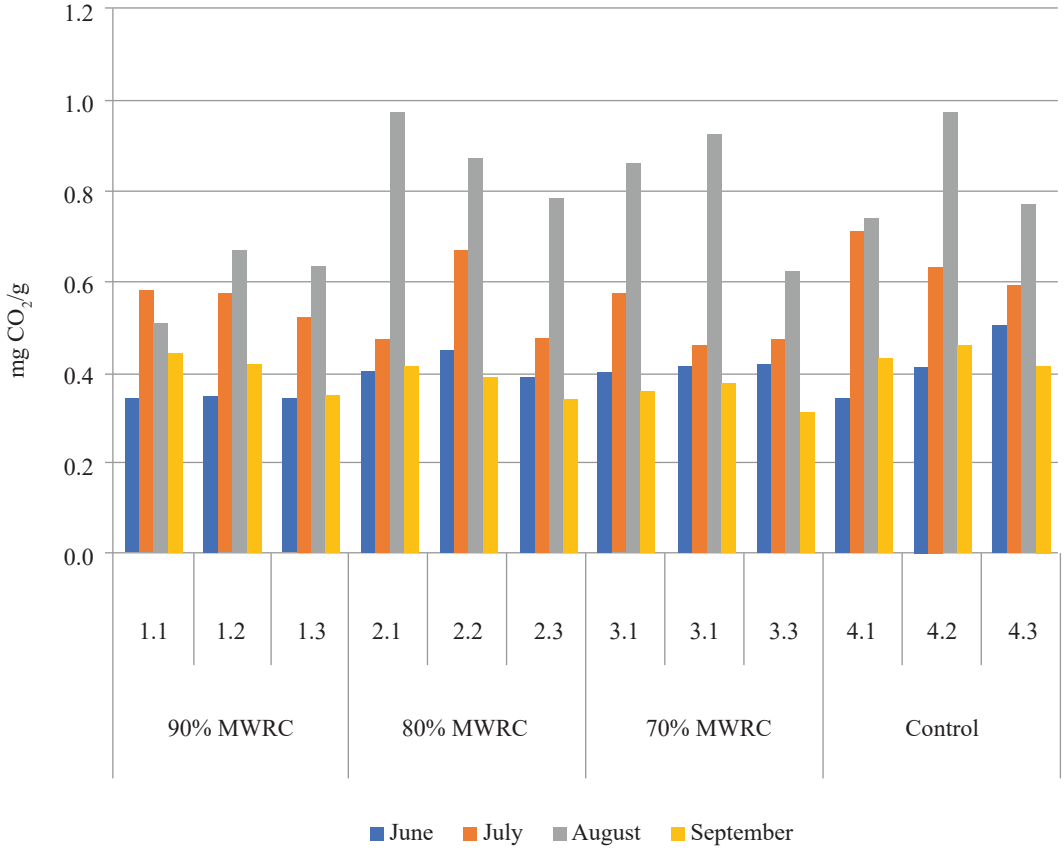
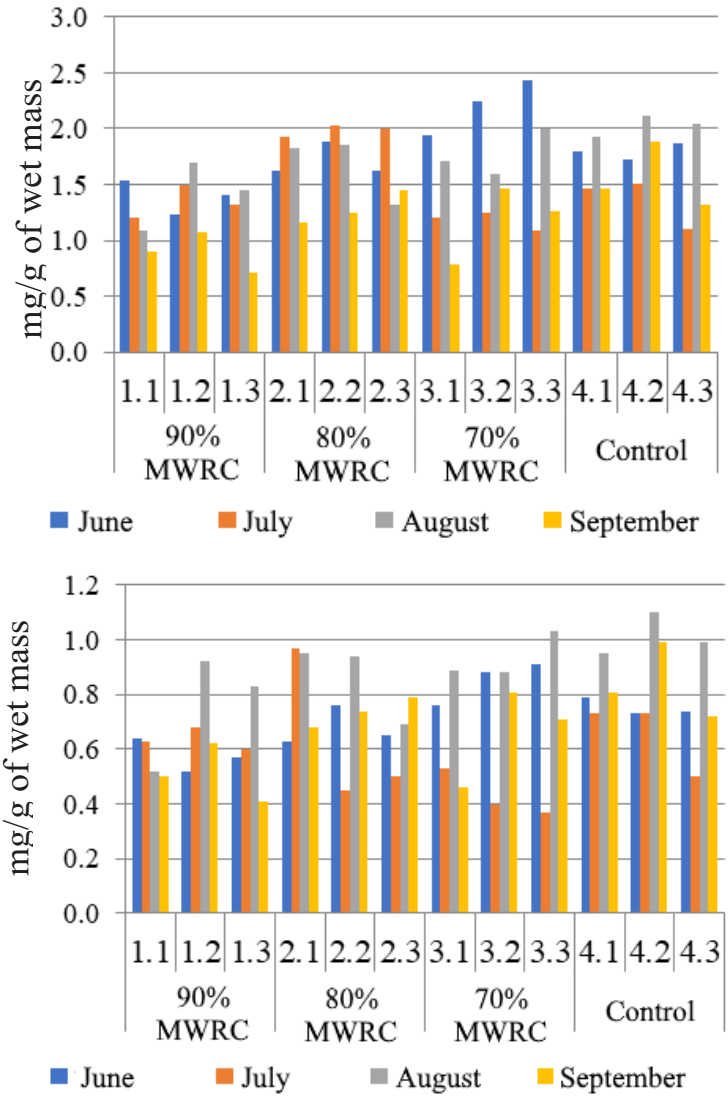


