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Marketing and Production Basics of Field Cut Production

Bed system of producing cut zinnias. (Photos courtesy of John Dole)

There are a multitude of factors to consider when deciding if outdoor cut flower production is for you. Here, we examine the many facets of this type of production to help you make the right choice.

By John M. Dole and Lane Greer

Commercial, field-grown cut flower production encompasses an incredible array of plant materials, including fresh, dried and preserved flowers, stems and berries. A large portion of fresh and dried cuts in North America is grown outdoors. Cuts are marketed through a variety of channels — some summer-only, others year-round. Proper selection of plant materials can allow year-round production, although harvests will be limited during the winter in temperate climates.

The season starts with woody trees, shrubs, vines and bulbs flowering in the early spring. Perennials and biennials begin flowering mid-spring in the south and late spring in the north. Annuals make up the bulk of production during the summer, supplemented with perennials and woody plants. By fall, the annuals are winding down, a few fall perennials will be flowering, and woody plants with berries or other decorative fruits can be harvested. Woody plants with decorative stems are harvested during the winter when they are leafless.

MARKETING CHANNELS

Due to the highly perishable nature of their product, fresh cut flower growers must develop an intensive marketing strategy. Local, niche markets are often the best choice for small growers. Selling to local florists or other retailers is one of the best marketing strategies. Fifty years ago, florists grew their own product, so there was a greater variety of flowers. This is no longer the case, and now, florists are clamoring for fresh, hard-to-find, hard-to-ship items.

Although direct marketing to consumers can offer the benefit of higher prices, this strategy requires additional time and expense. The range of possibilities for direct marketing includes farmers' markets, bucket shops, pick-your-own and subscription selling. Of these, farmers' markets are probably the most common marketing channel.

Wholesale markets require larger volumes of flowers and growers receive lower prices per stem. The greatest benefit of wholesaling is that a grower has an established market for the product and relatively little time is spent finding individual customers. Few small- to- medium-sized growers sell exclusively to wholesalers, however, because of the low prices received. Growers thinking of selling to a wholesaler should visit them to see what kinds of products they offer. Because wholesalers do most of their business in the morning, they will have more time for talking with growers in the afternoon. One important point to clarify with wholesalers is transport: Will the wholesaler pick up flowers from your door, will you deliver to the buyer's door or will you ship?

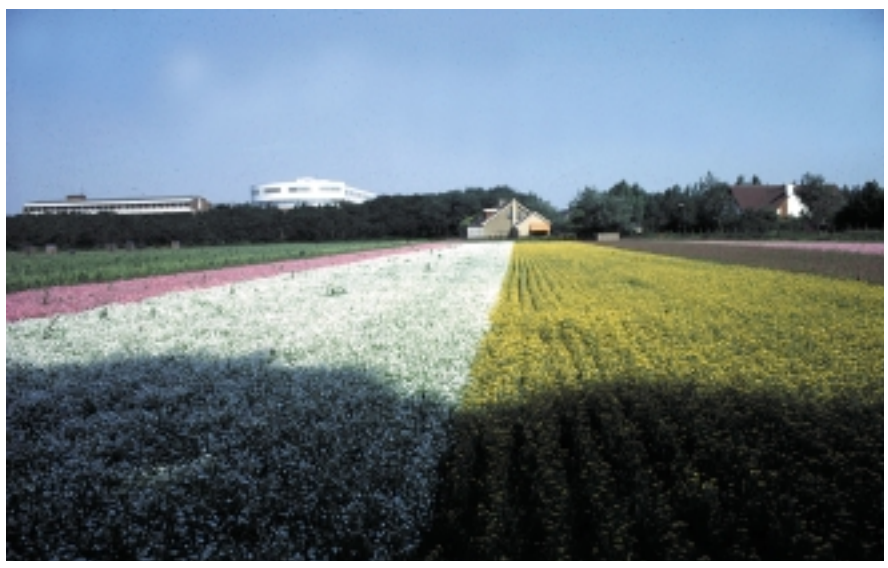
Growers may find it advantageous to develop a mixture of marketing avenues. For instance, a grower may decide to sell fresh cut flowers to retail or wholesale florists and at the farmer's market. This way, growers can sell long stems to florists and shorter stems to buyers at the farmer's market. Selling at the farmer's market would also increase short-term cash flow, since wholesalers usually pay their accounts only once a month.

Growers may choose to dry their crop when prices for fresh cuts drop. Drying flowers requires extra labor and storage space. These costs should be factored into deciding whether or not it is advantageous to dry flowers. However, dried flowers are not as perishable as fresh, and they may be a good choice for growers located far from the marketplace. Remember to make the decision to dry a crop before it is harvested — low-quality, old flowers that remain unsold from the fresh market will result in low-quality dried flowers as well.

