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Getting Started in the Production of Field-grown Cut Flowers

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Do you have a roto-tiller and at least 1/2 acre of land? Consider cut flower production. Commercial vegetable growers, tobacco farmers, and young people interested in summer income are all potential candidates. Andy Hankins, VCE Extension Specialist for Alternative Agriculture, notes that even large-scale grain and livestock farmers have regained some profitability in their operations by adding cut flower production. For many greenhouse and nursery operations, mid-summer business is slow relative to spring. A field-grown cut flower business is a viable option to fill in the summer production and cash flow gap. Available, arable land of at least half an acre can be utilized. The term "cut flowers" includes a variety of plant material both fresh and dried or preserved. Buds, flowers, stems, branches, seed heads, stalks—any plant parts used for floral and decorative purposes—are considered to be cut flowers. The number and diversity of available crops are virtually limitless. Many people entertain the notion of becoming cut flower growers. Though the concept seems rather romantic, the reality of the business is that it's extremely labor- and time-intensive. This publication is designed to provide a production overview and to serve as a starting place to help you decide if the field-grown cut flower business is for you.

Why Grow Cut Flowers?

The cut flower market in the U.S. has changed dramatically over the years. The Dutch dominated the flower growing market in the '80s with new varieties. Competition from Third World countries increased as they took a lion's share of the "traditional" domestic cut flower market. Rising freight costs put a damper on shipping from one coast to the other. 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 incredible potential for expansion. Growing market segments exist, such as supermarket floral departments. Though large quantities of cut flowers are imported into the U.S. from Holland, Central and South America, and the Caribbean, there is still room (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. The cut flower market is based on supply and demand, but you can often create your own demand by offering high quality and unusual product with reliable service to back it up. Crops produced in the cooler "shoulder" seasons (spring and fall in Virginia) can demand a higher price since the market is not typically flooded with product. Especially in reference to the small or starting grower, the following phrase is repeated over and over in both the research and 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, your capital investment.

Cut flowers usually are sold by the bunch, in arranged bouquets, or individually. Marketing options include selling to wholesalers, florists or other retail outlets, or direct 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.

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"Direct to the public" sales include farmer's markets, roadside stands, or cut-it-yourself arrangements. How much you wish to interact with the public can help determine if a cut-your-own business is right for you. On-site sale, whether in the field or from a stand, requires a good location in a populated area, and a desire to deal with (not a mere tolerance of) the 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 or nursery 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 now becomes a cost factor. Farmer's markets offer a low-overhead market for novice growers. You can experiment with displays, mixed bouquets, dried materials, etc., and enjoy relatively autonomous pricing. There are many other retail opportunities available, such as restaurants, banks, etc. Craft shows are great sales venues for preserved and dried plant material.

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 pre-made bouquets as a labor-saving option to florists. Florists are constantly searching for new and unusual material.

Selling to wholesalers entails meeting their grading, sorting and packaging requirements, and consistency is greatly appreciated. Though 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. 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. If you form a relationship with a wholesaler, don't undercut them by selling directly to their retailers. For a directory of wholesale florists and florist suppliers, contact the Wholesale Florists & Floral Suppliers of America (see Resources).

Exporting to Europe is ambitious but now possible - for example, to meet tremendous demand for floriculture products, German markets have reduced import tariffs by 50% (Germany imported $2 billion worth of cut flowers in1998). USDA's Foreign Agricultural Service assists exporters interested in marketing their floricultural products in Germany and other countries.

Last but not least, the Internet offers a new marketing niche. You can provide product information in a website to potential customers, product availability lists updated weekly or even daily, and create interactive order forms. The Web is also useful for following price trends: the USDA publishes wholesale cut flower prices from major city markets such as Miami, New York, and San Francisco (http://www.ams.usda.gov/fv/mncs/fvwires. htm).

On the subject of pricing: 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).

Regardless of your market, consistency of quality and service should be your business goals. In order to compete with the offshore market (lower price), 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, postharvest recommendations - anything to improve quality and service.

Product Variety: Find Your 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 the preceding. Start with species or varieties proven to grow in your area - Virginia's climates are as varied as its geography. Introduce other species on a trial basis before committing to large-scale plantings. 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!

