University of Kentucky
College of Agriculture,
Food and Environment
Cooperative Extension Service

Center for Crop Diversification Crop Profile
CCD-CP-64

Poinsettias

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Introduction

Poinsettias (*Euphorbia pulcherrima*) are subtropical plants that originated in Mexico and Guatemala. In their native climate, poinsettias are small woody shrubs that may reach a height of more than 10 feet. In most of the U.S., poinsettias are grown as indoor potted plants popular at Christmas time. While the showy bracts are suggestive of flower petals, they are really modified leaves. The actual poinsettia flowers are less conspicuous by comparison, forming a yellow to red cluster in the center of the bracts.

Poinsettias are photoperiodic; in other words, they initiate flowering based on day length. Flowers are initiated naturally when there is less than 12 hours of daylight per day, mid-to-late September, depending on the variety. Day length can be modified to time flower initiation by either blacking out the crop or extending or providing day-extension photoperiodic lighting.

Marketing

Potential retail markets include farmers markets and direct sales from the greenhouse or farm. Wholesale markets include local garden centers, florists, groceries, discount department stores, farm stores and roadside stands. Other potential markets include interior designers, as well as organizations that use poinsettia sales as fundraisers (such as schools and clubs).

Market Outlook

This traditional Christmas plant is the best-selling potted flowering plant in the U.S. Poinsettias are sold over a six-week period beginning in early November. Greenhouse operators are efficient at growing poinsettias; while the market is

relatively large, profits per plant may be small due to a large supply. Red-colored poinsettia cultivars remain the most popular, with novelty cultivars gaining some popularity in recent years. Producers should always identify market opportunities before producing novelty cultivars.

Production Considerations

Cultivar selection

Cultivar selection is a critical decision for commercial poinsettia growers, but as breeders continue to release new and exciting varieties each year it can seem an overwhelming task. In addition to the classic red and white, bracts may come in various novelty colors such as pink, peach, orange and lilac. Bract colors may also be solid, variegated, marbled or flecked. Other horticultural variations include leaf color (light to dark green colors; solid or variegated), leaf and bract shape, growth habit, height and pinching requirements to stimulate branching. Knowing your customer preferences and the market de-

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mand will be critical in selecting cultivars with the desirable traits. Another important characteristic to consider in cultivar selection is the expected time required to reach a salable stage following the start of inductive short-days. This is called the "response time" and cultivars with similar response times are organized into "response groups." Modern cultivars range from an 8-week response time to as long as 11 weeks. These response groups may be referred to as early-, mid- or late-season. Additionally, growers will need to consider other characteristics from a production standpoint: adaptability to local greenhouse conditions, ease of branching, light requirements, cold tolerance, disease and pest resistance, and plant vigor. Specific information on varieties is usually provided by breeders and/or marketers.

Growers who produce multiple varieties will have the market advantage. However, different varieties can also have different scheduling needs and production practices will have to be modified accordingly.

Production

A heated greenhouse structure is necessary for producing poinsettias. Tobacco greenhouses can be used; however, poinsettia production during the late summer and fall might compete for labor with tobacco harvest, housing and stripping.

Poinsettias are propagated vegetatively from cuttings taken from stock plants. A key decision facing new growers is whether to produce their own stock plants for cuttings or to purchase cuttings, either unrooted or rooted. Intermittent mist, root-zone heating and lighting are essential for rooting high-quality poinsettia cuttings. Once rooted, cuttings are transplanted directly to the final container for "finishing."

There is no single best growing substrate for producing quality poinsettias; however, a very well-drained substrate is important to prevent waterlogging and potential for disease infection. Peat-based substrates are most commonly used, but bark-based substrates can produce comparable crops but may require more irrigation.

It is important to maintain an optimal substrate pH range from 5.5 to 6.5 for poinsettia production. If the substrate pH drifts lower than 5.5, plants will become stunted and bract color development is delayed. Sub-

strate pH below 5.4 to 5.6 may inhibit magnesium (Mg) uptake, resulting in lower or older leaves becoming Mg-deficient and exhibiting interveinal yellowing. Monthly applications of Epsom salts delivered in the irrigation system without fertilizer will prevent Mg deficiency and symptomology development. Substrate pH values above 6.5 inhibit iron availability and cause interveinal yellowing to develop on the upper leaves and stunted plant growth.

Poinsettias require medium to high fertility levels between 150 and 300 ppm N, with the rate adjusted to take into account plant vigor. Individual plant nutrient elements such as potassium, calcium, sulfur, or molybdenum (Mo) may become deficient. Molybdenum deficiency can readily occur during poinsettia production. The most common symptomology observed is a thin, marginal yellow halo-like band that occurs on recently matured leaves (middle of plant) ranging from the leaf tip to base. Leaf distortion, rolling, and leaf edge burn or death may also be observed. To prevent Mo deficiency, growers must consider providing supplemental applications of Mo.

As stated above, poinsettias are sensitive to day length and even low light from artificial sources, such as streetlights, can delay flowering. Where external light sources are a problem or to initiate flowering at an earlier date than would naturally occur, black-out curtains should be used to sustain the dark period or skotoperiod. Selection of cultivars to meet the market demand and precise monitoring and controlling day length, light, temperature and nutrition are necessary to produce a marketable and profitable crop on schedule.

