

# Growing Cut Flowers for Market



**Barb Laschkewitsch**  
Research Specialist

**Ron Smith**  
Extension Horticulturist

*Persons trying to enter the business of growing fresh cut flowers need to realize that it is just that, a business, and needs to be treated as such. Factors to be considered when undertaking this type of business include knowledge of the target market, choice and culture of crops, and management of labor, input costs and resources. Being able to grow and harvest a marketable product will not ensure success.*

## Markets

The most critical aspect of business is finding a product market. Test market interest by growing some flowers as a hobby and taking samples around to potential clients for a reaction. If there is no interest in the product, there is no reason to continue. Main outlets for cut flowers include wholesale florists, retail florists, farmers markets, roadside stands and pick-your-own operations. Other possible markets include grocery stores, craft fairs, restaurants, corporations and hotels/motels. Using the internet to market is currently a novel approach but should be considered as it will increase the potential consumer base. Transportation may become a larger issue with internet marketing.

When selling directly to businesses, adding value to the product by arranging the flowers in some manner may increase sales. Remember, though, that adding value in this manner will increase labor costs.

Many potential markets exist, limited only by one's imagination. Developing a viable market takes time and effort; a trusting relationship must be built up over time.

## Selecting Crops

Once a market has been found and the decision has been made to continue with a cut flower business, the second most important decision to make is what crop to grow. There are many factors to consider but one of the most important is to fit potential crops into the existing growing environment. Labor costs are always high when dealing with floriculture crops, and growing any plant where the conditions are not favorable leads to frustration and higher labor costs. The potential crop should also possess resistance to diseases and pests. The goal should be minimal inputs of pesticides to keep costs under control and for public relation purposes in direct product sales. The plants selected should ideally produce inflorescences on long stems, particularly if the target

**NDSU**  
**Extension Service**

North Dakota State University  
Fargo, North Dakota 58105

market is a retail florist. A stem length of 18 inches is often the minimum standard. Other characteristics of an ideal crop are:

- high production per square foot
- ease of harvest
- post harvest life of 7-10 days or longer
- a long production period with repetitive harvests

Annuals, herbaceous perennials, woody plants and bulbs can all be used as cut flowers/ foliage. Annuals complete their life cycle in one growing season. Herbaceous perennials and bulbs are those which usually die back to the ground at the end of the growing season and resume growth in the spring. Most hardy, woody plants survive the winter season in the dormant state but do not die back to the ground as the herbaceous perennials do. Production management, harvest, pest and disease control are all different for each of these categories. This is another area where careful decision making is required.

## Annuals

Annuals provide growers with the advantage of growing crops that are currently most popular with the consumer. With new crops being grown each season, there is less chance of disease and pest problems. Annuals typically have a longer blooming season than perennials. One potential disadvantage of annuals, however, is the higher cost associated with planting each growing season. Direct seeding would be more cost effective than starting seeds early and transplanting out into the field. Table 1 lists common annuals useful as cut flowers.

**Table 1. Annuals used as cut flowers**

Scientific Name	Common Name	Comments / Cultivars
<i>Agastache cana</i>	Giant Hyssop, Hybrid Agastache	Produces spikes of tubular, mauve pink flowers; 'Heather Queen' performed well in the 1999 bedding plant trials at NDSU in Fargo.
<i>Ageratum houstonianum</i>	Ageratum, Floss Flower	'Blue Horizon' and 'Florists White' are two recommended cultivars.
<i>Antirrhinum majus</i>	Snapdragon	'Rocket' series has tall stems and is tolerant of cool weather. Harvest when the florets are half open.
<i>Celosia spicata</i>	Wheat Celosia	Can also be air dried but tends to be delicate and shatter easily.
<i>Dianthus barbatus</i>	Sweet William	Typically a biennial, but newer cultivars should bloom the first year from seed.
<i>Eustoma grandiflorum</i>	Lisianthus	Difficult to start from seed, will need to start in December or January for June bloom. Don't let it get root bound. 'Echo' series has double flowers.
<i>Gomphrena globosa</i>	Globe Amaranth	Typically used as a dried flower but can be harvested fresh. 'Strawberry Fields' is a red cultivar that has done well in the Fargo trial gardens.
<i>Helianthus annuus</i>	Sunflower	Pollenless cultivars are best for cutting. 'Sunbright', 'Moonbright' and 'Sunbeam' are good. Have not done well in Fargo due to insects but growers near Bismarck have had success.
<i>Limonium sinuatum</i>	Notchleaf Statice	Can be used fresh or dried. Aster Yellows can be a problem.
<i>Pennisetum setaceum</i>	Annual Fountain Grass	Plumes can be used fresh or dried.
<i>Rudbeckia hirta</i>	Black-eyed Susan	'Indian Summer' has done well in the trial gardens at NDSU. Considered a half hardy perennial because plants don't reliably overwinter. Good substitution for sunflower in designs.
<i>Salvia farinacea</i>	Mealy-cup Sage	Blue, white or bi-color flower spikes can be used fresh or dried.
<i>Scabiosa atropurpurea</i>	Scabiosa, Pincushion Flower	Stems may need support.
<i>Zinnia elegans</i>	Zinnia	These prefer hot, dry weather. 'Oklahoma', 'Giant Dahlia Blue Point' and 'State Fair' are recommended cultivars.

