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**КРИТИЧЕСКИЙ ПЕРИОД
ВРЕДНОСТИ СОРНЫХ РАСТЕНИЙ В
ЦЕНОЗЕ МЯТЫ ПЕРЕЧНОЙ КАК
ЭЛЕМЕНТ ТЕХНОЛОГИИ ЕЕ
ВОЗДЕЛЫВАНИЯ В ЛЕСОСТЕПНОЙ
ЗОНЕ ЧЕЧЕНСКОЙ РЕСПУБЛИКИ**

**CRITICAL PERIOD OF WEED HARMFULNESS
IN THE PEPPERMINT CENOSIS AS AN
ELEMENT OF TECHNOLOGY FOR ITS
CULTIVATION IN THE FOREST-STEPPE
ZONE OF THE CHECHEN REPUBLIC**

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На современном этапе практически во всех сферах жизни предпочтение отдается продуктам природного происхождения. Здравоохранение – не исключение, для лечения и профилактики, а также для следования принципам здорового образа жизни используются средства растительного происхождения. На территории Российской Федерации препараты на основе растительного сырья составляют примерно 45% от общего числа производимых медикаментов. Необходимость возделывания лекарственных растений сегодня не вызывает сомнений. Важны исследования как по селекции отечественных сортов и гибридов лекарственных растений, так и по совершенствованию технологии их возделывания в условиях Российской Федерации. Чеченская Республика по комплексу почвенно-климатических условий может также стать производителем сырья мяты перечной. Цель исследования – сравнительная оценка продолжительности критического периода вредности сорнополевого компонента в посеве различных сортов мяты перечной в условиях лесостепной зоны Чеченской Республики. Период проведения исследований 2022-2025 гг. Исследование проводилось в лесостепной зоне Чеченской

Nowadays, preference is given to natural products in virtually all areas of life. Healthcare is no exception, with herbal remedies used for treatment and prevention, as well as for maintaining a healthy lifestyle. In the Russian Federation, herbal preparations account for approximately 45% of all medications produced. The need for medicinal plant cultivation is now undeniable. Research into both the selection of domestic varieties and hybrids of medicinal plants and the improvement of cultivation technology in the Russian Federation is important. The Chechen Republic, given its combination of soil and climatic conditions, has the potential to become a producer of peppermint raw materials. The objective of this study was to comparatively assess the duration of the critical period of weed damage in crops of various peppermint varieties in the forest-steppe zone of the Chechen Republic. The study will run from 2022 to 2025. The study was conducted in the forest-steppe zone of the Chechen Republic. Two peppermint varieties, Mechta and Rozovskaya Aroma, were used. A mixed type of peppermint infestation was identified. The critical period for weed damage in the Rozovskaya Aroma peppermint community was 22 days from emergence; for the Mechta variety, it was 28 days. Therefore, in the forest-steppe zone, from a competitive perspective, the Rozovskaya Aroma peppermint variety is the most suitable for cultivation

Республики. Использованы два сорта мяты перечной – Мечта и Розовская Арома. Установлен смешанный тип засоренности мяты перечной. Критический период вредности сорных растений в ценозе мяты перечной, сорт Розовская Арома составил 22 дня с момента появления всходов; сорт Мечта 28 дней. Таким образом, в условиях лесостепной зоны с точки зрения конкурентоспособности сортов мяты перечной наиболее целесообразно возделывание мяты перечной, сорт Розовская Арома

Ключевые слова: МЯТА ПЕРЕЧНАЯ, СЫРЬЕВАЯ БАЗА, ФЛОРИСТИЧЕСКИЙ СОСТАВ, СОРНОПОЛЕВОЙ КОМПОНЕНТ, ПОТЕРИ УРОЖАЯ, КРИТИЧЕСКИЙ ПЕРИОД ВРЕДНОСТИ

Keywords: PEPPERMINT, RAW MATERIAL BASE, FLORISTIC COMPOSITION, WEED COMPONENT, CROP LOSS, CRITICAL PERIOD OF HARMFULNESS

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Introduction. Nowadays, preference is given to natural products in virtually all areas of life. Healthcare is no exception, with herbal remedies used for treatment and prevention, as well as for promoting a healthy lifestyle. In the Russian Federation, herbal-based medications account for approximately 45% of all medications produced. The primary therapeutic effect is determined by the active ingredient, which is present in the greatest quantity, and the complex of compounds found in the plant, which cannot be synthesized artificially. Herbal-based medications are not addictive and are significantly less likely to cause allergic reactions [2, 4, 6].

