

# Cut Flowers

## History

Formal cut flower production began in the Netherlands in the 16 and 1700's with the development of the greenhouse. Greenhouses allowed the forcing of outdoor plants so they could be produced out of season and the flowers sold. Lilac bushes were dug, subjected to normal seasonal cold temperatures and brought into the greenhouse to induce flowering.

As Europeans settled the United States, they brought cut flower production with them, beginning with the first greenhouses being built near cities in the mid to late 1700's. The development of air transport and refrigerated trucks allowed the industry to move further from cities, to areas with the best climates for optimum production and lower production costs. A few crops were grown outside. Carnation and rose production moved to the front range of Colorado and then to Coastal California, gladiolas and chrysanthemums to Florida and California. At this time, only a few species, like gladiolus, were grown in the field. California eventually dominated the cut flower industry.

Because cut flowers do not have roots or soil, they were not restricted by normal plant quarantine policies. With an interest in disrupting the drug trade in South America, U.S. officials encouraged cut flowers as an alternative crop in Columbia and the first carnations were produced in Bogotá in the mid 60's. A mild climate with high light and cheap production costs like labor and greenhouse heat made the industry boom and Ecuador soon followed. Currently the three crops that are the backbone of the florist industry, carnations, chrysanthemums and roses, are all imported.

After a difficult time, most big U.S. producers switched to potted or bedding plants and small, local producers emerged to fill the need for high quality flowers that had not been boxed and shipped dry over long distances. Varieties, floral trends and marketing also developed beyond the highly structured, traditional floral design and sales customs. A broad range of cut flowers is now sold directly to consumers at farmers markets, to specialty florists, supermarkets and wholesalers. Much of the production occurs in the field but also in greenhouses, barely heated hoop houses and unheated high tunnels.

## Growing

### VARIETIES

Over 100 varieties of flowers are grown as "specialty" cut flowers (those beyond the big three traditional crops of roses, carnations and chrysanthemums). They may be annuals, perennials, woody trees and shrubs, bulbs or native plants harvested from the wild. Annuals are the most produced and they are divided into Annuals - warm season plants that grow from seed to

flower in one growing season, Hardy Annuals – single season plants that survive low temperatures in the field, and Half-hardy Annuals which cannot survive a freeze but thrive in cool spring temperatures.

Flowering perennials are those plants which survive from year to year, generally increasing in size and producing more flowering stems as they mature. Bulb flowers are chosen for the most important factors that define all appropriate cut flowers: long stem life, long vase life (the number of days that a flower is attractive in a vase after being cut) and quality – the ability to retain their original appearance after being cut from the plant. Woody shrub and tree varieties are chosen for their suitability to the local climate.

Flower growers find that some varieties of each species perform better than others in the warm, moist climate of Louisiana. The best way to find good varieties is to talk to other flower growers and to trial several, observe for qualities like long lasting flowers with long straight stems, and take notes to help with selections for the following year. Choose varieties and species that require a minimum of chemical spraying, as you will be handling the flowers intimately. See the major cut flower varieties recommended for Louisiana in Table 1.

**Table 1. RECOMMENDED CUT FLOWER SPECIES FOR LOUISIANA**

Species	Remarks	How to Cut*	Bloom time**
<b>Hardy Annuals</b>			
Bachelor Buttons <i>Centaurea cyanus</i>	Direct sow October, December. Cut low.  Used in bouquets. 12” spacing.	Cut single stems when flowers first open, leaving a few nodes at base for secondaries. March-April.	Late March - April
Canterbury Bells <i>Campanula medium</i>	Biennial grown as an annual. Fall plant to vernalize. 6-8” spacing.	Cut to base of plant.	May - June
Delphinium <i>D. elatum</i>	Perennial grown as an annual. Plant plugs in fall, planting additional every 4 wks. 12-18” spacing.	Cut to base of each stem when florets at bottom are 1/3 open.	April - July
Larkspur <i>Consolida ambigua</i>	Direct sow October, early December. Produces secondary shoots. May spring plant for smaller flowers. “Imperial Giants”. Dries well. 6” spacing.	Cut single stems when 1/3 of florets have opened, leaving a few nodes at base for secondaries. Cut for 6	Late March - April

