Nursery
FACTSHEET

BRITISH COLUMBIA | Ministry of Agriculture

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Field Grown Cut Flowers

INTRODUCTION

The culture of field grown flowers is an area of floriculture that is generating a lot of interest and is enjoying a steady growth rate. It provides a way to enter the floriculture industry without the $100 to $150 per square metre capital costs that are involved in some greenhouse crops. Recently, the largest area of growth has been in the specialty cut flowers as opposed to the more traditional field grown crops like statice, dahlias and gypsophila. As gardening increases in popularity, home consumers are becoming familiar with the many new and different flower species. In turn, consumers are starting to look for and demand these flowers in floral design work.

Site Selection

Whether you plan to lease or own the land, there are basic, yet important, site considerations (see Table 1). It is easier if you start with a suitable site rather than try to modify it later.

Table 1. Considerations when selecting a production site

Soil: It should be fertile and well drained. Soil tests are a basic management tool. Even if you are familiar with the soil in the area, it must be tested to determine pH, organic matter and nutrient levels. A pH of 6.0–6.5 is suitable for most cuts. Know the requirements of your crop before you make any major changes.

Water: Good quality water must be available in sufficient quantities. Have the water source tested to determine essentials like pH and EC (salinity).

Terrain: Flat land is easier to work. Watch out for low lying pockets that might be prone to early and late frosts, or flooding during the wet months.

Shade: Most cut flowers will need full sun all day. Sites that are located on the north side of mountains or trees will have reduced production capabilities. However, some partly shaded areas on the site will allow for increased cropping diversity.

Drainage: Good drainage plays an important role in disease control, plant growth and overwintering. Poorly drained areas will need to be corrected.

Size: Field grown cut flowers don't require a huge land base, but make sure that the site is large enough to accommodate any future expansion plans.

Winds: If you are in a windy area, you might want to consider windbreaks. Windbreaks help to reduce water stress and mechanical damage to plants. Select plants for the windbreak that will not shade production areas.

Fencing: A good fence not only keeps out foraging wildlife but also anyone who wants free samples.

Access: The site must allow for easy access for production equipment, harvesting and crop removal. If you plan to sell the product through a road side stand or U-pick, parking, access and visibility are also important considerations.

Crop Selection

An important concept to keep in mind with field-grown cut flowers is that your crop selection and yield must be market driven, not production driven. Unless you are near a large population centre, like the Fraser Valley, most cut flowers are sold through niche markets, and therefore have a limited demand. Excess volumes will only serve to lower prices. Determine a flower's end-use to decide whether it's an industry staple or a specialty niche market item. For example, is it used as filler or a focal point in wedding work? Another consideration is whether you want to sell your crop as fresh or dried flowers, or a combination of both. These factors will help in your plans to settle on a crop mix, marketing venue, and on the volumes the market might bear. There are many market options available: the United Flower Growers' Co-op, farmer's markets, supermarkets, garden centres, roadside or city stands, hotels, restaurants, craft stores, florists, or as a U-pick. Depending upon your location and crop choice, you may sell your product through one or more market outlets.

When deciding on your crop mix, don't overlook some of the more common money makers. Novelty and specialty flowers are great, but the crop mix should include some traditional items, even if they're predominantly used as fillers. Traditional crops and named cultivars are often easier to grow because there is more production information available. On the other hand, if a flower is found in most home gardens there may not be a high demand for it in the regular growing season. Always be on the lookout for new and unusual flowers. Spend your winters reading North American, European and Japanese seed catalogues, and books on gardening and perennials. Remember to introduce new species gradually to the market place. Just because you think it's the perfect flower don't expect the consumer to want it in large volumes. Evaluate varieties not just by their appearance, but also for other important criteria like vase life, fragrance, hardiness and drought tolerance.

There are many production factors to consider, including:

- ⇨ cost of production,
- ⇨ production per square metre,
- ⇨ the length and ease of extending the production season,
- ⇨ resistance to pests,
- ⇨ stem length, and
- ⇨ ease of harvesting.

One final important consideration; be sure that you can manage the cultural requirements of a new crop. Local climate, the length of the growing season, the number of frost-free days, and rainfall will constrain your crop choice. Crops must not only be able to grow in your climate, but they must also suit your production techniques and anticipated selling window. Grow a combination of annuals, biennials, perennials, bulbs, woody cuts and ornamental grasses to stagger production and cash-flow. Table 2 examines some of the advantages and disadvantages of the various crop types.