Annuals will produce in the year planted and most are easily started from seed. 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. 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 with fragrance are a possibility for the specialty florist market—also the heirloom roses such as cabbage and bourbons could fetch top dollar during the wedding season. Woody species can be used to extend production time to include early spring flowers (either naturally or on forced branches such as pussy willow or flowering apricot), summer flowers (*Buddleia* spp.) late season berries, or ornamental stems such as the corkscrew willow (*Salix matsudana cultivars*) harvested in the fall and winter. Relatively low maintenance and long-term production are benefits of including "woodies" in your field-grown cuts program. Do 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 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 "copycatting." If a species is particularly popular/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 the Association of Specialty Cut Flower Growers (ASCFG), 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, regional meetings, and an annual conference with excellent opportunities to learn from other growers.

Costs of Cut Flower Production

Relatively little work has been done on the economics of field production of cuts (many sources have developed budgets for outdoor production of vegetables - 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. 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.

Variable costs include materials such as fertilizer, lime, plants, chemicals, etc. Production labor is also allocated to each unit. If you are already in the nursery or greenhouse business, you are probably aware of the factors comprising total labor costs per hour - not just the hourly rate, but social security, workmen's 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.

Don't be timid concerning investing in new technology. The labor (read: cost) savings can be substantial. Also, understand local environmental regulations, both current and impending. Invest in facilities and techniques that lessen 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 beds are virtually required to ensure proper drainage (unless the soil is very sandy). 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. 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. 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, part of Virginia's Cooperative Extension. Soil sample boxes and information sheets are available at your local Cooperative Extension office. 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 has its proponents and detractors. Some growers insist on it for weed suppression and moisture retention. 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.

Plant Material

Plant material can be acquired from a number of sources. Annuals can be direct sown into the beds or transplanted as plugs (whether bought-in or produced on-site). Some annual species should be seeded in succession to continually produce as long as the growing season allows. Perennials are best started from plugs, 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, you may want to start with at least 4 inches to 1 gallon material. Crop rotation for annuals is a good idea. Change sites to reduce the incidence of soil-born pathogens.

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 higher incidence of disease as air circulation is limited. Conversely, too much space is an invitation to weeds and reduces yield per square foot. Note that dense planting often encourages longer stems. The spacing of annuals varies by species, ranging from 4 to 6 inch centers to 1 foot x 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 between 1 foot x 1 foot and 2 foot x 2 foot or 1 foot between plants and 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 year of production in order to maintain productivity.

Tall or relatively top-heavy species will require stem support. Rig beds with adjustable wire or plastic netting that can be raised as plants mature. 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 species, such as *Phlox paniculata*, benefit from pinching 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. Fertilizer delivery methods range from broadcast or side dress application of granular fertilizer to fertigation (application of nutrients through the irrigation system). 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. Limited space does not allow a full discussion on fertilizer sources and recommendations. Consult the cited references or your local Cooperative Extension service.

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. Fungicides, pesticides and shotguns are all of use in the battle for maximum yield. IPM (integrated pest management) is highly recommended as a money-saving and environmentally acceptable pest and pathogen control method for field cut flower production. If you are using only organic means or biological controls to produce your crop, tell your customers! Use it as a marketing edge.

Crop Harvest and Handling

Harvest

In warm weather, it is imperative that field-grown cut flowers be harvested early in the morning. Harvest when plant water status is high and temperatures and transpiration are relatively low. Wait until dew or other moisture has evaporated, if possible. Wet flowers and foliage are more susceptible to postharvest pathogens. Do not harvest when light level and temperature are at a 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 insure uniformity of the product. Field and handling sanitation is just as important as it is 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 one "fell swoop" to eliminate excess handling which can increase the cut's exposure to pathogens and water stress. 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 references 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 the VCE Web Publication 426-619W, "Field Production of Cut Flowers: Potential Crops."

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 3.0 to 5.5) inhibits bacterial growth helping flowers persist longer. Preservatives are also formulated to be effective at 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 are 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% 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 which are appropriate for the species you are growing. The majority of specialty cut flower growers use the indispensable 5-gallon plastic bucket. Be aware that some species such as snapdragon and gladiolus exhibit a (negative) geotropic response: stems laid flat will bend upwards, away from the gravitational pull, resulting in curved stems.

Vehicular and personnel requirements necessary for timely deliveries are often overlooked in the planning of a cut flower business. 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. There are many options available at a wide range of costs - built-in-place coolers, prefabricated cold storage units, or even modified refrigerated transportation units such as refrigerated semi-tractor trailers or ice cream trucks. If using an independent shipper, be sure your carrier is educated to the need to maintain temperatures between 35° and 40° F during transit.