Based on the above, the need for medicinal plant cultivation is now beyond doubt. Research into both the selection of domestic varieties and hybrids of medicinal plants and the improvement of cultivation technology in the Russian Federation is important [3, 5, 12].

Peppermint (*Mentha piperita* L.) is a plant with a long-established reputation. It is widely used in the pharmaceutical, perfume, cosmetics, food, liquor, and tobacco industries. It is included in the pharmacopoeias of various countries. It is one of the most important aromatic plants, possessing antiseptic, antimicrobial, anti-inflammatory, antispasmodic, and choleric properties.

<http://ej.kubagro.ru/2025/08/pdf/41.pdf>

Currently, another area of application for peppermint is being noted: it has begun to be used as an environment-forming phytoncidal plant in urban landscapes and interiors.

Currently, the Russian Federation is experiencing a significant shortage of peppermint raw materials, due to the crisis in the medicinal plant industry. There is an urgent need to establish and further strengthen a domestic raw material base for this crop. The main areas where peppermint is grown are Krasnodar Krai, the Republic of North Ossetia-Alania, and the Republic of Crimea. However, the Chechen Republic, given its combination of soil and climate conditions, could also become a producer of peppermint raw materials.

It should be noted that the cultivation of peppermint, despite the relatively large proportion of manual labor, is quite profitable, which is explained by its high yield, resistance to adverse factors, and competitiveness.

Purpose of the study— comparative assessment of the duration of the critical period of harmfulness of the weed component in the crops of different varieties of peppermint in the conditions of the forest-steppe zone of the Chechen Republic.

Research methodsThe study utilized the Guidelines for Studying Economic Thresholds and Critical Periods of Weed Harmfulness in Agricultural Crops. A model field experiment was conducted to simulate varying durations of peppermint agrocenosis care. The study was conducted from 2022 to 2025. The study was conducted in the forest-steppe zone of the Chechen Republic on soils typical of the zone. Two peppermint varieties were used: Mechta and Rozovskaya Aroma. The growing season for both varieties is approximately 120 days. Climatic conditions during the study period were favorable for cultivating all components of the agrocenosis [10].

Results and discussion.

Cultivation of peppermint in a model experiment is carried out according to the generally accepted technology for the zone [6].

The weed flora within the mint community is quite diverse, with late spring weeds predominating (65.8%). Three-part ragweed was identified as a quarantine weed (Table 1).

Table 1. Pests of peppermint crops (2022-2025)

