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Fact Sheet

Fact Sheet 468

Enterprise Guide for Southern Maryland: Producing Cut Flowers--General Field Crop Management

This fact sheet is one in the series Enterprise Guide for Southern Maryland, *providing information about alternative agricultural enterprises for farmers.*

Many farmers in Southern Maryland are considering alternative enterprises to supplement their incomes. Cut flowers are one alternative crop you may want to consider. Field grown cut flowers are an attractive addition to the product mix of pick-your-own and roadside stand operations in Maryland. This fact sheet discusses several key items to consider for the successful production of field grown cut flowers. Cut flower producers should remember that a variety of cut flowers harvested throughout the season is more profitable than focusing on one variety.

Selecting Varieties

You must experiment to determine which plants are best suited to your unique conditions. The following are some guidelines for choosing varieties. The ideal cut flower, if it existed, would meet all of these criteria:

- high value per production unit
- high production per square foot
- pest and disease resistance
- low initial cost of seeds, seedlings or plants
- long field life
- drought resistance
- resistance of the flowers to water damage
- unlimited demand
- long stems (18 inches) that are easily harvested
- postharvest vase life of at least 7 days
- extended production season
- ability to use surplus production as a dried or preserved floral product
- aesthetically pleasing foliage on flowering stems
- pleasing fragrance of flowers and foliage

Choosing a Site

Most cut flowers grow best in full sunlight. Make sure the soil is well drained with some organic matter. A small amount of wind protection is essential if tall plant material is grown. Avoid locations where early or late season frosts are a recurring problem. If animal foraging is a problem, fencing may be necessary to prevent complete crop loss. A source of irrigation water should be located nearby to ensure production during summer drought.

Planting the Crop

Planting Periods

The exact planting dates depend on several factors: plant classification (such as annual, biennial or perennial), harvest period desired, and type of cropping system.

Annuals

Plant annuals (such as zinnias, marigolds, snapdragons or calendulas) in the field as soon as the danger of frost is past. Earlier flowering occurs if transplants are used. You should sow seeds 4 to 6 weeks before the planting in a greenhouse or cold-frame. Several sequential plantings may be necessary to ensure a continuous supply of top quality cut flowers from June until November. When selecting cultivars for cut flower production, choose cultivars which have not been developed for the bedding plant pack trade. Instead, select older cultivars which may be too large for packs but make excellent cut flowers. Another source of excellent cut flower varieties are European and Japanese plant breeders.

Biennials

Plant biennials such as digitalis, sweet-william and bells-of-Ireland in the fall to ensure an adequate cold treatment before growth starts in the spring. Most biennials require a cold treatment to induce uniform flowering. If plants cannot be planted in the fall, plant the transplants into the field as soon as the soil can be worked in the spring.

Three alternative methods are:

- placing transplants in a cooler with incandescent or fluorescent lighting for 4 to 6 weeks at 40 to 45°F before transplanting;
- starting the transplants early, hardening them off in February and holding them in an unheated coldframe until planting; or
- spraying the plants after transplanting with 500 to 1,000 parts per million (ppm) of gibberellic acid.

Although these methods will promote flowering, the greatest yield with highest quality will occur if plants grow vegetatively in the field for at least 2 to 4 months before flowering. It is not easy to stagger the planting date of biennials to ensure continuity of production. Most biennials flower synchronously unless plants are stored in coolers to stagger the planting date or young vegetative plants are treated with gibberellic acid. If conditions are optimum, some biennials such as sweet-william can be manipulated to produce flowers until a killing frost occurs. Another method to stagger peak harvest dates is by cultivar selection, although cultivar flowering dates are not easily obtained and often are unreliable.

Perennials

Perennials can be subdivided into three main groups:

- plants with storage organs which can remain in the ground for 3 or more years (allium, liatris, peonies and lilies);
- plants with storage organs which must be dug and stored each year (dahlias, ranunculus and gladiolus); and
- clump or rhizomatous plants which are left in place for 2 to 4 years before division (monarda, shasta daisy, achillea, delphinium and astilbe).

When planting perennials for cut flower production, use as few of the plants in the second group as possible since the added labor and handling costs of digging and storing the crop may not be offset by the plant's yield or sales potential. There are many suitable cultivars of perennials which make excellent cut flowers. These cultivars are available from specialty propagators as divisions. Expect a wide variation in color, form and flowering dates from most seed propagated perennials.

There is no practical method for staggering the harvest period of the perennials in the third group. Once you have established the planting, anticipate the harvest each year at about the same time, give or take a week. You can grow some of the perennials in the first group with a staggered harvest if plants are dug each year and stored at 35 to 40°F. Plant the cold-treated plants every 2 to 3 weeks starting in April to ensure continuity of harvest from June until October. Many of the perennials in the second and third groups will continue to flower for 1 to 2 months if the plants are properly managed. All of the perennials can be delayed by covering the plants with straw and white plastic in midwinter and waiting to remove it until the plants show early signs of life in spring. They may also be forced into early growth by covering the beds with a cloche made of clear plastic in early spring. Plants should be kept pruned of all old flowers and damaged foliage to ensure continuous flower production.

