VASHCHENKO V.V., SHEVCHENKO A.A.
Dnipro State Agrarian and Economic University, Ukraine

When creating cultivars with potential performance and adaptability, one should determine the roles of genotype and environmental factors in yield formation. Phenomenological and genetic-biometric methods were used for this purpose. As to the genetic control of earing time, incomplete intra-locus dominance and inter-locus additivity were determined, suggesting a possibility of selection starting from F$_3$, with cultivar Svarozhych as a source of fast ripening and cultivar Bohun as a source that extends this period length.

**Key words:** spring barley, cultivar, hybrid, “seedlings-earing” interphase period, combining ability.

**Introduction.** Barley grain is a significant contribution to the food security and export capacity of Ukraine. Yield reflects biotic and abiotic factors affecting plants during their development. In the future, the gross production should be increased due to boosted yields, which can be ensured via breeding/genetic improvement of this crop and creation of modern cultivars for changing environmental conditions. This problem can be solved through a systemic approach to the breeding process in order to identify limiting factors, to involve new genetic diversity, and to optimize assessments and selections.

**Literature review and problem articulation.** Most economically valuable traits are quantitative, and their expression is mostly determined by environmental conditions, which have the greatest effects on the formation of a trait in the plant ontogenesis. Depending on limiting factors, the genetic control of the trait changes.

The growing period is one of the most important indicators determining the areal of a cultivar, its potential and actual yields, as well as other features such as drought resistance, grain quality, resistance to diseases and pests [1, 2].

Barley is an early ripening crop, and its growing period depends both on the ecological zone and on the genotype, varying 55 to 95 days or even wider. An investigation of collection accessions under water deficit showed that the most productive genotypes had growing periods of 69–80 days.

It is known that the growing period consists of two phases: vegetative (“seedlings–earing”) and reproductive (“earing–ripening”) ones. The soil and clime effects during these phases differ greatly. The variability of the “seedlings-earing” period is strongly associated with on the biological/genetic characteristics of cultivars ($Vrn$, $Ppd$ genes), while the “earing–ripening” phase is usually influenced by temperature and humidity [3–7]. In addition, it was revealed that there was a strong correlation between the vegetation length and the (“seedlings-earning” interphase period, so it is important to study this feature [8].

The responses of cultivars to the photoperiod and the air temperature by accelerating or slowing down the earing phase also affect the yield. In years with early dry springs and high air temperature, some collection accessions began earing on May 25–27, while others delayed earing because of a short photoperiod and did not sprout until May 30–June 1, but they better tillered, and, with a significant amount of water, gave larger yields, forming spikes later and simultaneously. Cultivars that are very responsive to the photoperiod did come into ear until June 4–5, but their plant performance was optimal provided good water supply.

Sowing of collection accessions in different timeframes with various seeding rates demonstrated that genotypes with optimal growing periods were highly plastic and their plant performance slightly decreased, which was manifested as a decrease in the grain number per spike.
and 1000-grain weight. Such features of cultivars are taken into account when one selects parents for hybridization.

At present, there extensive experimental data on the inheritance of the “seedlings–earing” interphase period in cereals. Literature review revealed that in the first-generation (F₁) hybrids the vegetation length was under polygenic control and could be much shorter than the more short-season parent, equal to that in either of the parents, intermediate compared to the parents, or longer than that in the more late-ripening original cultivar [9–10].

When the genetics of the “seedlings-earing” interphase period was studied, the prevalence of an additive-dominant complex of genes in the determination of this trait was demonstrated, i.e. intra-locus dominance and inter-locus additivity were noticed. [7, 11–14]. As a rule, a partial, not complete or complete dominance, and sometimes overdominance are observed inside loci. This phenomenon is attributed both to the assortment of cultivars involved in experiments and to the meteorological conditions during the plant vegetation. The fact that the dominant genes shorten the earing time and the recessive ones extend it is very important [15–18].

**Purpose and objectives.** Therefore, our purpose was to determine the variability and genetic control of the “seedlings–earing” interphase period in spring barley under water deficit, to theoretically substantiate generations for selection in the diallel crossing design using cultivars bred at different breeding institutions and of different ecotypes, thereby solving the problem of shortening the spring barley breeding process.

**Material and methods.** The study was conducted at Donetsk State Agricultural Station of NAAS of Ukraine. In 2018–2019, hybridization was performed and over 150 grains for each combination were obtained. In 2019–2020, the field experiments were laid out; cultivars and hybrids were sown within the optimal timeframe. The plots were arranged as per a P₁ F₁ P₂ scheme. The row length was 1.5 m. A cassette seeder SKS-6-10 was used. The nutrition area was 10 cm x 20 cm. The experiments were carried out in three replications. The predecessor was black fallow.