Figure 1. Intensity of tissue respiration of leaves of Augustyn grape plants under different PSWL and load of inflorescences (average for 2017-2020)

The study of the state of the photosynthetic apparatus, primarily the content of pigments, can provide information about the state of the plant because even in conditions of short-term water stress, accelerated disintegration of pigments is noted. It was found that under moisture deficiency, the content of chlorophylls, especially chlorophyll A, decreases, and the amount of carotenoids increases (Stoev, 1984).

It was determined that in June and July, the largest amount of chlorophyll A was in the tissues of plant leaves in the variants with irrigation of 70% MWRC 50, 75, 100% inflorescences and 80% MWRC 75% inflorescences (by 9.3-30.8% more compared to the control variants) (Fig. 2). In June-July, the content of chlorophyll A in the leaf tissues of all control vines was at 1.72-1.87 mg/g of wet mass, while in August, it in-

creased by 7.8-23.3% compared to previous data, probably due to the high adaptability of the Augustyn variety to soil moisture deficit. In August, the amount of chlorophyll A in irrigation plants decreased by 5.7-29.3%. In September, at the beginning of the period of senescence of leaves, active ripening of vines and outflow of metabolites from leaves, the amount of chlorophyll A decreased to 1.07-1.88 mg/g of wet mass. In June, the amount of carotenoids was higher in the tissues of the leaves of the control vines (0.73-0.79 mg/g of wet weight), except for the variant 70% MWRC 75-50% inflorescences, where this indicator exceeded the control by 20.5-23.0% (Fig. 2).



chlorophyll A carotenoids

Figure 2. The content of pigments in the tissues of the leaves of Augustyn grape plants under different PSWL and load of inflorescences (average for 2017-2020)

During further records, this trend was maintained, the content of carotenoids in plant tissues of control variants mostly exceeded this indicator in vines under irrigation, reaching maximum values in August – 0.95-1.10 mg/g of wet mass.

It is known that with insufficient moisture supply, the growth period of grape shoots is shorter, and the growth intensity weakens, and the yield of vines decreases. The size of internodes decreases, as a result of which the average number of leaves along the length of the shoot increases (Stoev, 1984). The present study confirms that irrigation certainly has a positive effect on the growth and development of grape plants. In general, the average values of the number and diameter of leaves on experimental vines (on irrigation) and on control vines (without irrigation) did not significantly differ from each other and were within 328.1-438.8 pcs./vine and 14.8-7.5 cm, respectively (Table 1). The leaf surface area of the plants of the 80%, 70% MWRC 50% inflorescence and 70% MWRC 75% inflorescence variants was the largest (858.7-896.4 dm^2) and exceeded the control values by 12.0-20.4%. The leafiness of the shoots was the greatest in the control variants with a load of inflorescences of 75 and 100%, in vines with irrigation of 90% PSWL this indicator was lower by 16.8-31.3%, 80% PSWL– by 9.6-17.3%, 70% PSWL – by 13.9-28.7% compared to the control.

