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CORRELATION BETWEEN QUANTITATIVE AND QUALITATIVE TRAITS OF WINTER RAPE

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The article presents an evaluation of quantitative and qualitative traits of 15 maternal lines of winter rapeseed, as well as the correlation relationships between them. Based on the obtained results, two lines were identified: A7/S301 and B3/B305, which simultaneously demonstrated high yield (2.7 and 2.3, respectively) and oil content (45.5% and 45.3%). The line B3/B305 was also characterized by a low glucosinolate content (15.4). These lines are recommended for breeding aimed at high yield and oil content with reduced glucosinolate levels. High positive correlations were observed between plant height and stem length (r = 0.82), and between thousand seed weight and the number of lateral branches (r = 0.74). A negative correlation (r = -0.72) was found between stem length and the number of lateral branches. Yield showed a moderate positive correlation with the number of lateral branches and thousand seed weight (r = 0.52 and r = 0.59, respectively), and a negative correlation with the number of pods on the main raceme (r = -0.47). Oil content was positively correlated with plant height, stem length, number of pods on the main raceme, and number of seeds per pod (r = 0.38, r = 0.61, r = 0.37, and r = 0.36, respectively), and negatively correlated with the number of lateral branches and thousand seed weight (r = -0.37 and r = -0.58). Glucosinolate content showed moderate positive correlations with the number of lateral branches, number of seeds per pod, thousand seed weight, and yield (r = 0.41, r = 0.48, r = 0.31, and r = 0.32, respectively), and a negative correlation with the length of the main raceme (r = -0.44).

Keywords: *Brassicanapus*, biometric measurements, yield, oil content, glucosinolate content, correlation relationship

Introduction. Rapeseed is among the strategic oilseed crops of agriculture in Ukraine, ensuring food security both domestically and internationally. The development of production of these crops stimulates the growth of Ukraine's agro-industrial sector, generates foreign currency revenues, and contributes to the country's economic stability.

Breeding programs for rapeseed are aimed at developing new hybrids and varieties resistant to diseases, pests, and unfavorable growing conditions, with high yield and oil content, improved oil quality, and optimized fatty acid composition and ratios to support various end uses. Addressing this task involves studying source material to identify the best donors and promising genotypes for traits important in breeding, which requires the application of statistical analysis across as many traits as possible.

One of the most valuable statistical methods for analyzing results of research projects aimed at increasing yield is the analysis of correlation coefficients between quantitative and qualitative traits characteristic of a given crop. The correlation coefficient reflects the strength and direction of relationships between plant traits, each

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of which may also be influenced by environmental conditions. Moreover, correlation analysis between different traits and grain yield significantly helps determine the relative importance of these traits and their value as selection criteria (Shafieian et al., 2024).

Studying relationships between traits plays an important role in determining selection direction in the development of new varieties, enabling preliminary evaluation of plants and objective identification of samples with high qualitative and quantitative characteristics, as well as their influence on yield or other important crop indicators (Barbieru, 2024; Kosev, Georgieva, 2022).

The correlation dependence of quantitative traits is of great importance for the breeding process. Understanding the relationships among quantitative traits within a specific ecological niche allows for identifying the contribution of each trait to yield selection, assessing varietal plasticity, and making adjustments to breeding technology practices (Mahmood et al., 2025).

Studies on establishing correlations between yield and its components have been conducted in numerous crops, such as barley (Gocheva, Dimova, 2024; Neykov et al., 2022), maize (Mahmood et al., 2025), rice (Kostylev et al., 2023; Perves et al., 2025), pea (Kalapchieva et al., 2021; Barbieru, 2024), cotton (Alaedin et al., 2022), and many others. General conclusions from these studies indicate that correlation relationships between yield and other traits can be effectively applied in breeding depending on specific objectives.