		weeks. Hang inside to dry.	
Lisianthus <i>Eustoma grandiflora</i>	Plant plugs October, December. Cut entire cluster. Will rebloom. Support. Needs good drainage. 8" spacing.	Cut entire plant to base, leaving a few inches for secondaries to emerge 12 wks. later.	Late May – later summer
Snapdragon <i>Antirrhinum majus</i>	Start transplants in Sept. Plant out Nov. 1. Produces secondary shoots. May spring plant for smaller flowers. "Rocket" and "Potomac" (greenhouse). Caterpillar damage as days warm. Geotropic. 6" spacing.	Cut single stems to within an inch of base when lower 1/3 of flowers have opened. Secondaries will emerge and are suitable for bouquet work. March-April.	Late March – May
Stock <i>Matthiola incana</i>	Start transplants in Sept. Single stem or branched. Select seedlings for doubles. See video <a href="#">here</a> . "Cheerful" & "Katz" are 95% double. Plant out Nov. 1. Cut to ground. Drainage sensitive. 4" spacing.	Cut entire plant to ground. Use ethylene blocker as a one hour pulse before placing in keeping solution. Feb-March.	February - March
Sweet Pea <i>Lathyrus odoratus</i>	Direct sow Oct., Nov. Trellis. Snap out of leaf node. Short stems and vase life. 3-4" spacing.	Bend and break flowers out of leaf axils. Do not leave open flowers on vines or production will cease. March – May.	Feb - April
<b>Half-hardy Annuals</b>			
Ageratum <i>Ageratum houstonianum</i>	Start transplants Jan. 1, plant out mid-Feb. Branching plant. 12" spacing. Needs lengthening days to bloom.	See diagram for cutting branching plants.	Late March - June
Aster <i>Callistephus chinensis</i>	Start transplants Jan. 1, plant out mid-Feb. Bouquet or single stem. Plant again in July for fall crop. Bright colors. 6-12" spacing.	Cut single stems to ground; follow diagram for cutting branching varieties.	May

Queen Anne's Lace (Bishop's Weed) <i>Ammi majus</i>	Start transplants Jan. 1, plant out mid-Feb. Cut low. Plant again in July for fall crop. Filler. 8-12" spacing.	Cut entire plant or discard large top flower and cut as branching plant.	April - August
Saponaria <i>Saponaria vaccaria</i>	Direct sow in October, January. Good filler. 6-8" spacing.	Cut when multiple blooms have opened. Blooms for 6 weeks.	April - May
Statice <i>Limonium sinuata</i>	Start transplants Jan. 1, plant out mid-Feb. Good filler and dried flower. Plant in Nov for high tunnel. 12" spacing.	Cut many single stems and bunch together for 1-1 1/2" bundle. Blooms for months	Late March - May
<b>Warm Season Annuals</b>			
Aster <i>Callistephus chinensis</i>	Start transplants in July for fall plant. Single stem or bouquet. Bright colors. 6-12" spacing.	Cut single stems to ground; follow diagram for cutting branching varieties.	Sept - Oct
Caryopteris <i>Caryopteris incana</i>	Start seeds or cuttings for transplant in mid-summer. 12" spacing. Needs shortening days to bloom.	See diagram for cutting branching plants.	Sept - Oct
Celosia <i>Celosia cristata, spicata</i>	Direct seed or start transplants for March planting. Tender. Produces secondary stems. Succession plant. 6-12" spacing.	Cut cock's comb when largest head size reached; feather when 1 <sup>st</sup> flower is mature. Leave a few inches at base for secondaries to develop. All flowers ready at once.	Mid-June - frost
Corn (Broom or Indian)	Direct seed in spring. Used for dried arrangements for fall. 6-8" spacing.	Hang to dry inside.	May - June
Cosmos <i>Cosmos bipinnata, sulfurea</i>	Direct seed or start transplants for better stand. Bright colors. Branching plant. 8-12" spacing.	See branching plant cutting diagram.	May - June
Gomphrena (Globe Amaranth)	Direct seed after frost. Multiple colors. "Fireworks" is good pink. Watch for	See branching plant cutting diagram.	June - frost

