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EFFECT OF ECOLOGICAL GROWING CONDITIONS ON PRODUCTIVITY STABILITY AND PLASTICITY OF MALE STERILE HYBRIDS OF SUGAR BEETS

Вивчено адаптивний потенціал нових ЧС гібридів цукрових буряків, створених за участю тетраплоїдних запилювачів білоцерківської селекції залежно від ґрунтово-кліматичних умов зон вирощування. За регіонами виділено найбільш пластичні і стабільні перспективні гібриди у широкому діапазоні екологічних умов вирощування. Нові ЧС гібриди завдяки високій пластичності здатні успішно адаптуватися до лімітуючих факторів життєзабезпечення і стресових явищ у різних ґрунтово-кліматичних зонах, мають високу врожайність коренеплодів, цукристість і збір цукру. Найбільш цінними для виробництва є гібриди, у яких коефіцієнт стабільності перевищує 70 %. За результатами досліджень такому рівню відповідають усі досліджувані ЧС гібриди – за рівнем врожайності коренеплодів, цукристістю й збором з одиниці площі.

Ключові слова: пластичність, стабільність, коефіцієнт регресії, продуктивність гібридів.

Introduction. Evolutional, ecological and bio-energetic factors, which direct the processes of potential implementation, ensure the preservation of the activity of certain organism functions; play a leading role in the adaptation system of sugar beet cultivation. *Adaptation* of a hybrid characterizes its adjustment degree to soil-climatic conditions, and *plasticity* is its ability to survive in certain ranges of the environmental conditions [3, 4].

Analysis of recent research and publications. According to the definition of a founder of agronomical ecology Giovanni Azza [1], the yield level is a derivative of two components – productivity and stability.

Ecological researches help identify the effect of abiotic and biotic factors of the certain environment on genotype as well as their impact on growth, development and crop capacity of sugar beet hybrids. The accumulation of the environmental changes is seen in the variability of certain quantitative features of a plant structure – its phenotype, which form some morphological characteristics of a plant structure, yield capacity, output quality, resistance to biotic and abiotic factors, defined by an original form [2, 3, 5].

High sensitivity of some hybrids to unfavorable growing conditions affects the area of their spreading into certain ecological zones and limits their general spreading. Which is why, the main task of plant breeding is to widen the response of hybrids to the environmental conditions, in particular for the regions with stressful hydrothermal conditions. Based on the testing results of sugar beet hybrids in different growing regions, it is possible to predict genetically established degree of their adaptability to growing conditions [5, 7-10].

Evaluating hybrids by the parameters of ecological plasticity, it is possible, with high accuracy, to expect stable sugar yield for many years in a definite agro-climatic zone.

The purpose of the research is to determine, among the studied sugar beet hybrids of Bila Tserkva selection, the genotypes which show stable productivity in various ecological conditions.

Materials and methods. The studying of the ecological condition effect of the Steppe, the Forest-Steppe and Polissia on root crop capacity, sugar content and sugar yield was carried out on the hybrids

of Bila Tserkva RBS (research breeding station) of the Institute of bio-energetic crops and sugar beets of the NAAS (National academy of agrarian sciences) – Aidar, Heroi, Dzhura Kiborh, Kozak – using the methodology of the Institute [2] Phenotypic effect and regression coefficient were determined according to the methodology [5, 6].

Results and discussions. To make a quantitative stability estimation of a hybrid crop capacity level, two parameters are used:

- *regression coefficient* characterizes the effect of certain environmental conditions on the crop capacity level,

- *average quadratic deviation* of factual yields from general dispersions (it characterizes yield stability in various growing conditions).

General adaptability tendency of MS hybrids to a certain growing region, based on the ecological research results, was determined according to regression coefficient of Eberhart and Rassel:

$$b_i = \frac{\sum X_{ij} I_j}{\sum I_j}, \quad (1)$$

where b_i – regression coefficient of the yield of each (*i-th*) hybrid under better or worse conditions;
X_{ij} – crop capacity of *i*-th variety in any *j*-conditions;
I_j – index of *j*-th conditions, which is a difference between the average yield of all varieties in these conditions and general average yield among all the trials.

