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SELECTION OF WATERMELON STARTING MATERIAL BY ADAPTABILITY FOR BREEDING FOR SUITABILITY FOR INTENSIVE AND ORGANIC GROWING TECHNOLOGIES

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The adaptive potential of a watermelon collection was evaluated by the following characteristics: total and marketable yields and average marketable fruit weight. The following parameters were determined: b_i – regression coefficient of a genotype's response to changing conditions (plasticity), Sg_i – genotype's stability, GBV_i –breeding value of the watermelon collection genotype. By the coefficient of environmental plasticity (b_i), the collection watermelon accessions were categorized as with low, medium or with high environmental plasticity for different characteristics. Taking into account the environmental variability parameters in the collection watermelon accessions, we selected accessions with enhanced responses to changes in growing conditions for involvement them in the breeding of cultivars and hybrids suitable for intensive growing technologies, as they are able to yield rather stably in such conditions. We also identified watermelon accessions to be used as starting materials in the breeding of genotypes suitable for organic growing technologies. The accessions selected have optimal responses to the year's conditions, are relatively stable in terms of expression of these traits under changing growing conditions and are characterized by their high levels.

***Key words**: watermelon, breeding, collection accessions, breeding trait, growing technology, stability, plasticity, breeding value.*

Introduction. Recently, yields of agricultural crops, including watermelon, have not significantly increased. Lack of high-yielding cultivars, which are adapted to soil and climatic conditions and certain growing technologies, in production is the main limiting factor [1]. At the current stage of agricultural science, the creation of genotypes that stably yield a lot when grown with different technologies and introduction of them into production is an urgent issue [2]. In watermelon breeding, the problem of insufficient stability and fulfilment of yield potential to provide valuable vitamin products remains relevant; it can be solved only by developing new genotypes with a set of valuable economic features and high adaptive capacity [3].

The environmental-genetic approach to breeding allows developing ways and methods of rational use of genotypes and obtaining new cultivars and hybrids that are resistant to adverse environmental factors, gaining information about the reaction norms of genotypes, etc. [4].

To ensure sufficient watermelon yields, it is necessary to grow new highly adapted cultivars and hybrids of this crop [5]. Parameters of the environmental variability of each genotype are very important, since with rise in the potential productivity of cultivars and hybrids, their demands to cultivation technologies increase greatly, and the amount and quality of their yields become more dependent not only on biotic, but also on abiotic factors [6]. Therefore, the identification of new sources of valuable stable or plastic traits with desirable norms of reaction to changes in growing conditions is a very important trend of melon studies, which allows answering the challenge of competitive cultivars and hybrids with desirable parameters [7].

The availability of specialized starting materials makes it possible to create watermelon cultivars and hybrids for breeding using different growing technologies. Comprehensive evaluation of the adaptive potential of the available gene pool enables one to select starting materials (accessions with valuable economic features) for their involvement in breeding [8, 9]. Studies of the global genetic potential of watermelons using a complex approach to identification of stable sources of different traits and involvement of them in hybridization with further application of analytical breeding methods enable creating diverse starting materials and fruitfully use them both in varietal and in heterotic breeding of this crop [10, 11, 12].

It is possible to select highly adaptive staring materials by comprehensive evaluation of environmental variability parameters of genotypes [13, 14]. Genotypes' responses to changes in environmental conditions are assessed by coefficient of environmental plasticity (b_i), which reflects the plasticity and stability of an accession related to the averaged reaction of all studied forms to changing environmental conditions in research years. The higher b_i is, the steeper the regression line is and the more susceptible to changes in growing conditions the accession is. Most researchers determine the coefficient of environmental plasticity using the traditional method of regression analysis [15]. Special attention is paid to assessments of plasticity of different traits and their peculiarities under changing growing conditions [16, 17]. Highly plastic watermelon sources, which are most suitable for the breeding of genotypes suitable for organic technologies, are also of interest for production in different regions of Ukraine, where this crop is not traditional. For example, recently there have been many publications reporting that highly plastic watermelon cultivars are grown in Transcarpathia by transplanting, even in industrial volumes [18, 19, 20]. Hence, our research was aimed, firstly, at the selection of intensive accessions with enhanced responses to growing conditions, above-average stability and breeding value for certain characteristics, which can be used in the breeding of cultivars and hybrids for intensive growing technologies. The second objective was to select relatively stable accessions that have optimal responses to year's conditions at the average population level, which can be used in the breeding of highly plastic cultivars and hybrids with high adaptive capacity for the breeding of genotypes suitable for organic technologies.

