

Production of Edible Flowers in Florida¹

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Edible flowers are an emerging category of food items. Contemporary chefs are showing a renewed interest in edible flowers and new cookbooks, along with popular articles in the United States highlight this interest (Bradley 2014; Bradshaw 2018; Breyer 2017; Sandborn 2015). Consumers appreciate edible flowers' flavor, color, and texture, and typically use them to garnish main dishes, entrees, desserts, salads, soups, and drinks (Barash 1993; Barash 1998a, b; Belsinger 1991; McVicar 1997; Rusnak 1999). Although their popularity in the US is recent, edible flowers have been part of European, East Indian, Middle Eastern, and Asian culinary traditions for at least a thousand years (Cichiwecz et al. 2004). There are more than 55 known genera of edible flowers (Badertscher and Newman 1996; Barash 1993; Belsinger 1991; Mcvicar 1997), some of which are commonly grown in Florida (Table 1).

In many edible flower varieties, flowers, flower buds, and leaves can be edible and contain high concentrations of bioactive metabolites, which provide medicinal benefits. In addition to being beautiful in any dish, edible flowers contain many minerals and nutrients such as vitamins A, C, riboflavin, and niacin (Arya et al. 2014; Petrova et al. 2016). They also possess anti-inflammatory, anti-mutagenic (neutralize mutation-inducing agents), anti-nociceptive (offer relief from nerve pain), and anti-tumorigenic (counteract the formation of tumors) properties (Ratnasooriya et al. 2005; Ukiya et al. 2002, 2006; Wongwattanasathien et al. 2010). Edible flowers are thus valuable because of their visual appeal, taste, nutritional content, and medicinal

properties; therefore, they are considered “functional foods”.

Small-scale growers have been successfully producing edible flowers in Florida. They target local outlets such as farmers' markets, grocery stores, and high-end restaurants and bars. The success of these growers is dependent upon producing sufficient edible flowers weekly, because the flowers generally have a limited shelf life (Hochmuth and Cantliffe 1990).

To maintain shelf life of edible flowers, they are packaged and distributed in small, rigid, and clear plastic containers (Whitman 1991) that are placed for sale in refrigerated displays. In general, refrigerated cases in grocery stores are maintained at 8°C and 9°C in the winter and summer, respectively (Le Blanc et al. 1996). Kelley et al. (2003) recommend a storage temperature of around to 10°C for some species of edible flowers to ensure a median one-week shelf life and maintain marketability.

Although growers and distributors are mainly concerned with lengthening the shelf life of edible flowers, they should also consider the food safety hazards of these products, which are intended to be eaten raw. Doyle and Erickson (2008) highlight the increasing concern about possible contamination of fresh produce. Therefore, producers should further scrutinize possible sources of contamination and consider implementing practices that reduce risks before the product reaches the consumer. When considering edible flowers and food safety, producers should advise

1. This document is HS1321, one of a series of the Horticultural Sciences Department, UF/IFAS Extension. Original publication date July 2018. Visit the EDIS website at <http://edis.ifas.ufl.edu>.

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consumers to store all fresh, edible flowers in a refrigerated space until ready to eat and, immediately prior to consumption, they should rinse in fresh water to remove potential contaminants (Wetzel et al. 2010) and also remove the styles and stamens from the flowers, as the pollen may cause an allergic reaction (Mlcek and Rop 2011). The production and commercialization of edible flowers can be successful with good food safety practices and solutions for the possible problems.






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Table 1. Edible flowers grown in Florida. Common herbal medicinal uses, colors, varieties, and seed sources are listed.

Common name (<i>Scientific name</i>)	Common uses	Color	Variety	Company
 <p>Alysum (<i>Lobularia maritima</i>) Credits: Johnny's Seeds</p>	Antiscorbutic Astringent Diuretic	Peach, pink, purple, white, and yellow	Sweet alyssum	Johnny's Seeds, Burpee, Eden Brothers, American Meadows, Bulk Seed Store, Harris Seeds, Swallowtail Garden Seeds, Lowes, and Amazon
 <p>Amaranthus (<i>Amaranthus spp.</i>) Credits: Johnny's Seeds</p>	Carminative Astringent Depurative Diuretic Laxative Stomachic	Deep purple, pink, and red	Coral Fountain, Emerald Tassels, Love-Lies-Bleeding, Hot Biscuits	Johnny's Seeds, Burpee, Eden Brothers, Amazon, True Leaf Market, Sustainable Seed Company, Rare Seeds, Seeds Now, and Grow Organic
 <p>Amazon Neon (<i>Dianthus spp.</i>) Credits: Monica Ozores-Hampton</p>	Anthelmintic Antibacterial Diaphoretic Diuretic	Pink, purple, and purple with white	Cherry, Purple, Rose magic	Johnny's Seeds, Burpee, Eden Brothers, Bulk Seed Store, Harris Seeds, Swallowtail Garden Seeds, and Amazon. Organic seeds available.
 <p>Basil (<i>Ocimum basilicum</i>) Credits: Johnny's Seeds</p>	Antimicrobial Antioxidant Antimicrobial	Purple	Aromato	Johnny's Seeds, Eden Brothers, Bulk Seed Store, Harris Seeds, Amazon, Seeds Now, Seeds of Change, and Park Seed. Organic seeds available.
 <p>Borage (<i>Borago officinalis</i>) Credits: Monica Ozores-Hampton</p>	Anticonvulsant Bronchodilator Vasodilator	Blue	Borage	Burpee. Organic seeds available.

