

***PHACELIA TANACETIFOLIA*: A BRIEF OVERVIEW OF A POTENTIALLY USEFUL INSECTARY PLANT AND COVER CROP**

Small Farm Success Project

Fact Sheet Number 2a

Introduction

Phacelia tanacetifolia is a versatile plant that is used extensively in Europe, both as a cover crop and as bee forage. It is also being increasingly used in California – especially in vineyards. Phacelia is quick to grow and flower and grows well in dry soil. It does a good job of limiting nitrate leaching when planted in early fall. It winterkills at about 18°F. In cooler regions, it can be used as a between cash crops cover crop in the summer. Phacelia is listed as one of the top 20 honey-producing flowers for honeybees and is also highly attractive to bumblebees and syrphid (hover) flies. Phacelia's habit of flowering abundantly and for a long period can increase



beneficial insect numbers and diversity, because it provides high quality nectar and pollen. It's also useful as a cut flower with its unusual and attractive blooms, strong stems, and long vase-life. Because phacelia germinates well at cool temperatures and grows quickly, cut flowers can be available by mid-spring.

Available research reports were reviewed to ascertain the potential benefits and problems with using phacelia as a cover crop, intercrop, or insectary plant in the mid-Atlantic region. In general, the research was conducted in areas with dissimilar climates to America's mid-Atlantic. However, this plant is being used in a wide range of climatic regions, and this illustrates its adaptability to climate and soil types. The fact that Europeans imported our U.S. native plant, use it extensively, and have bred for specific characteristics indicate its value in a crop rotation system. Its positive traits may prove useful in our region.

Information about the plant and its germination requirements

Phacelia tanacetifolia is an herbaceous, non-leguminous, flowering annual in the Hydrophyllaceae family. It's native to the arid southwest region of the United States and Mexico. Height ranges from 6 to 47 inches. The foliage appears ferny, and the flowers are in flat-topped clusters in shades of purple or occasionally white. Spring- and summer-planted phacelia flowers approximately 6 – 8 weeks after germination. Flowering continues for 6 to 8 weeks. Phacelia is a long-day plant and requires a minimum of 13 hours of daylight to initiate flowering (roughly mid-April to early September in the mid-Atlantic).

Phacelia is comparable to buckwheat (*Fagopyrum esculentum*) in many ways. Cultural differences are that buckwheat germinates more readily - especially at higher soil temperatures, and phacelia is more tolerant of cold and drought.

Phacelia seed needs dark for good germination – bury the seed a 1/4 inch. Phacelia seed also requires cool soil temperatures for germination (although it will grow well in hot, dry soil). Research reports indicate the optimum soil temperature for germination is between 37 - 68°F (soil temperatures closely follow air temperatures). Wet or compacted soils reduce germination success. Planting phacelia thickly or with an appropriate nurse crop may be one approach to counteract possible germination difficulties under suboptimum conditions. A nurse crop such as buckwheat germinates reliably quickly and serves to protect the ground from erosion and shelter the second crop as it germinates more slowly. Suitable nurse crops when phacelia is used as an insectary planting would be quick-germinating insect-friendly herbs and flowers such as borage (*Borago officinalis*), cosmos (*Cosmos sulphureus*), achillea (*Achillea millefolium*), and buckwheat. Planting phacelia before a rain or lightly irrigating after planting may improve germination rates.

Value to Insects

Phacelia is highly attractive to honeybees, bumblebees, and syrphid flies, and these insects are valuable pollinators. Syrphid fly larvae are voracious feeders on aphids and young caterpillars. Phacelia is also reputed to attract other beneficial insects, such as parasitic wasps and minute pirate bugs. It provides both pollen (for protein – needed for egg production) and nectar (for carbohydrates – needed for energy).

Insectary plants are those with high volume, quality nectar and/or pollen that are extremely attractive to beneficial insects. They are planted for the primary purpose of attracting pollinators, and predators and parasites of pest insects. Phacelia's habit of quick growth and long flowering make it highly suitable as an insectary plant. It can be succession sown so that it is in flower all season or it can be sown at a specific time to build up beneficial insect populations in anticipation of their need to control a crop pest.