Purpose - to select watermelon starting materials by major productive indicators (yield, average marketable fruit weight) for the breeding of genotypes suitable for intensive and organic cultivation technologies.

Materials, Methods and Conditions. The experiments were conducted in the northern part of the Left-Bank Forest-Steppe of Ukraine, in the central moderately humid area of the Kharkivska Oblast, in 2018-2020. The experiments were carried out on soils typical for the forest-steppe – typical low-humus medium-loam chernozem on loess (pH of salt extract - 5.7; sum of absorbed bases - 26.0 mg-eq per 100 g of soil; hydrolytic acidity - 2.8 mg-eq per 100 g of soil; humus content – 4.3%; hydrolyzable nitrogen – 139.0 mg/kg; mobile phosphorus – 106-119 mg/kg; exchangeable potassium – 93 mg/kg soil). The climate in the research area is temperate-continental. The experiments were located on natural infections.

Collection watermelon accessions were studied: 101 cultivars from 9 countries (Ukraine, China, the USA, Moldova, Kazakhstan, Thailand, the Czech Republic, Italy, etc.). Cv. 'Maks Plus' (Ukraine) was taken as the control accession. The adaptive potential of the watermelon collection was analyzed by productive indicators. The yields in the nursery were harvested and recorded manually; by weight, fruits were categorized as commercial (large, medium, small) or non-commercial.

The following parameters were determined: Sg_i – genotype's stability, b_i – regression coefficient of the genotype's response to changing conditions (plasticity), GBV_i – genotype's breeding value. Plants were grown by traditional technology in the Forest-Steppe of Ukraine (DSTU 3805-98, 1998; DSTU 5045:2008, 2008) [21, 22]. Seeds were sown manually within the first or second 10 days of May, depending on the weather. Water was poured into the holes. The sowing arrangement in the experiments was 1.4 x 0.7 m. The record plot area was 19.6 m^2.

Watermelon plants were fertilized and protected in compliance with scientific and practical recommendations [23]. The study was conducted in accordance with routine methods of breeding

[7, 24, 25]. The collection accessions were selected and evaluated for different breeding directions in accordance to current recommendations [26, 27, 28]. Kilchevskiy & Khotylyova's method, 1997 [29] was used to estimate the genotypes' stability parameters. The coefficient of environmental plasticity (b_i) was calculated by Eberhart & Russel algorithm, 1966 [16]. Data were statistically and mathematically processed in Statistica 6.

Results and Discussion. From the experimental results on 101 watermelon accessions, the numerical value of the regression coefficient (coefficient of environmental plasticity) b_i was determined. By this parameter for major breeding traits, the collection watermelon accessions were categorized into three groups: with low, medium and high environmental plasticity.

It is known that accessions with enhanced responses to growing conditions, which yield a lot under favorable growing conditions, are valuable for the breeding of intensive genotypes. Analysis of the adaptive potential of the collection accessions in terms of yield and its constituents allowed for selection of sources for the breeding of intensive genotypes.

Table 1

Environmental variability parameters of the sources for the breeding of intensive cultivars and hybrids; mean for 2018-2020