Winter rapeseed breeding is primarily aimed at increasing yield and oil content, and in most cases reducing glucosinolate content. For successful breeding, correlation analysis between traits is widely used, as it reveals the degree of influence of various plant components on yield formation and improvement of quality traits, enabling more targeted selection efforts (Barbieru, 2024; Kostylev et al., 2023; Perves et al., 2025). Identifying correlations between yield, productivity, and quantitative and qualitative plant traits, as well as agronomic practices and crop management measures, makes it possible to select the best source material for breeding and determine optimal cultivation and management practices to enhance yield and improve crop quality.

The aim of this study was to evaluate 15 winter rapeseed lines for quantitative and qualitative traits and to investigate the correlations between them.

Materials and Methods. The study was conducted on the breeding field of the scientific crop rotation of the Institute of Oilseed Crops of the National Academy of Agrarian Sciences (NAAS) of Ukraine during 2016–2018. The experiments were established in accordance with the methodologies of breeding process management and field experimentation (Kovalchuk, Moisieiev, 2004; Rozhkov et al., 2016). The research material consisted of 15 maternal lines of winter rapeseed bred at the Institute of Oilseed Crops of NAAS.

Meteorological conditions during the study period varied in temperature and precipitation, with deviations from long-term average data observed.

Weather conditions during the 2015–2016 growing season of winter rapeseed: In August, precipitation was sufficient but occurred within a very short period (during the second decade). During September and the first two decades of October, there was no precipitation at all, and temperatures in September significantly exceeded the long-term average. As a result, crop stands were uneven, and plants did not form a sufficiently developed rosette; however, moderate winter temperatures contributed to plant overwintering. Due to a higher number of lateral shoots, it was possible to obtain

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a yield. The spring–summer period of 2016 was favorable for the growth and development of winter rapeseed.

Weather conditions during the 2016–2017 growing season: The autumn period was extremely unfavorable. Due to the lack of precipitation and elevated temperatures, seedlings emerged only in October. However, sufficient and evenly distributed rainfall during October and November, as well as favorable temperature conditions, contributed to rosette formation. Air temperature during winter was higher than the long-term average in all three months, which ensured successful overwintering without plant losses. Spring and summer conditions were generally favorable; although temperatures were above average, sufficient rainfall during summer ensured satisfactory plant growth and development.

Weather conditions during the 2017–2018 growing season: Although average temperatures in August and September were higher than the long-term average, uniform precipitation in September, October, and November ensured seedling emergence and the formation of well-developed rosettes before winter. High precipitation during winter and March contributed to successful overwintering without losses and allowed seed yield formation under conditions of very low rainfall and elevated temperatures in the subsequent period. Overall, weather conditions during the 2017–2018 growing season were satisfactory for winter rapeseed growth and development.

It can be concluded that for winter rapeseed cultivation in the southern Steppe zone of Ukraine, the critical period is seedling emergence (August–September). In conditions of soil moisture deficiency and elevated temperatures during this period, only favorable winter and early spring weather conditions allow plants to form a yield.

Biometric studies of quantitative traits included: plant height, stem length, number of first-order branches, length of the main raceme, number of pods on the main branch, and number of seeds per pod. Biometric measurements were taken at the wax ripening stage of pods. After harvest, thousand seed weight was determined. Yield data were obtained by weighing seeds from plots and recalculating to 1 ha at standard moisture content, followed by analysis of variance.

Qualitative traits (glucosinolate content in seeds and oil content) were determined in the laboratory of mass analysis and instrumentation of the Institute of Oilseed Crops of NAAS using specialized equipment: AMB-1006 express analyzer, chromatographs “Chrom-5”, “HP6890”, “Tsvet-500”, and Soxhlet apparatus, according to current regulatory documentation. Oil content in rapeseed was determined by solvent extraction of crude fat from the test sample and weighing of the defatted residue (GOST 13496.15-97). Statistical processing and presentation of results were performed using Microsoft Excel (Microsoft Office) and Statistica software (Kiselyov et al., 2017).