Table 3 provides a partial list of plants that can be used as cut flowers. More than one botanical name appears for some plants due to reclassification. If you plan to market the cuts as fresh cut flower bouquets, there should be a broad selection of species to provide a good mix of colour, forms and shapes throughout your marketing period. But don't overextend yourself by trying to grow too many species. Start off slow and as your knowledge and expertise expands, you can then increase your crop selection.

Table 2. Some advantages and disadvantages of growing annuals, perennials, bulbs, woody plants and ornamental grasses for the production of cut flowers

Crop	Advantages	Disadvantages
Annuals	• seeds are usually inexpensive and easy to germinate • direct seeding = lower costs • staggered seeding, multiple plantings possible	• weeding and harvesting are labour intensive • low market price on species commonly found in home gardens
Perennials	• harvested for several years; no annual replanting costs • many unusual species that are unfamiliar to consumers • yields can be high in later years	• yields may be low in first years • seeds may be difficult to germinate; stratification & scarification requirements vary by species • bought plugs can be expensive • difficult to control and extend the harvest window • harvesting may be labour intensive • weed control is difficult • varying vigour and overwintering capabilities • many species need to be dug-up and divided every 3 to 5 years
Bulbs	• multiple planting; some species may be interplanted or planted over top of others • bulbs can be left in and harvested every year (some species) • both cut flower and bulb can be marketed (some species)	• bulbs can be expensive • specialized equipment is required
Woody Cuts	• room for market growth • plant on "extra" or marginal land • provide off-season revenue (winter or early spring cuts) • double as windbreaks	• little post-harvest or production research work done
Ornamental Grasses	• low costs, high production • broadleaf weeds are easily controlled with lawn-type herbicides	• easy to flood the market

Table 3. A partial list of plants that can be grown for use as cut flowers

A. ANNUALS (Biennials – B)
Ageratum
Ageratum houstonianum
Agrostemma githago
Amaranthus caudatus, A. cruentus, A. hypochondriacus, A. tricolour
Ambrosia mexicana
Amethystea caerulea
Ammi majus (Queen Anne's Lace)
Ammobium alatum
Anethum graveolens (flowering dill)
Antirrhinum majus (snapdragons)
Arctotis stoechadifolia
Argyranthemum frutescens (*Chrysanthemum frutescens*) (marguerite daisy)
Asclepias curassavica
Atriplex hortensis
Bupleurum griffithii, B. rotundifolium
Calendula officinalis
Callistephus chinensis (asters)
Campanula medium (B)
Carthamus tinctorius (safflower)
Caryopteris incana (blue spirea)
Celosia argentea var. cristata, plumosa, spicata
Centaurea cyanus (cornflower, bachelor's button), *C. americana, C. moschata*
Chrysanthemum (Parthenium, Matricaria)
Cirsium japonicum
Consolida cultivars (larkspur)
Cosmos bipinnatus
Craspedia globosa (drumstick)
Dianthus barbatus (sweet William-B)
Didiscus coeruleus (Trachymene coerulea)
Emila javanica (Cacalia), E. sonchifolia
Eupatorium maculatum, E. purpureum
Euphorbia marginata
Eustoma grandiflorum (Lisianthus)
Fibigia clypeata (B-seedpods for drying)
Godetia amoena
Gomphrena globose
Gypsophila elegans
Helianthus annuus (sunflowers)
Helichrysum bracteatum (strawflowers)
Helipterum manglesii
Iberis amara, I. umbellata (candy tuft)
Lathyrus odoratus (sweet pea)
Lavatera trimestris
Lepidium ruderale, L. sativum (for drying)
Leucanthemum maximum (shasta daisy)
Limonium caspium, L. perezii, L. sinuatum (common statice), *L. suworowii, L. sinense*
Lobelia speciosa
Lunaria annua (money plant-B)
Lupinus cultivars
Matthiola incana (stocks)
Moluccella laevis (bells of Ireland)
Nicandra physalodes
Nigella damascena, N. hispanica, N. orientalis
Papaver somniferum (pods for drying)
Physalis alkekengi (Chinese lantern)
Rudbeckia hirta (cone flower)
Saponaria vaccaria (Vaccaria pyramidata)
Scabiosa atropurpurea, S. stellata (seed head)
Trachelium caeruleum
Xeranthemum annuum
Zinnia elegans