The following cultivars were involved in the diallel crossing: Partner (variety *nutans* Schübl, short-season) bred at Donetsk Institute of Agroindustrial Production; Baskak (variety *nutans* Schübl, steppe ecotype, short-season) and Svarozhych (variety *nutans* Schübl, steppe ecotype, short-season) bred at Dnipro State Agrarian and Economic University; Komandor (variety *nutans* Schübl, steppe ecotype, mid-ripening) bred at the Breeding and Genetic Institute; Bohun (variety *nutans* Schübl, forest-steppe ecotype, mid-ripening) bred at VYa Remeslo Myronivka Institute of Wheat.

Data were processed using the package of applications for processing genetic and breeding experiments "EliteSystems gr." developed by the PPI nd.a. V.Ya. Yuriev NAASU. Based on genetic analysis, the following Hayman parameters were determined: P₃ – r (Wr + Vr), Xₚ – correlation coefficient between the sum of Wr + Vr and the mean values of traits in the parents, which characterizes the direction of dominance; P₆ – (√H₁/D) –measure the average degrees of dominance over all loci in the population; P₉ – (1/4 H₂/H₁) – mean value of plus or minus alleles of all loci; P₁₃ – (√4DH₁ + F/√ 4DH₁-F) – ratio of the total number of dominant genes to the total number of recessive genes in the parental cultivars, where D, H₁ and H₂ are components of variation attributed to genes with additive effects, dominant and recessive genes, respectively. The genetic control was assessed using Hayman graphs (dependence of Wr on Vr – respectively covariance and variance) and the parameters. In a Hayman graph, the relationship between Wr and Vr is expressed through the linear regression coefficient bₚ. We used these parameters, which relatively really describe the organization of a quantitative trait, as V.A. Dragavtsev did in his study (1995). The parameters of adaptability, stability of genotypes and environment as a background for yield-oriented selection were calculated by A.V. Kilchevskiy and L.V. Khotylyova’s method (1997). Analysis of variance and correlation analysis were performed in compliance with B.A. Dospekhov’s recommendations (1985). The GCA effects and SCA variances were calculated by V.G. Volf and P.P. Litun’s method (1980) [19–23].

The weather in 2019-2020 was characterized by various hydrothermal indicators, favoring comprehensive assessments of starting material of spring barley for productive and adaptive potentials as well as for the “seedlings-earing” interphase period.
Results and discussion. In our study, the “seedlings–earing” interphase period in the cultivars varied 42.8 days to 49.1 days in 2019 (Table 1).

Table 1. *“Seedlings-earing” interphase period in the spring barley cultivars, days*  

| Cultivar   | Years   | Mean (2019–2020) |
|------------|---------|------------------|
| Partner    | 42      | 45               | 44               |
| Baskak     | 41      | 45               | 43               |
| Svarozhych | 40      | 46               | 43               |
| Komandor   | 42      | 46               | 44               |
| Bohun      | 48      | 50               | 49               |
| Mean       | 42      | 47               | 44               |
| LSD_{0.05} | 1.08    | 0.98             | —                |

In F₁ hybrids, the “seedlings-earing” interphase period varied significantly, depending on crossing of cultivars of different ecotypes (Table 2).

Table 2. *“Seedlings-earing” interphase period in F₁ spring barley hybrids, days*  

| Hybrid combination | 2019 | 2020 | Mean (2019–2020) |
|--------------------|------|------|------------------|
| Partner / Baskak   | 41   | 46   | 44               |
| Partner / Svarozhych| 42   | 46   | 44               |
| Partner / Komandor | 42   | 46   | 44               |
| Partner / Bohun    | 42   | 45   | 44               |
| Baskak / Partner   | 40   | 45   | 43               |
| Baskak / Svarozhych| 41   | 45   | 43               |
| Baskak / Komandor  | 41   | 45   | 43               |
| Baskak / Bohun     | 41   | 46   | 44               |
| Svarozhych / Partner| 41   | 46   | 43               |
| Svarozhych / Baskak| 41   | 47   | 44               |
| Svarozhych / Komandor| 41  | 47   | 44               |
| Svarozhych / Bohun | 40   | 45   | 43               |
| Komandor / Partner | 41   | 45   | 43               |
| Komandor / Baskak  | 42   | 46   | 43               |
Not significant differences the “seedlings–earing” interphase period between the cultivars and F₁ hybrids and its variability, depending on the hydrothermal mode in the study years, were demonstrated by analysis of variance (Table 3).