As a numerical indicator of correlation showing the strength and direction of relationships between traits, the correlation coefficient (r) is used. Correlation ranges from 1 to 0 in direction; it can be positive or negative. Based on previous studies in this field (Kondratenko et al., 2023), correlation coefficients are conventionally divided into three groups: $r < \pm 0.3$ indicates a weak correlation, r from ± 0.3 to ± 0.7 indicates a moderate correlation, and $r > \pm 0.7$ indicates a strong correlation.

Results and Discussion. Over a three-year period, we evaluated winter rapeseed maternal lines for quantitative and qualitative traits (Table 1). It was established that the lines differed from each other in all analyzed traits.

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Table 1

Evaluation of winter rapeseed lines by quantitative and qualitative characteristics (2016-2018)

Sample	Plant height, cm	Length of the stem, cm	Number of lateral shoots, pcs.	Length of the central tassel, cm	Number of pods on the central branch, pcs.	Number of seeds in a pod, pcs.	Thousand seed weight, g	Yield, t/ha	Oil content, %	Glucosinolate content µmol/g
A1/FO9	150.6	38.7	8.3	56.3	51.5	24.1	4.3	2.0	42.7	20.1
A2/B305	145.2	32.6	9.5	52.9	52.9	24.0	4.8	2.4	42.7	17.1
A3/B305	153.7	48.8	8.1	54.5	53.7	28.6	4.0	2.1	46.8	20.7
A4/B305	151.4	44.1	8.5	52.3	54.1	27.9	4. 5	2.3	44.5	20.3
A5/SV9	158.9	46.3	10.0	43.8	56.0	25.8	4.8	2.1	43.3	20.9
A6/FO9	141.3	32.9	10.2	45.3	48.0	25.3	4.8	2.1	41.2	19.4
A7/S301	151.7	50.0	9.1	44.7	54.6	24.7	4.3	2.7	45.5	21.1
B1/SV9	156.0	45.7	9.3	52.5	44.5	23.7	4. 8	2.5	43.3	16.7
B2/B305	155.0	38.4	8.8	54.6	50.5	25.6	4.5	2.3	42.5	18.6
B3/B305	149.7	37.5	9.3	54.0	47.7	26.3	4.3	2.3	45.3	15.4
T1/SV9	151.5	47.5	8.2	51.7	56.4	24.6	3.8	1.8	45.0	15.7
T2/S301	155.4	52.2	7.0	56.0	59.0	23.4	3.7	1.9	43.7	18.5
T3/S301	155.9	47.7	8.9	56.9	59.9	24.5	4.2	2.2	45.1	19.4
T4/B305	157.6	51.8	7.4	55.8	58.1	23.0	3.7	1.8	44.7	12.9
T5/B305	162.6	57.0	6.7	56.5	58.3	24.4	4.4	2.1	44.4	14.6
Mean	153.1±1.37	44.7±1.87	8.6±0.27	52.5±1.14	53.7±1.17	25.1±0.41	4.3±0.10	2.2±0.07	44.0±0.38	18.1±0.66

Source: developed by the author

The average plant height in the experimental group was 153.1 cm. Five lines exceeded the average value, with the highest values observed in lines A5/SV9 and T5/B305, reaching 158.9 cm and 162.56 cm, respectively. The lowest plant height values were recorded in lines A2/B305 and A6/FO9, at 145.2 cm and 141.3 cm, respectively.

Regarding stem length, 8 lines exceeded the average value, while 7 were below it (44.7 cm). The highest value was recorded in line T2/S301, and the lowest in A2/B305, at 52.2 cm and 32.6 cm, respectively.

The average number of branches was 8.6. The highest number of branches was observed in line A6/FO9, while the lowest values were recorded in lines T5/B305, at 10.2 and 6.7 branches, respectively.

The average length of the main raceme was 52.5 cm. Nine lines exceeded this value, with the highest values observed in four lines: T3/S301, T5/B305, A1/FO9, and T2/S301.

The average number of pods on the main raceme was 53.7. Eight lines exceeded this value, with the highest number recorded in line T3/S301 (59.9 pods).