Table 3. A partial list of plants that can be grown for use as cut flowers (cont'd)

B. PERENNIALS
Achillea filipendulina, A. millefolium
Aconitum carmichaelii, A. napellus
Agastache rugosa, A. scrophulariifolia
Alchemilla mollis
Alyssoides utriculata (for drying)
Anaphalis margaritacea (pearly everlasting)
Aquilegia caerulea (columbine)
Armeria pseudarmeria
Asclepias incarnata, A. tuberosa (butterfly weed)
Aster ericoides, N. novae-angliae, N. novi-belgii (Michaelmas daisy)
Astilbe X arendsii
Astrantia major
Campanula glomerata, C. latifolia, C. persicifolia, C. pyramidalis
Catananche caerulea
Centaurea dealbata, C. macrocephala, C. montana
Centranthus ruber
Cephalaria alpina, C. gigantea
Chelone obliqua
Chrysanthemum coccineum (painted daisy), *C. X superbum (Leucanthemum maximum)*
Cimicifuga racemosa
Delphinium cultivars, D. X belladonna, D. cardinale, D. nudicaule, D. semibarbatum
Echinacea purpurea (purple cone flower)
Echinops bannaticus, E. ritro, E. sphaerocephalus
Erigeron speciosus
Eryngium amethystinum, E. bourgatti, E. planum
Gentiana asclepiadea, G. Makinoi cultivars, *G. triflora var. japonica*
Gypsophila paniculata
Helenium autumnale, H. Hoopesii
Heliopsis helianthoides var. scabra
Heuchera sanguinea
Hypericum androsaemum
Kniphofia uvaria (red hot poker)
Lavandula angustifolia, L. latifolia
Limonium gmelinii, L. latifolium, L. tataricum (German statice)
Lunaria rediviva
Lupinus polyphyllus
Lychnis chalcedonica, L. viscaria
Lysimachia clethroides, L. punctata
Malva moschata
Monarda citriodora, M. didyma (Bergamot)
Paeonia cultivars
Pardancanda X *norrisii* (seed heads for drying)
Phlox paniculata
Physalis alkekengi var. franchetii (Chinese lantern)
Physostegia virginiana (obedient plant)
Platycodon grandiflorus (balloon flower)
Rudbeckia fulgida, R. laciniata
Scabiosa caucasica, S. ochroleuca
Sedum spectabile
Sidalcea malviflora
Solidago canadensis
X *Solidaster luteus*
Tricyrtis hirta, T. macropoda
Trollius chinensis, T. X cultorum, T. europaeus
Verbena bonariensis, V. hastata
Veronica longifolia, V. spicata
Veronicastrum virginicum var. album

Table 3. A partial list of plants that can be grown for use as cut flowers (cont'd)

C. BULBS
Acidanthera bicolour
Allium caeruleum, A. fistulosum, A. flavum, A. giganteum, A. sphaerocephalon
Alstroemeria cultivars
Anemone coronaria 'De Caen'
Convallaria majalis (lily of the valley)
Crocosmia X *crocosmiiflora*
Dahlia cultivars
Freesia X *hybrida*
Gladiolus spp.
Iris cultivars
Liatrus spicata
Lilium cultivars
Narcissus cultivars
Nerine sarniensis
Ornithogalum arabicum
Ranunculus asiaticus
Triteleia laxa (Brodiaea)
Tulipa cultivars

D. WOODY CUTS
Buddleia davidii
Callicarpa americana
Celastrus orbiculatus, C. scandens
Corylus avellana 'Contorta'
Cotinus coggygria (smoke bush)
Cytisus spp. (broom)
Erica spp. (heather)
Forsythia spp.
Hamamelis spp. (witch hazel)
Hydrangea spp.
Ilex aquifolium (English holly), *I. decidua, I. verticillata*
Prunus spp.
Salix discolour (pussy willow), *S. matsudana, S. sachalinensis* 'Sekka'
Skimmia japonica, S. reevesiana
Spiraea spp.
Syringa spp. (lilac)
Viburnum spp.