### Table 3

| Factor                              | mS      | Fr   | F₁   | %      |
|-------------------------------------|---------|------|------|--------|
| Environmental conditions (A)        | 3332.32 | 6646.74 | 3.96 | 99.76  |
| Genotype (B)                        | 5.11    | 9.89 | 1.69 | 0.15   |
| Interaction (AxB)                   | 2.38    | 4.61 | 1.65 | 0.07   |
| Error                               | 0.52    | -    | -    | 0.02   |

Thus, the share of the first factor (A) was 99.76% of the total variability of the trait, and the shares of genotype and genotype-environment interaction were only 0.15% and 0.07%, respectively.

The equality of the group mean values for cultivars and hybrids indicates, firstly, an intermediate type of inheritance, and secondly, the predominance of additive effects in the determination of the trait. This was confirmed by analysis of the combining ability of the cultivars in their hybrids. Table 4 shows that the share of the GCA variances was 70.8% of the total variability of the trait.

### Table 4

| Parameter | 2019 | %     | 2020 | %     |
|-----------|------|-------|------|-------|
| GCA       | 7.59*| 70.8  | 1.68*| 79.5  |
| SCA       | 1.93*| 18.0  | 0.31*| 14.5  |
| PE        | 1.19*| 11.2  | 0.13 | 6.0   |

*P ≤ 0.05

Significant influence and SCA variance, the effects of allelic and non-allelic interactions were higher in a less favorable year: 18% vs. 14.5%.

Analysis of the hybrid combinations indicates that the female effect, which increases the earing time, was seen in the hybrid combinations Partner/Komandor, Komandor/Baskak, Bohun/Baskak, and Bohun/Komandor. Of the cultivars under investigation, Baskak and Svarozhych reduced the earing time, while Komandor and Bohun increased it, and the GCA effects were most pronounced in the latter (Table 5).

### Table 5

| Names of graph points (Fig. 2) | Cultivar | 2019 | 2020 | Mean (2019–2020) |
|-------------------------------|----------|------|------|------------------|
| 1                             | Partner  | -0.27| -1.010| -0.68 |
| 2                             | Baskak   | -0.14| -0.22| -0.18 |
| 3                             | Svarozhych| -0.45| -0.12| -0.28 |
| 4                             | Komandor | 0.41| 0.13| 0.27 |
| 5                             | Bohun    | 0.46| 1.32| 0.89 |
Genetic analysis was performed by Hayman’s method (Fig. 2). Evaluation of the $W_r - V_r$ difference homogeneity using t-test revealed no epistatic interaction ($t = 0.21$ and $0.10$ insignificant).

The regression line passes above the origin, indicating the leading role of dominance in the genetic control of the “seedlings–earing” period. This is confirmed by the indicator of medium degree of dominance ($P_6 = 0.76$ and $0.79$).

The divergence of the cultivar points along the regression line is significant, indicating the differentiation of the genotypes by the presence of dominant and recessive genes.

![Figure 2](image)

**Figure 2.** Dependence between covariance ($W_r$) and variance ($V_r$) of the “seedlings–earing” interphase period in the spring barley cultivars.

In 2019, Partner and Komander were in the dominant zone, Baskak, Svarozhych and Bohun – in the recessive one.

In 2020, Svarozhych and Komandor were in the recessive zone, and Bohun moved from the recessive zone to the dominant one. In general, the location of the cultivars along the regression line is relatively stable. Positive correlation coefficients between $W_r + V_r$ and $X_p$ ($P_3 = 0.32 \pm 0.40$ and $0.52 \pm 0.32$) indicate the stability of genetic systems determining the barley earing time, but they are insignificant, indicating the dominance direction, i.e. both dominant and recessive genes can reduce or increase this trait.
In the loci that show dominance, the product of the frequencies of positive and negative alleles was asymmetric, the P9 index was 0.16 and 0.19 for the study years, respectively, i.e. not equal to 0.25, and the ratio of the total number of dominant genes to the total number of recessive ones, proceeding from the values of >1, indicates prevalence of the former. In the genetic control of the “seedlings-earing” interphase period, incomplete intra-locus dominance and inter-locus additivity were recorded.

