

Edamame

Introduction

Edamame is a name applied to several specialty varieties of edible green vegetable soybeans. While it is the same species as the traditional grain soybean (*Glycine max*), edamame has a sweet, nutty flavor and a larger seed with better digestibility.

Edamame is an important vegetable in Asia, where it is harvested and eaten in the green stage. Demand for edamame in America has grown with the popularity of Asian cuisine. In addition, edamame reportedly has many health benefits. Green pods are very high in protein, particularly for a vegetable, and contain several isoflavones (sometimes called phytoestrogens since they have chemical structures similar to the human hormone). Many research findings indicate that isoflavones have positive health benefits, including anti-cancer activity.

Marketing and Market Outlook

Marketing edamame is more closely related to marketing vegetables than conventional oilseeds. The current market for edamame in Kentucky is primarily associated with specialty produce and farmers markets located near population centers. Produce brokers have indicated that they are willing to handle uniformly packaged, high quality edamame. Development of a niche market for edamame in Kentucky was first promoted on a small scale by soybean and commercial vegetable producers in Daviess County (Western Kentucky). There have also been small producers in Central Kentucky



successfully marketing fresh edamame in Louisville and Lexington area farmers markets.

Frozen edamame is currently available in major supermarket chains. The primary production areas of edamame for freezing are on the West Coast and Upper Midwest. Rising transportation costs have stimulated an interest from some eastern U.S. frozen food packers in sourcing more edamame farther east.

Production Considerations

Cultivar selection

Soybeans, including edamame, initiate flowering when a minimum night length has been reached. Each cultivar is placed into one of several maturity groups based on the zone or region for which it is best adapted. Varieties best adapted to Kentucky are generally in maturity Groups III, IV, and V. Producers who are unfamiliar with soybean production need to determine their soybean maturity region. Identifying varieties appropriate for the region of production is critical to success. For a more in-depth

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discussion of soybean maturity groups, refer to the UK publication *Soybean Production in Kentucky Part II* (AGR-129).

Site selection and planting

Edamame production is similar to that of traditional grain soybeans. Because of the larger seed size, green edible soybeans may require changes in planter plate size or planting technique. Kentucky producers have also successfully started edamame in greenhouses for field transplanting.

Edible soybeans do well in deep or moderately deep, well-drained, fertile soils. Gently sloping land where flooding, run-off, and erosion are minimal is also recommended. Seeds require a soil that is warm, moist, and free of living weeds. Fields known to have high populations of soybean cyst nematode should be avoided. The optimum planting period in Kentucky is from early May to mid-June, when soil temperatures have reached the 65°F minimum necessary for rapid emergence.

Pest management

Reports currently indicate that the range of disease and insect pests affecting edamame is the same as for grain soybeans. However, since edamame is harvested when green, growers will be able to avoid many of the late season problems that occur on traditional soybeans. *Pesticides registered for grain soybeans are generally not cleared for use on soybeans harvested as a vegetable crop*; however, each product label should be examined to determine this. Since there are no herbicides approved for edamame production, growers in Kentucky are using mechanical and hand cultivation for weed control.

Harvest and storage

Vegetable soybeans have a very short harvest window of only a few days. Immediate post-harvest cooling is essential to maintain product freshness for market. Edamame is generally hand harvested on small farms, as traditional bean

harvesters may be too expensive for a limited planting of this crop. In many Asian countries edamame is harvested before dawn while the air is still cool and moist. It is recommended that Kentucky growers harvest edamame early in the morning hours when pods are cool. This will help the pods keep longer and reduce the amount of field heat that must be removed after harvest. Cooling may be accomplished using forced air, vacuum, or hydrocooling.

Fresh edamame does not store well. Growers can expect that harvested beans will retain flavor and appearance for approximately 1 week when properly stored. Ongoing research involving postharvest keeping quality of edamame has focused on specialized films for packaging.