E. ORNAMENTAL GRASSES
Agrostis nebulosa
Briza maxima, B. media, B. minor
Carex grayi (morning star sedge)
Hordeum jubatum
Hystrix patula
Lagurus ovatus
Luzula nivea
Panicum virgatum
Pennisetum alopecuroides, P. flaccidum, P. orientale, P. setaceum (Ruppelii)
Phalaris canariensis
Setaria macrostachya, S. pumila, S. viridis
Sorghastrum sadlerana
Uniola latifolia (Chasmanthium latifolium)

Cultivation

Bed size and Preparation

Flower beds should be aligned north to south to maximize the light penetration of the leaf and flower canopy. The average worker has about a 60 centimetre reach, so beds shouldn't be much wider than one metre. Wider beds can result in missed flowers or damage to the outside of the bed from reaching for flower spikes in the center. Beds shouldn't be much longer than 30 to 35 metres (100 feet), any longer and they become difficult and awkward to walk around. A final step is to determine the aisle space between the rows. Wide aisles allow for greater flexibility with equipment and an increased ease of harvesting, but they decrease the returns per square metre. Plant height and width must be taken into account, or one crop could end up shading or smothering another. Again, the bottom line is space utilization; the yield per square metre is important, but it is off-set by equipment and cultural requirements. If you plan to sell through a U-pick, beds should be narrower and shorter to minimize picking damage. The aisles should be covered in grass or bark to help keep people's shoes clean while they pick.

Consider installing raised beds. They may not always be suitable for a commercial setting, but their better drainage allows for earlier planting and harvesting and a reduced incidence of root rot diseases caused by poor drainage. Beds need to be raised 10 to 15 centimetres. If you choose to go with raised beds, make sure that you leave enough room between them to move your equipment.

Good soil preparation is essential for long-term perennials. Sites for beds should be ploughed to a depth of 35 to 45 centimetres to loosen the soil prior to bed formation. The next step is to disc or rotovate to break-up large soil clumps and to produce a more uniform bed. Depending upon your soil test results, any soil amendments should be worked in at this time. Additions of organic matter should be worked in to a depth of 20 centimetres. The soil can be fumigated for weed, disease and insect control. Be sure to follow label instructions concerning safety, minimum and maximum soil temperatures, time to planting, and potential crop phytotoxicity.

Scheduling

Planting time varies with your climate, the plant type (annual, biennial or perennial), cropping system, and desired harvest time. Keep records of your planting dates, weather, harvest times, and yields. They can be valuable for planning future production. Try to time part of the production so that it is ready for the market before or after it appears in home gardens. Prices are generally higher for flowers harvested during the shoulder-seasons. The more you can extend your growing season and have flowers ready for the "off-seasons" the better. It allows you to capture the higher prices and it helps to spread the cash flow. Stagger plantings throughout the spring and early summer to ensure a continuous supply. Keep in mind that the later plantings will have a shorter time to harvest and may also have shorter and thinner flower stems because of the higher temperatures and longer day length. Production may also be lower.

Annuals should be planted when there is no longer any frost danger. Seeds can be started 4 to 6 weeks before the expected planting date by sowing them in trays in a greenhouse or cold frame and then planting them outside when frost danger is over. Another option is purchasing plugs instead of seeds; they cost more, but they will be in flower earlier than those crops that are directly seeded in the field, and they avoid the expense of operating a propagation greenhouse. Early plantings can be covered with plastic hoop tunnels to provide frost protection and increase temperatures for an earlier harvest. Don't hesitate to do some small-scale trials. Maybe some of the more hardy annual species can overwinter in your area with minimal protection to allow for an earlier start the following spring. Biennials like Sweet William and Bells of Ireland should be planted in late summer or early fall. This gives them a good growing period before winter, resulting in more uniform flowering the following spring.

If you have access to a cooler, it can be used to extend the flowering season for some perennials. Bare root stocks or plugs can be placed in a cooler with lights for 4 to 6 weeks at 5 to 7°C to achieve the cold period. Keeping the plants in the cooler and staggering the planting dates allows for an extended harvest period.

Planting Density

The number of plants to grow per square metre, or the planting density, is a trade-off between increased yield and decreased quality. While close spacing produces increased yields per square metre it results in smaller flowers and lower quality. Stems are generally weaker and longer due to the decreased light levels. The incidence of disease can be higher due to the decrease in air movement caused by the crowding. Increased space between plants results in better quality, but lower yields per square metre.