## Perennials

One advantage of growing perennials is they do not need to be planted each year. Soil preparation is often more critical, however, since they remain in one area for two years or more. Because of their more permanent status, they have a greater possibility of developing disease and insect problems than annuals do. Some herbaceous perennials may need to be divided and replanted as often as every two years. When dividing, more plants can be propagated from the old ones, which lowers the costs associated with purchasing new plants. Others, such as peonies, do not tolerate disturbance as well. Perennials have a shorter blooming season than many of the annuals, which can be a disadvantage. Table 2 lists some common perennials that can be grown as fresh cut flowers or foliage.

## Bulbs

Bulbous crops include those that grow from underground parts such as bulbs (specialized leaf tissue), corms (specialized stem tissue), tubers (specialized stem tissue) and rhizomes (underground stems). Because these types of plants usually do not branch much, they can be planted more closely than annuals or other perennials, which can lead to a higher yield per square foot of planting. When used as cut flowers, bulbs are typically treated as an annual and planted new each year. This is in contrast to a garden situation where they would be treated as perennials and left in one spot for more than a year.

Advantages of growing bulbous plants include the ease of harvest of typically leafless stems, closer planting leading to a higher yield per square foot, unique flower forms and a current strong market.

Disadvantages include having to plant each season, a higher cost associated with purchasing bulbs compared to seed, and having to completely remove plant parts

from the field to avoid weed problems the following season. Table 3 lists common bulbous species used as cut flowers.

**Table 2. Herbaceous perennials used as cut flowers**

Scientific Name	Common Name	Comments
<i>Achillea filipendulina</i>	Fernleaf Yarrow	Can be sold fresh or dried. Yellow and gold cultivars keep color better than pastels. Can become a weed problem.
<i>Achillea ptarmica</i>	Sneezewort	'The Pearl' has profuse, button-like white flowers.
<i>Aster novae-angliae</i> <i>Aster novi-belgii</i> <i>Astilbe x arendsii</i>	New England Aster New York Aster Astilbe, False Goat's Beard	Late summer to fall blooming; many hybrids from tall to short Astilbe is shade tolerant and blooms late spring through early summer.
<i>Centaurea macrocephala</i>	Golden Basket Flower, Globe Centaurea	Large plant which produces puffy yellow flowers good for drying. Has done well in the perennial display gardens at NDSU in Fargo.
<i>Delphinium</i> hybrids	Delphinium	Many cultivars available with more being introduced by European breeders.
<i>Gypsophila paniculata</i>	Perennial Baby's Breath	'Perfecta' is the industry standard.
<i>Limonium latifolium</i>	Perennial Statice	Can be used fresh or dried.
<i>Paeonia</i> hybrids	Peony	Double-flowered types are popular. Can be used fresh or dried. Plants live up to 20 years or more.
<i>Scabiosa caucasica</i>	Perennial Scabious, Pincushion Flower	Stems tend to get tangled and may winter-kill if soil is too moist when dormant.
<i>Solidago</i> spp.	Goldenrod	People mistakenly believe this flower is the cause of hayfever.

