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CULTIVATION OF THE SPECIES *PHACELIA TANACETIFOLIA* BENTH., IN THE CONTEXT OF CLIMATE CHANGES AND SUSTAINABLE DEVELOPMENT IN AGRICULTURE

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Abstract:

Native to the American continent and part of the *Hydrophyllaceae* botanical family, *Phacelia tanacetifolia* Benth. is an annual cultivated species that has become increasingly important in recent years in the current ecological context, marked by many evident climate changes. Known as the honey plant that "saves" honey production in difficult years when acacia harvesting productions present poor results, phacelia has recently attracted the attention of Romanian farmers due to its remarkable agrophytotechnical characteristics. These include the species high genetic resistance to extreme weather conditions (drought and even frost), resistance to diseases and weeds, short vegetation period and even its ability to contribute to soil improvement (specially when used as green manure). Also, due to its distinct characteristics, it can also be used as a fodder species with an extremely high degree of palatability, and from an ecological point of view, it actively contributes to the preservation and improvement of biodiversity.

This study aims to explore the multiple uses of this valuable species, both from a honey and fodder perspective, as well as from the perspective of the agro-ecological advantages offered by its expansion in cultivation.

• Introduction

Phacelia tanacetifolia Benth. is an annual cultivated species that has gained particular popularity in recent years, both for its remarkable versatility and its ability to adapt to the increasingly acute ecological problems arising from climate change in recent years. In this paper, we aim to highlight some of the main advantages of expanding the cultivation of phacelia from three different perspectives: as an important honey plant, a valuable fodder species, and a plant with an important agro-ecological role in the current soil and climate conditions.

For agriculture, the climate crisis is a huge challenge, as this economic sector, which is essential for human life, is considered one of the most affected. The occurrence of extreme phenomena such as prolonged atmospheric and soil drought, unusual temperatures in some seasons, heat waves, heavy rains, hail, or even floods, lead to major negative effects on plant and animal productions.

For this reason, sustainability strategies in agriculture must include viable measures to adapt to and limit the effects of climate change, one of the most important actions being the cultivation of species that are resistant to thermal stress and have modest requirements in terms of vegetation factors.

In this regard, several plants are becoming increasingly recognized and cultivated in our country, such as: sorghum, Sudan grass, sainfoin (these species that are highly resistant to drought), triticale (has low soil requirements), brome grass (particularly resistant to frost, temperature fluctuations, and low soil fertility requirements), and phacelia (low requirements for all vegetation factors).

Native to North America (California), *Phacelia tanacetifolia* Benth. belongs to the *Hydrophyllaceae* botanical family and was cultivated along Europe in the past, mainly as an ornamental plant. However, research in recent decades has shown the remarkable versatility of this annual species.

In this regard we would like to present some of the main advantages of cultivating this species:

1. An exceptional honey plant in current ecological conditions

Phacelia honey productions are very high, ranging from 200 to 1000 kg per hectare, which is the reason why the plant is increasingly more appreciated by beekeepers.

In recent years, the species has also become known as the "savior" of honey in difficult climatic years, with cold, wet and even frosty springs leading to poor acacia harvests.

The honey obtained is of exceptional quality and is highly appreciated for its slightly floral and citrus aroma, golden color, and pleasant consistency, but especially for its soothing and anti-inflammatory therapeutic properties, which contribute to gastrointestinal comfort and cardiovascular health.

2. Valued fodder plant

The species has significant fodder value, due to its good green mass production (20-25 t/ha), and has been used increasingly in cattle feed in recent years.

Phacelia has high palatability (especially due to its pleasant taste) and digestibility.

Also, fodder-honey mixtures are increasingly being cultivated for both purposes: honey production and green mass, hay, or silage. Along with phacelia, some annual legumes are also cultivated, such as spring fodder peas or spring vetch. However, the best production results were found with a mixture of phacelia and spring mash (consisting of spring vetch and oats).

3. Plant with an important agro-ecological role in current soil and climate conditions

In the context of promoting sustainable agriculture, the cultivation of phacelia stands out due to its many advantages, such as:

- ❖ protective plant (cover crop) with a relatively short life cycle, which helps prevent surface soil erosion and reduce the occurrence of weeds and nematodes in the soil;
- ❖ source of green manure. Along with mustard, clover, and vetch, the species is of interest for cultivation due to its ability to improve the physical and chemical properties of the soil, especially the nutrient regime;
- ❖ easy cultivation technology and flexibility in cultivation, due to the species' moderate requirements for vegetation factors;
- ❖ suitability for organic farming;
- ❖ good crop rotation plant, especially when cultivated after species that release the land early (barley, wheat, rapeseed).

Conclusions

In the current ecological context, the cultivation of adaptable and resistant species is becoming increasingly imperative. Among these, for our country, phacelia stands out for its multiple advantages, supporting sustainable agricultural practices and important sectors of agriculture such as beekeeping and fodder production.

The agronomic and ecological role of this valuable species cannot be underestimated, given its ability to protect and improve soil properties, especially physical and chemical ones, while also contributing to the restoration of humus reserves, an essential component of fertility.