<i>G. globose, pulchella</i>	insect damage. Succession plant. 8-12" spacing.		
Marigold <i>Tagetes spp.</i>	Start transplants for planting after frost. Choose large, African marigolds. Unpleasant foliage smell. "Gold Coin" is good. Succession plant. 5-6" spacing.	See branching plant cutting diagram. Removal of most foliage will reduce scent.	June - frost
Sunflower <i>Helianthus annua</i>	Direct seed after frost. Single stem, pollenless most desirable. Colored varieties have shorter vase life & branching plants. Succession plant, increasing time between plantings when days are longest. 10-12" spacing, 18-24" for branching c.v.'s.	Cut single stem, pollenless varieties to the ground. Follow diagram for branching plants. Cut when petals have barely unstuck from disc. Cut evening before if beetles are present.	Mid May - frost
Zinnia <i>Z. elegans, pumila</i>	Direct seed after danger of frost. Succession plant every 4 wks. Branching plant. "Benary's Giant" best. "Oklahoma" smaller, mildew resistant. 12" spacing. Cut for months.	Cut as soon as flower is open. Discard blooms with many stamens showing. See diagram for cutting branching plants.	April - frost
<b>Bulbs</b>			
Anemone <i>Anemone coronaria</i>	Fall plant. "de Caen", "St. Bridget" best. Grow in high tunnel or greenhouse. Grow as annual, planted 5-6" apart.	Cut down to branching point.	Feb - March
Brodiaea <i>Brodieae lactea</i>	Fall plant. Blue corymb. Good for bouquets. 3" spacing.	Cut deep down into foliage. Leave foliage on plant to nourish bulb.	April
Calla lily <i>Zantedeschia aethiopica</i>	Fall plant. White; colored varieties require superior drainage. Use frost protection or grow in high tunnel. 12" spacing.	Yank up from plant.	Feb - March

Crocoshmia (Montbretia) <i>Corcosmia x corcosmiflora</i>	Bright red. Requires frequent division to maintain stem size. 12" spacing.	Cut deep down into foliage.	Late June
Drumstick allium <i>Allium sphaerocephalum</i>	Fall plant. Only allium for LA. Blooms mid spring within 2-3 wks. Dries w.ll. Will perennialize. 3" spacing.	Cut deep down into foliage. Blooms 2-3 weeks,	March - April
Dutch Iris <i>Iris hybrids</i>	Fall plant. Many good c.v.'s. Will perennialize. 3" spacing.	Cut deep down into foliage when top bud emerges and just begins to unfurl. All bloom out in 2 weeks.	March - April
Freesia <i>Freesia x hybrida</i>	Fall plant. High tunnel or frost protection required. 3" spacing.	Cut to base or to first joint if there's a market for short stems. Cut when the bottom bud opens.	February - March
Gladiola <i>Gladiolus hybrids</i>	Fall or spring plant. Full size or pixies. Problems with thrips. Tall glads do better with support. Succession plant. Geotropic. 3-4" spacing.	Cut deep down into foliage when lowest flower opens.	June- frost
Grape Hyacinth <i>Muscari armeniaca</i>	Force in flats or pots in cooler beginning Nov. 1. Remove Feb. 1 and set in sun. Yank stems out of bulb for length.	For cuts, yank stem out of bulb for longest stem. Pots are ready when foliage and flower are fully colored.	Feb - March
Liatris <i>Liatris spicata</i>	Fall plant. First flower largest but will make secondaries. Spacing 5".	Cut when 1/3 of flower has opened.	June - July
Lilies <i>Lilium asiaticum, L. orientalis</i>	Only Asiatic hot colors perennialize. Use top size bulbs planted in fall. Orientals do not perennialize and blast in hot years. 4" spacing.	Cut when first flower opens or the night before opening and allow to open inside. Leave 1/3 of stem on plant to nourish bulb.	May - June