The average number of seeds per pod was 25.1. Six lines exceeded the average value, with the highest value recorded in line A3/B305 (28.6 seeds per pod)

The average thousand seed weight was 4.3 g; in 7 lines of the experimental group this indicator was higher than the mean value. The highest value, 4.8 g, was recorded in four lines: A2/B305, A5/SV9, A6/FO9, and B1/SV9.

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The average yield across the experimental lines over the three-year study period was 2.2 t/ha. Seven lines had yield above the average value. The highest yield was recorded in A7/S301 (2.7 t/ha). Five lines had yield below the average but not lower than 2.0 t/ha. Three lines had yield below 2.0 t/ha: T1/SV9, T4/B305, and T2/S301, with values of 1.8, 1.8, and 1.9 t/ha, respectively.

Regarding oil content, the lines were distributed as follows: 8 lines had values above the average (44%). The highest oil content was observed in line A3/B305 (46.8%), while the lowest was in A6/FO9 (41.24%).

All lines in the group were characterized by low glucosinolate content: in 10 lines this indicator was below 20 μmol/g. The lowest value was recorded in T4/B305 (12.9 μmol/g), and the highest in A7/S301 (21.2 μmol/g) (Table 1).

Thus, significant differences among winter rapeseed lines were observed across many studied traits. Based on the three-year study, the best-performing lines were identified in terms of yield: A7/S301, B1/SV9, A2/B305, and B3/B305; oil content: A3/B305, A7/S301, B3/B305, and T3/S301; and glucosinolate content: T4/B305, T5/B305, B3/B305, and T1/SV9. It should be noted that two lines showed superior performance across multiple traits simultaneously: B3/B305 (yield, oil content, and glucosinolate content) and A7/S301 (yield and oil content). These lines are recommended for breeding studies.

Correlation analysis was performed using mean trait values over the three years of study (Table 2).

Based on correlation coefficients, plant height showed a high, positive, and significant correlation with stem length (r = 0.82), and moderate correlations with main raceme length, number of pods on the main raceme, and oil content (r = 0.33, 0.49, and 0.38, respectively). A moderate negative correlation was observed with the number of lateral branches (r = -0.57), and weak correlations with number of seeds per pod, thousand seed weight, yield, and glucosinolate content (r = -0.15, r = -0.29, r = -0.20, r = -0.23, respectively).

Table 2

Correlation coefficients between quantitative and qualitative traits of winter rapeseed (2016–2018)

Sign	PH	LS	NLSh	LCB	NPCB	NSP	TSW	Y	OC	GC
PH	1									
LS	0.82**	1								
NLSh	-0.57**	-0.72**	1							
LCB	0.33*	0.21	-0.68**	1						
NPCB	0.49*	0.66**	-0.59**	0.24	1					
NSP	-0.15	-0.15	0.22	-0.17	-0.18	1				
TSW	-0.29	-0.58**	0.74**	-0.46*	-0.59**	0.16	1			
Y	-0.19	-0.26	0.52**	-0.31*	-0.47*	0.17	0.59**	1		
OC	0.38*	0.60**	-0.37*	0.22	0.37*	0.36*	-0.58**	0.05	1	
GC	-0.23	-0.19	0.41*	-0.44*	-0.05	0.48*	0.31*	0.32*	-0.08	1

Notes: *,** – significant at p<0.05 and p<0.01

Trait abbreviations: PH – plant height; LS – stem length; NLSh – number of lateral branches; LCB – main raceme length; NPCB – number of pods on the main raceme; NSP – number of seeds per pod; TSW – thousand seed weight; Y – yield; OC – oil content; GC – glucosinolate content.

Source: developed by the author

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A negative correlation between plant height and thousand seed weight was also reported by Li et al. (2026), explaining that in a population, an ideal plant type should maintain optimal height, ensure ventilation and light penetration, resistance to lodging, and optimize assimilate transport into the grain.

