UK COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF KENTUCKY — COLLEGE OF AGRICULTURE

Greenhouse-grown Lettuce and Greens

Introduction

Lettuce and greens are well adapted for production in cool or unheated greenhouses and high tunnels in Kentucky. Potential lettuce types for greenhouse production include romaine, Bibb and leaf lettuces. Mesclun can include any mix of baby lettuces, greens and herbs; however leaf lettuces are often a main component. A variety of lettuce leaf textures (smooth to crinkled), as well as colors (green to red), can be added to these bagged salad mixes.

The term "greens" is often used to refer to a number of leafy vegetables which belong to several unrelated plant families. Common greens that could be produced in a greenhouse include spinach, turnip greens, collards and mustard greens. Specialty greens, such as arugula, sorrel, chicory, and Asian greens, also show potential.

Marketing

Lettuces and greens produced in the greenhouse require a specialized niche market that may take some time to develop. Potential growers should talk to restaurant chefs, caterers or to produce brokers, especially those who sell to restaurants. Lettuce and greens are also excellent for early and late season sales at farmers markets. Success for these crops and markets will be limited to those individuals that are really committed to producing and marketing them.

Market Outlook

The demand for lettuce and greens has increased as health-conscious Americans continue to consume more fresh produce. Lettuce is the third largest vegetable item (behind potatoes and tomatoes) in the average American diet. The popularity of salad bars and bagged salad greens has added to the increased demand for these products. Sales at farmers markets and to the food service industry should offer opportunities for growers able to supply a consistent amount of quality products into the market place.

Production Considerations

Production systems

Lettuce and greens can be grown in a cool or unheated greenhouse from September 15 until June. Leaf lettuce, Bibb lettuce and a number of greens may be adapted to the tobacco greenhouse float system. They could possibly be grown on protected outdoor float beds, as well. These crops are grown in typical "float" trays in the same way as tobacco transplants. This involves first sowing seeds in a standard plug (plastic) tray where the seedlings grow for 2 to 3 weeks. Seedlings are then transplanted to the final spacing in float trays for the last 3 to 5 weeks of production.

Lettuce and greens can also be grown in the soil floor of a small

or large greenhouse. These crops, which prefer a sandy loam soil that is high in organic matter, are seeded directly into rows or beds. Seedlings are thinned a 6 inch to 8 inch spacing for heads or young leaves are simply harvested from plants for mixed baby greens. Drip irrigation greatly reduces splashed soil so the leaves are easier to clean.

University of Kentucky researchers continue to evaluate lettuce and greens production. Their main interest is the use of organic fertilizers in the float water. Such a system would make it possible for plants to be sold in the expanding "organic" market. The results have been very promising; however, more information is needed before recommendations can be made. Research is also being conducted using a system similar to the one described on the Cornell CEA Web site.

Pest management

Environmental conditions that favor plant growth also favor the rapid build-up and spread of insects and diseases. There are very few pesticides labeled for greenhouse production of these crops so insect and disease management will be crucial.

Potential insect problems include aphids and thrips. The use of insect screening on the sidewalls will be necessary, if sidewall ventilation is used. Tender, young plants are particularly susceptible to damping-off. Water aeration is necessary to reduce water molds. Tipburn, a physiological disorder, can also occur on greenhouse-grown greens.

Harvest and storage

Leaves or heads of plants are typically washed, carefully drained dry, weighed and packaged. Hydroponic plants are generally harvested and shipped with the roots intact for longer post-harvest life. Greens must be cooled immediately after harvest and stored near freezing in high humidity conditions. Plants are often packaged individually in plastic bags and then boxed as the market requires. Washed greens for mesclun are usually mixed as they are bagged.

Labor requirements

Labor is needed for seed sowing, transplanting, harvest, packaging and shipping.

Economic Considerations

Greenhouse production requires a significant start-up cost, as well as demanding labor and management. Initial investments include greenhouse construction, production system costs and equipment. The cost of a production-ready greenhouse, excluding land costs, can run approximately $10 per square foot. A well-run operation should have gross returns of $5 to $12 per square foot of production space for the season, depending on crop quality and market.

More Information

- Additional Crops for Greenhouse Tobacco Growers Using the RAFT System (University of Kentucky)
http://www.uky.Edu/Agriculture/HLA/Anderson/raft_veg/home.htm
- Alternative Crops for Greenhouse Tobacco Growers (University of Kentucky, 1997)
http://www.uky.edu/Agriculture/HLA/anderson/raft_veg/intro.htm
- The Greenhouse Business in Kentucky – A Review of Crops and How to Begin a Business (University of Kentucky, 2002)
http://www.uky.edu/Ag/HLA/anderson/greenhousesinkentucky.pdf
- Managing the Greenhouse Environment to Control Plant Diseases, PPFS-GH-1 (University of Kentucky, 2004)
http://www.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-GH-1.pdf
- Nutrient Analysis of Selected Commercial Organic Fertilizers for Greenhouse Lettuce Production (University of Kentucky, 2002)
http://www.ces.ncsu.edu/depts/hort/greenhouse_veg/pdf/lettuceorgfert.pdf
- Production and Yield of Selected Edible Greens in Hydroponic Ponds (Float Beds) in a Greenhouse (University of Kentucky, 2004)
http://www.uky.edu/Ag/Horticulture/anderson/brassica.pdf

- Selected Resources and References for Commercial Greenhouse Operators (University of Kentucky, 2002) http://www.uky.edu/Ag/Horticulture/anderson/greenhousereferences.pdf
- CEA Grower's Handbooks (Cornell, 2001) http://www.cornellcea.com/handbook_home.htm
- Greenhouse and Hydroponic Vegetable Production Resources on the Internet (ATTRA) http://attra.ncat.org/attra-pub/ghwebRL.html
- Greenhouse Vegetable List of References (North Carolina State University, 2001) http://www.ces.ncsu.edu/depts/hort/hil/hil-32-a.html
- Hydroponic Greenhouse Lettuce Enterprise Budget (Ohio State University, 2003) http://www.oardc.ohio-state.edu/hydroponics/Economics/economics.htm
- Integrated Pest Management for Greenhouse Crops (ATTRA, 1999) http://attra.ncat.org/attra-pub/gh-ipm.html
- Organic Greenhouse Vegetable Production (ATTRA, 2000) http://www.attra.org/attra-pub/ghveg.html
- Specialty Lettuce and Greens: Organic Production (ATTRA, 2002) http://www.attra.org/attra-pub/lettuce.html