

**CLIMATE-RESILIENT CURRANT CULTIVATION IN TEMPERATE LATITUDES***Sabirova Dilbar Oralbaevna**Technology of Medicinal Plant Cultivation*

**Abstract:** This article examines the main approaches to climate-resilient currant (*Ribes* spp.) cultivation in temperate latitudes. Particular attention is paid to the selection of varieties adapted to variable climatic conditions, agricultural practices that increase plant resistance to stress, as well as the role of organic farming and modern technologies (mulching, drip irrigation, protective shelters). The risks associated with global warming are analyzed, including precipitation instability, late frosts and new phytopathogens. Emphasis is placed on the importance of a regional approach, selection of resistant varieties and the introduction of agroecological principles. The article provides examples of successful strategies for sustainable currant cultivation in Russia, Poland, Canada and Scandinavian countries.

**Keywords:** currant, climate resistance, agricultural technology, resistant varieties, temperate latitudes, stress resistance, climate change

Currant is one of the key berry crops of temperate latitudes, possessing high nutritional value and resistance to moderately cold climate. However, modern climate changes, expressed in the increase in average annual temperatures, more frequent weather anomalies (droughts, heavy rains, frosts), create new challenges for sustainable currant production. Regions where climate conditions were previously stable suffer especially - now even there sharp temperature fluctuations, disruption of phenological phases and increased incidence of plant diseases are observed. Sustainable currant cultivation requires an integrated approach, including the correct selection of varieties adapted to a specific climate zone, the use of effective agricultural practices and systematic monitoring of the condition of plantings. Of particular importance are methods aimed at preserving soil moisture, preventing heat and water stress, protecting against spring frosts and controlling pests whose range is expanding due to warming.[1]

In addition, modern achievements in breeding play an important role - developing varieties with resistance to biotic and abiotic stress. Elements of landscape planning (for example, laying protective forest belts) and digital technologies are also important: sensory farming, risk forecasting, agrometeorology. All this is aimed at adapting berry crops to new climatic realities without losing yield and product quality.

Climate-resistant currant cultivation begins with the correct selection of varieties. For temperate latitudes, varieties with an early flowering period and a short growing season, as well as varieties that can withstand sudden changes in temperature, are of particular value. Examples: 'Dobrynya' (blackcurrant) is winter-hardy and resistant to powdery mildew; 'Red Cross' (redcurrant) tolerates spring frosts well.[2]

**Adaptive agricultural practices**

Mulching (straw, bark, agrofabric) helps retain moisture, reduce soil temperature in hot weather and suppress weeds.

Drip irrigation provides a measured supply of water directly to the roots, minimizing losses and the risk of over-watering.

Covering plants with non-woven materials in early spring helps protect flower buds from late frosts.

Organic fertilization increases the biological activity of the soil and plant resistance to stress.

Modern monitoring methods (sensors of humidity, temperature, acidity) help to respond promptly to changes in the microclimate. Frost and phytosanitary risk forecasting systems allow farmers to take preventive measures, such as turning on irrigation or using biopreparations. The use of biofungicides and mycorrhizal fungi allows not only to combat diseases (anthracnose, powdery mildew), but also to strengthen plant immunity. Soil microbiota plays an important role in the resistance of bushes to water stress and nutrient deficiency.[3]

Creating hedges, using plantings taking into account prevailing winds and slopes increases the microclimatic stability of the site. Different regions (for example, Karelia, Altai, Moscow region) require different planting patterns and agricultural techniques adapted to the local climate. In conditions of increasing climatic stress, sustainable currant cultivation in temperate latitudes requires a revision of approaches to agricultural technology and varietal policy. The use of climate-resistant varieties, the integration of organic farming methods, monitoring and microbiological protection form the basis of a new paradigm - adaptive gardening. Research shows that the introduction of mulching, drip irrigation and protective shelters allows not only to stabilize yields, but also to improve the overall health of plantings. Precision farming technologies, previously used in industrial crops, are increasingly being mastered in berry growing, including on small farms. Of particular importance is the interdisciplinary approach: cooperation between agronomists, climatologists, breeders and farmers allows developing individual strategies for sustainable production. State support in the form of subsidies for drip irrigation, weather insurance and access to high-quality planting material also contributes to the dissemination of sustainable practices.

Thus, sustainable currant cultivation in a changing climate is not only an agricultural task, but also a strategic element of food security. Adaptation requires knowledge, flexibility and the implementation of innovative solutions, which makes this industry promising and relevant in the coming decades.

## References

1. Zhbanova, E.A. "Adaptation of currant varieties to climatic conditions of central Russia", Gardening and Viticulture, 2023.
2. Knyazhev, S. D. (2022). "Climate-smart berry production: Ribes spp. in the era of change", Acta Horticulturae.
3. Shevelev, I.N. "Modern agrotechnical methods in the cultivation of currants", Agrarian science, 2021.
4. Martynov, P.V. "Use of mulching and drip irrigation in organic berry growing", Ecological agriculture, 2024.

5. Panfilova, O. et al. (2025). "Optimizing Microclonal Propagation of Red Currant Cultivars", *Horticulturae*, 11(2), 149.