Stem length showed a moderate positive correlation with number of pods on the main raceme and oil content (r = 0.66 and r = 0.61), a weak correlation with main raceme length (r = 0.21), and negative correlations (high, moderate, and weak) with number of lateral branches (r = -0.72), thousand seed weight (r = -0.58), number of seeds per pod (r = -0.15), yield (r = -0.26), and glucosinolate content (r = -0.19).

The number of lateral branches showed a high positive correlation with thousand seed weight (r = 0.74), a moderate correlation with glucosinolate content (r = 0.41) and yield (r = 0.52), and a weak correlation with the number of seeds per pod (r = 0.22). It also showed a strong negative correlation with stem length (r = -0.72), a moderate negative correlation with plant height (r = -0.57), main raceme length (r = -0.68), number of pods on the main raceme (r = -0.59), and oil content (r = -0.37). In the study by Li et al. (2026), a significant positive correlation was found between the number of lateral branches and both the number of seeds per pod and the number of pods on the main raceme.

Main raceme length showed a moderate positive correlation with plant height (r = 0.33), and weak correlations with stem length, number of pods on the main raceme, and oil content (r = 0.21, r = 0.24, r = 0.21, respectively). Negative correlations ranged from moderate to weak with other traits: number of lateral branches (r = -0.68), thousand seed weight (r = -0.46), glucosinolate content (r = -0.44), yield (r = -0.30), and number of seeds per pod (r = -0.17).

Correlation coefficients for the number of pods on the main raceme were moderately positive with plant height (r = 0.49), stem length (r = 0.66), and oil content (r = 0.37), and weakly positive with main raceme length (r = 0.24). Negative moderate and weak correlations were observed with number of lateral branches, thousand seed weight, yield, and number of seeds per pod (r = -0.59, r = -0.58, r = -0.47, respectively). Correlation with glucosinolate content was almost absent (r = -0.05).

The number of seeds per pod showed a moderate positive correlation only with oil content and glucosinolate content (r = 0.36 and r = 0.48, respectively). All other correlations in our study, both positive and negative, were weak. In contrast, other researchers (Radic et al., 2021; Li et al., 2026) reported a significant positive correlation between number of seeds per pod, yield, and number of pods on the main raceme. According to Li et al. (2026), this indicates that yield components are predominantly synergistic rather than compensatory, meaning that simultaneous improvement of pod number and seed number per pod is possible through genetic improvement or agronomic management.

Thousand seed weight showed a high positive correlation with number of lateral branches (r = 0.74), a moderate correlation with yield (r = 0.59) and glucosinolate content (r = 0.31), and moderate negative correlations with stem length (r = -0.58), main raceme length (r = -0.46), number of pods on the main raceme (r = -0.59), and oil content (r = -0.58). Correlations between thousand seed weight and other traits were weak, both positive and negative.

Yield showed a moderate positive correlation with number of lateral branches and thousand seed weight (r = 0.52, r = 0.59), a weak correlation with number of seeds per pod (r = 0.17), and negative correlations (moderate and weak) with number of pods

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on the main raceme (r = -0.47), main raceme length (r = -0.30), plant height (r = -0.20), and stem length (r = -0.26).

According to other studies, yield positively correlates with number of pods per plant, pod length, number of seeds per pod, and thousand seed weight. Liersch et al. (2024) reported highly significant positive correlations between yield and thousand seed weight, while correlations between yield and plant height or oil content were positive but statistically insignificant. Positive correlations between yield and thousand seed weight were also reported by Sadeghizadeh (2023) and Zamani et al. (2025). Khan et al. (2022) and Tahira et al. (2023) also found that yield positively correlates with number of lateral branches, number of pods per plant, and oil content. Manhart et al. (2025) reported strong positive correlations among seed weight per plant, seed yield, and oil output; pod length, seed weight per plant, and yield; number of pods per plant, number of seeds per pod, and seed weight per plant; number of branches per plant, seed weight per plant, and yield; and plant height, seed weight per plant, yield, and number of branches per plant.

