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Getting Started in the Production of Field-Grown, Specialty Cut Flowers

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Specialty cut flowers are one of the most profitable field crops you can grow. Lynn Byczynski, editor of Growing For Market newsletter (see Resources section), estimates a value of $25,000 to $35,000 per acre for field-grown cuts. The most basic requirements are at least half an acre of open, arable land, a rototiller, and, of course, time and effort. This publication is directed to those new to market gardening, but commercial vegetable growers, tobacco farmers, and young people interested in summer income are all potential candidates. Even grain and livestock farmers have increased profitability in their operations by adding cut flower production. For many greenhouse and nursery operations, mid-summer business is slower, relative to spring. A field-grown cut flower business is a viable option to fill in the summer production and cash flow gap.

"Specialty cut flowers" denote crops other than the major florist crops of mums, roses, and carnations. The term "cut flowers" includes a variety of plant material, both fresh and dried or preserved. Buds, flowers, stems, colorful or budding branches, seed heads, stalks — any plant parts used for floral and decorative purposes — are considered cut flowers. With the right product mix, production is not limited to summer. The number and diversity of herbaceous and woody crops is virtually limitless (fig. 1).

Figure 1. Even a small plot can produce a wide variety of material. Virginia Specialty Cut Flowers, Saluda, Va. Photo by Evelyn Scott.

Becoming a cut flower grower seems idyllic at first glance — armloads of blossoms, the association with romance and weddings. However, the reality of the business is that it is extremely labor- and time-intensive. This publication is designed to provide a production overview and to serve as a starting point to help you decide if the field-grown cut flower business is for you.

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Why Grow Cut Flowers?

The cut flower market in the U.S. has changed dramatically over the years. The Netherlands dominated the flower growing market in the '80s with new varieties. With the advent of affordable overnight airfreight, imports from Central and South American countries increased as they took a lion's share of the traditional, domestic cut flower market. In the U.S., the once-profitable production of standard crops like mums, carnations, and roses has been supplanted by nontraditional and specialty cut flowers. The U.S. flower consumption market — though not nearly as sophisticated and well-developed as the European and Japanese markets — has potential for expansion. Growing market segments exist, such as upscale supermarket floral departments and farmers markets. Though large quantities of cut flowers are imported into the U.S. from Central and South America, Holland, and the Caribbean, there is still a place (and profit) in the cut flower business for the savvy grower. Some relatively high-dollar-value crops do not ship well and are best produced locally. Local production usually equals longer vase life. As interest in locally grown food has skyrocketed, consumers are also paying attention to the proximity of other products. One of the most dramatic increases has been in the demand for locally grown wedding and event flowers.

The cut flower market is based on supply and demand, but you can often create your own demand by offering high quality and unusual products with reliable service to back it up. Crops produced in the cooler "shoulder" seasons (spring and fall in Virginia) can demand a higher price because the market is not typically flooded with product (fig. 2).

Especially in reference to the small or starting grower, the following phrase is repeated over and over in the industry literature: *Quality sells*. Grow for quality and don't be afraid to charge for it — price will follow quality.

Who or Where Is My Market?

The profitable grower does not wait until he or she has harvest-ready flowers to decide their fate. Have a clear market plan established ahead of time. Your target market influences what you will grow, how it will be handled and packaged, and most important, the capital investment required. Cut flowers are usually sold by the bunch, in arranged bouquets, or individually.

Figure 2. An unheated cold frame provides enough protection to produce cool-tolerant crops like poppy (*Papaver*) and *Ranunculus* in early spring. Wollam Gardens, Jeffersonton, Va. Photo by author.

Marketing options include selling to wholesalers, florists, or other retail outlets, or directly to the public. The obvious route when first starting out is to target local markets. As your volume increases, you may want to deal with wholesalers and distributors. "Direct to the public" sales include farmers markets, roadside stands, or cut-it-yourself operations. How much you wish to interact with the public can help determine if a direct sales business is right for you. On-site sales, whether in the field or from a stand, require a good location in a populated area and a desire to deal with (not merely tolerate) the general public. Production considerations may be altered a bit for the "cut your own" concept. If you are integrating a field cut flower business with a pre-existing greenhouse, nursery, or farm stand that retails to the public, the additional marketing requirements would be minimal.