	<p>Antiseptic Anti-inflammatory Bactericide</p>	<p>Orange and yellow</p>	<p>Alpha, Resina</p>	<p>Johnny's Seeds, Burpee. Organic seeds available.</p>
	<p>Anti-complementary Anti-coagulant Anti-inflammatory Anti-viral Hypoglycemic Immunological</p>	<p>Blue, pink, purple</p>	<p>Classic magic</p>	<p>Johnny's Seeds, Eden Brothers, Park Seed, True Leaf Market, Amazon, Harris Seeds, American Meadows, and Swallowtail Garden Seeds. Organic seeds available.</p>
	<p>Antioxidant Anti-inflammatory</p>	<p>White</p>	<p>Chamomile, Roman chamomile</p>	<p>Johnny's Seeds, Burpee</p>
	<p>Flavor additive</p>	<p>Pink and purple</p>	<p>Ruby moon</p>	<p>Johnny's Seeds, Eden Brothers, True Leaf Market, Park Seed, Amazon, Grow Organic, and Swallowtail Garden Seeds</p>
	<p>Anti-inflammatory Antiseptic</p>	<p>Purple</p>	<p>Elegance purple and Munstead-type</p>	<p>Johnny's Seeds, Burpee, Eden Brothers, Bulk Seed Store, Sustainable Seed, Park Seed, and Grow Organic. Organic seeds available.</p>
	<p>Carminative Diuretic Expectorant Febrifuge Stimulant</p>	<p>Pink, red, and white</p>	<p>Panorama</p>	<p>Johnny's Seeds, Burpee, Eden Brothers, Amazon, Swallowtail Garden Seeds, and American Meadows</p>
<p>Calendula (<i>Calendula officinalis</i>) Credits: Monica Ozores-Hampton</p>				
<p>Centaurea (<i>Centaurea cyanus</i>) Credits: Johnny's Seeds</p>				
<p>Chamomile (<i>Matricaria recutita</i>) Credits: Caroline Tardivo</p>				
<p>Hyacinth Bean (<i>Dolichos lablab</i>) Credits: Johnny's Seeds</p>				
<p>Lavender (<i>Lavandula</i>) Credits: Johnny's Seeds</p>				
<p>Monarda (<i>Monarda didyma</i>) Credits: Johnny's Seeds</p>				

	Antibiotic Antiscorbutic Disinfectant Expectorant	Cream, orange, red, and yellow	Night and day, Empress of India	Johnny's Seeds, Burpee. Organic seeds available.
	Antioxidant Anti-inflammatory	Blue, red, purple, orange, pink, yellow, white, green, and brown	Victoria blue	Johnny's Seeds, Burpee, Park Seed, Swallowtail Garden Seeds, and Eden Brothers.
	Flavor additive	Red	Scarlet runner bean	Johnny's Seeds.
	Flavor additive	Pink, purple, lavender, orange, red, yellow, and white	Madame butterfly	Johnny's Seeds, Burpee, Eden Brothers, Harris Seeds, Park Seed, Swallow Garden Seeds, and True Leaf Market.
	Flavor additive	White, blue to purple, and green to brown	Avalanche, Golden sweet, Oregon giant, and Royal snow	Johnny's Seeds, Seedway.
	Flavor additive	Cream, pink, peach, lavender, purple, blue, and white	Quartet yellow, White, Marine, Red, Purple, Fantasy and Iron pink, blue, purple, white, etc.	Johnny's Seeds, Burpee, Swallowtail Garden Seeds, and Stokes Seeds.



Viola (*Viola spp.*)

Credits: Monica Ozores-Hampton

Flavor additive

Yellow, blue, orange, and violet

Tricolor, Helen mount

Johnny's Seeds, Burpee.