Accession	Mean across the years ($\bar{X}$)	Sg_i, %	b_i	GBV_i
Sources for the breeding of intensive cultivars and hybrids in terms of the "total yield" trait, t/ha				
Maks Plus (control)	64.72	5.65	1.03	47.37
Klondike	49.83	12.05	2.00	21.35
Yatum	51.05	10.47	1.84	25.68
Sladkiy Briliant	46.62	12.18	1.87	19.67
Yarylo	46.83	14.12	2.28	15.45
Skhidnyi Prynts	53.97	10.25	1.67	27.71
For the entire sample (101 accessions):				
X_{min}	15.07	0.63	-1.42	-13.30
X_{max}	66.33	29.72	3.32	60.53
A_m - X_{max} - X_{min}	51.26	29.09	4.74	73.83
Sources for the breeding of intensive cultivars and hybrids in terms of the "marketable yield" trait, t/ha				
Maks Plus (control)	63.80	5.08	1.34	49.80
Klondike	46.92	14.65	3.45	17.24
Sladkaya Dakota	55.43	6.02	1.56	41.03
Sladkiy Briliant	44.85	9.62	2.15	26.24
Sladkiy Briliant 2	54.18	13.33	3.47	23.00
Yarylo	46.33	12.46	2.91	21.42
Skhidnyi Prynts	51.22	10.71	2.22	27.55
For the entire sample (101 accessions):				
X_{min}	13.19	1.64	-2.38	-15.76
X_{max}	64.34	31.89	4.65	57.33
A_m = $X_{max} – X_{min}$	51.15	30.25	7.03	73.09
Sources for the breeding of intensive cultivars and hybrids in terms of the "average marketable fruit weight" trait, kg				
Maks Plus (control)	2.50	7.54	-2.37	1.65
Sladkiy Briliant	2.24	8.37	3.96	1.46
For the entire sample (101 accessions):				
X_{min}	0.99	0.73	-12.44	-1.94
X_{max}	3.99	45.70	20.11	3.71
A_m = $X_{max} – X_{min}$	3.00	44.97	32.55	5.65

Thus, according to the level of "total yield" trait, 26 cultivars with increased responses to growing conditions (b_i = 1.51–3.32) were distinguished; they can be classed as intensive genotypes. The experimental results demonstrated that 5 accessions were of the greatest value

(‘Klondike’, ‘Yatum’, ‘Sladkiy Briliant’, ‘Yarylo’, and ‘Skhidnyi Prynts’), with relatively high mean total yields in the three study years ($\bar{X}$= 49.83 t/ha, 51.05 t/ha, 46.62 t/ha, 46.83 t/ha, and 53.97 t/ha, respectively), for the breeding of intensive cultivars and hybrids (Table 1). These cultivars were characterized by medium stability (Sg_i = 12.05%, 10.47%, 12.18%, 14.12%, and 10.25%, respectively) and medium breeding value of the genotype (GBV_i = 21.35, 25.68, 19.67, 15.45, and 27.71, respectively).

By the numerical value of the coefficient of environmental plasticity (b_i), 40 collection accessions (b_i = 1.51–4.65) were considered as having enhanced responses to growing conditions in terms of the "marketable yield" trait.

For the breeding of intensive cultivars and hybrids by this feature, 6 accessions were of the greatest value: ‘Klondike’, ‘Sladkaya Dakota’, ‘Sladkiy Briliant’, ‘Sladkiy Briliant 2’, ‘Yarylo’, and ‘Skhidnyi Prynts’ giving relatively high marketable yields during the research ($\bar{X}$ = 46.92 t/ha, 55.43 t/ha, 44.85 t/ha, 54.18 t/ha, 46.33 t/ha, and 51.22 t/ha, respectively). These accessions were medium stable (Sg_i = 14.65%, 6.08%, 9.62%, 13.33%, 12.46%, and 10.71%, respectively) and characterized by medium breeding value of the genotype (GBV_i = 17.24, 41.03, 26.24, 23.00, 21.42, and 27.55, respectively).

According to the " fruit average weight" trait, 43 collection accessions can be classed as showing enhanced responses to growing conditions ($b_i > 2.05$); however, most of them had a low breeding value of the genotype (GBV_i ranged 2.03 to 0.24), or were unstably or low-yielding. In this group of accessions, high-yielding cv. ‘Sladkiy Briliant’ with an average fruit weight of 2.34 kg stood out as the best one, had a sufficiently high breeding value of the genotype (GBV_i = 1.46), was medium stable (on the average level of the sample; Sg_i = 8.37 %) and showed an increased response to changing growing conditions (b_i = 3.96).