There are many direct sales opportunities away from the farm as well, though transportation becomes a cost factor. Farmers markets offer a low-overhead venue for novice growers, but competition is growing. Popular markets often have a wait list of vendors, and many established vegetable growers are getting into cut flowers. But if you can get into a market, you can experiment with displays, mixed bouquets, dried materials, etc., and enjoy relatively autonomous pricing. Bouquet subscriptions have proved profitable for many growers, with the products delivered periodically to a central location for pick up, much like a CSA (community supported agriculture) share. Additionally, many CSAs offer cut flower bouquets or bunches as a subscription

add-on. Craft shows are great sales venues for preserved/dried plant material.

Many growers that sell directly to the public end up as ad hoc floral designers for weddings and special events. If you're a real "people person," this can be a great niche; if not, the time pressures and high expectations of the bride can be unpleasant. Sales to retailers such as florists, garden centers, grocers, and upscale or gourmet specialty stores are other options. Industry experts suggest that for businesses other than florists, start with a few sizes of mixed bouquets, then move to quantities of single species. Offer premade bouquets as a labor-saving option to florists. Florists are constantly searching for new and unusual material, often direct from the grower.

Selling to wholesalers is an attractive option for those who prefer not to deal with direct sales. Wholesalers will usually insist you meet their grading, sorting, and packaging requirements, and consistency is greatly appreciated. Though the price will be lower, wholesalers will often accept large quantities. If you are selling to both retail florists and to wholesalers, offer your wholesaler a quantity-based price break. Be aware that when dealing with wholesalers, payment is usually made 30 to 45 days out, so don't expect c.o.d. terms. An important caveat: If you form a relationship with a wholesaler, do NOT undercut them by selling directly to their retailers/florists. Also, consignment sales are not recommended. If you're offering your product at wholesale prices, let someone else do the marketing and make the retail contacts. For a directory of wholesale florists and florist suppliers, contact the Wholesale Florist & Florist Supplier Association (see Resources).

Regardless of your target market, create a website so you can provide product information to potential customers. Customers of all kinds appreciate current product availability lists that are updated weekly or even daily. A number of website platforms and plug-ins can help you create interactive order forms. Photo galleries of both your products and your farm are tremendous selling tools. Social media is a natural and valuable extension of your website and is the equivalent of "word of mouth" promotion (fig. 3).

Try to establish one consistent factor in your pricing. Some examples include: the same number of stems per bunch regardless of species; the same price per bunch but vary the number of stems (good if offering a large assortment of unusual material). The fewer price points, the better. Regardless of your market, consistency of quality and service should be your business goals. In order to compete with the offshore (lower price) market, local growers must offer comparable quality, grading, packaging, and promptness. Educate your buyer. Provide price lists, quantities available, descriptions of the material if it is unusual or not well-known, and postharvest recommendations — basically anything to improve quality of service.

Product Variety: Find A Niche

There are annuals, perennials, grasses, woody shrubs, trees, and vines all suitable for use as cut flowers or other cut plant material. Flowers can be grown specifically for fresh use, dried use, for parts other than flowers such as seed pods, or any combination of these. Start with species or varieties proven to grow in your area. Virginia's climates are as varied as its geography.

Figure 3. Facebook, Twitter, and other social media sites are free, yet effective ways to gain customers as you market your products and services. Facebook page created by Audrey Hodges, Faith Flower Farm, Virginia Beach, Va.

Introduce other species on a trial basis before committing to large-scale plantings.

Annuals will produce in the year planted and most are easily started from seed (fig. 4). Annual seed is readily available and lower in cost compared to perennials and bulbs. Tender or half-hardy perennials can also be grown as annuals, with a bonus if they overwinter.