One caution – if you have a large area of phacelia planted, time the planting so that phacelia flowers are not blooming when you need a crop pollinated. Phacelia flowers are so attractive to pollinators that the flowers would compete successfully for pollinator services against most other flowering plants.

Use as a Fall/Winter Cover Crop and/or Mulch

Phacelia may be suitable as a winter-killed cover crop when a heavy crop residue is not needed in the spring. Research in other regions shows phacelia has the potential to produce abundant biomass and does a good job at catching excess nitrates before they leach into groundwater. Phacelia winter-kills at about 18°F, and the residue breaks down quickly. Its use as a fall/winter cover crop may be appropriate when it will be followed by a vigorous cash crop (e.g. potatoes) in early spring.

Little research has been done on phacelia's suitability as a mulch (living or dead). Positive results were found using it as an intercrop with corn and sugar beets, as an undercrop in vineyards and apple orchards, and as a dead mulch with tomatoes. As a living mulch, phacelia was found to tolerate some tractor traffic. Its benefits as a weed-controlling dead mulch would be limited due to the rapid breakdown of the residue.

Management

Phacelia seed should be broadcast on a finely prepared seedbed. A cultipacker or rake can be used to bury the seed to a 1/4 inch. If possible, lightly irrigate. Phacelia is best planted when the soil temperature is between 37 – 68°F. Research reports show the seeding rate for phacelia when used as a cover crop as 11 – 18 lbs/ac. Use 7 – 12 lbs/ac if drilling. Use the higher seeding rate to increase phacelia's weed suppressing abilities. (Note – it seems likely that with cool soil temperatures, well-aerated soil, good coverage of the seed, and irrigation after seeding, a much lower seeding rate is possible.)

When used as a fall/winter catch crop, phacelia needs to be planted as early as possible in the fall. Phacelia winterkills at 18°F and the residue breaks down quickly. An early spring crop can be planted into the residue.

When used as an insectary planting, phacelia can be succession sown, or sown with other insectary plants such as borage (*Borago officinalis*), buckwheat (*Fagopyrum esculentum*), bachelor's button (*Centaurea cyanus*), and dill (*Anethum graveoleus*). Permanent insectary areas can be sown and allowed to reseed naturally from year to year. Use a seeding rate of 3 – 5 lbs/ac when phacelia is planted alone; less if phacelia is sown in a mixture. Research has shown that 40% phacelia in a mixture works well.

Conclusions

Phacelia has proven its usefulness as a food source for pollinators and other beneficial insects. It has also proven its value as a cover crop in other regions of the world. It is largely untested in the mid-Atlantic. While clearly not the cover crop for every situation, it may be a good choice in some situations – especially when there is a desire to attract beneficial insects. We need more information about this potentially useful plant and on how it performs in this part of the world.

We also need information about phacelia's usefulness as forage. Several publications mentioned forage as a use, and phacelia has a nitrogen content of 4%, but little else is known about its suitability as animal feed.

Seed sources

Phacelia is not yet widely available in the United States and seed is usually available only as the straight species (rather than as a cultivated variety or cultivar). Europe has developed many cultivars and phacelia is the primary component in two “bee forage” mixes available there. Phacelia seed is inexpensive in areas where it is used extensively, but not currently in the U.S. There are 234,960 seeds to the pound, however, so a pound of phacelia goes a long way.

Sources for additional information

Phacelia tanacetifolia: What we know about its suitability as an insectary plant and cover crop in the mid-Atlantic region. L. Gilbert. Small Farm Success Project – Fact Sheet Number 2. 12 p. Copies available from: Mark Davis, Sustainable Agricultural Systems Lab, Rm. 110, Bldg. 001, 10300 Baltimore Blvd., Beltsville, MD 20705 301-504-9068 It is also available as a download at: www.smallfarmsuccess.info

UC SAREP - U. of California Sustainable Agriculture Resource and Education Program – Cover Crop Database <http://www.sarep.ucdavis.edu/ccrop/>

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