SITE SELECTION AND PRODUCTION SYSTEMS

The best locations for cut flower production are sunny, relatively flat, with well-drained soil. The site should be accessible at all times, even after a heavy rainstorm, as flowers will need to be harvested regardless of the weather. On the other hand, the site should have water for irrigation and postharvest requirements. While air movement is necessary to prevent or reduce disease problems, the site should also be protected from excessive winds that can damage the plants and flowers.

Production can be in rows spaced far



Field of cut flowers grown for drying using single-row cultivation.

enough apart for a tractor or rototiller to pass between. The row system is limited to specific crops because of the difficulty of supporting the crops and of the high potential for dirt and other debris to splash on the foliage and flowers. Consequently, most field cut production occurs in 2.5- to 4-foot-wide beds with two or more rows of plants within each bed. The beds should not be too wide, or they will cause difficulty when reaching into the center of the bed to harvest flowers. Beds are often raised 2-8 inches high to encourage drainage and allow quick drying after a rain. Beds can be mulched before or after planting with plastic, landscape fabric or organic materials to reduce weeds and water loss. Support can be provided with plastic mesh stretched between posts, usually metal t-posts, spaced in pairs every 20-30 feet along the bed.

Aisles should be wide enough to allow people to move between the beds without damaging the plants, which tend to grow and lean out into the aisles. If there is sufficient land, aisles can be made wide enough to allow a small vehicle to enter, decreasing the labor associated with carrying harvested flowers.

SOIL PREPARATION

The soil should be amended with fertilizers and organic matter prior to planting and a soil test should be collected and submitted to a lab for analysis. A local Cooperative Extension Service office may be able to provide information on collecting and sending in soil samples. Based on the soil test results, the soil pH may need to be raised with lime or lowered with sulfur (see Table 1 below). Nutrients may also need to be added to raise the nutrient level up to the desired rate (see Table 2 above). Soil tests should be taken

Table 1. Rates of limestone and sulfur for altering soil pH.

Existing soil pH	SANDY SOILS to pH 6.0	SANDY SOILS to pH 6.5	LOAM SOILS to pH 6.0	LOAM SOILS to pH 6.5	CLAY SOILS to pH 6.0	CLAY SOILS to pH 6.5
	Pounds of limestone/100 ft² (kg/100 m²) needed to raise soil pH					
4.8	4.5 (22)	7.0 (35)	8.0 (40)	12.0 (60)	12.0 (60)	17.0 (85)
5.0	4.0 (20)	6.0 (30)	7.0 (35)	11.0 (55)	10.0 (50)	15.0 (75)
5.5	2.0 (10)	4.0 (20)	4.0 (20)	7.0 (35)	5.0 (25)	10.0 (20)
6.0	0.0	2.0 (10)	0.0	4.0 (20)	0.0	5.0 (10)
	Pounds of sulfur/100 ft² (kg/100 m²) needed to lower soil pH					
7.5	—	1.0-1.5 (5.0-7.5)	—	1.5-2.0 (7.5-10.0)	—	2.0-2.5 (10.0-12.5)
8.0	—	2.5-3.0 (12.5-15.0)	—	3.0-4.0 (15.0-20.0)	—	4.0-5.0 (20.0-25.0)
8.5	—	4.0-5.0 (20.0-25.0)	—	5.0-6.0 (25.0-30.0)	—	6.0-7.5 (30.0-37.5)
9.0	—	5.0-7.5 (25.0-37.5)	—	—	—	—

Table 2. Soil test interpretation for nitrogen, phosphorus and potassium.

NUTRIENT	LEVEL IN SOIL	RANKING
Nitrogen	0-25 ppm	Low
	26-50 ppm	Medium
	51-80 ppm	High
Phosphorus	0-50 lb/acre (0-56 kg/ha)	Low
	51-200 lb/acre (57-225 kg/ha)	Medium
	201+ lb/acre (226+ kg/ha)	High
Potassium	0-250 lb/acre (0-280 kg/ha)	Low
	251-500 lb/acre (281-560 kg/ha)	Medium
	501+ lb/acre (561+ kg/ha)	High

at least annually as soil pH and fertility can vary between years. Inadequate nutrition will reduce cut flower yields and quality. However, excessive fertilization wastes fertilizer, may pollute the ground or surface water and can damage plants.

Supplemental fertilizers, either organic or inorganic, may be needed later in the production season, especially in the warm climates where the season can be six months to a year long. Supplemental fertilizers can be applied as dry fertilizers or can be dissolved in water and applied through the irrigation system (fertigation). Generally, fertigation is less labor-intensive once the fertilizer injector is incorporated into the irrigation system.