The choices for perennials are endless. Some traditional perennial crops that bring a good price include peonies (both fresh and dried), lily of the valley, and calla lilies. Garden-type roses are a possibility for the specialty florist market. Fragrant heirloom roses such as cabbage and bourbons can fetch top dollar during the wedding season. Woody species can be used to extend production time to include very early spring stems and flowers (either naturally or on forced branches such as pussy willow or flowering apricot), summer flowers (*Buddleia*), late-season berries, or ornamental stems such as the corkscrew willow (*Salix matsudana* cultivars) harvested in the fall and winter (fig. 5).

Relatively low-maintenance and long-term production are benefits of including "woodies" in your field-grown cuts program. Keep in mind that it may take a few years for some species to reach marketable harvest size.

Both wholesalers and florists want to be the first with unusual or improved varieties. If you have the space, consider a larger product mix. A wide variety of cuts allows you to service a greater percentage of the needs of your customers. Consistently test new crops. The ability to provide the floral wholesaler or retailer with unusual material will make you invaluable. Most wholesalers or retailers will pay for samples of a new variety. In the same vein, be aware of changes in consumer style and color preferences. Comb the pages of greenhouse, floral, and horticultural industry publications and websites along with consumer lifestyle magazines to keep abreast of what's hot. Look for the best cultivars of a particular species you want to grow. New varieties may offer higher yields and better disease resistance. Be cautious when jumping on a bandwagon. If a species is particularly popular or profitable this season, chances are good that it will be available in mass quantity the following year.

For information on everything from new cultivars to production techniques, consider joining the Association of Specialty Cut Flower Growers. This grower-based group offers bountiful information in the form of a great newsletter, The Cut Flower Quarterly, plus access to back issues, cut flower-related publications, discussion lists, regional meetings, and an annual conference with excellent opportunities to learn from other growers.

Figure 4. There are myriad species, hybrids, and cultivars of easy-to-grow annual *Celosia* — one of the most useful cut-and-come-again crops.

Figure 5. Bright late-winter stems of *Forsythia*, yellow-twig dogwood (*Cornus*), and pussy willow (*Salix*), ready for delivery. Wollam Gardens, Jeffersonton, Va. Photo by author.

Costs of Cut Flower Production

Relatively little work has been done on the economics of field production of cuts. However, many resources provide budgets for outdoor production of vegetables, and these can be valuable references. The categories of overhead and variable costs are roughly similar to those incurred in greenhouse production, but there are some important differences. Robin Brumfield, agricultural economics Extension specialist at Rutgers University, recommends tracking costs with the following system:

- Variable costs are allocated to each unit of production. These costs of production will change as the units of production change. Variable costs include materials such as fertilizer, lime, plants, chemicals, etc. Production labor is also allocated to each unit.

- Overhead or fixed costs are incurred without regard for the number of units produced. As more units are produced, the fixed cost per unit decreases.

If you are already in the nursery or greenhouse business, you are probably aware of the factors that make up total labor costs per hour — not just the hourly rate, but social security, workers' compensation, unemployment and disability insurance, and paid holidays. Be sure to include these, if applicable, when calculating total labor costs per hour.

Overhead costs are not allocated to a specific crop. Costs must be allocated by some other method, such as cost per acre. Overhead costs include irrigation equipment (don't even consider not having irrigation) and related fertilizer proportioners, storage tanks, or farm ponds. Machinery, equipment, and buildings make up a substantial percentage of fixed costs. Tractors, fertilizer spreaders, sprayers, carts, wagons, delivery trucks/trailers, coolers, sheds, and office buildings are all considered initial investments. Depreciation on these items should be calculated in terms of "useful life." Keep good records and be cognizant of all costs involved on a daily basis to be sure you are receiving fair value for your product.

Develop a business plan and stick with it! Experts advise against increasing the size of your business until you know it is profitable. An interesting industry trend is toward smaller acreage for cut flower production: 0.5 to 2 acres. Overproduction can be a problem. Most local markets can't accommodate the volume produced on 10 acres of cut flowers, no matter how beautiful they are! One of the best investments can be in labor-saving technology. The cost savings can be substantial. Also, understand local environmental regulations, both current and impending. Invest in facilities and techniques that lessen your dependence on chemicals.