Analysis of the environmental variability parameters in the 101 collection watermelon accessions enabled us to identify accessions with enhanced responses to changing growing conditions, which at, the same time, consistently produced sufficiently high yields, for the breeding of cultivars and hybrids suitable for intensive growing technologies. By the yield constituents, several breeding-valuable accessions were distinguished: 5 were selected due to the "total yield" trait, 6 – due to the "marketable yield" trait, and 1 – due to the "average fruit weight" trait.

Our study demonstrated that genotypes that yielded stably under any growing conditions were valuable for organic growing technologies. Therefore, for the breeding of highly adaptive genotypes, accessions that slightly respond to changes in growing conditions, that is, are highly plastic, are valuable. For the breeding of genotypes with relative stable expression of the breeding traits, which would be suitable for organic growing technologies, sources were selected by stable yields in the study years (Table 2).

Thus, high-yielding ($\bar{X}$ from 49.41 to 64.47 t/ha) accessions were selected by the "total yield" trait: ‘Sladkaya Dakota’, ‘Atamanskyi’, ‘Royal Majestic’, ‘Wm 14’, ‘Minimeloni’, and No. 9 with the coefficient of environmental plasticity b_i from 0.86 to 1.10; they were relatively stable accessions, with optimal responses to year’s conditions and a sufficiently high breeding value of the genotype (GBV_i = 42.61, 28.07, 45.12, 33.44, 52.70, and 39.50, respectively). Cv. ‘Minimeloni’ showed the highest stability of the genotype (Sg_i = 3.85%).

By the numerical value of the coefficient of environmental plasticity for the "marketable yield" trait, the group of genotypes with high environmental plasticity included 14 accessions that slightly responded to changes in growing conditions; their regression coefficients were around 1 (b_i = 0.85–1.13). Of them, 4 accessions were distinguished due to high yields: ‘Atamanskyi’, ‘Royal Majestic’, ‘Karapuz’, and ‘Monomakh’ (54.95 t/ha, 56.40 t/ha, 64.34 t/ha, and 46.59 t/ha, respectively); they were noticeable for both sufficiently high breeding value of the genotype (GBV_i = 32.68, 44.78, 55.64, and 38.45, respectively) and stability (Sg_i = 9.39%, 4.77%, 3.13%, and 4.05%, respectively).

Table 2

Environmental variability parameters of the sources for the breeding of organic cultivars and hybrids; mean for 2018-2020

Accession	Mean across the years ($\bar{X}$)	Sg_i, %	b_i	GBV_i
Sources for the breeding of relatively stable cultivars and hybrids in terms of the “total yield” trait, t/ha				
Maks Plus (control)	64.72	5.65	1.03	47.37
Sladkaya Dakota	55.94	5.02	0.94	42.61
Atamanskyi	56.54	10.61	1.10	28.07
Royal Majestic	59.22	5.02	0.99	45.12
Wm 14	49.41	6.81	0.97	33.44
Minimeloni	64.47	3.85	0.86	52.70
No. 9	51.64	4.94	0.88	39.50
For the entire sample (101 accessions):				
X_{min}	15.07	0.63	-1.42	-13.30
X_{max}	66.33	29.72	3.32	60.53
A_m - X_{max} - X_{min}	51.26	29.09	4.74	73.83
Sources for the breeding of relatively stable cultivars and hybrids in terms of the “marketable yield” trait, t/ha				
Maks Plus (control)	63.80	5.08	1.34	49.80
Atamanskyi	54.94	9.39	0.85	32.68
Royal Majestic	56.40	4.77	1.10	44.78
Karapuz	64.34	3.13	0.88	55.64
Monomakh	46.59	4.05	0.94	38.45
For the entire sample (101 accessions):				
X_{min}	13.19	1.64	-2.38	-15.76
X_{max}	64.34	31.89	4.65	57.33
$A_m = X_{max} - X_{min}$	51.15	30.25	7.03	73.09
Sources for the breeding of relatively stable cultivars and hybrids in terms of the “average marketable fruit weight” trait, kg				
Maks Plus (control)	2.50	7.54	-2.37	1.65
Atamanskyi	2.17	2.97	0.96	1.88
Bingo	1.99	2.99	0.93	1.72
Foton	2.24	4.20	1.12	1.82
Orfey	1.91	3.57	0.98	1.61
A-14 Tur	2.57	1.90	1.15	2.35
No. 7 Zx	2.64	1.52	0.98	2.46
For the entire sample (101 accessions):				
X_{min}	0.99	0.73	-12.44	-1.94
X_{max}	3.99	45.70	20.11	3.71
$A_m = X_{max} - X_{min}$	3.00	44.97	32.55	5.65