According to Eberhart S.A. & Rassel W.A., a quantity of regression coefficient characterizes a general tendency in crop capacity change of each MS hybrid depending on certain ecological conditions. If regression coefficient has a sign approximate to 1 (b_i @ 1.0), then a hybrid is considered to be plastic (Fig. 1).

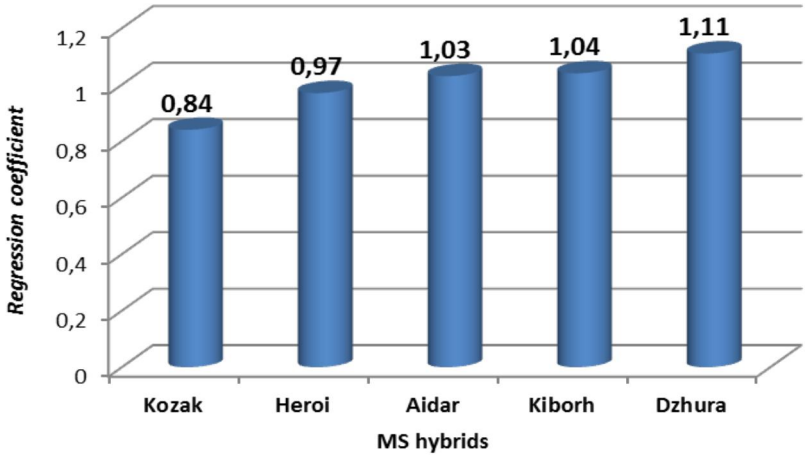

Fig. 1. **Estimation of MS hybrids according to coefficient of Eberhart and Rassel.**

Among the studied MS hybrids according to regression coefficient, Heroi, Aidar and Kiborh appeared to be plastic, Dzhura was highly plastic.

The stability degree of crop capacity of MS hybrids is fixed according to a deviation indicator from general dispersion: the higher a negative deviation indicator from general dispersion, the higher stability of crop capacity MS hybrid has; hybrids with deviations from regression which approximate zero are plastic, and those which are distant from zero and have a positive sign are very plastic (Fig. 2).

Among the studied MS hybrids, Kozak had high genetic stability; its deviations from average dispersion had sign "minus" and its value was significantly < 0. MS hybrids Heniy, Aidar and Kiborh were plastic (their deviations approached to ±0) and Dzhura was very plastic (deviation indicator from average dispersion was the most distant from zero).

An integrated ecological estimation of hybrids as to the suitability degree of some regions for the cultivation of MS sugar beet hybrids was carried out through ecological variety testing by means of laying a multi-factor trial, where the interaction of a hybrid and soil-climatic conditions of certain regions was studied.

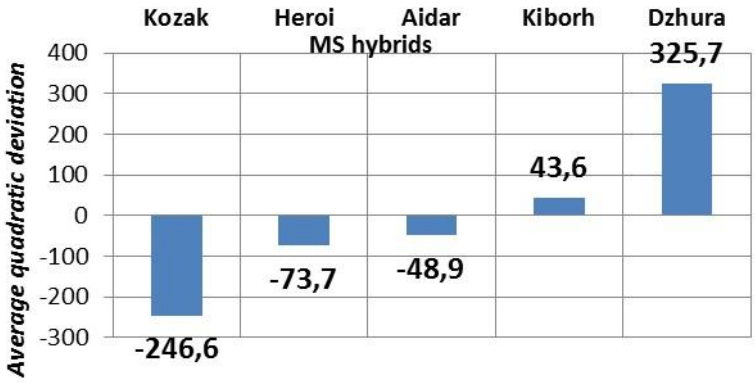

Fig. 2. **Characteristics of MS hybrids as to stability and plasticity.**

The trial was done by a mix scheme, when the effect of ecological conditions of the regions was combined with the effects of differences in soil fertility within the repeats of the demonstration trials of RBS (research breeding station) of the Institute. The estimation was done according to the following statistic indicators: average crop capacity, dispersion and standard deviation from average arithmetic mean; maximal and minimal value and fluctuation range of crop capacity, error of average arithmetic mean; determination of homeostatic and coefficient of agronomical variety stability.