**Table 3. Bulbs, corms and tubers used as fresh cut flowers**

Scientific Name	Common Name	Comments
<i>Allium giganteum</i>	Giant Flowering Onion	Can reseed itself and become a weed problem in the field.
<i>Gladiolus</i> hybrids	Gladiolus	Corms not cold hardy and need to be dug each fall; long vase life of 7-10+ days.
<i>Liatris spicata</i>	Gayfeather, Blazing Star	Can be used fresh or dried; lavender and white colors.
<i>Lilium</i> hybrids	Hybrid lilies	Asiatic, Aurelian and Oriental best for cut flowers.
<i>Narcissus</i> spp.	Daffodil	Many hybrids available.
<i>Tulipa</i> spp.	Tulip	The cooler the temperature, the longer the stem will get.

## Woody plants

Currently, woody plants are relative newcomers to the fresh cut floral market. A large potential market exists for just the right product. One advantage that woody plants have over annuals, herbaceous perennials and herbs is the different stages that can be harvested and used. In the winter bare branches with attractive bark or buds could be harvested; spring and summer yield flowering branches; fall provides autumn colors of foliage as well as berries which can be used either fresh or preserved. Woody plants live for many years without needing division or disease and pest management that herbaceous perennials require. Established farm shelter belts or mature landscape plants could yield an abundance of usable material. New plantings, however, may take two years or more to begin yielding a marketable product.

Woody plants carry some disadvantages as well. More knowledge of growth habit is required by the harvester to ensure continued success the following seasons. One important thing to note when harvesting flowering branches is whether or not the particular species blooms on current wood or one-year-old wood. Branching habit will also be affected by the type of pruning done. Because woody plants are relatively new to the fresh cut flower and foliage industry, knowledge on post-harvest care is lacking and it may be up to the grower to experiment and find techniques to contribute to a longer vase life of the product. Table 4 lists a few species that could provide plant parts for the fresh cut flower and foliage market.

**Table 4. Woody plants used for fresh or preserved stems, foliage, berries or bark**

Scientific Name	Common Name	Comments
<i>Celastrus scandens</i>	American Bittersweet	Red-orange berries are produced in the fall.
<i>Cornus alba</i>	Tatarian Dogwood	Brightly colored stems are used.
<i>Forsythia</i>	Forsythia	Yellow flowers produced early spring.
<i>Hydrangea paniculata</i>	Panicle Hydrangea	Can be used fresh or dried but large, white flowers may be too big for some floral designs.
<i>Quercus</i> spp.	Oak	Leaves of several species can be preserved with glycerin for the fall market.
<i>Salix</i> spp.	Willow	Curly, twisted branches are most popular in the floral design field.
<i>Spiraea</i> spp.	Spirea	Spring to summer flowering shrubs.
<i>Syringa</i> spp.	Lilac	Lilacs have a short vase life of 3-5 days. They bloom spring to early summer.

## Cultural Methods

### Bed preparations

Soil preparation is very important, especially with perennials which may grow in one spot for two or more years. It is advisable to take soil samples to the local county extension office and obtain an identification of your particular soil type along with an analysis of the nutrient supply in the soil. If necessary, add amendments such as compost to enrich the soil.

Some growers recommend using raised beds to grow cut flowers. Raised beds reduce the probability of saturated field conditions and ease harvest by raising the height of the flowers.

### Seeds or transplants?

When annuals are grown, a decision must be made on whether to purchase established plants or start plants from seed. Both decisions have associated costs. Starting

plants from seed requires special equipment and additional space. As a result, costs may be higher than when purchasing plants started by a wholesaler. If perennials are being grown, extra plants can often be propagated from existing ones.

Fast-growing crops like zinnias and marigolds are usually ready for initial harvest starting in late June or early July. These can be direct seeded as soon as the soil is warm enough. Other crops like ageratum, lisianthus, and celosia, should be started in a cold frame and moved out as transplants.

### Mulching

Mulching is often recommended as a cultural practice, particularly for water and weed management. If plastic mulch is being used, black is preferred to clear since it keeps weeds from sprouting and tearing the plastic. Other mulches include straw, shredded bark, peat moss, pine needles and shredded leaves.

Each type has advantages and disadvantages. The type of mulch used is dependent on cost, availability and preference of the grower. Keeping labor costs down by reducing weeding and watering is crucial in making a profit from these crops.

### **Watering**

A good supply of water is critical in maintaining vigorous plants and quality cut flowers. Many growers of cut flowers recommend drip irrigation (at a rate of 1 gallon per hour) because it is more economical than overhead watering. It also decreases water on the foliage, which lessens chances of fungal diseases developing. Frequency of watering will depend on soil type, weather conditions and crop, but a basic rule of thumb is to give the plants 1 inch of water per week.