Need to Know More? Where to Go for Additional Information

Numerous state floriculture and greenhouse associations (often associated with the state's Extension service) 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. The World Wide Web is becoming a truly useful source for contacts and information. Equipment and floral wholesalers, agricultural chemical companies, and agricultural Extension agencies are all entering the Internet information and product market with gusto.

References and Recommended Reading

Armitage, Allan M. 1993. Specialty Cut Flowers. The production of annuals, perennials, bulbs and woody plants for fresh and dried cut flowers. Varsity Press/Timber Press, Portland, OR Ph. 800.327.5680. *A to Z production information from the leader in discovery and development of specialty cut flower crops. Coverage by genus and species includes propagation, environmental requirements, field and greenhouse performance, harvest and postharvest, and pests and diseases.*

Armitage, Allan M. 1997. Herbaceous Perennial Plants. 2nd ed. Stipes Publishing, Champaign, IL.

Dirr, M.A. 1990. Manual of Woody Landscape Plants: Their Identification, Ornamental Characteristics, Culture, Propagation and Uses. 4th ed. Stipes Publishing, Champaign, IL. *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. 1999. Floriculture: principles and species. *Production information for a number of cut flower crops is included in this comprehensive book on greenhouse, field, and foliage plant floriculture.*

Gast, K.L.B., et al., 1994. Cold Storage for specialty cut flowers and plant material (MF-1174), Cooperative Extension Service, Kansas State University, Manhattan. How to build your own cooler.

McAvoy, Richard J. 1997. Annuals for Field-grown Cut Flowers. Connecticut Greenhouse Newsletter 197:1–8.

Reid, Michael and Linda Dodge. 1996. Cut Flowers: Postharvest Handling Review. In: The Cut Flower Quarterly. 8(1):23–24.

Stevens, Alan. 1996. Field Grown Cut Flowers: A Practical Guide & Source book. Avatar's World Ph. 800.884.4730. *Focuses on management, marketing and production with some specific crop information, mistakes to avoid, and reams of sources and directories. Dr. Stevens is a noted cut flower specialist and consultant.*

Other Resources

The Association of Specialty Cut Flower Growers. ASCFG, Inc. MPO Box 268, Oberlin, OH 44074. Ph. 216.774.2887. *The quarterly newsletter that accompanies membership is an excellent resource for new crop information, marketing tips, industry news and research updates. An e-mail list-serve is also maintained as a forum where members can have ongoing discussions of pricing, cultural techniques and other topics. The author wishes to recognize the countless grower contributions to the Cut Flower Quarterly that helped comprise this article*

Growing for Market. Lynn Byczynski, editor and publisher. *A monthly newsletter for market gardeners, contains a monthly column on field–grown cut flower production and marketing. This newsletter is geared for small–scale operations and also focuses on sustainable production techniques.* GFM is available for $27/year from: Growing for Market, PO Box 3747, Lawrence, KS 66046, 800-307-8949

Arnosky, Frank and Pamela. 1999. We're Gonna Be Rich! GFM Books. *Four years' worth of monthly columns from Growing for Market. This book focuses on the Arnoskys' vast experiences in raising cut flowers in the difficult climate of south Texas.* Available for $24.95 from GFM Books, PO Box 3747, Lawrence, KS 66046, 800-307-8949

Sustainable Cut Flower Production - Horticulture Production Guide. Lane Greer, ATTRA Program Specialist. Appropriate Technology Transfer for Rural Areas (ATTRA), P.O. Box 3657, Fayetteville, AR 72702. Phone: 1-800-346-9140; FAX: (501) 442-9842
http://www.attra.org/attra_pub/cutflower.html#resource

Wholesale Florist and Florist Supplier Association. 147 Old Solomons Island Road, Suite 302, Annapolis, Maryland 21401. Phone: 410-573-0400, or toll free 888-289-3372. Fax: (410) 573-5001

Society of American Florists
http://www.safnow.org
The Society of American Florists provides marketing, business and government services for all participants in the U.S. floral industry.

USDA wholesale price reports
http://www.ams.usda.gov/fv/mncs/fvwires.htm

North Carolina State University Cooperative Extension. *The Disease, Insect, and Related Pest section of the Floriculture home page web site (www2.ncsu.edu/floriculture/) offers several publications of relevance to cut flower producers concerning IPM and insect/disease identification and control.*