To determine homeostatic and agronomical stability, the equations were used:

Average arithmetic mean $$\bar{x} = \sum X / n, \quad (2)$$

where X – variant, n – quantity variant (indicators);

dispersion $$\sigma^2 = \frac{\sum f\left(X - \bar{x}\right)^2}{n-1}, \quad (3)$$

where f – frequency; x – average arithmetic mean;

standard deviation $$\sigma = \sqrt{\sigma^2}, \quad (4)$$

error of average arithmetic mean $$s_x = \sigma / \sqrt{n}, \quad (5)$$

ecological coefficient of variations, in %; it characterizes a degree of an indicator variability $V_e = 100\sigma / \bar{x}$,

homeostatic – an indicator of a genotype breeding value

$$Hom = \frac{\bar{x}}{V_å}, \quad (6)$$

– coefficient of agronomical stability; varieties whose stability coefficient exceeds 70% are the most valuable for cultivation

$$As = 100 - Ve. \quad (7)$$

The results of ecological research of MS sugar beet hybrids by zones of Ukraine are given in Table 1.

The best MS hybrids which exceeded average root crop capacity the most – 45.6 t/ha, were: on the average – Kozak and Aidar (46.7 and 45.7 t/ha, respectively); and in the Forest-Steppe and the Steppe zones – all the studied hybrids. In the Forest-Steppe zone, Dzhura, Aidar and Kozak were the best as to root crop capacity (49.5, 49.4 and 49.2 t/ha, respectively), and in the Steppe zone – Aidar, Kiborh and Dzhura (54.2, 54.3 and 54.5 t/ha, respectively).

It is possible to argue about the stability of MS hybrids to negative effect of the ecological conditions of the growing region based on *the variation range of crop capacity* (difference between maximal and minimal): *the lower this indicator, the more stable a hybrid is*. Kozak appeared to be the best hybrid according to this indicator, then Heroi and Aidar (R = 17.1-20.4 t/ha).

Table 1 – **Ecological variety testing of MS sugar beet hybrids by zones of Ukraine in 2016**