| Harmful object | | Experience options | | | | | | | | | | | |
|---|------------------------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| II | Dandelion | -/X | X/- | X/- | -/X | X/- | -/- | X/- | -/- | X/- | X/- | -/X | x/x |
| | Plantago lanceolata | x/x | -/X | -/X | x/x | X/- | -/- | X/- | X/- | X/- | X/- | X/- | X/- |
| | Sour sorrel | x/x | X/- | -/X | -/X | X/- | -/- | -/X | -/X | -/X | -X | X/- | X/- |
| I.II | Common pycnose berry | -/- | -/- | -/- | X/- | X/- | -/- | X/- | -/- | X/- | X/- | X/- | X/- |
| | Bird's knotweed | -/X | X/- | -/X | X/- | -/X | -/- | X/- | -/X | -/X | -/X | X/- | X/- |
| | White goosefoot | -/- | -/X | -/- | X/- | X/- | -/- | X/- | X/- | -/X | X/- | X/- | X/- |
| I.III | Blue cornflower | X/- | x/x | X/- | -/X | -/X | -/- | x/x | X/- | X/- | -/- | X/- | X/- |
| I.IV | Amaranthus retroflexus | -/X | X/- | x/x | X/- | X/- | -/- | X/- | X/- | X/- | X/- | -/X | -/X |
| | Chicken millet | -/X | X/- | X/- | X/- | X/- | -/- | X/- | X/- | X/- | X/- | X/- | X/- |
| | Blue setaria | -/X | -/X | X/- | -/X | -/X | -/- | x/x | X/- | X/- | X/- | -/X | -/X |
| | Ambrosia artemifolia | x/x | X/- | -/X | -/X | -/X | -/- | X/- | X/- | x/x | X/- | X/- | X/- |
| | Ambrosia tripartite | -/X | -/X | -/X | X/- | -/X | -/- | -/X | x/x | -/X | X/- | x/x | X/- |
| | Canadian fleabane | X/- | -/- | X/- | X/- | X/- | -/- | X/- | -/X | X/- | -/X | -/X | X/- |
| | Black nightshade | -/X | X/- | -/X | X/- | X/- | -/- | X/- | -/X | X/- | X/- | X/- | X/- |
| IV | Field thistle | X/- | X/- | X/- | X/- | -/X | -/- | X/- | X/- | X/- | -/X | -/X | X/- |
| | Pink sow thistle | X/- | -/X | -/X | X/- | X/- | -/- | X/- | X/- | X/- | -/X | x/x | X/- |
| | Field bindweed | X/- | -/X | -/X | X/- | -/X | -/- | X/- | X/- | X/- | X/- | X/- | X/- |
| | Elm of many colors | -/X | -/X | -/X | X/- | -/- | -/- | -/- | X/- | X/- | X/- | X/- | X/- |
| I.VI | Couch grass | X/- | -/X | -/X | -/X | X/- | -/- | -/X | -/X | -/X | -/X | X/- | -/X |
| | Humay | -/- | X/- | X/- | -/X | X/- | -/- | X/- | X/- | -/X | X/- | -/X | X/- |
| | Yarrow | -/X | X/- | -/X | X/- | -/X | -/- | X/- | X/- | X/- | -/X | X/- | X/- |
| II. | Mint flea | -/X | -/X | -/X | X/- | X/- | -/- | -/X | X/- | X/- | X/- | X/- | X/- |
| | Aphid | -/X | X/- | X/- | X/- | -/X | X/- | X/- | -/X | X/- | -/X | X/- | X/- |
| | Spider mite | -/X | X/- | X/- | X/- | -/- | X/- | -/X | X/- | -/X | X/- | -/X | X/- |
| III. | Rust | -/X | X/- | X/- | -/- | -/- | X/- | X/- | X/- | X/- | -/- | -/- | -/- |
| | Powdery mildew | X/- | -/X | X/- | -/X | -/X | X/- | X/- | X/- | -/X | X/- | -/X | X/- |
| | Septoria | -/X | X/- | X/- | -/X | -/X | -/- | -/- | X/- | X/- | -/X | -/- | -/X |
| Note: numerator – peppermint, variety Rozovskaya Aroma; denominator – variety Mechta. Care of crops from the beginning of the germination phase, days: 1-10; 2 - 20; 3 - 30; 4 - 40; 5 - 50; 6 - clean crops throughout the growing season; crops infested from the beginning of the germination phase, days: 7 - 10; 8 - 20; 9 - 30; 10 - 40; 11 - 50; 12 - infested throughout the growing season. I. – Weeds; II – Taproot; I.II. – Early spring; I.III. – Wintering; I.IV. – Late spring; IV – Root suckers; I.VI. – Rhizome; II. – Pests; III. - Diseases. | | | | | | | | | | | | | |

As Table 1 shows, the pest spectrum is limited. The main pests—mint flea beetles, aphids, and spider mites—are common on both peppermint varieties studied.

Peppermint plants are rarely susceptible to diseases, partly due to favorable climatic conditions during the study period. It's worth noting the resistance of the Mechta peppermint variety to pathogens; they are resistant to rust and powdery mildew, and to a lesser extent, septoria [1, 7, 11].

The critical period for weed damage, according to the Methodological Guidelines, was determined graphically, using yield as the indicator. For example, the yield of green forage of peppermint (Rozovskaya Aroma variety) was 15.8 t/ha, while the yield of Mechta variety was 14.6 t/ha (Figs. 1-2).