### **Fertilizing**

Another important area of growing quality cut flowers is a fertilization program managed to get maximum benefits at the lowest possible cost. One of the first things a grower of cut flowers should do is get the soil tested to determine what types of nutrients may be in the soil and available to the plants. The local county extension office should be contacted for assistance. Once a soil analysis is made, then a decision on type of fertilizer and mode of application must be made. Timing is often critical to get the best quality crop. Annuals, which supply continued harvests over the course of a season, may benefit from a constant low feed; perennials, which often have a flush of bloom and then stop, would benefit more from an early spring or late fall application to boost overall growth.

There are many application methods. Choice depends on grower preference, type of fertilizer being used and associated costs. Liquid fertilizers can be put through irrigation equipment that may already be in place, while granular types can be incorporated prior to planting or applied as a side dressing.

### **Pest control**

Pest control can be especially critical with a crop that is purchased directly by the consumer and needs to have a flawless appearance. Many growers of fresh cut flowers prefer to use a minimum of pesticides if any at all. Other growers rely on chemicals to keep pests in check but take care to use relatively "safe" materials at the lowest possible rates. Managing pests with or without the use of chemicals requires grower knowledge of different pests, their life cycles and best method of control.

To lessen the chance of a major insect wiping out a crop, grow healthy, vigorous plants. Also monitor the crop closely to detect pests as early as possible. Treating "hot spots" is more cost effective than having to treat an entire crop with an insecticide. Know what insects are likely to attack the current crop and watch the weather, as pests often migrate in from other parts of the country on upper level winds. There are web sites that track movement of certain insects over the course of a growing season. Contact your local county extension agent or university for more information on these programs.

Choice of chemicals depends on the pest, grower preference, and when the crop is going to be harvested and marketed. It is best to consult with local county extension agents

for updates on pesticides currently available for use on cut flowers. Some common materials that many consider organic include insecticidal soaps, pyrethrums (naturally occurring compounds in the plant *Chrysanthemum cinerariaefolium*), Bt (*Bacillus thuringiensis*, a highly selective bacteria which starves the target insect by destroying its gut) and neem (also known as azadirachtin) which is extracted from the seeds of the neem tree (*Azadirachta indica*).

Besides insects, other "pests" may include gophers, rabbits, and mice. These may be more of a problem on perennials or woody plants that are in the field over winter. Control of these may include the use of poisons or traps, or barriers such as netting or fencing to protect the plants.

### **Disease control**

Growers need to be aware of how environmental conditions and planting practices can influence disease development. Some common disease problems on cut flowers are leaf spots caused by either fungal or bacterial agents, powdery mildew (fungal) and aster yellows (mycoplasma spread by leafhoppers). If a crop is particularly susceptible to a disease, it should not be grown. In eastern North Dakota, *Limonium sinuata* (notchleaf statice) and *Callistephus chinensis* (China aster) are especially susceptible to aster yellows. The extra care required to keep this in check will decrease profits markedly. Disease forecasting models available on the World-Wide-Web are becoming more common in predicting when outbreaks are likely to occur. An informed grower is often able to avoid serious disease problems by adjusting cultural practices accordingly.

## Harvest

Horticulture is typically a labor intensive science. Labor management is critical to reduce costs. Approximately half of direct labor costs are associated with harvesting; well-trained workers can reduce labor costs by as much as 10 percent. One of the key considerations, is training workers what not to harvest so they can quickly pass over undesirable flowers and harvest the rest. The proper stage of harvest is dependent on the crop. Some flowers such as zinnia and ageratum are best harvested when fully mature. Others, such as roses and gladiolus, will continue to open and need to be harvested before they are fully mature. Still others, such as lilies, can be harvested in the bud stage and still open fully. Table 5 lists the best stage of harvest for selected crops. Harvest in the early morning hours while the flowers' stores of water are highest.

## Post-harvest

Once harvested, flowers can either be placed directly into buckets of water containing preservative or dry packed (packed out of water) to be hydrated later. Both methods have advantages and disadvantages. Using buckets with water and preservative will maintain the water level in the crop, but transporting can sometimes be difficult. Transportation is easier with dry packing, but flowers need to be placed into a cooler or put into water as soon as possible to avoid damage from wilt.