Ecological region	MS hybrids					Average, xcj	difference, Ij
	Kozak	Heroi	Aidar	Kiborh	Dzhura		
Roots, t/ha							
Polissia	35,5	33,8	33,8	32,7	32,3	33,6	-12,1
Forest Steppe	49,2	48,9	49,4	48,6	51,3	49,5	3,8
Steppe	52,5	53,9	54,2	54,3	54,5	53,9	8,2
Average	45,7	45,5	45,8	45,2	46,0	45,6	
Standard deviation	9,0	10,5	10,7	11,2	12,0		
Max – max. crop capacity	52,5	53,9	54,2	54,3	54,5		
Min – min. crop capacity	35,5	33,8	33,8	32,7	32,3		
R – fluctuation range of crop capacity	17,1	20,1	20,4	21,6	22,2		
Sx – error of average arithmetic mean	4,0	4,7	4,8	5,0	5,4		
Ve,% – variation coefficient	19,8	23,0	23,3	24,8	26,1		
Hom – homeostatic	2,31	1,98	1,97	1,82	1,76		
As – coefficient of agronomical stability	80,2	77,0	76,7	75,2	73,9		
Sugar content, %							
Polissia	18,0	17,7	17,8	17,8	18,2	17,9	-0,2
Forest Steppe	18,6	18,5	18,6	18,4	18,6	18,5	0,4
Steppe	18,2	18,0	18,9	17,1	17,8	18,0	-0,1
Average	18,3	18,1	18,4	17,8	18,2	18,1	
Standard deviation	0,31	0,40	0,57	0,65	0,4		
Max – max. crop capacity	18,6	18,5	18,9	18,4	18,6		
Min – min. crop capacity	18	17,7	17,8	17,1	17,8		
R – fluctuation range of crop capacity	0,6	0,8	1,1	1,3	0,8		
Sx – error of average arithmetic mean	0,14	0,18	0,25	0,29	0,18		
Ve,% – variation coefficient	1,67	2,24	3,08	3,66	2,20		
Hom – homeostatic	10,9	8,1	6,0	4,9	8,3		
As – coefficient of agronomical stability	98,3	97,8	96,9	96,3	97,8		
Sugar yield, t/ha							
Polissia	5,80	5,98	6,02	5,81	5,87	5,90	-2,36
Forest Steppe	9,15	9,04	9,19	8,94	9,53	9,17	0,91
Steppe	9,56	9,71	10,25	9,28	9,70	9,70	1,44
Average	8,17	8,24	8,49	8,01	8,37	8,26	
Standard deviation	2,06	1,99	2,20	1,91	2,16		
Max – max. crop capacity	9,56	9,71	10,25	9,28	9,70		
Min – min.crop capacity	5,80	5,98	6,02	5,81	5,87		
R – fluctuation range of crop capacity	3,76	3,72	4,23	3,46	3,83		
Sx – error of average arithmetic mean	0,92	0,89	0,99	0,85	0,97		
Ve,% – variation coefficient	25,2	24,1	26,0	23,8	25,9		
Hom – homeostatic	0,32	0,34	0,33	0,34	0,32		
As – coefficient of agronomical stability	74,8	75,9	74,0	76,2	74,1		

Error of average arithmetic mean and variation range are used to haracterize average arithmetic at 5 % value i ($x \pm t_{05}s_x$) – *the smaller fluctuations in average range, the more reliable the result is.*

Variation coefficient characterizes the degree of average arithmetic variability – *up to 10%* – low *variability, 10-20 – average and >20 – high.* The majority of MS hybrids of sugar beets have higher variability of crop capacity – V > 20%.

Homeostatic characterizes breeding value of a hybrid genotype – *the higher this indicator, the higher the hybrid is estimated for further breeding work.* Homeostatically all the studied MS hybrids appeared to be valuable as to root crop capacity and sugar yield, Kozak, Dzhura and Heroi were more valuable as to sugar content.

Coefficient of agronomical stability characterizes economic value of a hybrid; according to it, the most valuable for cultivation are the hybrids which have stability coefficient more that 70%. Based on the research results, all the studied MS hybrids correspond to this level by both the level of root crop capacity and sugar content and yield per area unit.

Specific significance of a hybrid is explained by both genetic potential (E_i) and stability of its realization (R_i). The comparison of indicators E_i and R_i is carried out according to average value in the trial of ecological variety testing, which is $E_i = 0$, and $R_i = 1$.

To compare independent distributed samples of equal volumes ($N = const\ s_i^2$) Cochran's criterion is used. The value of Cochran's criterion (G_{05}) is taken from the table according to the degrees of freedom of a number of the studied region – r and a number of hybrids – N-1.

If Cochran's criterion is $G_{fact} < G_{05}$, *sample dispersions differ significantly; if* $G_{fact} > G_{05}$ – *sample dispersions differ slightly.*

Calculations of specific significance of MS hybrids were made by sugar yield (Table 2).