Narcissus	Fall plant. Choose c.v.'s for our area to perennialize. "Carlton"  Is good large trumpet c.v. Cut just before opening. Spacing 5-6".	Cut when first open or in a swollen bud. Do not mix in bucket with other cuts	Feb - March
Ranunculus <i>Ranunculus asiaticum</i>	Fall plant. Best in high tunnel or with frost protection. Excellent cut. Plant spider-like tubers with "legs" down. Spacing 3-4".	Cut entire stem or to first joint, depending on stem length desired.	Feb - March
Spanish bluebells <i>Hyacinthella hispanica</i>	Fall plant. Blue bell spike flower for bouquets. Yank out of bulb for longest stem. Perennializes. Spacing 5-6".	Cut deep into foliage for 12" stem. Yank out of bulb for 15" stem.	Late April - May
Tuberose <i>Polyanthus tuberosa</i>	Single only for good vase life. May be kept in bloom for months by sidedressing every 2 wks. Plant clumps rather than single bulbs; divide every 4 yrs. Spacing 6".	Cut to base. Band stems together and use a tall bucket for support.	June - July
Agastache	Blue, red or apricot spike flower. Herbal smell. TP early spring. Summer bloomer. 12" spacing.	Cut when first florets open. See diagram for cutting branching plants	Summer
Alstroemeria	Garden flower. Good for bouquets and farmers market. Too hot/humid for greenhouse alstro here. Invasive. Early summer bloom. Space 12".	Yank out of plant, recut stems to desired length.	Summer
<b>Perennials</b>			
Aster	Airy filler flower. "Monte Casino" is good. Minor spring and summer bloom, most in fall. 12" spacing.	Cut to base.	Fall
Balloon Flower	Takes 3 years to produce sturdy bell shaped flower in blue or white. 6" spacing.	Cut to base.	Summer

Black-eyed Susan	“Goldsturm” is perennial, “Indian Summer” is large, impressive, and grown as an annual though started as 4” in fall and transplanted. 12” spacing.	Cut the shorter “Goldsturm” to base when first flower opens. See branching diagram for larger “Indian Summer”.	Summer
Gerbera Daisy	100’s of cut flower c.v.’s; many must be trialed to find those which perennialize. High tunnel with summer shade. Protect from freezing to keep in production year-round.	Bend stem back and forth to loosen from plant. Recut and place in tall bucket with hardware cloth lid, hanging flowers down through mesh. Set at room temperature for one hour before refrigerating.	Year round with protection
Lace Veil Statice	2 years to full production. Airy yellow/white filler. 5-10 stems per plant. Sea Lavender statice also very good. 12” spacing.	Cut many single stems and bunch together for 1-1 ½” bundle.	Spring
Leatherleaf Fern	Protect from freezing. Clean out dead fronds in spring. Never cut all fronds in bed.	Cut down deep into foliage.	Year-round with protection
Phlox	Native <i>P. Pilosa</i> is pink, 15” tall. Only a few c.v.’s of <i>P. paniculate</i> can grow here. 6-8” spacing	Cut to base.	Mid-summer
Physostegia	Summer spike flower. Thin bed regularly. Cut back in June to force heavier stems in Aug. Spacing 6”.	Cut to base.	Late summer
Red Hot Poker	Large, yellow/red spike flower. Valued for men’s floral arrangements. 2 yrs. to full production. 24” spacing.	Cut deep down into foliage.	April
Scabiosa	Blue or white with 24” stem. 6” spacing.	Cut to base.	Spring



Salvia	S. farinacea has good vase life and also dries well. 12" spacing.	See diagram for cutting branching plants. Constant cutting keeps in production all summer.	March - summer
Shasta Daisy	Spring blooming member of mum family. Other fall-blooming mums with green, non-fuzzy foliage also perennialize. 12" spacing.	Cut to base.	April
Sweet William	Biennial treated as a perennial (fall start, vernalize over winter). Another good dianthus is <i>D. hollandia</i> . 5-6" spacing.	Cut to base.	March - April
Tropicals	Large group of stiff, waxy flowers for S.LA: Bird of Paradise, Pinecone Ginger, Red Ginger, Shell Ginger. Protect from freezes. Will not bloom after severe winters.	Cut to base. Keeping solution unnecessary.	Late summer
Tansy	Western native with 36" tall gold buttons. Tough. Dries well. Good filler. Herbal.	Cut to base. Hang to dry.	Summer
Veronica	Tall blue or pink spike. Can be kept in production all summer with regular cutting. 12" spacing.	Cut to base.	April - June
Yarrow	Smaller <i>millefolium</i> may wilt. Keep in bucket to observe for wilting before using. Larger, gold <i>A. filipendulina</i> is tough and dries well but may not be perennial in S. LA. 12" spacing.	Cut to base. Hang to dry.	April - June
<b>Trees, Shrubs, Roadside Finds</b>			
Curly Dock	Field weed with lovely celadon seed head which turns reddish as summer progresses. Collect.	Cut to base	Early summer