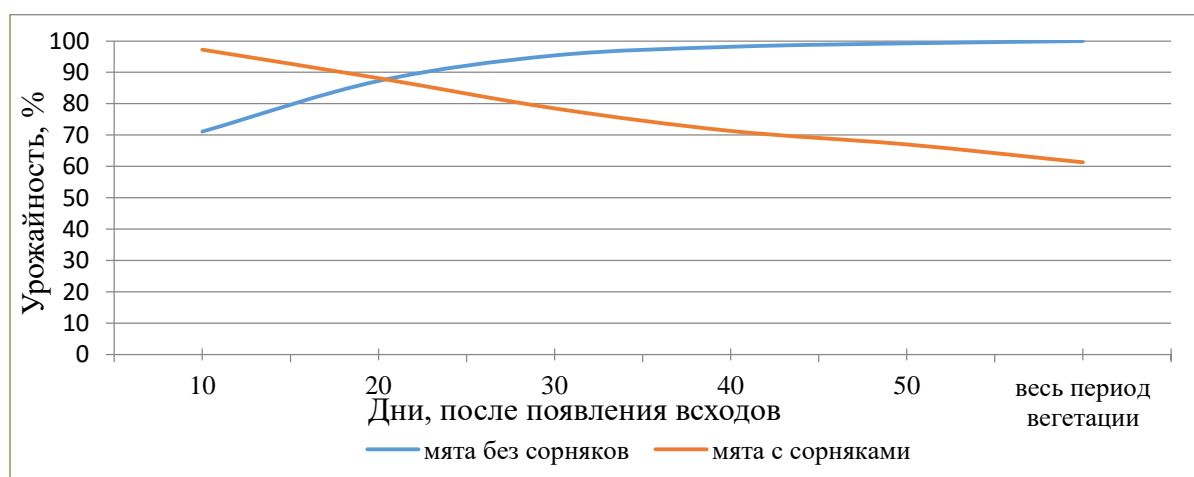


Figure 1. – Graphical definition of the critical period of harmfulness of weeds in the peppermint community, Rozovskaya Aroma variety (forest-steppe zone of the Chechen Republic) (2022-2025)

One of the study's stages was determining the pigment content in mint leaves. Pigment content is an indicator of photosynthesis intensity, and therefore the yield and quality of medicinal plants. Pigment content was determined photometrically. It was found that pigment content in peppermint leaves was inversely proportional to the abundance of the weed component [6, 8, 9].

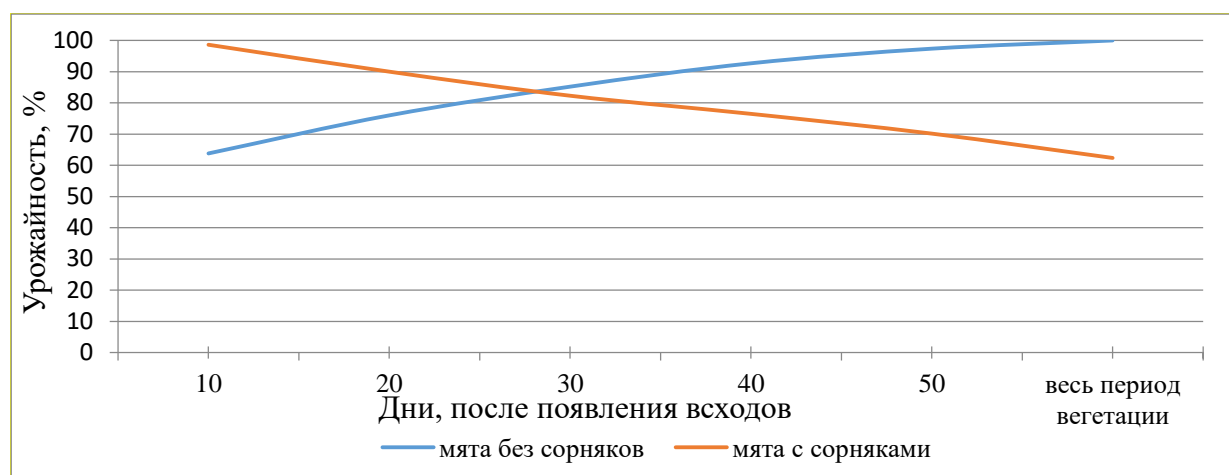


Figure 2. – Graphical definition of the critical period of harmfulness of weeds in the peppermint community, variety Mehta (forest-steppe zone of the Chechen Republic) (2022-2025)

The critical period for weed damage in the Rozovskaya Aroma peppermint community is the first 22 days from the emergence of the medicinal plant; for the Dream peppermint community, it is 28 days.

Conclusion Peppermint cultivation is possible and feasible in the forest-steppe zone of the Chechen Republic. The Republic enjoys all the necessary conditions and is an ecologically clean region, which plays an important role in the production of environmentally friendly medicinal plant materials. A model field experiment revealed a mixed type of peppermint weed infestation. The critical period for weed damage in the Rozovskaya Aroma peppermint community was 22 days from emergence; for the Mehta variety, it was 28 days. Therefore, in the forest-steppe zone, from a competitive perspective, the Rozovskaya Aroma peppermint variety is the most suitable for cultivation.

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