

FIELD PEA (*Pisum sativum* L.)

WHAT ARE FIELD PEA?

Field peas (*Pisum sativum* L.) are one of the first and oldest domesticated crops, appearing in the Mediterranean and Middle East over 12,000 years ago. Field pea differ from vegetable pea, in that field pea are consumed for their mature dry seed. It is also important not to confuse field pea with cowpea or black-eyed peas, as field pea are a completely different species, with a distinct appearance. Field pea are produced on semi-dwarf, semi-leafless plants, typically with shorter green pods, and green or yellow seed. Cowpea belongs to the species *Vigna unguiculata*, and are short with a variety of leaf shapes, with long, thin, purple pods.

Field pea are one of the important cool season food legumes grown around the world, primarily produced in Canada, France, China, Russia, Ukraine, and the Western United States. Field peas are consumed globally by people and livestock as a source of protein, as protein makes up about 20-25% of the whole seed. Field pea are also rich in prebiotic carbohydrates, which foster good gut health and aid in reducing diet related disease, such as obesity and high blood pressure. They are also a relatively cheap food, making them important to low income diets. Field pea are also legumes, growing root nodules that allow the plants to fix and use atmospheric nitrogen without any inorganic fertilizer input. Nitrogen is one of the most limiting nutrients for agriculture, and the increased available nitrogen derived from cool season food legumes benefits subsequent crops including cereals and vegetables.

Field pea producers must consider the market they would like to enter and what local consumers want to buy, i.e., livestock feed or human edible products, as different varieties exist for each end use. Next, the grower should take into account the type of field pea that is suitable for the harvest equipment and climate of the field location. Field peas can have either determinate or indeterminate growth, reaching heights of 2-6 feet, respectively, though smaller, semi-dwarf types are almost always used in production. Each growth type has different abiotic stress advantages, with indeterminate peas adapting to moisture and heat stress without sacrificing seed yield, while the shorter, determinate type prefers more rain and mild summers (North Dakota State University 2016). Taller field pea plants are more likely to lodge, thus

requiring modifications to harvesting procedures. Peas can have one of two main leaf types: (1) normal leaves with leaflets along the rachis and (2) semi-leafless in which the leaflets are converted to tendrils. Semi-leafless types tend to be easier to harvest and resist lodging, while normal leaf types may require support for growth. Almost all commercially produce pea varieties are semi-leafless, semi-dwarf types. More information on varieties and field trial performance in South Carolina will be made available on the Clemson University – Go Organic website.

HOW ARE FIELD PEAS GROWN?

Field pea is an annual, cool season food legume that has been used in crop rotations with cereals for centuries. Field pea can also be used as a cover crop, a forage for livestock, and green manure. Field pea is a 110- to 115-day crop that can be planted once the soil is around 40°F and prefers growing conditions between 55 and 64°F. As a cool-season crop, the plants can be left uncovered throughout the winter and withstand snowfall. Field peas are adapted to a variety of soils but prefer loamy or sandy soils with a slightly acidic to neutral pH (5.5 to 7). Field peas should be seeded at a rate of around 120 lbs/acre, but if weed competition is high, then the seeding rate can be increased to 200 lbs/acre. In soils with low nitrogen, field peas should be inoculated with *Rhizobium leguminosarum* to allow for the adequate establishment of nitrogen-fixing nodules.

FIELD PEA PESTS AND DISEASE

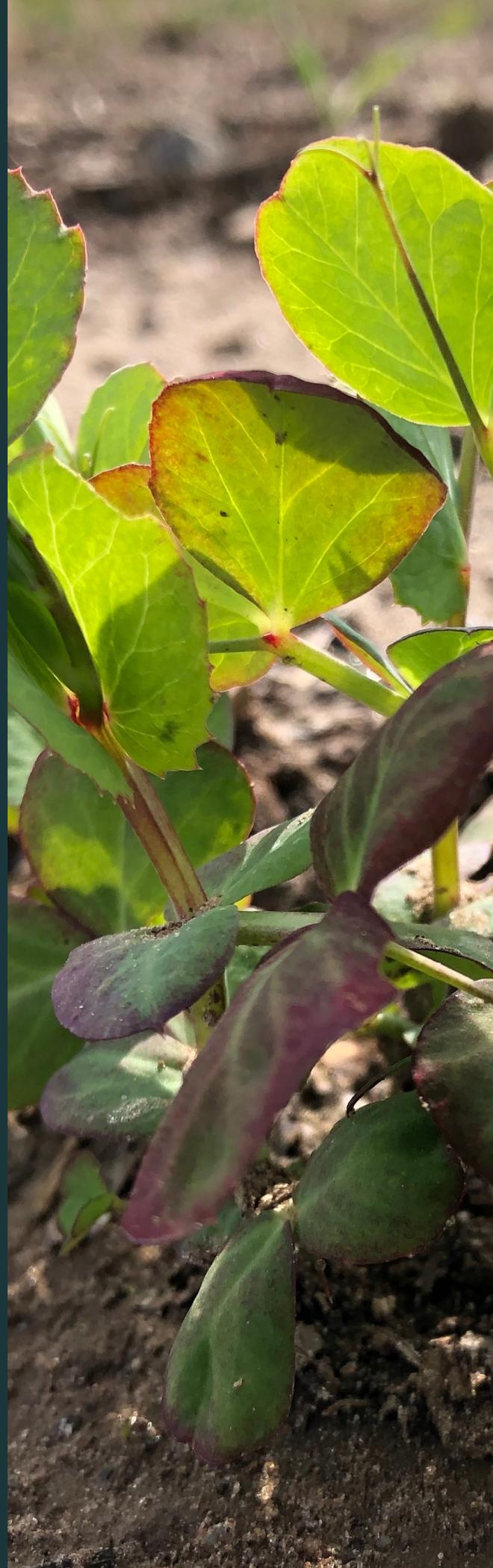
- Blights: Ascochyta blight, bacterial blight
- Root rots: Ascochyta foot rot, Aphanomyces root rot
- Stem rots: Sclerotinia stem rot
- Pests: Pea aphids, Lygus bugs, grasshoppers, leaf and seed weevils
- Additional: Powdery mildew