The prevalence of the additive-dominant genes in the heredity of the “seedlings–earing” interphase period suggests a possibility of selecting desired genotypes in the early generations, starting with F3. Svarozhych can be used as a source to reduce the “seedlings–earing” interphase period, while Bohun can lengthen it. This trait is controlled by a single genetic system.

Conclusions. Cultivars of different ecotypes bred at different breeding institutions, with due account for their competitiveness in terms of performance, were taken as initial components.

Of crossing designs, we preferred diallel crossing for the following reasons: it allows obtaining the full range of combinatorics of the parents’ genetic information. The assemblage of F1 hybrids and parental cultivars gives a typical segregation. Starting selection, we have an idea about the trait inheritance and can determine from which generation to start it.

Positive correlation coefficients between Wr + Vr and Xp (P3 = 0.32 ± 40 and 0.52 ± 0.32) indicate the stability of genetic systems determining the barley earing time, but they are insignificant, indicating the dominance direction, i.e. both dominant and recessive genes can reduce or increase this trait. The trait is controlled by a single genetic system, so selection can be based both on dominant alleles and on recessive ones, regardless of whether or not they reduce “seedlings–earing” interphase period. One should prefer recessive alleles, because they can be manifested in F2.

Svarozhych can be used as a source to reduce the “seedlings-earing” interphase period, while Bohun can lengthen it.

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станції НААН України. В 2018–2019 рр. виконано гібридизацію, по кожної комбінації отримано більше 150 зерен. В 2019–2020 рр. закладено польовий дослід в оптимальні строки, висіяно сорта та гібриди за схемою P₁ F₁ P₂, довжина рядка 1,5 м. касетною сівалкою СКС-6-10, площа живлення 10x20см, повторність – триразова, попередник – чорний пар.

Біометричний аналіз отриманих результатів проведено за програмою ППП ОСГЄ «EliteSystems gr.», розробленою IP ім. В.Я. Юр'єва НААНУ. На основі генетичного аналізу визначено наступні параметри Хеймана.

Обговорення результатів. Тривалість міжфазного періоду сходи–колосіння у сортів в 2019 р. варіювала в межах 42,8–49,1 доби. У гібридах першого покоління цей міжфазний період більш варіабельний від схрещування сортів різних екотипів.

Достовірний вплив варіанції СЗК, ефекти алельної та неалельної взаємодії є вищими в менш сприятливий рік, 18% проти 14,5%. За аналізом гібридних комбінацій материнський ефект, при якому збільшується термін колосіння, установлено в гібридних комбінаціях Партнер/Командор, Командор/Баскак, Богун/Баскак, Богун/Командор. Серед сортів скорочують строки колосіння Баскак та Сварожич, подовжують – Командор і Богун, у останнього ефекта ЗКЗ є найбільш вираженими.

Перевірка однорідності різниці Wr–Vr через критерій t не виявив епістатичної взаємодії (t = 0,21 і 0,10 незначуще). Лінія регресії проходить вище початку координат, що вказує на провідну роль домінування в генетичному контролі терміну періоду сходи–колосіння. Це підтверджується показником середнього ступеню домінування (Пб = 0,76 і 0,79). Розбіг точок сортів вздовж лінії регресії є значним, що вказує на диференціацію генотипів за наявністю домінантних та рецесивних генів.

У 2019 році в домінантній зоні опинилися сорти Партнер і Командор, в рецесивній – Баскак, Сварожич і Богун. У 2020 році – в рецесивній зоні сорти Сварожич, Командор, сорт Богун перемістився від рецесивної зони до домінантної. В цілому розташування сортів уздовж лінії регресії є відносно стабільним. У локусах, які проявляють домінування, добуток частот позитивних і негативних алелей асиметричний, а відношення загальної кількості домінантних генів до загальної кількості рецесивних, виходячи із параметрів більше однієї, вказує на перебільшення перших. У генетичному контролі міжфазного періоду сходи–колосіння фіксується неповне внутрішньолокусне домінування і адитивність між локусами.

Висновки. За вихідні компоненти було використано сорти різних селекційних установ екотипів з урахуванням їх конкурентності за продуктивністю. Серед схем схрещування перевагу надано діалельній, так як вона дозволяє отримати всебічну комбінацію генетичної інформації компонентів. Сукупність гібридів F₁ і батьківських сортів надає типове розщеплення. Починаючи добори, маємо уявлення про спадковість ознаки та змогу визначитися, з якого покоління його починати.

