

Chia

Introduction

Chia (*Salvia hispanica*) is an annual plant in the mint family that is recognized by the U.S. Department of Agriculture as a specialty crop. It is grown commercially for its seeds, which are rich in omega-3 fatty acids. Chia seeds also provide an excellent source of soluble fiber and antioxidants. Until recently, chia seed production was only feasible in tropical and subtropical latitudes due to the long growing season required to complete seed development. While chia plants grow well in temperate climates, they require short days to flower and are normally killed by frost before seeds mature. Researchers at the University of Kentucky (UK) have recently been engaged in groundbreaking chia breeding research. This has resulted in patent pending varieties of long daylength flowering lines of chia capable of producing seed in the Commonwealth. After several years of research and field trials, chia is emerging as a viable commercial crop for Kentucky growers.

Marketing

UK's new early summer lines of chia have been licensed to Kentucky Specialty Grains (KSG), a producer-owned company in Franklin, Kentucky, and to Kentucky Chia, a Louisville-based company. The KSG licensing agreement allows them to pursue commercialization of this crop, which includes developing optimum production practices and expanding market channels. Their goal is to market chia primarily to the food industry. Kentucky Chia



CHIA PLANTS IN BLOOM (LEFT) AND SEED (RIGHT)

seeks to distribute domestically grown chia to the equine industry, selling to animal feed retailers, equine feed manufacturers, and large equine farms. Growers producing chia in Kentucky would work closely with one of these companies. KSG estimates that Kentucky farmers could sell Kentucky-grown chia from 4,000 to 5,000 acres, 2 to 4 years after commercial production begins. This could initially impact 40 to 50 farmers, each growing 100 acres of chia.

Market Outlook

Chia is one of the highest sources of omega-3 fatty acids known. Currently with the high demand for chia relative to supply, chia seed and seed products (such as oil) have a much higher value than canola, soy, or flax.

Human consumption of omega-3 has been linked to many health benefits, including a lower risk of heart disease, cancer, and possibly stroke, as well as improved brain functions. The health foods and nutraceutical industries are currently marketing raw



CHIA PLANTING.

chia seeds as a dietary supplement, as well as incorporating the seeds into snack foods, drink mixes, and cereals; milled chia is sold for use as flour. The global market for nutraceuticals is continuing to grow due to an aging population, interest from a broader spectrum of consumers in functional foods that include ingredients like omega-3 fatty acids, and increasing interest and use in preventative medicine. This market is expected to grow based on current nutritional trends. Increasing awareness of the health benefits of omega-3 foods has fueled an industry that is currently unable to meet the high demand.

Chia is a good candidate for organic production; an added benefit in selling to the health food market. Currently there is little difference between the price returns of conventionally produced chia and organic chia because of the high demand and low supply. However, as supply increases, organic chia should bring higher price premiums.

Production Considerations

Crop description and cultivars

Chia is an herbaceous plant with opposite, serrated leaves approximately 1½ to 3 inches long and 1 to 2 inches wide. Also known as “lime-leaf sage,” plants reach a height of a little over 3 feet at maturity. Clusters of blue to purple to white flowers develop on spikes forming at the end of each branch. Seeds are oval and approximately 2 mm (0.08 inches) long and 1 mm (0.04 inches) wide. The shiny seed coat varies in color from

cream to charcoal grey with darker irregular markings or specks.

The patent-pending varieties developed as a result of UK’s selective breeding program are available only from KSG and Kentucky Chia. Lines differ in oil quality, seed color, height, and maturity.

Site selection and planting

Chia is a low-maintenance crop that prefers moderately fertile, well-drained soils. While moisture is necessary for seedling establishment, this crop is highly intolerant of wet soils. Seeds are planted into a fully tilled seed bed using a standard grain drill or planter with small seed metering capability; some adjustments to this equipment may be necessary. Because of the small seed size, precision planting is important to ensure good seed-to-soil contact. Chia is planted in April or May and harvested in October in Kentucky.

Cultural requirements, such as plant spacing and nutritional needs, are still being refined. Chia is harvested early enough that it may be possible to double-crop chia with winter wheat, but the feasibility of this has not been fully researched.

Pest management

Neither insects nor diseases have posed a problem in Kentucky to date. Weed management is most critical during establishment; however, weeds become less of an issue once the canopy closes. Despite the fact that chia is an aggressive crop, researchers are not concerned that it could become invasive or present a problem for subsequently planted crops; most commonly used herbicides tested against chia have succeeded in killing it.

Harvest and storage

Chia is mechanically harvested with a standard combine. Unlike other grains that may be stored on-farm immediately following harvest, chia is expected to go directly to the processor/cleaning plant after harvest.



CHIA SEED SIZE COMPARED TO A DIME.

Labor requirements

Labor needs are approximately 2 to 4 hours per acre for production and harvest. Some additional time may be needed in early stages of production for proper drill (planting) setup.

Economic Considerations

Initial investments are similar to row crop production, including land preparation and purchase of seed. According to Kentucky Specialty Grains, production costs for chia are estimated to be less than per acre production costs for soybeans, with harvest and marketing costs similar to those costs for soybean. The UK Department of Agricultural Economics has projected no-till soybean variable costs in 2013 as less than or at \$400 per acre, with fixed costs adding approximately \$50 per acre. Variable expenses per acre for chia are expected to be less than soybeans. Returns to land, capital and management for chia are projected to be higher than returns for soybean grown on the same land.

Selected Resources

On the Internet

- Chia — A Possible New Crop for Kentucky? in Tobacco Tech (Kentucky Tobacco Research and Development Center, 2010) 4.26 MB file <http://www.ca.uky.edu/KTRDC/T.T.%20Aug%202010.pdf>
- Extending the range of an ancient crop, *Salvia hispanica* L. — a new ω 3 source (University of Kentucky, 2011) <http://www.uky.edu/Ag/Agronomy/PLBC/Research/pubs/Jamboonsri-12.pdf>
- Improvement of New Oil Crops for Kentucky (University of Kentucky doctoral dissertation by Watchareewan Jamboonsri, 2010) http://uknowledge.uky.edu/gradschool_diss/120/
- Kentucky Chia <http://kychia.com/>
- Kentucky Small Grain Growers Association <http://www.kysmallgrains.org/>
- Kentucky Specialty Grains kummer.chris@yahoo.com

In print

- *Chia: Rediscovering a Forgotten Crop of the Aztecs*. Ricardo Ayerza and Wayne Coates. 2005. University of Arizona Press: Tuscan. 197 pp.

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Photos by Tim Phillips (bloom, pg. 1 & planting, pg. 2) and Anthony Clark (seed, pg. 1), University of Kentucky; and Maelor Davies, Kentucky Tobacco Research and Development Center (seed, pg. 3)

For additional information, contact your local [County Extension](#) agent