When cutting flowers from plants which are in continuous production, always leave at least one-third of the fully expanded leaves on the plant. This will promote subsequent production.

Planting Beds

Grow the plants in 4- to 6-inch raised beds to maximize drainage and reduce root rot problems. The beds should lie in a north-south direction to maximize light penetration of the canopy. Before planting, incorporate organic matter into the beds to a depth of 8 inches. In poorly drained soil, place drain tiles 8- to 12-inches deep to improve drainage. If the soil has a hardpan, plant a deep-rooted cover crop such as alfalfa to break up the hardpan.

The planting bed should be no more than 3½ feet wide and 125 feet long. The 3½-foot wide bed allows maximum light penetration to the center of the bed and facilitates harvesting. The average worker can easily reach in at least 2 feet to cut the flowers. Beds longer than 125 feet may prove cumbersome and lead to an unjustified expenditure of time and foot travel to remove the crop from the field. For pick-your-own operations, use a 3- by 25-foot bed with sodded aisles so consumers can easily harvest flowers without damaging the crop.

Plant Density

Plants can be grown at various densities or in different configurations. Planting density is dependent on: plant size, number of years between replanting, sensitivity of the crop to disease, and method of harvest and staking.

Grow plants that are very large, such as baby's breath, one plant per 1½ to 2 square feet. Grow smaller plants, such as zinnias, three to five plants per square foot. When perennials like yarrow are cultivated for 3 to 5 years in one location, space them one per square foot to allow space for the plant to multiply. If powdery mildew is a problem, as in zinnias, decrease the planting density to reduce the severity of the disease. Finally, if plants must be individually staked, as in delphinium, decrease the density so the plants will be easier to handle.

There are as many planting configurations as there are growers. Generally you should plant large perennials, two to three plants across in a "five- or eight-dice" pattern (Figure 1). Plant annuals at a higher density than perennials. A planting configuration that may make harvesting easier consists of two rows spaced close together with a larger space between the two double rows (Figure 2). This configuration increases air flow through the bed and makes plant handling easier. In all cases, space plants with the highest density along the side and the lowest density in the middle of the bed.

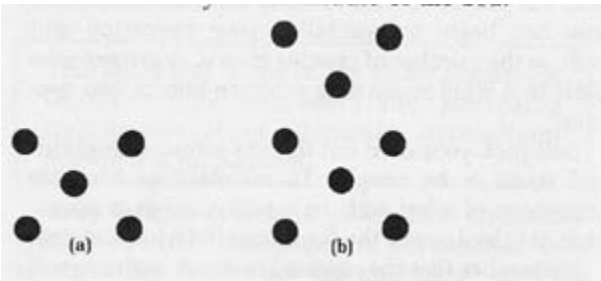

Figure 1. Planting configuration: (a) five-dice pattern (two across); (b) eight-dice pattern (three across).

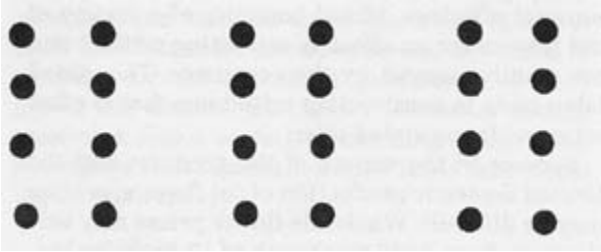

Figure 2. Alternate planting configuration.

Plant Supports

Most cut flowers require some form of crop support to reduce breakage and grading out because of dirty flowers, crooked stems or poor floral display. Use a 6-inch open wire or nylon mesh net for crop support. The mesh is supported horizontally with steel fenceposts or heavy wooden stakes. You can also use hand-tied wire supports, but construction requires additional time and labor. Avoid staking plants individually, since it is both labor intensive and unnecessary if the correct varieties are grown or bed wire supports are used. You can also cut well-branched 1- to 2-inch caliper boughs from deciduous trees and push them deeply in the soil among the plants to provide an inexpensive means of support.

Caring for the Crop

Water and Nutrient Requirements

Field grown cut flowers will require a larger total volume of water than most other field crops. To maintain quality and maximize yields, you may need to water plants daily, depending on soil type. Do not use overhead watering systems since they promote the spread of disease and cause severe flower damage. Several new types of trickle irrigation equipment are available which supply water where it is needed without waste. Check with local irrigation suppliers for sources of these systems.

Fertilizer Requirements

Along with the increased water usage comes the need to increase fertilizer application. Incorporate 25 to 45 pounds of nitrogen per acre before planting. Depending on the crop grown, apply 200 to 500 ppm of nitrogen weekly through the irrigation system. You may also apply topdress slow-release fertilizers on the bed at planting time. The application of fertilizers should parallel the plants' needs with higher rates during early stages of growth and lower rates before harvest.