Eleven watermelon accessions were selected by the "average fruit weight" trait; they showed a high environmental plasticity (b_i = 0.91–1.15). In this group, high-yielding accessions were selected: ‘Atamanskyi’, ‘Bingo’, ‘Foton’, ‘Orfey’, ‘A-14 Tur’, and No. 7 Zx with an average fruit weight of 1.91-2.64 kg; they were characterized by high environmental plasticity (b_i = 0.96, 0.93, 1.12, 0.98, 1.15, and 0.98, respectively) and sowed a sufficiently high breeding value of the genotype (GBV_i = 1.88, 1.72, 1.82; 1.61, 2, 35, and 2.46, respectively) for this trait. Cv. ‘A-14 Tur’ and No. 7 Zx were characterized by high stability (Sg_i = 1.90% and 1.52%, respectively) of this trait.

Analysis of the environmental variability parameters in the 101 collection watermelon accessions in order to use them as starting materials in the breeding of genotypes with high environmental plasticity, which would be suitable for organic cultivation, allowed us to select a number of accessions by yield constituents: 6 breeding-valuable accessions were selected by the "total yield" trait, 4 – by the "marketable yield" trait, and 6 – by the "average fruit weight" trait.

They optimally responded to year conditions, were relatively stable in terms of high levels of expression of these traits under variable growing conditions.

Conclusions. For the breeding of genotypes suitable for intensive technologies, accessions with enhanced responses to changing growing conditions were selected; at the same time, they maintained a sufficiently high stability of yields. The breeding-valuable accessions were selected by yield constituents: 5 - by the "total yield" trait; 6 – by the "marketable yield" trait; and 1 – by the "average fruit weight" trait.

Analysis of the environmental variability parameters in the watermelon collection to be used as starting materials in the breeding of genotypes suitable for organic cultivation enabled us to select a number of accessions: 6 – by the "total yield" trait; 4 – by the "marketable yield" trait; and 6 - by the characteristic "average fruit weight" trait. The selected accessions optimally responded to changing conditions of cultivation and showed relatively stable and strong expression of these traits.

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SELECTION OF WATERMELON STARTING MATERIAL BY ADAPTABILITY FOR BREEDING FOR SUITABILITY FOR INTENSIVE AND ORGANIC GROWING TECHNOLOGIES

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Purpose and Objectives. To select watermelon starting materials by major productive indicators (yield, average marketable fruit weight) for the breeding of genotypes suitable for intensive and organic cultivation technologies.

Materials and Methods. Collection watermelon accessions were studied: 101 cultivars and lines from 9 countries. Cv. 'Maks Plus' (Ukraine) was taken as the control accession. The following parameters were determined: Sg_i – genotype's stability, b_i – regression coefficient of the genotype's response to changing conditions (plasticity), GBV_i – genotype's breeding value. Plants were grown by traditional technology in the Forest-Steppe of Ukraine (DSTU 3805-98, 1998; DSTU 5045:2008, 2008). Watermelon plants were fertilized and protected in compliance with scientific and practical recommendations. The study was conducted in accordance with routine methods of breeding. Kilchevskiy & Khotylyova's method, 1997 was used to estimate the genotypes' stability parameters. The coefficient of environmental plasticity (b_i) was calculated by Eberhart & Russel algorithm, 1966. Data were statistically and mathematically processed in Statistica 6.

