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PARAMETERS OF THE MODEL OF THE CAMELINA SATIVA VARIETY FOR THE CONDITIONS OF THE RIGHT-BANK FOREST-STEPPE OF UKRAINE

The article presents the results of the study of main economic signs of somaclonal lines of camelina sativa. On the basis of regression analysis of the data, a forecast of the most important elements of the structure of productivity for the maximum specified yield of camelina sativa in the conditions of the Right-Bank Forest-Steppe of Ukraine was done.

Key words: camelina sativa, productivity, correlation, regression, analysis

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ПАРАМЕТРИ МОДЕЛІ СОРТУ РИЖІЮ ЯРОГО ДЛЯ УМОВ ПРАВОБЕРЕЖНОГО ЛІСОСТЕПУ УКРАЇНИ

У роботі наведено результати дослідження основних господарсько-цінних ознак соматоклональних ліній рижію ярого. На основі проведеного регресійного та кореляційного аналізу даних, зроблено прогнозування найважливіших елементів структури продуктивності за максимально обгрунтованої урожайності культури в умовах Правобережного Лісостепу України.

Ключові слова: рижій ярий, продуктивність, кореляція, регресія, аналіз

Camelina sativa is a promising agricultural crop. A short vegetation period, resistance to diseases and pests, undemanding to growing conditions make the technology of camelina production simple, cheap and environmentally friendly [1].

Camelina has the high oil content in the seeds – about 45 %. It has a balanced complex of natural antioxidants, biologically active substances and has medicinal and dietary properties. Camelina oil is used for the production of varnishes, paints, soaps, plastics, biodiesel [2, 3].

The main reason that restrains the expansion of crop cultivation is insufficient varietal plant breeding.

Effective management of the breeding process first of all requires substantiation of the model of the future variety – a combination of traits and properties necessary to realize the planned level of productivity. In order to rationally model the parameters of the variety, the selectionist must know the correlations between the elements of the crop structure and their contribution to the overall productivity of the crop, the influence of specific limiting factors at individual ontogenetic phases on the growth and development of plants, etc. [4, 5].

A competitive variety should be characterized by high and stable productivity, be adapted to the soil and climatic conditions of the growing area, resistant to negative

environmental factors, suitable for intensive agricultural technologies, have high product quality.

The purpose of our research was to analyze the extent of variability and interrelationship of the main economic signs of somaclonal lines of camelina sativa and to substantiate the parameters of the variety model for the conditions of the Right-Bank Forest-Steppe of Ukraine.

The *ex vitro* evaluation of somaclonal lines of camelina sativa, obtained from explants of Stepovy 1, Peremoha, Klondike and Euro 12 varieties, was carried out during 2017–2022 at the experimental sites of the Department of Genetics, Plant Breeding and Biotechnology of the Uman National University of Horticulture.

The yield, crop structure, biological and morphological features of plants - height and branching, the number of pods per plant, the number of seeds in a pod, the weight of 1000 seeds, the duration of the vegetation period, and the biological stability of plants (plant survival) were analyzed.

According to the assessment of the correlation relationships between the economically valuable breeding traits of camelina sativa, the studied indicators differ among themselves in terms of the level of interaction. The indicators of seed collection from one plant ($r=0.98$), the number of pods per plant ($r=0.84$) and plant survival ($r=0.71$) have a significant influence on the formation of productivity. The average correlation effect on productivity is the number of seeds per pod ($r=0.44$), the number of branches per plant ($r=0.60$), plant height ($r=0.37$) and the duration of the growing season ($r=0.38$).

The mass of seeds per plant strongly depended on the number of pods per plant ($r=0.85$), but had an average positive correlation with the number of seeds per pod ($r=0.48$), the number of branches per plant ($r=0.59$), plant height ($r=0.37$), plant survival ($r=0.62$) and duration of the growing season ($r=0.37$). There is a weak negative relationship between the number of seeds in a pod and plant height ($r=-0.29$) and the duration of the growing season ($r=-0.18$), between the mass of a thousand seeds and the number of pods per plant ($r=-0.08$).

Regression analysis of the entire array of experimental data made it possible to predict the value of the most important elements of the productivity structure for the maximum specified yield. For a maximum yield of 3.0–3.5 t/ha, the weight of seeds per plant should be 2.1–2.4 g, while the plant should form 13.4–15.9 branches, 159.5–182.1 pods and 16.8–19.5 seeds per pod. The mass of a thousand seeds should have 2.34–2.95 g, plant height – 90.7–105.8 cm and plant survival - at the level of 98.9 %, and the duration of the growing season should be in the range from 103 to 110 days.

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