Corkscrew Willow	Small tree for S.LA with curly stems.	Cut 36" long. Split stem for greater water uptake.	Year-round
Eupatorium	<i>Coelestinum</i> (Blue mist flower) Is native look-alike for ageratum. Grows at edge of shady sites in late summer/fall. Boneset is tall, fall-blooming, with large white flower. Collect.	Cut to base.	Late summer
Forsythia	Garden shrub blooming in February. Cut back hard when young to force extra shoots. Remove old canes from mature plants. Easy cutting.	Cut entire stem.	Feb - March
Fruit branches	Double peach and cherry ornamental (non-fruiting) fruit trees. Excellent early spring cut flower.	Cut 30-36" long.	March
Goldenrod	Open fields. Garden varieties are almost identical. A related inter-generic cross, <i>Solidaster</i> , is an excellent garden perennial. Collect.	Cut to base.	August
Hydrangea	Deciduous shrub. Pink or blue depending on soil pH. Acidify for blue with aluminum sulfate (1/2 oz./gallon) monthly or lime for pink. Grow 3' apart, in full sun, with irrigation.	Cut when flower expands and takes on true color (all flowers begin white). To dry, leave on plant until petals appear papery and no longer.	May - June

\* Strip foliage from all stems, leaving only top third near flower. No foliage in water

\*\* Dates given are for South Louisiana, will be 2-3 weeks later in North Louisiana

## WHEN AND HOW TO PLANT

Annuals may be started inside as transplants or direct seeded, depending upon the size of the seed. The smallest seeded plants are always started as transplants. Time of planting depends upon whether crops are Annuals (frost-tender and grown in the warm season), Half-hardy Annuals (frost-tender plants that prefer cool temperatures), or Hardy Annuals (cold hardy to 20-30 degrees F or lower). Start transplants inside under lights 6 weeks before planting time

using a well-drained seed-starting mix and cell trays. Direct seeded plants are planted after soil has cooled (hardy annuals) or soil has warmed (annuals).

Perennials are started as seeds in September in cell trays using a well-drained, seed starting mix. When plants have 4 true leaves, they are moved to 4" pots and placed outside to grow through the winter. Plants are placed in their final position in the row or bed in early spring, usually mid-February through mid-March. Gerbera daisies should be planted in a high tunnel or unheated greenhouse in the spring.

Bulbs are generally available to purchase in fall around October 1. Gladiolas and lilies are more commonly available in spring, but if obtainable in the fall, should also be planted then. Plant them in the field at close spacing, with larger bulbs being planted deeper than small bulbs. Half-hardy bulbs like freesia, ranunculus and anemones require serious frost protection in the field and are better suited to a high tunnel or unheated greenhouse.

Trees and shrubs are best planted in full sun in the fall in a well-drained soil. Dig a hole that is twice as wide as the root ball but no deeper, as loosening soil under the root ball may later result in the tree or shrub sinking below the soil line and stressing the plant. Do not plant after March or plants will be unable to root in well enough to survive high temperatures without considerable close attention to watering. Mulch well.

In Louisiana, tender, half-hardy annuals are started January 1 for transplant in mid to late February; annuals in late January for transplant after last frost;

## **WHERE TO PLANT**

All field grown specialty cut flower crops are grown in full sun (at least 6 hours/day) in well-drained soil with a pH of 6 to 6.8. Plant in raised beds or rows 8-12" high. Because cut flowers are in production year-round, fields should be constructed for good drainage during the rainier winter months. Addition of organic matter ([compost](#), peat moss, rotted hay or composted manures) will improve stem size and sturdiness. Apply 3-4" and rake in before building rows.