Unless your soil is the perfect sandy loam, it will probably need to be amended with organic matter. The addition of organic matter can cure many problems — it can loosen and increase the aeration of heavy clay soils or increase the nutrient and water retention of sandy soils. A variety of different sources of organic matter can be added, including compost, cover crops, manures, straw, hay, silage and wood chips. Organic matter can be applied in the fall after the fields are cleared, in the spring prior to planting, or as a mulch during production to reduce weeds and water loss.

Manures need to be composted or aged prior to application or applied several weeks prior to planting. Straw, hay and wood chips may also need to be composted prior to use as they can temporarily deplete the soil of nitrogen as they decay. If applied directly, a little extra nitrogen application may be needed. Also, be sure that all organic matter is weed-free. If you accidentally introduce one or more weed species to the farm, you may be fighting them for years.

Cover crops are a relatively easy method to add large amounts of organic matter to soil. Cover crops can be planted in the fall after the annuals have been removed or in the spring after the winter annuals/biennials, such as larkspur, have been harvested. Cover crops can and should be planted on any areas that will remain unplanted for a lengthy period of time. The alternative ➧

Blue and red cut ageratum ready for market.

is to allow the area to grow up in weeds, which will make weed control difficult when the area is later planted. Aisles can also be planted to a low cover crop to reduce weeds. A number of legume cover crops, such as alfalfa (*Medicago sativa*), cowpeas (*Vigna unguiculata*), crimson clover (*Trifolium incarnatum*), hairy vetch (*Vicia villosa*) and Austrian winter peas (*Lathyrus hirsutus*), fix nitrogen, which is added to the soil when the cover crop is incorporated.

A field kept weed-free with the help of landscape fabric.

FIELD ESTABLISHMENT

Field plantings can be established through a variety of methods. Direct seeding can be used with species that germinate and grow rapidly. Plants with large seeds, such as sunflowers and zinnias, do well when direct-sown. Some species, such as larkspur and ammi, also do not transplant well and are best direct-sown.

Many growers use transplants to establish their plantings. Transplants can be purchased ready to plant from suppliers or can be grown in a greenhouse. Purchased transplants reduce the hassle of propagating your own plants, which can be especially important with some difficult-to-propagate species, such as lisianthus (*Eustoma*). However, purchasing transplants may limit the number of species, cultivars and colors available and delivery is not always timely. Transplants can be grown or purchased in a variety of plug or cell sizes. Small plug sizes are generally less expensive but may need to be irrigated frequently after planting in the field. In addition, small plugs will easily outgrow the flat if not planted promptly and can be difficult to irrigate properly in the greenhouse. Larger plugs are more expensive but establish in the field more easily and can be held in the greenhouse longer before they need to be planted.

Perennial cuts can be established by means of divisions or rooted cuttings. Dormant divisions can be planted soon after arrival from the supplier or held in a cooler or cool location until they can be planted. Nondormant divisions and rooted cuttings should be planted as soon as possible.

A variety of species produce bulbs, corms, tubers or tuberous roots that can be planted. Some species are not cold-hardy and the bulbs must be dug up in the fall and stored in a cool location over the winter until replanted in the spring. Other species can remain in the ground and be handled as other perennials.

Although not cost-effective, potted perennials, shrubs, vines and trees can be used. Usually a few plants are purchased to test the species, and if successful, large numbers of plugs, divisions or rooted cuttings are purchased or grown.

PLANT SPACING

Optimum plant spacing varies greatly with the variety. Plants that become large are usually planted in two rows per bed, occasionally with plants staggered, while smaller, single-harvest annuals such a plume celosia may be spaced only 4-6 inches apart with up to 10 rows across the bed. Generally, tight spacing increases yield and profit per square foot of bed space but decreases yield per plant and air circulation. Thus, if initial plant costs are high, wide spacing may allow you to maximize the number of harvestable stems per plant. In addition, wide spacing increases air circulation and may prevent or reduce diseases. For some species, close spacing can increase stem length, which may be particularly important with species that tend to be too short. However, close spacing does not increase stem length for all species.

Annuals are generally spaced anywhere from 4 x 4 inches to 18 x 18 inches apart. Perennial spacing ranges from 12 x 12 inches to 24 x 24 inches, and woody shrubs and trees

are spaced 2-6 feet apart. Remember, most trees and shrubs are harvested heavily enough to keep the final plant size small.

IRRIGATION

Cut flowers are generally a high-value crop and irrigation will probably be necessary, regardless of the climate. Irrigation systems are relatively inexpensive and pay for themselves in reduced labor and increased yields and quality within a few months to a couple of years. Generally, the preferred irrigation system is drip tapes. After planting, irrigation drip tapes can be laid; one to three tapes per bed are used depending on the soil type and irrigation needs of the crop. With row cultivation, one drip tape can be used per row or double row (two rows closely spaced together). Hand irrigation with a hose and nozzle is time-consuming, which results in high labor costs, but may be necessary for the first irrigation after planting to ensure that young plants with small root systems receive enough water. Overhead sprinkler irrigation is cost-effective but is generally limited to when the plants are young. Later in the season, overhead irrigation may splash soil on the foliage and flowers, knock plants over and increase disease problems. Your local cooperative extension office or irrigation supplier may be able to assist in designing an effective and inexpensive irrigation system.