Позитивні значення коефіцієнтів кореляції між Wr + Vr та Хр (P3 = 0,32 ± 40 та 0,52 ± 0,32 свідчать про стабільність генетичних систем, детермінованих міжфазний період сходи–колосіння ячменю, недостовірний зв'язок вказує на спрямованість домінування, тобто скорочувати або подовжувати тривалість можуть як домінантні, так і рецесивні гени. Контроль ознаки здійснюється однією генетичною системою, добір можливий як на основі домінантних, так і рецесивних алей. Перевагу доцільно надавати рецесивним алейям, тому що їх провів можливий в F₂.

За джерело короткого міжфазного періоду сходи–колосіння рекомендується використовувати сорт Сварожич, а джерело тривалого періоду – Богун.

Ключові слова: ячмінь ярий, сорт, гібрид, тривалість міжфазного періоду сходи–колосіння, комбінаційна здатність.

ИЗМЕНЧИВОСТЬ И ГЕНЕТИЧЕСКИЙ КОНТРОЛЬ МЕЖФАЗНОГО ПЕРИОДА ВСХОДЫ-КОЛОШЕНИЕ ЯЧМЕНЯ ЯРОВОГО В УСЛОВИЯХ НЕДОСТАТОЧНОГО УВЛАЖНЕНИЯ
Цель исследований. Определение изменчивости и генетического контроля продолжительности межфазного периода всходы–колошение ячменя ярового в условиях недостаточного увлажнения и теоретическое обоснование поколения отбора при диаллельной схеме скрещивания сортов различных селекционных учреждений и экологических типов, решает задачи по сокращению селекционного процесса ячменя ярового.

Материалы и методы. Исследования проведены на Донецкой государственной сельскохозяйственной станции НААН Украины. В 2018–2019 гг. выполнена гибридизация, по каждой комбинации получено более 150 зерен. В 2019–2020 гг. заложен полевой опыт, высевены сорта и гибриды по схеме Р1 F1 Р2, длина ряда 1,5 м, площадь питания 10х20 см, повторение – трехкратное, предшественник – черный пар.

Биометрический анализ полученных результатов проведен по программе «EliteSystems gr.», разработанной в ИР им. В.Я. Юрьева НААНУ. На основании генетического анализа определены параметры Хеймана.

Обсуждение результатов. Продолжительность межфазного периода всходы–колошение у сортов варьировала в пределах 42,8–49,1 суток. У гибридов первого поколения межфазный период всходы–колошения значительно варьировал от скрещивания сортов различных экотипов. Достоверное влияние варианс СКС, эффекты аллельного и неаллельного взаимодействия выше в менее благоприятный год, 18% против 14,5%. Анализ гибридных комбинаций указывает, что материнский эффект, при котором увеличиваются сроки колошения, присутствует в гибридных комбинациях Партнер / Командор, Командор / Баскак, МИП Богун / Баскак, МИП Богун / Командор. Сокращают сроки колошения сорта Баскак и Сварожич, увеличивают Командор и Богун, у последнего эффекты СКС наиболее выражены.

Проверка однородности разницы Wr–Vr через критерий t не выявила эпистатическое взаимодействие (t = 0,21 и 0,10 незначительное). Линия регрессии проходит выше начала координат, что указывает на определяющую роль доминирования в генетическом контроле межфазного периода всходы–колошение. Это подтверждается показателем средней степени доминирования. Разбег точек сортов вдоль линии регрессии значительный, что указывает на дифференциацию генотипов при наличии домinantных и резессивных генов.

В 2019 году в домinantной зоне оказались сорта Партнер и Командор, в рецессивной – сорта Баскак, Сварожич и Богун. В 2020 году – в рецессивной зоне Сварожич, Командор, сорт Богун переместился в рецессивной зоне в домinantную. В целом расположение сортов вдоль линии регрессии относительно стабильное. В локусах, проявляющих доминирование, частота положительных и отрицательных аллелей асимметрично, а отношение общего количества домinantных генов к общему числу рецессивных, исходя из параметров который больше единицы, указывает на преобладание первых. В генетическом контроле фиксируется неполное внутрилокусное доминирование и аддитивный эффект между локусами.

Выводы. В качестве исходных компонентов, привлечены сорта разных селекционной учреждений и экотипов с учетом их конкурентоспособности по продуктивности. Из схем скрещивания преимущество отдано диаллельной, так как она позволяет получить всестороннюю комбинаторику генетической информации компонентов. Совокупность гибридов F1 и родительских сортов предоставляет типичное расщепление. Начиная отбор, имеем представления о наследственности признака и возможности определиться, с какого поколения его начинать.