Plastic or landscape fabric may be used to assist with weed control and warm the soil in spring. Install drip irrigation tubing under plastic mulch. Keep the surface of fabric mulch clean to avoid the growth of weeds which may penetrate through the fabric into the soil. Some cut flowers are winter crops that require protection from hard freezes, especially in the colder northern part of the state. Spunbond frost cloth is helpful to keep them growing. Other winter crops benefit from the additional daytime heat generated by the sun in a protected structure such as a minimally heated hoop house or high tunnel. Temperatures can get warm enough to require ventilation during the day and stay above freezing at night. Gerbera daisies, although a hardy perennial, will freeze down, go winter dormant and stop producing flowers until spring if allowed to freeze. With minor protection, gerbera beds can produce thousands of stems through the winter. Winter bulbs like freesia, ranunculus and anemones also achieve their

highest production when provided with the winter protection of a high tunnel. Row cover may be added for cold periods and a small electric heater can assist on the coldest nights.

Rotate annual crops to avoid a buildup of diseases in the soil. Separate perennial areas from annual areas to avoid disturbing bulbs, shrubs, and flowering perennials with the frequent tilling and traffic in rows where annual crops are grown.

## **PLANT CARE**

Watering: Soil for all crops should have adequate moisture while plants are actively growing. Consistent watering of about 1 inch per week is recommended, using a thorough soaking to promote deep root growth. Increase watering during periods of high temperatures and drying winds, or on sandy soils. Bulbs are the exception, as they only require water while bulb foliage is up and growing. Bulbs prefer to remain dry during their summer and fall dormant season and should be placed on the edge of the cut flower plot to avoid unnecessary irrigation.

Fertilization: Fertilize the raised bed or row before direct seeding or transplanting cut flowers. Sprinkle on the top of the row and rake in before planting. {organic recs}

Alternatively, a synthetic fertilizer may be used at the rate of about 1.25 pounds (2.5 cups) of 13-13-13 for every 25 feet of row or 75 square feet. Broadcast, or sprinkle evenly, over the soil and then mix in about 3-6 inches deep using a rake. With a few exceptions, cut flower crops rarely require sidedressing. A few long-blooming crops, like zinnias, veronica, salvia, gerbera daisy, and tuberose will benefit from an application of fish emulsion or about 2 tablespoons 13-13-13 per plant after the first flush of bloom and every few weeks afterwards until out of production.

Support : Several crops will benefit from supports. Sweet peas require a trellis of netting to climb. Gladiolas can avoid lodging (being laid flat by high winds) with the use of netting. Lisianthus will also produce better stems with net support. To install netting, place 6" t-posts at the corners of the beds and at regular intervals (every 8-10 feet) within the bed. Place netting over the tops of the posts, move down to 1-2' from ground and secure with string or zip ties.

Weeds: Plastic and organic mulches will control most weeds. Weeds among plants may be hand pulled. Unmulched beds can be kept weed free by hoeing before plant canopies expand to shade out weeds.

Harvesting: Fresh cut flowers should be harvested early in the day, when water content in the plant is at its highest. When the sun comes out, plants get ready to photosynthesize and open the stomates in the leaves for gas exchange (CO<sub>2</sub> in, O<sub>2</sub> and water vapor out) and will lose water until sundown. In early morning, the stomates (breathing holes in leaves) have been closed all night and water content is at its peak. Flowers may also be harvested after sundown, but never in the middle of the day, as they may wilt and be unable to perk up again.

Stage of flower maturity and stem length are critical to harvesting high quality specialty cut flowers. Flowers must be cut as soon as they reach a developmental stage which will allow the flower to be attractive and continue to open. Some general guidelines are in Table 3. See individual crops in Table 1 for proper cutting stage for each different species.

**Table 3. GENERAL STAGES OF MATURITY FOR HARVESTING FLOWERS FOR BEST VASE LIFE**

Roses	Main bud should be closed and just slightly loosened at the top. Very tightly closed buds will not open. When cutting sprays of roses, allow the main bud to open and other buds to show color.
Spike flowers	Lowest bud should be open on gladiolas, lower 1/3 to 1/2 should be open on larkspurs and snapdragons.
Lilies, flowers with clusters of buds	No more than 1 bud open, with 3 or more buds to open later.
Sunflowers	At least 4/5 of petals should be open and central disc should be smooth and slick, not fuzzy. If most petals are not expanded, they will not open later.

**Every day left on the plant after maturity is a day off the vase life.** Vase life is the amount of time that a flower will remain attractive after being placed in the vase in the home. For peak quality, harvest every day.