Plants should be pinched to induce lateral shoot development. Growers should pinch plants to six to eight nodes from the substrate line two weeks after transplant or once roots meet the side of the container. Most often, pinching can be performed in late August or early September. Of course, pinching and lateral shoot growth and development will vary based on the environmental growing conditions, cultural practices, and market. It is critical that pinches be made on time according to schedule. Chemical plant growth regulators (PGRs) that reduce internode stem elongation are normally applied for height control. Other PGR options can be applied to enhance stalled plant growth.

Pest management

Greenhouse conditions that favor plant growth and development also favor the rapid build-up and spread of insects and diseases. Prevention and careful monitoring are the keys to insect and disease management. Controlling weeds under benches and around the greenhouse will also help reduce insect pests and disease problems; however, herbicides must never be applied in a greenhouse when crops are present.

Potential disease problems include Rhizoctonia root and stem rot, Pythium root rot, Thielaviopsis black root rot, Botrytis blight and bacterial soft rot. Regular preventative fungicide drenches in combination with good sanitation and cultural practices are essential to controlling poinsettia diseases. Common insect pests include whiteflies, thrips, fungus gnats, shoreflies and spider mites. Using yellow sticky cards to monitor insect populations can help growers determine when and how often insecticides should be applied.

Post-production

Poinsettias are finished and ready to be shipped when the primary bracts are fully colored and pollen is visible. Plants should be removed from the greenhouse environment within one to two weeks of reaching maturity. Sleeving helps protect plants during transport; however, sleeves should not be left on more than 24 hours from greenhouse to market. Temperature must be controlled through the shipping and selling process. Prolonged exposure to temperatures below 45°F will damage poinsettia bracts, and below freezing temperatures will damage the entire plant in a very short time.

Economic Considerations

Poinsettia production is a high-risk business with significant start-up costs as well as demanding labor and management. Typically, the profit margin for growing poinsettias is very low because of a highly competitive marketing environment. Some growers choose to produce poinsettias in a rotation with bedding plants. This enables them to keep their greenhouse in full production year-round and to receive some profits during the fall.

Initial investments include greenhouse construction, production system costs, and equipment. The cost of a production-ready greenhouse, excluding land costs, can run from the $5 per square foot range for a Quonset-style poly house to more than $20 per square foot for glass panel houses. Production costs and returns vary greatly depending on crops grown, greenhouse size, production system, and marketing strategy. Producers should develop production cost estimates specific to their situation. Useful worksheets for developing poinsettia production budgets may be found in the resource list below. A thorough discussion of poinsettia budget considerations is found in the Texas A&M Poinsettia Producers Guide.

Selected Resources

On the Internet

- Poinsettia Economics and Marketing (Texas A&M) http://aggie-horticulture.tamu.edu/ornamental/the-texas-poinsettia-producers-guide/economics-marketing/
- Greenhouse Business in Kentucky – A Review of Crops and How to Begin a Business (University of Kentucky, 2002) https://www.uky.edu/hort/sites/www.uky.edu.hort/files/documents/greenhousesinkentucky.pdf

• Managing Greenhouse & High Tunnel Environments to Reduce Plant Diseases, PPFS-GH-01 (University of Kentucky, 2016) http://plantpathology.ca.uky.edu/files/ppfs-gh-01.pdf
• Poinsettia Diseases, PPFS-GH-06 (University of Kentucky, 2010) https://plantpathology.ca.uky.edu/files/ppfs-gh-06.pdf
• Selected Resources and References for Commercial Greenhouse Operators (University of Kentucky, 2002) http://www.uky.edu/hort/sites/www.uky.edu.hort/files/documents/greenhousereferences.pdf
• North Carolina State University Floricultural Science Poinsettia Portal https://poinsettias.ces.ncsu.edu
• Floriculture (Purdue University) https://ag.purdue.edu/hla/Extension/Pages/floriculture.aspx
• Poinsettia Propagation, HO-235-W (Purdue University, 2009) https://www.extension.purdue.edu/extmedia/ho/ho-235-w.pdf
• Greenhouse Costs of Production Budgets: Poinsettias (Rutgers Cooperative Research and Extension, 2008) http://farmmgmt.rutgers.edu/greenhouse/poinsettias/ghpoinsettiasbudget.htm
• Interactive Greenhouse Crop Budget with Five Crops (Rutgers University) http://farmmgmt.rutgers.edu/green-house/greenhouseinteractiveform.html
• Integrated Pest Management for Greenhouse Crops (ATTRA, 2014) https://attra.ncat.org/product/integrated-pest-management-for-greenhouse-crops/
• Texas Poinsettia Producers Guide (Texas A&M) https://aggie-horticulture.tamu.edu/ornamental/the-texas-poinsettia-producers-guide/
• Virtual Grower 3 (USDA-ARS) http://www.ars.usda.gov/Research/docs.htm?docid=22087

In print
• Ball RedBook: Crop Production (Vol. 2). Jim Nau, editor. 2011 (18th edition). Ball Publishing, Inc.: West Chicago, IL. 800 pp. https://www.ipgbook.com/ball-redbook-products-9781883052683.php?page_id=32&pid=BPU

Suggested Citation:

Kaiser, C. and M. Ernst. (2020). *Poinsettias*. CCD-CP-64. Lexington, KY: Center for Crop Diversification, University of Kentucky College of Agriculture, Food and Environment. Available: http://www.uky.edu/ccd/sites/www.uky.edu.ccd/files/poinsettia.pdf

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Photos courtesy of W. Garrett Owen

November 2020