Table 2 – **Estimation of practical value of MS hybrids as to sugar yield in 2016,** t/cwt

Hybrid	Ecological region, r			Total	Average	E_i	R^i	β_{i2}
	Polissia	Forest-Steppe	Steppe					
Kiborh	5.80	8.45	9.27	23.5	7.84	-0.42	0.92	6.58
Heroi	6.00	9.00	9.70	24.7	8.23	-0.03	1.00	7.73
Kozak	6.40	9.10	9.60	25.1	8.37	0.11	0.87	5.93
Aidar	6.00	9.20	10.30	25.5	8.50	0.24	1.13	9.98
Dzhura	5.0	9.50	9.70	25.1	8.37	0.11	1.08	9.15
	30.1	45.3	48.6	123.9				14.3
χ_j	6.02	9.05	9.71	8.26		Gfact. =		0.46
$\overline{\chi_j}$	-2.24	0.79	1.45		G_{05} by degrees of freedom 2 and 4			0.64
E_j N =	5	r =	3	t_{05} =	2,23		$G_{fact.} < G_{05}$	

According to the calculation $G_{fact.} < G_{05}$ (0,46 < 0,64), so sample dispersions differ significantly. Rank estimation of practical value of MS hybrids is made in such consequence:

– generalized random error $s^2 = \sum \beta_i^2 / N = 14,3 / 5 = 2,86$,

– γE for the estimation of difference E_i by relation to $E_i = 0$:

$$\gamma_E = t_{05}\sqrt{\frac{S^2}{r} \times \frac{N-1}{N}} = 1,95$$

γR for the estimation of difference R_i by relation to R_i=1:

$$\gamma_R = t_{05}\sqrt{S^2 / N \times \sum_1^j E^2.j} = 4,69$$

A corresponding rank among the three ones is determined by parameters:

Equations to determine ranks for E_i and R_i	First	
	$\gamma < E_i$	$1-\gamma > R_i$
	Second	
	$-\gamma \le E_i \le \gamma$	$1-\gamma \le R_i \le 1+\gamma$
	Third	
	$-\gamma > E_i$	$+\gamma < R_i$

Rank estimation of practical value of MS hybrids of sugar beets as to sugar yield is given in Table 3.

Table 3 – **Rank estimation of practical value of MS hybrids of sugar beets as to sugar yield**

MS hybrid	Genotype effect		Plasticity degree		Total number of ranks
	E_i	rank	R_i	rank	
Kiborh	-0,4	3	0,9	1	4
Heroi	0,0	3	1,0	1	4
Kozak	0,1	1	0,9	1	2
Aidar	0,2	1	1,1	3	4
Dzhura	0,1	1	1,1	3	4
Average	0		1,0		

The lower the rank of the tested hybrid compared with a local one, the higher its economic value is.

Genotype effect in the studied MS hybrids by sugar yield manifested in this way: Kozak, Aidar and Dzhura belonged to the first rank; others – Kiborh and Heroi – to the third one. These MS hybrids had such ranks by their plasticity degree: Kiborh, Heroi and Kozak belonged to rank I, and Aidar and Dzhura – to rank III.

MS hybrid Kozak appeared to be the best according to the sum of ranks (rank sum 2); other hybrids had the same rank sum – 4.

Conclusions. According to the research results of the expertise of new MS sugar beet hybrids as to ecological plasticity and stability, it has been established:

Due to high plasticity, new MS hybrids are well adapted to limiting factors of life support and stressful events in various soil-climatic zones; they have high root crop capacity, sugar content and yield.

The most valuable hybrids for cultivation are those whose stability coefficient exceeds 70%. The research results prove that all the studied MS hybrids correspond to this level both by the level of root crop capacity and sugar content and yield per area unit.

As to the sum of ranks, MS hybrid Kozak is the best (rank sum 2); other hybrids have the same sum of ranks – 4.

