

DOI <https://doi.org/10.30525/978-9934-26-420-7-7>

**THE ROLE OF THE VARIETY IN THE IMPLEMENTATION
OF ADAPTIVE FARMING SYSTEMS
ON THE TERRITORY OF UKRAINE**

**РОЛЬ СОРТУ ПРИ РЕАЛІЗАЦІЇ АДАПТИВНОЇ СИСТЕМИ
ЗЕМЛЕРОБСТВА НА ПІВДНІ УКРАЇНИ**

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Climate change poses a serious challenge to agriculture, and requires the adaptation of agricultural systems and the development of sustainable production methods to minimize negative impacts on yields and productivity. In connection with the increase in air temperature in the Northern Hemisphere, food security will largely depend on how effectively crop production adapts to future climate changes [1, p. 12].

In the system of intensive agriculture, the highly productive use of suitable land for growing the most valuable and high-yielding crops, the use of ecologically plastic adapted varieties, taking into account the latest

achievements of agricultural science and best practices, is given one of the main places [2, p. 2]. Observations of scientists have established that the level of influence of the variety on the yield of cultivated crops among agrotechnical measures with their combined application is 10% [3, p. 40]. In this case, the variety and ecological environment make up the ecological potential of the field, and the adaptive farming system should provide such a functional organization of the ecological system that would contribute to the realization of maximum productivity.

Frequent droughts in the south of Ukraine must be taken into account when determining methods of soil treatment and a balanced nutrition system, which should be maximally aimed at realizing the adaptive genetic potential of plants. In arid conditions, one of the primary tasks is to maintain a high level of moisture supply and moisture conservation. Soil moisture reserves are a factor that is at a minimum every 5 out of 10 years, so the more important role in stabilizing and increasing the yield is given to the level of adaptability of zoned varieties. Unfortunately, it is practically impossible to combine high productivity and adaptability in one biotype at the same time. Therefore, adaptive agriculture involves the creation and introduction of fundamentally new varieties into agricultural production, which would have high corresponding reactions to the realization of potential opportunities for the formation of high productivity in conditions of stress. A modern variety should be oriented not only to a certain technology or level of technological support, but also to ensure that its main adaptability parameters correspond to a wide range of environmental factors of a specific implementation area. Modern selection has created varieties with a potential yield of more than 100 t/ha, but in agricultural production they realize this potential only by a third. One of the reasons for this situation is the insufficient level of their adaptability to adverse environmental conditions, especially in critical periods for this culture. Attempts to link this with the insufficient level of agriculture have their reasons, but as the results of studying the adaptive capabilities of modern varieties show, the level of their resistance to abiotic factors, especially heat and drought resistance, is still insufficient. The implementation of programs for the creation of varieties with complex resistance to abiotic factors involves the joint creative efforts of breeders, geneticists, physiologists, and biochemists.

In the conditions of the south of Ukraine for winter wheat, it is necessary to distinguish two critical periods in relation to soil drought. The first period is associated with a significant complication of sowing at the optimal time. According to the Breeding and Genetics Institute, it is possible to obtain partial seedlings only in pairs in 80% of cases over the last 10 years, after peas – 60%, after corn for silage – in 30%. The grain yield of non-paired predecessors was almost one and a half times less compared to black pair. The second critical period coincides with the phases of grain formation – full

ripeness. It should be noted that in the second period, winter wheat is negatively affected not only by soil drought, but also by high temperatures.

In our experiments, it was established that the rate of seed swelling and germination depends not only on the moisture content of the soil, but also on the biological characteristics of the culture and variety itself. In conditions of maximum soil moisture saturation, winter wheat grains absorb 30% of moisture from the dry mass after 8 hours, and 49% after 24 hours, spring barley grains absorb 44 and 62%, pea grains – 71 and 95%, and soybeans – 96.67 and 123%. It is characteristic that the rate of absorption within the studied varieties of soybean practically does not depend on the grain size.

The experiments also established significant differences within the 20 studied varieties of winter wheat in terms of their ability to germinate in conditions of limited water supply. For the south of Ukraine, the high level of potential possibilities of the organism to use soil moisture at various levels of its deficiency has recently been of great importance. A significant range of variations in the germination potential of grains of different wheat varieties in solutions with different osmotic pressures, ranging from 90% to 48%, was established.

In the second critical period (grain formation – full maturity), winter wheat plants are affected by soil drought and high air temperatures. Long-term experiments give us the opportunity to state that winter wheat plants in the south of Ukraine suffer more from high air temperatures than from soil drought. This became especially evident in the last 4–5 years, when temperature maxima were repeatedly exceeded during the entire observation period. Our experiments show that, unfortunately, heat-resistant varieties are much less compared to the number of genotypes resistant to soil drought.

The results obtained in field experiments allow us to conclude that there is a high correlative relationship between productivity and resistance to drought and heat.

As for variety specificity, out of the 112 varieties and forms studied in our experiments, we did not single out a single genotype that was distinguished by both high drought resistance and high heat resistance. A number of varieties combine these two characteristics at an average and above average level. More often, a high level of heat resistance is combined in one variety with a below-average level of drought resistance. If we take into account that in the south of Ukraine, high positive temperatures and soil drought act simultaneously, then the need to have such zoned varieties in agricultural production that would combine heat and drought resistance at least at an above-average level is clear. There is no doubt that the correct selection of varieties for each ecological niche, a specific farm in combination with the implementation of an adaptive farming system is a reserve for further increasing the productivity of both winter wheat and other crops in the south of Ukraine.

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DOI <https://doi.org/10.30525/978-9934-26-420-7-8>

**PROSPECTS FOR CULTIVATING GIANT MISCANTHUS
ON MILITARY DEGRADED SOIL****ПЕРСПЕКТИВИ КУЛЬТИВУВАННЯ МІСКАНТУСУ
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Розв'язана російською федерацією війна на території України, яка не припиняється понад 2 роки вже призвела до вилучення з сільськогосподарського обігу та суттєво обмежила використання біля