WEED CONTROL

Weed control is often the most time-consuming and labor-intensive component of field production. Large numbers of weeds in the production area will reduce flower quality and quantity and increase the labor time and cost of harvesting. Weeds also make insect and disease control more difficult, increase irrigation requirements and, of course, provide seeds for the next batch of weeds later in the season. A variety of methods are available for controlling weeds, and the typical farm will use many of them.

Timing. Regardless of the weed control method, timing of the field preparation is important relative to when the foliage canopy of the crop closes. In other words, when the bed or rows are covered with foliage, the light reaching the soil is reduced and weed seed germination and growth slows. If using manual weeding or cultivation, it is important that the last cultivation occurs as close to planting as possible. If the field is prepared too early in advance of planting, the weeds will begin germinating and growing. Thus, you will need to begin cultivation soon after planting. However, if you plant immediately after preparing the soil, the plants will begin to grow and develop a canopy, reducing the number of times cultivation is required. Often there is not enough time to prepare a field and plant it soon afterwards. One way around this problem is to prepare a large area when convenient and lightly cultivate the areas to be planted immediately before planting. Do not cultivate too deeply, as that will bring up new weed seeds that will germinate.

Hand weeding. Manual weeding by hand or by hoe is the age-old method of weed control. It is effective but time-consuming and expensive in terms of labor costs. A small amount of manual weeding will be required in any operation, such as at the end of rows or around the base of plants growing in plastic or landscape fabric. However, other methods of weed control should be used wherever possible. A variety of hoes are available that can effectively cut and remove weeds without disturbing the roots of cut flowers.

Mechanical cultivation. Mechanical cultivation can range from a walk-behind rototiller to a tractor-mounted cultivator. Mechanical cultivation can be used to cultivate the aisles between beds or rows of crops. The aisles must be wide enough to allow the equipment to pass without damaging plants and prevent the cultivator from being close enough to the crop roots to damage them. In addition, mechanical cultivation must be done before the crop is too tall to allow the tractor to pass by.

Flame weeding. In flame weeding, a hand-held or tractor-mounted propane burner emits a flame that is passed over the weeds. The weeds die from being seared by the high temperatures, not by being burned. Young weeds and broadleaved weeds are easiest to kill with flame weeding. Flame weeding can be especially useful with direct seeding, as the young weeds generally emerge first and the area can be flame-weeded prior to emergence of the cut flower seedlings. Effective flame weeding requires an experienced operator but can be efficient and cost-effective.

Herbicides. Herbicides are available in two types: 1) preemergent herbicides kill weed seedlings ➧

as they push up through the soil; and 2) postemergent herbicides are sprayed on the weeds and kill either the portion of the weed in direct contact with the herbicide or are taken up by the weed (systemic), move through the plant and kill the entire weed. Systemic, postemergent herbicides are especially useful for controlling perennial weeds and those with underground rhizomes or storage organs. As with all chemicals, herbicides should be applied carefully to prevent accidentally poisoning the person applying the chemical or injuring the cut flowers.

Mulches. A variety of mulches can be used to prevent weeds from growing. Organic mulches, such as weed-free hay, have the advantage of improving soils after they are incorporated at the end of the year; however, they can be time-consuming to spread on the field. Plastic mulches are useful in not only controlling weeds but also increasing soil temperature in the spring. Punching holes in the plastic and disposal of the plastic at the end of the growing season must be considered. Landscape fabric is expensive initially but lasts a long time in the field or can be reused. With all mulch types, you will probably still need to weed around the base of the plant.

FALL AND WINTER PREPARATION

In the fall, remove dead annuals and fallen plant material. Prune out diseased portions of perennials and woody plants. Do not cut back perennials until the middle of winter when the tops are completely dead. In the fall, mulch tender perennials if necessary to protect against the cold. Mulch can also help retain soil moisture and provide organic matter. If fall and winter are dry, be sure to irrigate occasionally; on the other hand, many perennials rot easily during the winter if they are too wet. GPN

Additional resources: Association of Specialty Cut Flower Growers, MPO Box 268, Oberlin, OH 44074; (440) 774-2887, ascfg@oberlin.net, www.ascfg.org. This national organization caters to field and greenhouse specialty cut flower growers. Specialty Cut Flowers, *by Allan Armitage (1993, ISBN 0-88192-225-0), has detailed production information on many specialty cut flowers.* The Flower Farmer, *by Lynn Byczynski (1997, ISBN 0-930031-94-6), has great production information, especially for beginning growers, and profiles of cut flower businesses.*

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