Results and Discussion. The adaptive potential of the watermelon collection was evaluated for the following characteristics: total and marketable yields and average marketable fruit weight. The following parameters were determined: b_i - coefficient of regression of the genotype's response to changes in conditions (plasticity), Sgi – genotype's stability, and GBV_i – genotype's breeding value of the watermelon collection. We established the amplitudes and ranges of variation of the yield indicators. By the coefficient of environmental plasticity b_i, the collection watermelon accessions were grouped as showing low, medium or high environmental plasticity for different traits. The collection accessions were categorized as follows: 1 - intensive genotypes with enhanced responses to growing conditions; 2 - with medium environmental plasticity; 3 - highly plastic, which slightly respond to changes in growing conditions. For breeding for various traits, we identified accessions of practical value in terms of stability parameters and genotype's breeding value (*GBV$_i$*) for intensive and organic cultivation technologies. Taking into account the environmental variability parameters in collection watermelon accessions to be used in the breeding of cultivars and hybrids suitable for intensive technologies, we selected accessions with enhanced responses to changing growing conditions, which also consistently yielded sufficiently high. As to the yield constituents (productive traits), 5 breeding-valuable accessions were selected by the "total yield" trait, 6 – by the "marketable yield" trait, and 1 – by the "average fruit weight" trait. Analysis of the environmental variability parameters in the watermelon collection to be used as starting materials in the breeding of genotypes suitable for organic cultivation enabled us to select a number of accessions by productive traits: 6 breeding-valuable accessions were distinguished due to the "total yield" trait, 4 – due to the "marketable yield" trait, and 6 - due to the "average fruit weight" trait. The selected accessions optimally responded to year's conditions and were relatively stable in terms of high levels of expression of these traits under in changing growing conditions.

Conclusions. For the breeding of genotypes suitable for intensive technologies, accessions with enhanced responses to changing growing conditions were selected; at the same time, they maintained a sufficiently high stability of yields. The breeding-valuable accessions were selected by yield constituents: 5 - by the "total yield" trait; 6 – by the "marketable yield" trait; and 1 – by the "average fruit weight" trait.

Analysis of the environmental variability parameters in the watermelon collection to be used as starting materials in the breeding of genotypes suitable for organic cultivation enabled us to select a number of accessions: 6 – by the "total yield" trait; 4 – by the "marketable yield" trait; and 6 - by the characteristic "average fruit weight" trait. The selected accessions optimally responded to changing conditions of cultivation and showed relatively stable and strong expression of these traits.

***Key words**: watermelon, breeding, collection accessions, breeding trait, growing technology, stability, plasticity, breeding value.*

ДОБІР ВИХІДНОГО МАТЕРІАЛУ КАВУНА ЗА АДАПТИВНІСТЮ ДЛЯ СЕЛЕКЦІЇ НА ПРИДАТНІСТЬ ДО ВИРОЩУВАННЯ ЗА ІНТЕНСИВНОЇ ТА ОРГАНІЧНОЇ ТЕХНОЛОГІЙ.

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Мета дослідження. Виділити вихідний матеріал кавуна за основними продуктивними показниками (урожайністю, середньої масою товарного плоду) для селекції генотипів, придатних до вирощування за інтенсивної та органічної технології.

Матеріали та методи. Об'єкт досліджень: колекційні зразки кавуна — понад 100 сортів та ліній з 9 країн світу. Стандартом слугував сорт Макс плюс (Україна). Було визначено: *Sgi* – стабільність генотипу, *bi* – коефіцієнт регресії реакції генотипу на зміну умов (пластичність), *СЦГі* – селекційна цінність генотипу. Технологія вирощування рослин загальноприйнята для зони Лісостепу України (DSTU 3805-98, 1998; DSTU 5045:2008, 2008). Дослідження проводили відповідно до загальноприйнятих методик з селекційної роботи. Для оцінки параметрів стабільності генотипів використано методику Kilchevskiy & Khotyleva, 1997. Коефіцієнт екологічної пластичності (*bi)* розраховано згідно з методикою Eberhart & Russel, 1966.