Although they add cost to the final product, floral preservatives should be used. The benefits preservatives provide in terms of longevity and quality of the product usually far outweigh any extra costs involved.

**Table 5. Proper stage of harvest for select cut flower crops**

Scientific Name	Common Name	Correct Stage of Harvest for Direct Sale
<i>Achillea filipendulina</i>	Yarrow	fully open flowers
<i>Agastache cana</i>	Giant Hyssop	just after opening
<i>Ageratum houstonianum</i>	Ageratum, Floss Flower	just after opening
<i>Allium</i> spp.	Flowering Onion	1/3 to 1/4 of florets open
<i>Antirrhinum majus</i>	Snapdragon	1/3 of florets open
<i>Astilbe</i> hybrids	Astilbe	2 of florets open
<i>Calendula officinalis</i>	Pot Marigold, Calendula	fully open flowers
<i>Celosia</i> spp.	Celosia	2 florets open
<i>Centaurea</i> spp.	Bachelor's Button, Cornflower	flowers beginning to open
<i>Consolida ambigua</i>	Larkspur	2-5 florets open
<i>Delphinium</i> spp.	Delphinium	2 of florets open
<i>Dianthus barbatus</i>	Sweet William	2 florets open
<i>Echinops ritro</i>	Globe Thistle	half-open flowers
<i>Eustoma grandiflorum</i>	Lisianthus	fully open flowers
<i>Gladiolus cultivars</i>	Gladiolus	1-5 buds showing color
<i>Gomphrena globosa</i>	Globe Amaranth	fully open flowers
<i>Gypsophila</i> spp.	Baby's Breath	flowers open but not over mature
<i>Helianthus annuus</i>	Sunflower	flowers just beginning to open
<i>Heliopsis helianthoides</i>	False Sunflower	fully open flowers
<i>Liatris spicata</i>	Blazing Star	2 florets open
<i>Lilium</i> spp.	Tiger, Asiatic, Oriental Lilies	colored buds
<i>Limonium</i> spp.	Statice, Sea-lavender	almost fully open flowers
<i>Paeonia</i> spp.	Peony	colored buds
<i>Phlox paniculata</i>	Garden Phlox	2 florets open
<i>Rudbeckia</i> spp.	Black-eyed Susan	fully open flowers
<i>Salvia farinacea</i>	Mealy-cup Sage	2 florets open
<i>Scabiosa</i> spp.	Pincushion Flower	half-open flowers
<i>Solidago</i> spp.	Goldenrod	2 open florets
<i>Tulipa gesneriana</i>	Common Garden Tulip	half-colored buds
<i>Zinnia elegans</i>	Zinnia	fully open flowers

A general purpose preservative for mainstream cut flowers provide the following benefits:

- adds a nutrient source-usually a 1.5-2% sucrose

- lowers the pH of the water to 3.5-4 which makes it (water) more available to the flowers
- reduces bacterial and fungal growth in the water

## Storage

If the product is not going directly to market, storage methods need to be evaluated. Refrigeration is critical to keep flowers looking fresh and to maintain their vase life after purchase. The optimum temperature for storage of the majority of fresh cut flowers is 32-38 F, with a relative humidity of 90-95 percent. This temperature/humidity combination lowers respiration and transpiration of the flower. It also slows growth of fungus and production of ethylene. These are all components that can shorten the shelf life of cut flowers.

## Ethylene

Ethylene is particularly damaging, causing the premature death of 30 percent of all floral crops. Ethylene is a naturally occurring, gaseous plant hormone that speeds up the aging process of plants exposed to it. It is given off by all higher plants but old, decaying plants emit larger quantities. Fruits, vegetables, car exhaust and cigarette smoke are also sources of ethylene.

Some flowers that are particularly sensitive include *Achillea* (yarrow), *Alstroemeria* (Peruvian lily), *Antirrhinum* (snapdragon), *Dianthus* (carnation) and *Lilium* (lilies).

Symptoms include uniform yellowing of leaves, and flowers or florets that drop off in large quantities.

To prevent ethylene problems, keep fruit and vegetables out of the floral cooler, clean out old and decaying flowers, and disinfect coolers and buckets with a 10 percent bleach solution (one part bleach to nine parts water) or commercial product. Filters can also be installed into coolers to filter the ethylene out of the air.

