



PHACELIA PLANT: ECOLOGICAL AND ECONOMIC SIGNIFICANCE

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ABSTRACT

This article analyzes the origin, botanical characteristics, worldwide distribution, and economic importance of phacelia. Phacelia occupies an important place in agriculture as a highly productive nectar-producing, forage, and green manure crop. The research findings demonstrate the significance of this plant in improving soil fertility, preserving biodiversity, and promoting the development of beekeeping.

Today, ensuring ecological sustainability in agriculture, preserving soil fertility, and developing beekeeping are among the most pressing challenges. In this regard, phacelia (*Phacelia tanacetifolia* Benth.) is considered one of the plants with significant agrobiological importance.

Phacelia belongs to the Hydrophyllaceae family and is distinguished by its rapid growth, drought tolerance, and high biomass production. It is widely cultivated in many countries as a honey-producing, forage, and green manure (siderat) crop. Furthermore, this plant serves as an important tool for conserving biodiversity in agroecosystems and reducing soil erosion.

Sustainable agricultural development, maintenance of soil fertility, and the production of environmentally safe products are among the key objectives of modern agriculture. In this context, the cultivation of multifunctional agricultural crops plays an important role. One of such promising plants is phacelia (*Phacelia tanacetifolia* Benth.), which demonstrates high economic efficiency as a honey-producing, forage, and green manure crop.

Originating from North America, phacelia is now successfully cultivated in many countries across Europe, Asia, and other continents. Its short growing season, adaptability to diverse soil and climatic conditions, and high biomass yield have increased interest in this crop. In particular, the importance of phacelia in beekeeping is invaluable, as it enables the production of large amounts of nectar and high-quality honey from a single hectare.

In recent years, the growing demand for organic farming and environmentally friendly agricultural products has increased the importance of efficient utilization of green manure crops. Phacelia is characterized by its ability to increase soil organic matter content, improve physical and agrochemical soil properties, reduce erosion processes, and attract beneficial entomophagous insects.

In addition, phacelia serves as a valuable source of green fodder for livestock. Its green biomass is rich in proteins, vitamins, and minerals, contributing to increased livestock

productivity. Moreover, the plant plays a significant role in maintaining biodiversity and ensuring ecological balance within agroecosystems.

Analysis of scientific studies and literature has shown that phacelia (*Phacelia tanacetifolia* Benth.) is one of the most promising multipurpose crops in agriculture. The biological characteristics of the plant, including its short vegetation period, rapid growth, and adaptability to different soil and climatic conditions, allow its successful cultivation in various regions.

The analysis revealed that one of the most important advantages of phacelia is its high nectar productivity. A hectare of phacelia can produce a substantial amount of nectar throughout the flowering season, providing a stable food source for honeybees. For this reason, it is highly valued as one of the leading honey plants in many countries worldwide. Increased bee activity in areas cultivated with phacelia not only enhances honey production but also improves the pollination efficiency of other agricultural crops.

The findings also demonstrated the significant importance of phacelia as a green manure crop. Its well-developed root system improves soil physical structure, loosens compacted layers, and enhances soil aeration. When incorporated into the soil, its green biomass increases organic matter content, enriches humus levels, and improves overall soil fertility. As a result, the productivity of subsequent crops increases, while the need for mineral fertilizers is partially reduced.

The advantages of phacelia as a forage crop were also identified. Its green biomass is rich in proteins, vitamins, and minerals, making it a high-quality feed source for livestock. This contributes significantly to improving livestock productivity.

Based on the obtained results, it can be concluded that phacelia is a universal crop that contributes equally to the development of beekeeping, crop production, and animal husbandry. Particularly in ecological farming systems, its effective use helps preserve soil fertility, strengthen biological balance, and improve the efficiency of agricultural production.

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