According to Radic et al. (2021) and Zhang et al. (2023), rapeseed yield is a complex quantitative trait mainly determined by three components: thousand seed weight, number of pods per plant, and number of seeds per pod. Yield also depends on traits such as plant height, number of primary branches, length of the main inflorescence, and number of pods on the main inflorescence.

Oil content in the present study showed a positive correlation with plant height (r = 0.38), stem length (r = 0.61), number of pods on the main raceme (r = 0.37), number of seeds per pod (r = 0.36), and main raceme length (r = 0.21), and a negative correlation with number of lateral branches (r = -0.37) and thousand seed weight (r = -0.58). In our study, the correlation between oil content and yield was almost absent (r = 0.05). However, Radic et al. (2021) and Chang et al. (2022) reported a positive correlation between oil content and yield. We assume that this relationship was influenced by extreme climatic conditions, namely reduced precipitation and increased temperatures during the growing season, which affected both oil content and yield.

Glucosinolate content showed positive correlations with number of lateral branches, number of seeds per pod, thousand seed weight, and oil content (r = 0.41, r = 0.48, r = 0.31, r = 0.32, respectively). Negative correlations were observed with plant height, stem length, and main raceme length (r = -0.23, r = -0.19, r = -0.44, respectively). Correlations with number of pods on the main raceme and oil content were nearly absent (r = -0.05 and r = -0.08). In contrast, Khan et al. (2022) reported a positive correlation between glucosinolate content and main raceme length.

The most breeding-relevant traits for this crop are yield, oil content, and glucosinolate content, which are strongly influenced by genetics, annual meteorological conditions, and agronomic practices (Li et al., 2026; Manhart et al., 2025; Liersch et al., 2024). The obtained results allow identification of which yield components can be used to improve productivity, increase oil content, and reduce glucosinolate content, thereby improving selection efficiency and optimizing the breeding process.

Figure 1 visually presents the strong and moderate correlation relationships among the analyzed traits of winter rapeseed.

There are a number of traits that determine such important indicators of a rapeseed variety or hybrid as yield, oil content, and glucosinolate content. There is a correlation between these traits, they interact with each other jointly, synergistically, determining important crop indicators (Zhang et al., 2023). Taking this into account,

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selection for yield, oil content, and reduction of glucosinolate content should be carried out taking into account the correlations between traits and the synergy between them (Li et al., 2026).

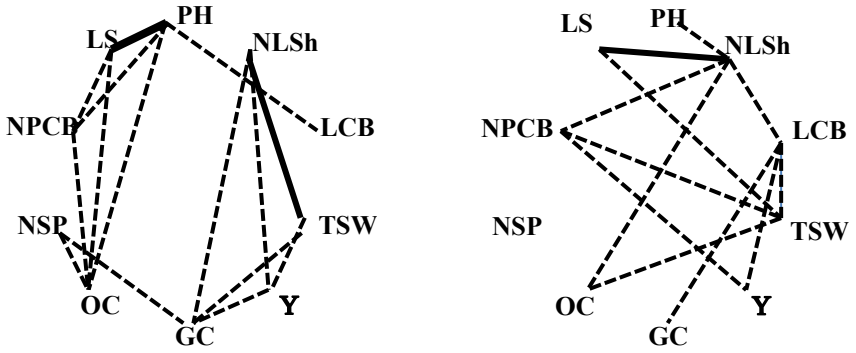

Fig. 1. **Correlations, a-positive, b-negative**

Notes: Correlations: ━━ high; - - - - medium

PH – plant height; LS – stem length; NLSh – number of lateral branches; LCB – main raceme length; NPCB – number of pods on the main raceme; NSP – number of seeds per pod; TSW – thousand seed weight; Y – yield; OC – oil content; GC – glucosinolate content.