Please consult the Index of Plant Disease in South Carolina or the Plant and Pest Diagnostic Clinic for more information:

<https://www.clemson.edu/public/regulatory/plant-problem/index.html>

Source: North Dakota State University. (2016). Field Pea Production.

<https://www.ag.ndsu.edu/publications/crops/field-pea-production/a1166.pdf>



FIELD PEA MARKET CLASSES

The major market classes of field pea are green cotyledon and yellow cotyledon. Both are used for livestock feed and seed, but only a select few varieties are available for the human consumption market. Varieties of specialty peas also exist, such as forage pea.

- Yellow Pea: Handel, CDC Mozart, CDC Minuet, CDC Golden, CDC Bronco, CDC Meadow, CDC Centennial, CDC Prosper, CDC Treasure, 1749-8, Cutlass
- Green Pea: CDC Montero, CDC Striker, CDC Sage, Patrick, 1996-216, 1812-5
- Forage Pea: CDC Sonata, CDC Tucker, Leroy, 1681-11

HOW ARE FIELD PEAS CONSUMED?

Field pea is often blended into livestock grain diets to provide additional protein, as they contain around 20 g of protein per 100 g of seed. In terms of human consumption, field pea can be cooked and served as a soup or eaten on their own. Additionally, a cup of field pea provides around 10-13g of prebiotic carbohydrates, which are essential for gut health and to combat obesity. Peas also provide other nutrients such as iron and zinc. This makes field pea an ideal candidate for health food markets.

ORGANIC FIELD PEA IN SOUTH CAROLINA

Consumers have shown an increased interest in organically grown crops as indicated by the 6.4% market growth rate in 2017, making the organic sector the fastest growing food market overall (Organic Trade Association 2018). Sales totaled approximately \$49.4 billion in 2017, and the US makes up nearly half of the global organic market (FiBL & IFOAM 2018). A 2014 Gallup poll indicates that 42% of Americans with annual incomes greater than \$30,000 try to incorporate organic products into their diets. With this in mind, the potential for growth of the organic market in SC is substantial; agriculture is a main source of revenue for the state, with over 25,000 farms and 4.1 million acres in production. Field crops such as corn, cotton, and wheat would do well to incorporate field pea as a rotational crop during the winter, as field pea would provide these crops with an additional source of nitrogen in poor SC soils. The cultivation of this new specialty crop could then provide another source of income for farmers, as well as aid in making their farming practices more sustainable and beneficial for the environment.



CONSUMERS HAVE SHOWN AN INCREASED INTEREST IN ORGANICALLY GROWN CROPS AS INDICATED BY THE 6.4% MARKET GROWTH RATE IN 2017, MAKING THE ORGANIC SECTOR THE FASTEST GROWING FOOD MARKET OVERALL



AUTHORS

- Sarah Powers: Ph.D. Student, Pulse Quality and Nutrition (Nutrigenomics), Department of Plant & Environmental Sciences, 270 Poole Agricultural Center, Clemson University, SC 29634-0310; spower2@g.clemson.edu.
- Dr. Rebecca McGee: Pulse Breeder, Research Geneticist (Plants), Johnson Hall, USDA, Washington State University, Pullman, WA; rebecca.mcgee@ars.usda.gov.
- Dr. Dil Thavarajah: Associate Professor, Pulse Quality and Nutrition (Nutrigenomics), Department of Plant & Environmental Sciences, 270 Poole Agricultural Center, Clemson University, SC 29634-0310; dthavar@clemson.edu.

FUNDING

Funding support for this project was provided by the Organic Agriculture Research and Extension Initiative (OREI) [award no. 2018-51300-28431/proposal no. 2018-02799] of the United States Department of Agriculture, National Institute of Food and Agriculture.

SOURCES

- Organic Trade Association. 2018. Press release. Maturing U.S. organic sector sees steady growth of 6.4 percent in 2017. <https://ota.com/news/press-releases/20236>
- South Carolina Department of Agriculture.
- <https://www.nasda.org/organizations/south-carolina-department-of-agriculture>
- FAOSTAT. <http://www.fao.org/faostat/en/#home>
- North Dakota State University. (2016). Field Pea Production. <https://www.ag.ndsu.edu/publications/crops/field-pea-production/a1166.pdf>
- FiBL & IFOAM. The World of Organic Agriculture: Statistics & Emerging Trends 2018.
- Gallup 2014 Food Consumption Survey
- Pavek, P.L.S. 2012. Plant fact sheet for pea (*Pisum sativum* L.). USDA-Natural Resources Conservation Service, Pullman, WA. https://plants.usda.gov/factsheet/pdf/fs_pisa6.pdf