Flowers with long, straight, single stems (example: sunflowers) are cut all the way to the ground. When cutting bulbs, move foliage aside to cut stem. The foliage will nourish the bulb for next season's bloom. Some species are cut ALMOST to the ground but a few leaf nodes are left on the main stem to permit smaller, secondary branches to form. Still other plants will form a large, branching plant which, if cut properly, will produce fresh stems for months. If cut all the way to the branching point, the plant will be reduced to the base in just a few cuts. If cut leaving a few leaf nodes above the branching point the plant will continue to produce additional shoots. See the cutting diagram for an example.



Insect Pests and Diseases: The many species of cut flowers are relatively insect and disease free but a few problems do occur, depending upon the season. Winter brings only rot to rosette-forming species like gerbera daisies and bachelor buttons. Summer conditions develop one of the few foliage diseases, anthracnose of zinnia. Insects may be more problematic in the summer season. As temperatures warm, caterpillars begin to damage snapdragon flowers and celosia foliage. With hot weather, beetles and weevils may attack sunflowers, removing petals and rarely, entire flower heads. Good drainage, spunbond row covers and timely cutting will solve many problems. Spraying of chemicals is discouraged, as considerable handling of cut flowers is necessary (cutting, carrying, leaf stripping, sorting, arranging in a vase). See Table 3 to aid in diagnosis and management of some common insects and diseases.

**Table 4. ORGANIC AND NATURAL MANAGEMENT FOR COMMON CUT FLOWER INSECT PESTS AND DISEASES**

Symptoms	Diagnosis	Organic and Natural Management
- Yellowed, mottled foliage - Twisted foliage - Black sooty mold on lower leaves	Aphids	<ul style="list-style-type: none"> <li>• Timely planting and harvesting</li> <li>• Reduce water stress</li> <li>• Weed control</li> <li>• Water jet to dislodge</li> <li>• Insecticidal soap, neem oil, pyrethrin, Azera</li> </ul>
- Holes in leaves - Holes in petals	Beetles	<ul style="list-style-type: none"> <li>• Early morning harvest</li> <li>• Harvest night before flower opening</li> <li>• Perimeter trap cropping</li> <li>• Super Light Insect Barrier</li> </ul>
- Reddish spots on lower leaves - Spots move up plant as season progresses	Leaf spot	<ul style="list-style-type: none"> <li>• Avoid overhead irrigation</li> <li>• Avoid working in fields when plants are wet</li> <li>• Remove plant debris</li> <li>• Reduce plant stress</li> <li>• Organic/natural fungicides</li> </ul>
- Missing flower parts - Holes in leaves - Frass	Lepidopteran larvae	<ul style="list-style-type: none"> <li>• Row covers</li> <li>• <i>Bacillus thuringiensis</i> sprays</li> <li>• Remove damaged foliage</li> </ul>

- Leaves in rosettes darken and soften - Leaves pull easily away	Rot	<ul style="list-style-type: none"> <li>• Grow on high rows</li> <li>• Improve drainage in field</li> </ul>
- Silvery feeding damage on leaves - Papery flowery sheaths	Thrips	<ul style="list-style-type: none"> <li>• Keep area around plot mowed, directing clippings away from rows</li> <li>• Predatory mites</li> <li>• Neem, pyrethrin, insecticidal soap</li> </ul>
- Removal of sunflower heads - Missing leaves	Weevils	<ul style="list-style-type: none"> <li>• If few flowers affected, do nothing</li> <li>• Serious infestation, spray backs of flowers with registered insecticide</li> </ul>

## Postharvest and Storage

After harvesting, keep flowers in a cool, shady place. Bring inside and strip away the bottom leaves that would be below the water level in the bucket. If not removed, they cause bacteria to grow in the water as they decay. Bacterial growth inside stems is the prime reason that fresh flowers wilt. Flowers that have been cut early in the day and kept cool may be arranged and expected to last in the vase for 5 – 14 days, depending on species. Keep flowers out of drafts and direct sunlight and do not place on surfaces that generate heat. For greatest keeping quality, wrap in a paper cone and keep flowers in refrigeration until used. Recut stems every time flowers are handled and place flowers in a keeping solution at all times. A good simple keeping solution is:

- 1 gallon warm water
- 1/2 cup white sugar
- 1 teaspoon bleach or vinegar

The sugar supplies carbohydrates to the flower, since roots and leaves, which normally supply carbs to flowers through photosynthesis, have been removed. The bleach suppresses bacterial growth. If vinegar is used, it suppresses bacterial growth by providing an unfriendly, acid pH. There are many commercial floral preservative solutions available, but they are all composed with the same premise in mind: carbohydrate source and bactericide.