Положительные значения коэффициентов корреляции между Wr + Vr и Хр (P3 = 0,32 ± 40 и 0,52 ± 0,32) свидетельствует о стабильности генетических систем, детерминирующих межфазный период всходы–колошение ячменя ярового, недостоверная связь указывает на
VARIABILITY AND GENETIC CONTROL OF THE “SEEDLINGS-EARING” INTERPHASE PERIOD IN SPRING BARLEY UNDER WATER DEFICIT

Vashchenko V.V., Shevchenko A.A.
Dnipro State Agrarian and Economic University, Ukraine

Purpose. To determine the variability and genetic control of the “seedlings–earing” interphase period in spring barley under water deficit, to theoretically substantiate generations for selection in the diallel crossing design using cultivars bred at different breeding institutions and of different ecotypes, thereby solving the problem of shortening the spring barley breeding process.

Material and methods. The study was conducted at Donetsk State Agricultural Station of NAAS of Ukraine. In 2018–2019, hybridization was performed and over 150 grains for each combination were obtained. In 2019–2020, the field experiments were laid out; cultivars and hybrids were sown within the optimal timeframe. The plots were arranged as per a P1 F1 P2 scheme. The row length was 1.5 m. A cassette seeder SKS-6-10 was used. The nutrition area was 10 cm x 20 cm. The experiments were carried out in three replications. The predecessor was black fallow.

Data were processed using the package of applications for processing genetic and breeding experiments "EliteSystems gr." developed by the PPI nd.a. V. Ya. Yuriev NAASU. Based on genetic analysis, the Hayman parameters were determined.

Results and discussion. The “seedlings–earing” interphase period in the cultivars varied 42.8 days to 49.1 days. In F1 hybrids, the “seedlings–earing” interphase period varied significantly, depending on crossing of cultivars of different ecotypes. Significant influence and SCA variance, the effects of allelic and non-allelic interactions were higher in a less favorable year: 18% vs. 14.5%. Analysis of the hybrid combinations indicates that the female effect, which increases the earing time, was seen in the hybrid combinations Partner/Komandor, Komandor/Baskak, Bohun/Baskak, and Bohun/Komandor. Baskak and Svarozhych reduced the earing time, while Komandor and Bohun increased it, and the GCA effects were most pronounced in the latter.

Evaluation of the Wr–Vr difference homogeneity using t-test revealed no epistatic interaction (t = 0.21 and 0.10 insignificant). The regression line passes above the origin, indicating the leading role of dominance in the genetic control of the “seedlings–earing” period. This is confirmed by the indicator of medium degree of dominance. The divergence of the cultivar points along the regression line is significant, indicating the differentiation of the genotypes by the presence of dominant and recessive genes.

In 2019, Partner and Komander were in the dominant zone, Baskak, Svarozhych and Bohun – in the recessive one. In 2020, Svarozhych and Komandor were in the recessive zone, and Bohun moved from the recessive zone to the dominant one. In general, the location of the cultivars along the regression line is relatively stable. In the loci that show dominance, the product of the frequencies of positive and negative alleles was asymmetric, and the ratio of the total number of dominant genes to the total number of recessive ones, proceeding from the values of >1, indicates prevalence of the former. In the genetic control of the “seedlings–earing” interphase period, incomplete intra-locus dominance and inter-locus additivity were recorded.
Conclusions. Cultivars of different ecotypes bred at different breeding institutions, with due account for their competitiveness in terms of performance, were taken as initial components. Of crossing designs, we preferred diallel crossing for the following reasons: it allows obtaining the full range of combinatorics of the parents’ genetic information. The assemblage of F₁ hybrids and parental cultivars gives a typical segregation. Starting selection, we have an idea about the trait inheritance and can determine from which generation to start it.

Positive correlation coefficients between Wr + Vr and Xp (P3 = 0.32 ± 0.40 and 0.52 ± 0.32) indicate the stability of genetic systems determining the barley earing time, but they are insignificant, indicating the dominance direction, i.e. both dominant and recessive genes can reduce or increase this trait. The trait is controlled by a single genetic system, so selection can be based both on dominant alleles and on recessive ones, regardless of whether or not they reduce “seedlings-earing” interphase period. One should prefer recessive alleles, because they can be manifested in F₂. Svarozhych can be used as a source to reduce the “seedlings-earing” interphase period, while Bohun can lengthen it.

Key words: spring barley, cultivar, hybrid, “seedlings-earing” interphase period, combining ability.