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EVALUATION OF THE EFFICIENCY OF INDUCTION MEDIA IN ANTHER CULTURE OF BREAD WHEAT (*TRITICUM AESTIVUM* L.)

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The study is aimed at evaluating the effect of the component composition of induction media on the expression of androgenic response in anther culture of winter bread wheat. The application of doubled haploid technologies is considered an efficient approach to accelerate breeding programs, particularly due to the rapid development of homozygous lines. One of the key stages of this technology is the induction of the sporophytic pathway of microspore development, the efficiency of which largely depends on cultivation conditions and the biological characteristics of the donor material [1-3].

Anthers of 10 winter bread wheat genotypes were used in the study and cultured *in vitro* on three types of induction media (190-2, W-14, and CBH3). The evaluation was carried out based on the frequency of callus formation and the ability to regenerate green and albino plants per 100 cultured anthers. Statistical analysis was performed using analysis of variance (ANOVA) to determine the

contribution of individual factors to the overall variation.

The obtained results demonstrated significant variability in the response of the studied genotypes depending on the induction medium. Callus formation varied widely: from 0 to 15.00 ± 2.06 on medium 190-2, up to 81.11 ± 1.85 on W-14, and up to 15.67 ± 2.10 on CBH3, reaching maximum values on W-14. The regeneration of green plants from callus obtained on different induction media varied within the following ranges: from 0 to 4.33 ± 1.18 (190-2), 42.89 ± 2.33 (W-14), and 2.67 ± 0.65 (CBH3). Some genotypes (F8, F42, F46) showed increased sensitivity to morphogenesis in anther culture *in vitro*, whereas others (F18, F21, F44, F54) demonstrated low or no morphogenetic response. Such variability confirms the complex nature of androgenesis control and highlights the importance of genotype-specific responses.

Statistical analysis revealed that the composition of the nutrient medium plays a dominant role at the initial stages of morphogenetic induction, while the influence of genetic factors becomes more pronounced during green plant regeneration [4-5]. A significant interaction between genotype and culture conditions was also observed, indicating differential realization of morphogenetic potential. The frequency of albino plant formation remained relatively low and exhibited a less predictable pattern of variation.

Additionally, the fertility of regenerated plants after acclimatization to soil conditions was assessed. It was found that the proportion of fertile plants did not differ significantly between induction media and ranged from 15.79 to 18.18%. However, the absolute number of fertile plants varied considerably, with the highest number obtained on W-14 (22 plants) compared to 190-2 (4 plants) and CBH3 (3 plants). This difference is attributed to the higher efficiency of morphogenesis induction and subsequent green plant regeneration on W-14 medium.

Thus, the fertility level of regenerants is primarily determined by biological characteristics of the material and is not dependent on the composition of the induction medium, whereas the total number of fertile plants is directly related to the efficiency of induction and regeneration processes. These findings highlight the advantages of W-14 medium for obtaining a higher number of doubled haploid lines in

breeding practice. The presented results can serve as a basis for further optimization of biotechnological approaches in wheat breeding programs.

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КЛІТИННІ ТЕХНОЛОГІЇ В УКРАЇНІ

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Регенеративна медицина – це нова галузь науки, спрямована на відновлення та регенерацію нормальних функцій тканин і органів, пошкоджених внаслідок старіння, хвороб, травм або вроджених вад. Серед передових технологій, таких як клітинна терапія, інженерія тканин та біоматеріалів, трансплантація, нано-