Crop Production Methods

Site Selection and Beds

The ideal site for cut flower production is in full sun with wind protection, an irrigation source, and easy access. Raised or mounded beds are virtually required to ensure proper drainage (unless the soil is very sandy). A bed height of 4 to 8 inches should suffice, and drainage can be enhanced by burying drain lines 12 inches below the beds. Break up the hardpan or clay layer at least 1.5 to 2 feet deep with a subsoiler. If a small tractor is already part of the farm, a time and labor-saving investment in a raised bed maker/plastic mulch layer may be worthwhile. Beds can be any length. Keep in mind that beds should be narrow enough for you, your employees, and/or customers to reach comfortably to the middle of the bed; 4 feet wide is a good target size. Aisle width is just as important; be sure to leave enough space to maneuver carts, wheelbarrows, etc., between the rows.

Proper preparation of the beds is essential to optimum growth and yield. There is no excuse for guessing as to the soil nutrient content; soil samples are analyzed for a nominal charge by the Virginia Tech Soil Testing Laboratory (www.soiltest.vt.edu), part of Virginia Cooperative Extension. Soil sample boxes and information sheets are available at local Extension offices (www.ext.vt.edu/offices). Amend beds with plenty of organic material. Well-composted horse or cow manure is excellent. Be sure it has aged to the point where weed seeds are no longer viable. Incorporate lime, superphosphate, and other nutrients as recommended by the results of your soil test.

If any of the beds are to lay fallow for a length of time, such as over winter, cover crops are excellent for increasing the organic matter content of the soil and reducing erosion. Recommended fall and winter cover crops for Virginia include hairy vetch, rye, barley, and crimson clover, or better yet, a combination of two or more of these crops. Summer cover crops can include soybeans, cowpeas, buckwheat, and sesame.

Mulch can be used over and/or between the beds for weed suppression and moisture retention. Mulching materials include plant byproducts such as bark, wood chips, straw, and more. Black plastic or landscape fabric is the mulch of choice of many larger operations (fig. 6). Others prefer to till between rows to control weeds. Because of the large variety of species grown as cut flowers, no single herbicide can be recommended.

Irrigation

Growing top-quality flowers and foliage requires consistent moisture. Do not depend on rainfall to provide all the plants' moisture needs. Most growers utilize drip irrigation as a time- and water-saving alternative to hand watering with a hose and breaker. Simple drip systems include a valve at the head of the bed connected to a main line, with a pressure-compensated tube or tape running the length of the bed, usually under the mulch. Depending on bed size and spacing of the crop, two lines per bed may be desirable. Emitters should be close to, but not on top of, the plant crown. Inexpensive timers can control the volume and frequency of irrigation events. Regarding all aspects of bed preparation, a bit of effort and expense early on can really pay off in crop quality, less weeding, and ease of harvest for the rest of the season.

Plant Material

Plant material can be acquired from a number of sources. Some seed-grown annuals can be "direct sown" into the beds; most are best transplanted as seedlings started in cell trays, called "plugs" for annuals. Vegetatively propagated perennials and woodies are also produced as rooted cells or "liners" (fig. 7). Plugs/liners can be brought in or produced on-site. Producing plugs and liners does require some sort of protected and temperature- and humidity-controlled germination or rooting area — a simple poly hoop house or glass-walled lean-to will suffice. Some annual species should be seeded in succession to continually produce as long as the growing season allows. Perennials are best started in cell trays (versus direct sown), whether seed or vegetatively propagated. There are many commercial sources for large plugs and starter plant liners. If perennial species are planted out in the spring, be sure they have been vernalized (cold treatment to induce flowering) if that particular species requires it in order to flower that season. For some slow-growing species, start with a larger plant, such as 1- or 2-gallon material. Many spring geophytes, such as daffodils and tulips, make terrific cuts; start with fall-planted bulbs, corms, and tubers. Dormant, bare-root perennials and woodies are available in early spring. Crop rotation for annuals is a good idea. Change sites to reduce the incidence of soil-borne pathogens.

Figure 6. Beautifully prepared beds await spring planting. Plastic mulch systems have long been used by vegetable growers and adapt well for cut flower production. Irrigation lines run down the center of each bed. Wollam Gardens, Jeffersonton, Va. Photo by author.