Ensuring the good development of the growth of shoots of a standard diameter and their timely ripening on the parent vines allows obtaining high-quality grafted grape vines. With this in mind, the authors of this study recorded the development of one-year shoots of parent vines. It was found that the total length of the shoots of parent vines under irrigation with different levels of PSWL with 100% load of inflorescences exceeded this indicator in control vines (without irrigation) by 5.3-26.3%, and the longest shoots – 161.44 cm – were in the vines of the variant with PSWL 70% MWRC (Table 1). In the case of a decrease in the load of the vines with inflorescences, it was noted that the longest shoots were in the vines of the variants with a load of 50% of the inflorescences, this indicator was 176.2-191.1 cm, which is 8.5-17.7% more than in the control vines.

Table 1. Agrobiological indicators of vines of the Augustyn variety under different PSWL and load of inflorescences (average for 2017-2020)

Variant	Number of leaves, pcs.	Leaf diameter, cm	Area of leaves per vine, dm^2	Leafiness of the shoot, cm^3	Shoot length, cm	Length of the mature part of the shoot		Shoot diameter, mm
						cm	%	
90% MWRC								
100% inflorescences	369.1	14.8	646.8	18.8	134.6	93.6	69.5	7.09
75% of inflorescences	372.9	15.2	669.9	14.3*	183.7*	135.0*	73.5	7.41
50% of inflorescences	328.1	17.5	794.0	15.8	191.1	161.4*	84.5	7.48
80% MWRC								
100% inflorescences	383.6	15.4	716.2	18.7	146.9	111.5	75.9	7.11

Table 1. Continued

Variant	Number of leaves, pcs.	Leaf diameter, cm	Area of leaves per vine, dm^2	Leafiness of the shoot, cm^3	Shoot length, cm	Length of the mature part of the shoot		Shoot diameter, mm
						cm	%	
75% of inflorescences	390.2	15.9	774.2	18.8	157.2	153.9*	97.9	7.15
50% of inflorescences	406.7	16.4	858.7	18.3	181.9	156.6*	86.1	7.82
70% MWRC								
100% inflorescences	370.1	15.2	664.3	15.9*	161.4*	120.0	74.3	7.31
75% of inflorescences	438.8	15.7	866.1	17.9	186.9*	156.5*	83.8	7.84
50% of inflorescences	419.3	16.5	896.4*	19.7	176.2	164.7*	93.5	7.51
Control								
100% inflorescences	373.0	16.0	747.4	22.6	127.8	123.6	96.7	7.51
75% of inflorescences	399.8	15.5	773.6	20.8	144.1	100.2	69.5	7.59
50% of inflorescences	382.7	15.9	744.4	17.7	162.4	111.7	68.8	7.53
LSD_{05}	58.0	1.8	119.4	6.3	28.9	32.1		0.48

Note: * – the difference with the control is statistically significant

The Augustyn variety is characterized by an early termination of growth processes and an early onset of shoot maturation, according to average annual indicators, it belongs to the group with satisfactory maturation of one-year shoots (at least 2/3 of the total length, or 65-80%). The authors of this study found that the degree of shoot maturation was the best in vines irrigated with PSWL 70% MWRC 50% inflorescences and 80% MWRC 75% inflorescences and was 93.5% and 97.9% of the total length (Table 1).