Source: developed by the author

Conclusions. Based on the evaluation of quantitative and qualitative traits, the lines with the best yield performance were identified as A7/S301, B1/SV9, A2/B305, and B3/B305; for oil content: A3/B305, A7/S301, B3/B305, and T3/S301; and for low glucosinolate content: T4/B305, T5/B305, B3/B305, and T1/SV9.

For breeding studies, two lines are recommended: A7/S301 and B3/B305, which simultaneously showed high yield and oil content. The line B3/B305 was also characterized by low glucosinolate content.

The study established correlation relationships between quantitative and qualitative traits of 15 maternal winter rapeseed lines.

The strongest positive correlation was observed between plant height and stem length (r = 0.82), and between thousand seed weight and number of lateral branches (r = 0.74), while a strong negative correlation was found between stem length and number of lateral branches (r = –0.72).

Yield showed a moderate positive correlation with number of lateral branches (r = 0.52) and thousand seed weight (r = 0.59), and a negative correlation with number of pods on the main raceme (r = –0.59).

Oil content was positively correlated with plant height, stem length, number of pods on the main raceme, and number of seeds per pod (r = 0.38, r = 0.61, r = 0.37, and r = 0.36, respectively), and negatively correlated with number of lateral branches and thousand seed weight (r = –0.37 and r = –0.58, respectively).

Glucosinolate content showed a positive correlation with number of lateral branches (r = 0.41), number of seeds per pod (r = 0.48), thousand seed weight (r = 0.31), and yield (r = 0.32), and a negative correlation with main raceme length (r = –0.44).

Considering the synergistic interaction of traits, yield improvement should be conducted through simultaneous screening of genotypes with higher thousand seed

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weight, increased number of lateral branches, and reduced number of pods on the main raceme.

To increase oil content, selection should focus on genotypes with simultaneously greater plant height, longer stem, higher number of pods on the main branch and seeds per pod, and lower number of lateral branches and thousand seed weight.

Reduction of glucosinolate content in meal can be achieved through screening genotypes with higher yield, number of lateral branches, number of seeds per pod, thousand seed weight, and longer main raceme.

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КОРЕЛЯЦІЯ МІЖ КІЛЬКІСНИМИ ТА ЯКІСНИМИ ОЗНАКАМИ ОЗИМОГО РІПАКУ

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В статті надана оцінка кількісних та якісних ознак 15-ти материнських ліній ріпаку озимого та кореляційні співвідношення між ними. За отриманими результатами виділені дві лінії: А7/S301 і В3/В305 з одночасно високими показниками урожайності – 2.7, 2.3 та олійності – 45.5, 45.3, лінія В3/В305 також характеризувалася низьким вмістом глюкозинолатів – 15.4. Дані лінії рекомендовані для селекції на високу врожайність та олійність і знижений вміст глюкозинолатів. Високі позитивні кореляції спостерігалися між ознаками висота рослин та довжина штамбу: r = 0.82, і масою тисячі насінин та кількістю бічних пагонів: r = 0.74, а негативна: r = -0.72 між довжиною штамба та кількістю бічних пагонів. Урожайність мала середню позитивну кореляцію з кількістю бічних пагонів та масою тисячі насінин: r = 0.52, r = 0.59, та негативну з кількістю стручків на центральній китиці r = -0.47. Олійність позитивно корелювала з ознаками висота рослин, довжина штамба, кількість стручків на центральній китиці та кількістю насінин у стручку: r = 0.38, r = 0.61, r = 0.37 та r = 0.36, а негативно з кількістю бічних пагонів та масою тисячі насінин – r = -0.37 і r = -0.58. Вміст глюкозинолатів мав середні позитивні кореляції з ознаками кількість бічних пагонів, кількість насінин у стручку, масою тисячі насінин і урожайністю: r = 0.41, r = 0.48, r = 0.31 і r = 0.32 і негативну з довжиною центральної китиці: r = -0.44 відповідно.

Ключові слова: *Brassica napus*, біометричні виміри, урожайність, олійність, вміст глюкозинолатів, кореляційний зв'язок

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