LIST OF REFERENCES

1. Ацци Д. Сельскохозяйственная экология / Д. Ацци. – Л.: Госсельхозиздат, 1932. – С. 7-284.
2. Методики проведення досліджень у буряківництві / [М.В. Роїк, Н.Г. Гізбуллін, В.М. Сінченко, Е.Р. Ермантраут та ін]; під заг. ред. акад. НААН М.В. Роїка і чл.-кор. НААН Н.Г. Гізбулліна. – К.: ІБКіЦБ НААН, 2014. – 373 с.
3. Кильчевский А.В. Экологическая селекция растений / А.В. Кильчевский, Л.В. Хотылева. – Минск: Тэхналогія, 1997. – 372 с.
4. Хангильдин В. В. Генетико-селекционное обоснование моделей сортов яровой пшеницы и гороха для Поволжско-Уральского региона / В.В. Хангильдин // Вопросы генетики и селекции на Урале и в Зауралье. – Свердловск, 1979. – 280 с.
5. Eberhart S. A. Stability parametres for comparing varieties / S. A. Eberhart, W. A. Rassel // Crop Sci, № 6, 1966. – Vol. 6. – P. 36-40.
6. Fisher R.A. Statistical methods for research workers /R.A. Fisher. – New Delhi:Cosmo Publications, 2006. – 354 p.
7. Мойсєйчєнко В.Ф. Основи наукових досліджень в агрономії: підручник / В.Ф. Мойсєйчєнко, В.О. Єщенко. – К.: Вища школа, 1994. – 334 с.
8. Сайт компании StatSoft, разработчика программы Statistica 6.0: http://www.statsoft.ru/.
9. Методика наукових досліджень в агрономії: посібник / Е.Р. Ермантраут, М.А. Бобро, Т.І. Гопцій та ін. – Харків: Харківський національний аграрний університет ім. В.В. Докучаєва, 2008. – 64 с.
10. Доронин В.А. Материалы Global Forum on the Vigor Effect of Gruiser / В.А. Доронин. – Vietnam: Syngenta. – 2011. – С. 156–178.

REFERENCES

1. Acci, D. (1932). Sel'skohozjajstvennaja jekologija [Agricultural ecology]. Leningrad, Gossel'hozizdat, pp. 7-284.
2. Roi'k, M.V., Gizbullin, N.G., Sinchenko, V.M., Ermantraut, E.R. (2014). Metodyky provedennja doslidzhen' u burjakivnyctvi [Methods of conducting research in beet growing]. Kyiv, IBCSB NAAS, 373 p.
3. Kil'chevskij, A.V., Hotyleva, L.V. (1997). Jekologicheskaja selekcija rastenij [Ecological selection of plants]. Minsk, Tjehnalogija, 372 p.
4. Hangil'din, V. V. (1979). Genetiko-selekcionnoe obosnovanie modelej sortov jarovoj pshenicy i goroha dlja Povolzhsko-Ural'skogo regiona [Genetic-selection substantiation of models of spring wheat and pea varieties for the Volga-Urals region]. Sverdlovsk, 280 p.
5. Eberhart, S. A., Rassel, W. A. (1966). Stability parametres for comparing varieties. Crop Science, no. 6, Vol. 6, pp. 36-40.
6. Fisher, R.A. Statistical methods for research workers (2006). New Delhi, Cosmo Publications, 354 p.
7. Mojsjejchjenko, V.F. Jeshhenko, V.O. (1994). Osnovy naukovyh doslidzhen' v agronomii' [Fundamentals of Scientific Research in Agronomy]. Kyiv, Vyshha shkola, 334 p.
8. Sajt kompanyy StatSoft, razrabotchyka programmы Statistica 6.0. [The site of the company StatSoft, developer of the program Statistica 6.0]. Retrieved from http://www.statsoft.ru/.
9. Ermantraut, E.R., Bobro, M.A., Gopcij, T.I. (2008). Metodyka naukovyh doslidzhen' v agronomii' [Methodology of scientific research in agronomy]. Kharkiv, Kharkiv National Agrarian University named V.V Dokuchaev, 64 p.
10. Doronin, V.A. (2011). Materyaly Global Forum on the Vigor Effect of Gruiser [Materials of Global Forum on the Vigor of Gruiser]. Vietnam, Syngenta, pp. 156-178.