Surfaces in the cooler should also be disinfected to keep harmful bacteria and fungi from growing. These will shorten the vase life of cut flowers through production of ethylene. Buckets should be disinfected after each use while all surfaces in the cooler should be thoroughly cleaned about once a week.

## Transportation

Transporting the crop from the field to the consumer takes special precautions. One important decision is whether to transport the material in or out of water.

Transporting the cut flowers out of water is termed 'dry-packing' and is practiced by commercial growers who ship their product all over the world. This method eliminates the weight of water in the buckets, but water stress on the flowers is more of a concern.

When shipping flowers dry, ice chips should be packed with the flowers to keep the internal temperature of the box down. A climate controlled truck to keep air cool should also be considered.

Flowers should be fully hydrated and "pulsed" before they are dry packed. Pulsing refers to the practice of putting flowers into a solution for a short period of time, from a few seconds to a few hours, to extend the vase life. Typically a preservative solution is used as a pulsing agent.

Care needs to be taken when packing flowers to keep petal damage to a minimum. Short distance transportation of flowers may allow for the use of buckets with water. Although harder and heavier to transport, flowers will not become water stressed, which could occur with dry packing. All of these decisions will impact the final cost of the product.

## Economics/Pricing

Information about current consumption of the product and market saturation must be known to arrive at a pricing structure.

Americans consume fewer floral products than Europeans and Japanese. About 75 percent of the floral products purchased in the U.S. are imported from Columbia and Ecuador. However, according to surveys conducted by the Association of Specialty Cut Flower Growers (ASCFG), Americans will readily consume locally grown flowers, especially if they offer quality and uniqueness. Locally grown products have the advantage of being fresher and having less potential damage in shipping and handling. Local growers also have a greater ability to respond to regional expectations. Each provides an advantage for the local market.

When pricing cut flowers, it is important to have a knowledge of the local market and what type of pricing structure is current. Having a close relationship with a local florist may help establishing a pricing guideline. Remember to figure in overhead costs of seed, labor, storage and transportation, but don't price the product so high that it's out of the range of the target market.

If the target market is a local wholesaler, the price may be less than what a retailer would pay, but it is likely the wholesaler would buy in bulk and more product would be utilized. A farmers' market might command a higher price for the product, but less may be sold. Again, deciding what the target market will be is crucial.

## Tentative Scenario – Zinnias

Here is a tentative scenario for zinnias, incorporating some of the concepts put forth earlier.

Approximately 1 oz of seeds will yield 1000 plants — direct sowing ½ oz/100 feet.

- Seed germinates in three to five days @ 80-85F, five to seven days @ 70-75F.
- Greatest bloom production when day length is less than 14 hours.
- When soil temperature is 70F or higher, time from direct seeding to harvest is about 6-7 weeks.
- Drip irrigate or hand water; do not irrigate overhead.
- Fertilizer needs should be based on soil test results, but about 1½ to 2 pounds of actual nitrogen is needed per every 1000 square feet of production area. A fertilizer ratio of 1:1:1 for N P K is adequate.
- Transplant or sow two weeks after the first planting, with additional plantings spaced a week apart, for a total of six successive plantings.
- Good production will yield an average of 1.3 stems per square foot per week.
- Harvest during the cool part of the day — early morning or late afternoon when the plants are free of dew. Cut stems as long as possible, and only those flowers that are fully open.
- Place newly harvested stems in a commercial floral preservative. They can be stored in vases at 36-40 F with 85-90 percent relative humidity for four days without affecting vase life.
- Insects and diseases include aphids, thrips, caterpillars, scarab beetles, and stem miners; powdery mildew, alternaria leaf blight, and aster yellows.
- Income: \$2.00/bunch, with 10 stems/bunch. A single planting would average \$2,600 (1.3 stems/sq. ft x 10,000 sq. ft. = 13,000 stems/10 stems/bunch x \$2.00/bunch = \$2,600). A higher value crop or successive plantings would naturally yield more income.

## Summary

Additional income from field grown flowers can be realized with market planning, patience, control of costs — especially labor — and attention to quality details. Some key points to remember are to start small and find a market before jumping into it. Also, choose cultivars that will grow best in the area, have 18 inches or greater stem length and possess a long or repetitive bloom time. Flowers sold for market should also have a vase life of at least 7-10 days.

At best, the market is a dynamic target with consumers constantly changing their preferences. To be a continual success, the grower must be willing to shift production to meet consumer preferences.

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