Figure 7. Make more plants! Tip cuttings of lavender (*Lavandula*) are held under mist until rooted. Photo by author.

Figure 8. Plastic mesh is a must for support of taller varieties. The Virginia Tech Catawba Sustainability Center, Catawba, Va. Photo by author.

Spacing and Support

Optimal spacing varies between species. What seems adequate spacing for a row of perennials the first year may result in overcrowding the following year. Dense spacing can lead to a higher incidence of disease because air circulation is limited. Conversely, too much space is an invitation to weeds and reduces yield per square foot. Note that for some species, dense planting encourages longer stems. The spacing of annuals varies by species, ranging from 4- to 6-inch centers to 1 foot by 1 foot. Be sure to thin rows to proper final spacing if direct seeded. Depending on the species' particular vigor, recommended spacing for perennial species ranges from 1 foot by 1 foot to 2 foot by 2 foot, or from 1 foot between plants to 2 to 3 feet between rows. Woody plants should be placed on 3-foot centers with more aggressive or larger species on 5-foot centers. Maintain moist conditions until plants are well established.

Division is beneficial (or imperative) for many perennial species after the second or third year of production in order to maintain productivity. Most tall or relatively top-heavy species will require stem support. Rig beds with adjustable wire or plastic mesh/grid that can be raised as plants mature (a popular brand is Tenax/Hortonova; fig. 8). Be sure the netting and supports are in place before the plants get too tall. It's extremely difficult to "retrofit" support without damaging the plants.

Many perennial species benefit from pinching (or shearing) early in the season to encourage branching and obtain the maximum number of stems per plant. Pinch as soon as the plants are well-established and elongating. Leaving some of the crop unpinched can result in earlier flowering and larger flowers with the trade-off of fewer stems. Consult crop-specific references for timing.

Fertilizer

Fertilizer requirements differ from crop to crop. Some annuals, such as the annual sunflower (*Helianthus annuus*), are heavy feeders and require periodic fertilization throughout the growing season. Some perennials, including ornamental grasses, require very little. Fertilizer delivery methods range from broadcast or side-dress application of a granular fertilizer or compost, to "fertigation" (application of nutrients through the irrigation system). Again, be sure to get a soil test before proceeding. Incorporation of a slow-release fertilizer during spring (not fall) tilling will give young plants a jump-start. Periodic on-site monitoring of soil and irrigation water pH and soluble salts will be a tremendous help in designing and adjusting an appropriate fertilizer program. The scope of this overview publication does not allow a full discussion on fertilizer sources and recommendations. Consult the cited references or your local Cooperative Extension office. Again, many vegetable production guides contain applicable fertilizer regimens and products.

Pest Management

Pests for field-grown cut flowers run the evolutionary gamut, from powdery mildew, aphids, and Japanese beetles, to rabbits, deer, and unscrupulous passers-by. Integrated pest management is highly recommended as a money-saving and environmentally acceptable pest and pathogen control method emphasizing proactive scouting. The cut flower field is full of pollinator attractors (though pollination is not desirable; it can shorten vase life for some species). Systemic pesticides or those with surface residue can harm pollinator populations. Again, some of the most relevant guides to field integrated pest management can be found in vegetable production literature. If you are able to use organic means or biological controls to produce your crop, tell your customers! It is absolutely a marketing edge.

Crop Harvest and Handling

When harvesting in warm weather, it is imperative that field-grown cut flowers be cut early in the morning. Harvest when plant water status is high, and temperatures and transpiration are relatively low. If possible, wait until dew or other moisture has evaporated. Wet flowers and foliage are more susceptible to postharvest pathogens. Do not harvest when light level and temperature are at their maximum. Shading the freshly harvested material also helps maintain lower temperatures. Harvesting at the proper stage of development for each species is very important: Too early, and some species may not open; too late can result in drastically reduced vase life. Harvest is the most labor-intensive aspect of cut flower production. Communication with your harvest workers is essential! Be clear about what is acceptable and what isn't to ensure uniformity of the product.