Pest Control

Weeds

Weed control is a serious problem in field grown cut flowers. You can use soil fumigants (methyl bromide, MC-33 or Vorlex) to control weeds and disease. Because of the limited acreage of cut flowers, only a few herbicides are labeled for cut flower production. Contact the author for herbicide suggestions to try on experimental plots. Some herbicides are very effective for weed control in cut flower production areas.

Weed barriers also help to control weeds. Black 1½- to 6-mil polyethylene and other mulches have been very effective in controlling weeds. In annual plantings, 2-mil plastic may suffice, but in perennials at least 4 mils is necessary because of the long term nature of the crop. Woven polypropylene is another type of mulch cover which is long lasting but expensive. It is best suited for perennials. When you use plastic mulches, it is essential that you install an irrigation system under the plastic.

Insects

Aphids, spider mites and thrips can be a serious problem on some cut flower varieties. Periodically, Japanese beetles, leaf rollers and leaf miners can attack specific plant material. Bees and wasps can be a nuisance during harvest.

Diseases

The most prevalent and serious disease problem is powdery mildew. It attacks the foliage and can disfigure foliage and flowers. Botrytis can be a problem during cool damp weather and it attacks flowers aggressively. Root rots can be devastating with water molds being the most prevalent problem. Some growers may have isolated problems with *Fusarium* or *Verticillium*. Keeping the field free of weeds and plant debris, and roguing diseased plants are the most effective methods for controlling these diseases.

Physiological Disorders

Nutrient deficiencies are quite common in field grown cut flowers. The most common is nitrogen, which appears as a general chlorosis and results in poor plant vigor. Although phosphorus and potassium are not normally lacking in the soil, isolated locations may be deficient of these nutrients. Periodic soil testing will identify problem areas which need to be watched more carefully.

Other Pests

Deer, rabbits and other rodents may destroy a large portion of the total harvest. There are few, if any, chemical means to discourage such foraging. Fresh boughs of spicebush (Lindera benzoin), a woodland native shrub and some brands of bar soap (such as Irish Spring) have been reported to deter these animals when placed strategically around the perimeter of the field. Planting the perimeter of the field with heavily aromatic plants such as achillea may also help. If all else fails, the expensive proposition of protective fencing may be the last resort.

Harvesting the Crop

Harvest flowers when they are at their "peak of perfection". This rather ambiguous phrase has many meanings as anyone in horticultural marketing knows. As a general rule, the "peak of perfection" is when the flower has just opened. Stems with more than one flower (such as statice or gladiolus) are usually harvested with less than one-third of the flowers fully opened.

Some plants can be harvested anytime once the flower head is fully expanded, such as achillea. Still others such as kniphofia, scabiosa and salvia may be harvested when they show color but have not opened. Plants such as achillea or German statice can be grown for both fresh cut flower market and the dried plant material market. Always investigate the dried flower market as a potential market outlet. Whether picking flowers for fresh use or for drying, remember that their condition will not improve after picking. Therefore, never wait too long to pick flowers or they will be past their prime when they reach the consumer. Cut the flowers at least three times a week to ensure maximum freshness and vase life.

Harvest cut flowers early in the day to prevent buildup of field heat within the bunches. After cutting, place the stems in tepid water with a floral preservative added. Place cut stems into a 40°F cooler overnight for subsequent grading and storage or leave them in a cool (less than 60°F) location. Always leave the plants in water for at least 2 to 3 hours before sale or grading to allow for a maximum amount of water uptake. Stems are graded by stem length (18 to 24 inches for most plants) and are downgraded for short or broken stems, poor flower condition, poor foliage condition or old flowers. Stems are bunched by weight (1- or 2-pound bunches) or by count (10 stems per bunch). Contact your local wholesaler for the correct market packaging.

Selling Cut Flowers

You can sell your flowers to a flower wholesaler, florist, or directly to the consumer. When you sell your flowers directly to the consumer, you should have at least five different species available for sale at all times. To maintain this selection of 5 species, grow 15 to 20 different species throughout the season. As you move further away from the consumer, you can begin to specialize your operation and reduce the number of species grown. A grower who sells to a wholesaler may produce one or two species.

Sell pick-your-own cut flowers either as individual stems or by weight. To maintain an accurate inventory of what sells in a pick-your-own operation, it is best to sell the flowers as individual stems.

Remember that the unusual is much easier to sell than the ordinary. The average consumer buys flowers on impulse and will be attracted to new and unusual offerings. Mixed bouquets of a variety of cut flowers are an effective marketing method and are readily enjoyed by the consumer. The added labor costs in constructing mixed bunches is often returned in expanded sales.

Because of the variety of the products and the limited domestic production of cut flowers, pricing may be difficult. Wholesale flower prices may easily range from $1.50 per bunch of 10 bachelor-buttons to $1.50 for a single stem of kniphofia. Remember the following guidelines for pricing. If a particular group of flowers cannot be sold for enough money to at least cover the expenses of field preparation, planting, growing and harvesting, do not sell them. This will keep the market from being flooded with cheap, low-quality flowers, increase demand for other flower varieties and species, and build good consumer relations.

Because of the diversity of plant material described in this fact sheet, contact the author for specific recommendations.

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