Влияние экологических условий выращивания на стабильность и пластичность продуктивности мужских стерильных гибридов сахарной свеклы

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Изучено адаптивный потенциал новых ЧМ гибридов сахарной свеклы, созданных при участии тетраплоидный опылителей белоцерковской селекции в зависимости от почвенно-климатических условий зон выращивания. По регионам выделены наиболее пластичны и стабильные перспективные гибриды в широком диапазоне экологических

условий выращивания. Новые ЧМ гибриды благодаря высокой пластичности способны успешно адаптироваться к лимитирующим факторам жизнеобеспечения и стрессовых явлений в различных почвенно-климатических зонах, имеют высокую урожайность корнеплодов, сахаристость и сбор сахара. Наиболее ценными для производства являются гибриды, в которых коэффициент стабильности превышает 70 %. По результатам исследований такому уровню соответствуют все исследуемые ЧМ гибриды – по уровню урожайности корнеплодов, сахаристости и сбору с единицы площади.

Ключевые слова: пластичность, стабильность, коэффициент регрессии, производительность гибридов.

Effect of ecological growing conditions on productivity stability and plasticity of male sterile hybrids of sugar beets

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Adaptive potential of new MS (male sterile) hybrids of sugar beets, developed with tetraploid pollinators of Bila Tserkva selection depending on soil-climatic conditions of the growing area, was studied. The most plastic and stable promising hybrids in a wide range of ecological growing conditions were singled out by regions. Due to high plasticity, new MS hybrids are well adapted to limiting factors of life support and stressful events in various soil-climatic zones; they have high root crop capacity, sugar content and yield.

The most valuable hybrids for cultivation are those whose stability coefficient exceeds 70 %. The research results prove that all the studied MS hybrids correspond to this level both by the level of root crop capacity and sugar content and yield per area unit.

Key words: plasticity, stability, regression coefficient, hybrid productivity.

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IMPROVEMENT OF THE ELEMENTS OF TECHNOLOGY OF MICROPROPAGATION CORNUS MAS L.

Існує ряд проблем з розмноженням і поширенням кизилу – надзвичайно цінної плодової культури в Україні. Перспективний спосіб розмноження кизилу – застосування мікроклонального розмноження *in vitro*. Шляхом ряду експериментів нами встановлено технологічні прийоми, які дозволяють удосконалити процес мікроклонального розмноження *Cornus mas L.* (сорти Ніжний та Екзотичний) на етапі введення в асептичну культуру: 1) відбір експлантів у фазу зелений конус; 2) деконтамінація препаратом Бланідас 300 (7 г/л автоклавованого дистиляту); 3) відбір експлантів з бруньок медіальної частини пагона; 4) вирощування донорних рослин в умовах депозитарію; 5) сумісне застосування як антиоксидантів аскорбінової кислоти (15 мг/л) та полівінілпіролідону (0,5 г/л) способом додавання їх у живильне середовище.

Ключові слова: *in vitro*, антиоксидант, деконтамінант, експлант, кизил, рослина-донор.

Introduction. Cornel (dogwood), also referred to as cornelian cherry (Cornus mas L.), a European species, is the only edible of many other species of cornel [1, 2]. The plants of this genus are common in the Eastern and Southern Europe, the Caucasus, Asia Minor, China and Japan. In Ukraine, cornel occupies nets to the most important place among the rare crops due to its unique consumer, medical, technical and other values, as well as to its undemanding to growing conditions. Cornel plants have high decorative qualities due to their early and abundant flowering, dense intensively green leaves, bright and beautiful fruits. They can withstand the cutting well and are resistant to dust and gases. They are used as a hedge in sunny and semi-shadowed areas. The wood is solid, very good, highly valued as a material for joinery and lumber. Cornel has wide ecological amplitude, it can grow in a variety of conditions, spread in the mountains to an altitude of 1000-1500 meters above sea level, grow on any soil.

Cornel is grown in Ukraine on private plot mainly s. The largest in Ukraine and the world industrial cornel orchard of 10.5 thousand trees grown on 14 hectares is located on basis of "Tokmatske 2010" farm. An important fact is that the seedlings were purchased in the Crimea, which makes problems with the purchase of planting material nowadays.