### Coolers

Sooner or later, you're going to need one. You can get by without one if you can sell your entire day's cut every single day. Some growers who market entirely through farmers markets just cut once or twice a week, the day before the market. Cutting so infrequently means it takes a big chunk of time to go through and cut everything that is at peak stage *plus* those that are past peak and older. You're more likely to accidentally include flowers that are past peak and are dabbling with damaging your good reputation for fresh, long lasting flowers. Cut as

frequently as you possibly can and get those flowers in the cooler. Every second that the flowers are out of the cooler, they are continuing to develop and are aging and losing quality.

Temperatures for most flowers, especially those originating in the temperate (cool temperature) world should be set in the low to mid-thirties. Roses, bulbs and most perennials and annuals fit in this range. Tropicals and warm season annuals like zinnias and sunflowers need to be held at a warmer temperature, more like 45 - 50° F. It's more difficult for a cooler to maintain warmer temperatures because it has to cycle a lot to keep the temperature just right. That makes the compressor cut on and off more and you're more likely to have repair problems resulting from all of that activity. If you are like most of us and can just run one temperature, stick to the low thirties and be careful not to allow the petals of the summer annuals like zinnias and sunflowers to touch the walls of the cooler.

A large, used, walk-in box, say 10' X 10', can be bought in easy-to-assemble pieces from a restaurant supply company for around \$1000. The compressor will run another \$2500 - 3000. For around \$600, a standard room air-conditioner can be manipulated to function as a compressor by installing a gadget that tricks its thermostat into reaching much lower-than-normal temperatures. On a smaller scale, a two-door restaurant cooler (like a coke wall unit) will work very well and hold eight or more buckets. Look for solid doors rather than glass, since glass doesn't hold in the cold as well as a solid insulated wall.

## Sources

### **Seeds, plugs and cuttings:**

Ball Seed Co. (owns Panamerican Seed and Fred C Gloeckner, a former major supplier of plugs, cuttings and seed). Must set up a commercial account. They sell EVERYTHING. Good technical info on growing. <https://www.ballseed.com/>.

Germania Seed Co., Chicago, IL, (800) 380-4721. Require payment with order, good selection of seeds and plugs. <https://www.germaniaseed.com/>

Harris Seed. Large selection. Has an organic line. <https://www.harrisseed.com/>

Organic seeds may be bought from Shepard's or Johnny's.

### **Supplies:**

Coolbot. Cooler system using a room air conditioner. <https://www.storeitcold.com/>

Floralife, Inc., Burr Ridge, IL, (800) 323-3689. Floral preservatives, ethylene blockers. <http://www.floralife.com/en/>



Chrysal, Miami, FL, (305) 477-0112. Chrysal and other floral preservatives.  
<https://www.chrysal.com/products>

Nashville Wraps. Floral sleeve supplier, many sizes. <https://www.nashvillewraps.com/floral-packaging/floral-supplies/mc-5>

### **Resources:**

Association of Specialty Cut Flower Growers (ASCFG), MPO Box 0268, Oberlin, OH, 44074. (440) 774-2887. <https://www.ascfg.org/>

Membership \$195. Produces an excellent, informative quarterly publication and product directory for members. Puts on a terrific rotating annual conference.

Specialty Cut Flowers by Allan Armitage, Timber Press, 133 S.W. Second Avenue, Ste. 450, Portland, OR, 97204 \$149. **THE** book on field cut flower production. Some find it a little technical....just ignore the graphs if you feel that way.

The Flower Farmer; An Organic Grower's Guide to Raising and Selling Cut Flowers by Lynn Byczynski, PO Box 3747, Lawrence, KS 66046, \$28.00.

## References

North Carolina State University Extension, A Brief History of Specialty Cut Flower Production  
<https://cutflowers.ces.ncsu.edu/welcome/brief-history-of-specialty-cut-flower-production/>

Harris SeedCo., Cut Flower Quick Facts Chart <https://cdn.shopify.com/s/files/1/1537/5553/files/ChartCutFlower.pdf>