Результати та обговорення. Досліджено адаптивний потенціал колекції кавуна за ознаками: загальна і товарна урожайність, середня маса товарного плоду. Визначено: b_i -

коефіцієнт регресії реакції генотипу на зміну умов (пластичність), Sg_i - стабільність генотипу, $СЦГ_i$ - селекційну цінність генотипу колекції кавуна. Дослідженнями встановлено амплітуду та розмах варіювання ознак продуктивності. За коефіцієнтом екологічної пластичності *bi*, колекційні зразки кавуна було розподілено на низько-, середньо- та високо- екологічно пластичні за різними ознаками. Колекційні зразки розподілено на генотипи: 1 - інтенсивного типу зі збільшеною реакцією на умови вирощування; 2 - з середнім рівнем екологічної пластичності; 3 - високо пластичні, які незначною мірою реагують на зміну умов вирощування. Для селекційної роботи на різні ознаки виділено зразки, які мають практичну цінність за показниками стабільності, за селекційною цінністю генотипу (*СЦГі*) для інтенсивної та органічної технологій вирощування. З урахуванням параметрів екологічної мінливості колекційних зразків кавуна для використані у селекції сортів і гібридів, придатних до вирощування за інтенсивної технології, виділено зразки зі збільшеною реакцією на змінні умови вирощування, які при цьому зберігали достатньо високу стабільність урожаю. За складовими урожайності (продуктивними ознаками) виділено: 5 селекційно цінних зразків за ознакою «загальна урожайність», 6 — за ознакою «товарна урожайність» та 1 за ознакою «середня маса плоду». За результатами досліджень параметрів екологічної мінливості колекції кавуна для використання у якості вихідного матеріалу при селекції генотипів придатних до вирощування за органічних технологій за продуктивними ознаками виділено: 6 селекційно цінних зразків за ознакою «загальна урожайність», 4 зразки за ознакою «товарна урожайність», 6 зразків за ознакою «середня маса плоду». Виділені зразки мають оптимальну реакцію на умови року, є відносно стабільними за рівнем прояву цих ознак у змінних умовах вирощування та характеризуються високими їх значеннями.

Висновки. Визначено параметри адаптивної здатності колекції кавуна для селекції генотипів, придатних до вирощування за інтенсивною та органічною технологіями. За результатами аналізу параметрів екологічної мінливості 101 колекційного зразка кавуна виділено зразки зі збільшеною реакцією на змінні умови вирощування, які при цьому зберігали достатньо високу стабільність урожаю. За складовими урожайності виділено: 5 селекційно-цінних сортозразків за ознакою «загальна урожайність»: Клондайк, Ятум, Сладкий брилиант, Ярило, Східний принц, 6 селекційно-цінних сортозразків за ознакою «товарна урожайність»: Клондайк, Сладкая дакота, Сладкий брилиант, Сладкий брилиант 2, Ярило, Східний принц та один селекційно-цінний сортозразок за ознакою «середня маса плоду» – Сладкий брилиант. За результатами досліджень параметрів екологічної мінливості колекції кавуна для використання їх як вихідного матеріалу при селекції генотипів, придатних для вирощування за органічної технології, виділено: шість селекційно-цінних сортозразків за ознакою «загальна урожайність»: Сладкая дакота, Атаманський, Рояль Маджестик, Wm 14, Minimeloni, № 9, чотири селекційно-цінних сортозразки за ознакою «товарна урожайність»: Атаманский, Рояль Маджестик, Карапуз, Мономах, шість селекційно-цінних сортозразків за ознакою «середня маса плоду» Атаманский, Бінго, Фотон, Орфей, А-14 Тур, №7 Zx. Виділені зразки мають оптимальну реакцію на змінні умови років вирощування, є відносно стабільними за рівнем прояву цих ознак та характеризуються високими їх значеннями. Отже, за результатами досліджень виділено джерела основних селекційних ознак кавуна за рівнем прояву адаптивних показників, що має практичне значення в селекції сортів та гібридів як для інтенсивних, так і для органічних технологій вирощування.

Ключові слова: *кавун, селекція, колекційній зразок, селекційна ознака, технологія вирощування, стабільність, пластичність, селекційна цінніст*