Field and handling sanitation are just as important as they are in the greenhouse business. Keep fertilizer injector systems, harvest knives or shears, postharvest handling buckets, surfaces, and coolers clean and sanitized. Do your cutting, grading, and bunching in rapid succession to eliminate excess handling that can increase the cut's exposure to pathogens and water stress.

More product than current demand? Don't leave it in the field! There are numerous ways to preserve and make use of surplus cuts: air drying, oven drying, silica gel, glycerin, etc. A number of publications discuss this subject; see the list of resources at the end of this article.

Postharvest Handling

Proper postharvest care of your cuts is essential for maintaining high quality and a long vase life. The plant's life processes continue even after the stem is cut; respiration, transpiration, growth, and development still happen. The cut stems and flowers remain sensitive to damage and disease. Floral preservatives and other additives are a necessary part of the postharvest process. Refer to specific recommendations for each species in Virginia Cooperation Extension publication 426-619, "Field Production of Cut Flowers: Potential Crops" (http://pubs.ext.vt.edu/426/426-619/426-619_pdf.pdf). Cool water can serve to promote cooling of the stems. Warm water is useful if the cuts are under extreme water stress. Monitor water pH. Acidic water (pH of 3.0 to 5.5) inhibits bacterial growth, helping flowers persist longer. Preservatives are also formulated to be effective at a lower pH. Mixing your own postharvest preservative concoctions is not recommended. There are many commercial sources for flower preservatives, conditioners, hydrators, and ethylene inhibitors.

Ethylene is another important consideration affecting postharvest longevity. Flowers cannot be stored with any kind of fruit or vegetable. The ethylene produced by the fruit or veggie will result in premature floral senescence. Good ventilation and removal of dead and dying flowers is essential to maintain a relatively ethylene-free environment.

Grading, Packing, and Delivery

There is no mandatory grading system for specialty cut flowers in the U.S. Voluntary grading standards exist for the major cut flower species as established by the Society of American Florists. General rules of thumb apply, however, emphasizing uniformity: no greater than 10 percent deviation in stem length, relative uniform stem diameter, flowers of uniform size and stage of development. Ten stems per bunch is the standard for most species, with some species sold in fives or as singles. There are myriad packing options: buckets, boxes, flowers held wet or dry; find out what is appropriate for the species you are growing. The majority of specialty cut flower growers use the indispensable 5-gallon plastic bucket (start collecting them now!; fig. 9).

Be aware that some species such as snapdragon and gladiolus exhibit a negative geotropic response: stems laid flat will bend upward, away from the gravitational

Figure 9. Sorting and bunching stems in preparation for market. Note the shade structure and large working space. Wollam Gardens, Jeffersonton, Va. Photo by Kim Jefferson.

pull, resulting in curved stems, so keep them as upright as possible. Vehicular and personnel requirements necessary for timely deliveries are often overlooked in the planning of a cut flower business. If not considered in planning your business, these things can get complicated (and expensive), reducing efficiency and profits. One alternative is to deliver directly from the field in the morning. This works adequately for immediate delivery to local markets.

However, if you need to hold the flowers for any reason, such as accumulating certain cuts for a larger wholesale market, cold storage facilities will be necessary to maintain temperatures between 35 and 40 degrees Fahrenheit. There are many options available at a wide range of costs. These include built-in-place coolers, prefabricated cold storage units, or even modified refrigerated transportation units such as refrigerated semitrailers or ice cream trucks. One of the most popular options with small growers is one or more used convenience-store-type display coolers.

Transportation to market or wholesaler can be as simple as a cargo van with seats removed, or a pickup truck with a tall cap. Many creative designs exist for shelving and for holding buckets in place while en route. Do everything possible to transport the cuts during the coolest part of the day.

Want to Learn More? Resources for Additional Information

Numerous state floriculture and greenhouse associations (often associated with state Extension services) publish excellent newsletters. For the price of a (nominal) membership fee, up-to-date research and grower experiences can be yours. Visit your local botanical gardens/arboreta/field trials for the first glimpse of new species and cultivars. Commercial but small-grower-friendly seed purveyors such as Johnny's Selected Seeds (www.johnnyseeds.com) feature new varieties as well as proven favorites, along with germination and planting information. Finally, the previously mentioned Association of Specialty Cut Flower Growers is the best community and resource for all facets of the business (fig. 10).