In control vines, which were cultivated without irrigation with a load of inflorescences of 100%, the degree of shoot maturation was also high – 96.7%. In general, shoot maturation was worse (62.1-73.5%) in the variants with the most intensive irrigation of 90% MWRC at 100% and 75% inflorescence load, probably due to excessive soil moisture. In control vines (without watering) with a load of 75% and 50% of inflorescences, the maturation of shoots was satisfactory (68.8-69.5%). In all variants with irrigation in the case of a load of 50% inflorescences, the length of the mature part of the shoots was 40.1-47.4% longer compared to the control, the difference is reliable. When loaded with inflorescences of 75%, the length of the mature part of the shoots decreased, but was greater than in the control variant of 75% inflorescences by 34.8-56.3%. The average diameter of the mature part of the shoots in vines on irrigation was 7.1-7.8 mm, in vines without irrigation (control) –

7.5-7.6 mm, the difference between the variants is not significant.

The study also analysed the number of shoots of different length on the vines, since a higher yield of the standard grafted vine can be obtained thanks to the development of medium and strong shoots (Table 2). Thus, in the control variant with 100% load of inflorescences, shoots with a length over 150 cm accounted for 40.8% of their total number, and in the variant with 90% MWRC irrigation, there were more such shoots – 42.8%, in the 80% MWRC variants – 51.7%, and 70% MWRC – 59.4%. In the case of a decrease in the load of vines with inflorescences, the share of long shoots (over 150 cm) increased to 73.9-74.4% (PSWL 90% of MWRC), 57.7-71.6% (PSWL 80% of MWRC) and 63.4-72.6% (PSWL 70% MWRC), while the proportion of long shoots in control plants was 49.3-71.1%. The total growth (total length of all shoots) of vines of experimental variants is significantly higher than in the control. For instance, in the variant with PSWL 90% MWRC, if the load of inflorescences was reduced to 50-75%, the total growth of shoots was greater compared to the control by 19.5-29.5%.

Table 2. Influence of drip irrigation and loading of vines with inflorescences on the growth of annual shoots of Augustine grapes (average for 2017-2020)

Variant 0-50		Shoot length, cm				Total growth of shoots	
		51-100	101-150	>150	cm	% to control	
90% MWRC 100% inflorescences	cm	7.0	573.8	1,175.0	1,313.4	3,069.2	130.1
	% of total growth	*0.2*	*18.7*	*38.3*	*42.8*		
90% MWRC 75% of inflorescences	cm	31.8	196.8	907.4	3,219.2	4,355.2	129.5
	% of total growth	*0.7*	*4.5*	*20.8*	*73.9*		
90% MWRC 50% of inflorescences	cm	0.0	288.6	769.8	3,075.6	4,134.0	119.5
	% of total growth	-	*7.0*	*18.6*	*74.4*		
80% MWRC 100% inflorescences	cm	18.4	554.2	1,014.8	1,700.8	3,288.2	139.4
	% of total growth	*0.6*	*16.9*	*30.9*	*51.7*		
80% MWRC 75% of inflorescences	cm	30.0	447.8	1,058.8	2,094.4	3,631.0	107.9
	% of total growth	*0.8*	*12.3*	*29.2*	*57.7*		
80% MWRC 50% of inflorescences	cm	27.8	311.8	942.8	3,231.6	4,514.0	130.5
	% of total growth	*0.6*	*6.9*	*20.9*	*71.6*		
70% MWRC 100% inflorescences	cm	64.2	425.2	745.2	1,806.4	3,041.0	128.9
	% of total growth	*2.1*	*14.0*	*24.5*	*59.4*		

Table 2. Continued

Variant 0-50		Shoot length, cm				Total growth of shoots	
		51-100	101-150	>150	cm	% to control	
70% MWRC 75% of inflorescences	cm	28.0	399.8	847.2	3,384.4	4,659.4	138.5
	% of total growth	*0.6*	*8.6*	*18.2*	*72.6*		
70% MWRC 50% of inflorescences	cm	18.0	290.0	1,205.4	2,617.0	4,130.4	119.4
	% of total growth	*0.4*	*7.0*	*29.2*	*63.4*		
Control 100% inflorescences	cm	8.4	790.0	598.2	962.8	2,359.4	100
	% of total growth	*0.4*	*33.5*	*25.4*	*40.8*		
Control 75% of inflorescences	cm	64.0	507.2	1,136.0	1,657.0	3,364.2	100
	% of total growth	*1.9*	*15.1*	*33.8*	*49.3*		
Control 50% of inflorescences	cm	55.2	299.0	646.4	2,457.8	3,458.4	100
	% of total growth	*1.6*	*8.6*	*18.7*	*71.1*		

Note: * for each of the experimental variants, there is a control variant with the same load of inflorescences.