Fresh edamame can be marketed in the pod or bunched on the stalk, depending on the market channel. Asian customers prefer to purchase edamame on the stalk. However, early marketing efforts in an upscale Louisville produce market showed that customers there were not very interested in edamame on the stalk. Farmers market customers, on the other hand, did not seem bothered by purchasing the product “on-stalk.” Edamame is preferred in pod form for sales to restaurants and wholesale outlets.

Labor requirements

Kentucky growers have effectively used careful hand picking, grading, and field packing to harvest the crop and prepare it for market. An unskilled, supervised worker should be able to harvest, grade, pack, and transport at least one box (25 pounds) of edamame per hour. A yield of 6,000 to 10,000 pounds per acre can be expected. Marketing the whole plant (bunched on the stalk) requires the least amount of time and labor.

Economic Considerations

Fresh edamame production is a niche product in Kentucky. Basic information about varieties, production practices, and harvest technique is still needed.

Initial investments include land preparation and purchase of seed. The main costs involved in production are harvesting and post-harvest handling. While hand harvest is the most viable technique for small-scale production, it raises harvest costs. Machine harvest is necessary for commercial wholesale production in the U.S. Some estimates indicate machines can cut edamame production costs by up to 25 percent.

Total expenses per acre, including annual fixed costs, are projected to be \$7,500 to \$12,000. Assuming 9,000 pounds of production at \$1.40 per pound, edamame has the potential to return \$(500)* to \$2,800 per acre to land and management on the fresh, wholesale market. For those producers with access to a mechanical harvester and direct local market for fresh edamame, returns could reach into the \$4,000 level per acre. Budget projections indicate a greater likelihood for edamame profitability in either direct-marketed, hand-harvested plots of an acre or less, or larger plots wholesaled directly to a frozen foods packer.

**Parentheses indicate a negative number, i.e. a net loss.*

Selected Resources

- Edamame Marketing Fact Sheet (University of Kentucky, 2002)
http://www.uky.edu/Ag/cdbrec/pubs/fact02_edamame.pdf
- Edamame Soybeans: Kentucky Estimated per Acre Costs and Returns (University of Kentucky, 2000)
<http://www.uky.edu/ag/cdbrec/pubs/budget2000.pdf>

- Edamame Soybean Marketing Project (University of Kentucky, 2000-2002)
<http://www.uky.edu/Ag/cdbrec/edamame.html>
- Marketing Challenges for Emerging Crops in Kentucky: Vegetable Soybeans (University of Kentucky, 2001)
http://www.uky.edu/ag/cdbrec/pubs/mkt_vegsoy.pdf
- Marketing New Crops: Edamame (University of Kentucky, 2001)
http://www.uky.edu/ag/cdbrec/pubs/edamame_marketing.pdf
- Production System for Extending the Harvest Time of Fresh-Market Edamame in Kentucky
<http://www.uky.edu/Ag/NewCrops/edamame.pdf>
- Edamame: A Nutritious Vegetable Crop (Purdue University, 2002)
<http://www.hort.purdue.edu/newcrop/ncnu02/v5-432.html>
- Edamame: Vegetable Soybeans (ATTRA, 2006)
<http://attra.ncat.org/attra-pub/edamame.html>
- Edamame, PNW-0525 (Washington State University Extension, 2000)
<http://cru.cahe.wsu.edu/CEPublications/pnw0525/pnw0525.pdf>
- Edamame Production for SW Washington (Washington State University, 1995-1996)
<http://agsyst.wsu.edu/edam.html>
- How to Grow Edamame: Planting Guidelines (Wannamaker Seeds)
<http://www.wannamakerseeds.com/plantingguidelines.html>
- Organic Edamame Production (North Carolina State University, 2007)
<http://www.cefs.ncsu.edu/resources/fieldnotesforfarmers/20070103organicedamame.pdf>

The inclusion of a commercial Web site as a resource does not represent an endorsement of the company or its products by the University of Kentucky.

Reviewed by Brent Rowell, Extension Specialist (Issued 2002, Revised 2005)

Reviewed by Tim Coolong, Extension Specialist (Revised 2009)

Photo by Todd Pfeiffer, University of Kentucky

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