Figure 10. Join the Association of Specialty Cut Flower Growers for access to a wealth of resources and opportunities! Website image used with permission of ASCFG.

Resources and Recommended Reading

Books

Armitage, Allan M. 2008. *Herbaceous Perennial Plants: A Treatise on Their Identification, Culture, and Garden Attributes*. 3rd ed. Champaign, Ill.: Stipes Publishing. The definitive guide to herbaceous perennials.

Armitage, Allan M., and Judy M. Laushman. 2008. *Specialty Cut Flowers: The Production of Annuals, Perennials, Bulbs, and Woody Plants for Fresh and Dried Cut Flowers*. 2nd ed. Portland, Ore.: Timber Press. A to Z production information for specialty cut flower crops. Coverage by genus and species includes propagation, environmental requirements, field and greenhouse performance, harvest and postharvest, and pests and diseases.

Arnosky, Frank, and Pamela Arnosky. 2010. *Local Color: Growing Specialty Cut Flowers*. Lawrence, Kan.: Fairplain Publications. This inspiring and entertaining book focuses on the authors' vast experience in raising cut flowers in the difficult climate of South Texas.

Byczynski, Lynn, 2008. *The Flower Farmer: An Organic Grower's Guide to Raising and Selling Cut Flowers*. 2nd ed. White River Junction, Vt.: Chelsea Green Publishing. From the publisher of Growing for Market newsletter, an outstanding resource for the beginning and experienced grower.

Dirr, Michael A. 2009. *Manual of Woody Landscape Plants: Their Identification, Ornamental Characteristics, Culture, Propagation and Uses*. 6th ed. Champaign, Ill.: Stipes Publishing. The definitive guide to woody ornamentals in the U.S. Useful cultural information for woody plants with "specialty cuts" potential.

Dole, John M., and Harold F. Wilkins. 2004. *Floriculture: Principles and Species*. 2nd ed. New York: Prentice Hall. Production information for a number of cut flower crops is included in the most comprehensive book on greenhouse, field, and foliage plant floriculture.

Greer, Lane, and John Dole. 2008. *Woody Cut Stems for Growers and Florists: Production and Post-Harvest Handling of Branches for Flowers, Fruit, and Foliage*. Portland, Ore.: Timber Press. Extend and expand your product line with much sought-after woody stems.

Other Resources

Associations

Association of Specialty Cut Flower Growers – www.ascfg.org. The quarterly newsletter that accompanies membership is an excellent resource for new crop information, marketing tips, industry news, and research updates. Members can have ongoing discussions of pricing, cultural techniques, and other topics in online forums. Regional and national conferences provide intensive learning opportunities.

Society of American Florists – www.safnow.org. The Society of American Florists provides marketing, business, and government services for all participants in the U.S. floral industry. Maintains the "Ultimate Floral Industry Supply Guide," with up-to-date links for services and supplies for retailers, wholesalers, and growers.

Wholesale Florist & Florist Supplier Association – www.wffsa.org. Provides networking and business opportunities to wholesale distributors and floral suppliers. Online search feature for wholesale floral and hardgoods suppliers.

Newsletter

Growing for Market – www.growingformarket.com. Lynn Byczynski, editor and publisher. A monthly newsletter for market gardeners. Absolutely a must! Contains a significant amount of information on cut flower production and marketing. This newsletter is geared for small-scale operations and focuses on sustainable production techniques. The newsletter is available in both print and online formats; one subscription allows access to the invaluable archives.

Website

North Carolina Cooperative Extension website: "Cut Flowers" – http://cutflowers.ces.ncsu.edu. Links to cut flower trials results, postharvest evaluations, upcoming events, etc. Also production information, including the "Southeast Outdoor Cut Flower Production Manual."

Services

Virginia Tech Soil Testing Lab – www.soiltest.vt.edu. Standard soil test (pH, P, K, Ca, Mg, Zn, Mn, Cu, Fe, B, and estimated CEC, plus a fertilizer and lime recommendation), free for farmers in Virginia.