CONCLUSIONS

Irrigation of the vines and reduction of the load with inflorescences had a positive effect on the physiological and biochemical indicators of the grapes, stimulated the accumulation of chlorophyll in the leaves of the parent plants, improved the watering of the leaf tissues, and contributed to the increase in the intensity of respiration during the period of active growth and development of the grapes. A positive effect of irrigation and a reduction in the load of vines with inflorescences up to 50% and 75% on the agrobiological indicators of parent vines was noted. The highest values of the total length of the shoots and the degree of their maturation were found in the vines of the variants with PSWL 90% MWRC 50% inflorescences, 80% MWRC 50% inflorescences, 70% MWRC 50% and 75% inflorescences. The analysis of different length groups of grape shoots showed that when the load of vines with inflorescences decreased, the proportion of long shoots (over 150 cm) increased the most in experiment 1 with PSWL 90% MWRC irrigation (up to 73.9-74.4%). The total growth (total length of all shoots) of irrigated vines exceeded the control. Thus, effective irrigation regimes and reducing the load of vines with inflorescences contributed to the growth of medium and strong full-fledged shoots, which are more productive. Further studies will analyse the qualitative and quantitative indicators of the yield of berries and the resulting grafting vine of grapes.

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Вплив краплинного зрошення та навантаження суцвіттями на ріст і розвиток маточних кущів винограду

Анотація. Високий вихід щеплених саджанців винограду та їхня якість залежать від багатьох факторів, у тому числі від якості прищепно-підщепних компонентів, що так само визначається належним доглядом за маточними насадженнями прищепних та підщепних лоз. Їхня агротехніка має бути направлена на кращий ріст та визрівання пагонів. На маточних кущах є обов'язковим технологічний прийом обломування пагонів, часткове видалення суцвіть не є таким поширеним у агротехніці маточників, однак позитивно впливає на загальний розвиток рослин. Маточні насадження за можливості слід зрошувати, оскільки недостатнє забезпечення вологою негативно впливає на стан кущів упродовж усього вегетаційного періоду та зимівлі. У даній роботі досліджено вплив прийому часткового видалення суцвіть (навантаження суцвіттями 100, 75 та 50 % від їхньої загальної кількості) на маточних кущах та вплив різних режимів зрошення (рівні передполивної вологості ґрунту 90, 80 та 70 % від найменшої вологоємності) на станматочних насаджень, зокрема на фізіологічні, біохімічні та біометричні показники рослин. Показано, що зрошення кущів та зменшення навантаження суцвіттями до 50 та 75 % від їхнього загальної кількості стимулювали накопичення хлорофілу в листках маточних рослин, покращували обводнення тканин листків, сприяли підвищенню інтенсивності дихання в період активного росту та розвитку винограду. Відмічено позитивний вплив зрошення та зменшення навантаження кущів суцвіттями до 50 та 75 % на агробіологічні показники маточних кущів винограду. Найбільші значення загальної довжини пагонів та ступеня їхнього визрівання були в кущів варіантів із РПВҐ 90 % НВ 50 % суцвіть, 80 % НВ 50 % суцвіть, 70 % НВ 50 та 75 % суцвіть. Отже, ефективні режими зрошення та зменшення навантаження кущів суцвіттями сприяли росту середніх та сильних повноцінних пагонів, які є більш продуктивними

Ключові слова: прищепні маточники винограду; рівень передполивної вологості ґрунту; кількість суцвіть; обводнення тканин листків; інтенсивність дихання; вміст пігментів; агробіологічні показники кущів