Planting density varies with plant size, the number of years between replanting, the sensitivity of the crop to disease, the method of harvest and the staking requirements. It also varies with each plant species; most seed catalogues or supplier's guides give recommended spacings. Some spacing principles are common to most crops. For example, the larger the size of the mature plant the more room that will be needed between plants. Gypsophila will need much more room than a smaller plant like zinnia. In general, perennials are planted less dense than annuals to allow for the several years of growth between digging and splitting. Plants that are prone to foliar diseases, for example snapdragons, will benefit from a wider spacing due to the increased air circulation. Perennials which need staking may benefit from an increased density where the flower stems tend to support each other.

Supports

Some plants will need a support system to prevent lodging and to keep flower stems off the soil. When stems fall over they are often unmarketable because of dirt, crooked growth, or uneven flower display. There are several methods to choose from: wire or plastic mesh, strings or sticks. The crop type and your harvesting method will affect the choice. Most growers choose to use a mesh system. It is important to install the mesh system before the plants actually need it; once plants require support they are too big to install the mesh without damaging the plants. If you want to avoid having to install a support system, choose naturally dwarf plants. Keep in mind that to be used for the fresh cut flower market, flower stems need to be a minimum of 30 centimetres in length. The exceptions are those flowers which are used in dry flower work.

Irrigation

The two main types of irrigation systems are overhead and trickle. Overhead watering is cheaper and easier to install than trickle systems, but overhead is an inefficient use of water. Trickle systems have less run-off and more water reaches the roots because less is lost through evaporation and contact with leaves and flowers. As a result, plants irrigated via a trickle system tend to have lower incidence of disease and lodging. Trickle watering is best suited for longer-term crops.

Plants should never be irrigated close to dusk because wet foliage combined with the cooler night temperatures are perfect conditions for disease development. It is best to irrigate in the early morning to allow foliage to dry before nightfall. Irrigation frequency depends upon the temperature and the crop requirements. Irrigation must be done often enough to prevent water stress. Wilting should not be your indicator of when to water because the resulting stress can decrease production. A general rule of thumb is 2.5

centimetres of water per week, but the amount required is affected by the crop, irrigation system, rainfall, temperature and soil structure. These factors will determine whether it is more practical to soak the soil and apply a certain volume per week or to apply small, frequent irrigations throughout the week.

Fertilizer

Before adding any fertilizer or organic matter, have the soil tested to determine its nutrient levels. Unless your soil is very fertile, or you have incorporated a well-composted manure before planting, the plants will need supplemental nutrition. A complete fertilizer should be used, for example 10-10-10, at a rate of 7 to 10 kilograms per 100 square metres. It should be incorporated into the soil during the preliminary bed preparation. This can be done each time before planting annuals and perennials. Established perennials also need some fertilizer. It can be applied as a side dress in early spring when plants are actively growing and after harvest to promote root and leaf growth. Good post-harvest growth provides plants with an improved overwintering ability and also acts to improve next year's harvest. Whether fertilizer is applied in spring or after harvest, it is important to keep the fertilizer away from the stems and leaves to minimize the chance of burning tender growth. If you have a trickle irrigation system, you can use liquid feeding through the irrigation system. Again, a complete fertilizer should be used at a concentration of about 200 to 300 ppm nitrogen, with weekly feedings.

Pests and Diseases

Weeds are a serious problem in field grown cut flower crops. They compete for nutrients, water, space and light. Fumigation of the soil before planting helps to control weed seeds, insects and some diseases. Pre-emergent herbicides are also available; check for phytotoxicity problems on your crops before applying. If herbicides are used, they must be applied accurately, at the right time, and at the right stage of weed growth for maximum effect. Always check the label for safety factors, target weeds and possible phytotoxicity problems. Never use the same sprayer for herbicides and any other type of spraying. Chemical weed control should be only a part of a full weed control program. Although it is time consuming and expensive, hoeing and hand weeding are also part of a weed control program. Mulching the crop is another option; it reduces the germination of weed seeds, retards soil drying, and adds organic matter to the soil as it breaks down. Weed barriers are another possibility. Many different types are available on the market, including plastic or paper products. They have the added benefits of reducing soil splashing on flowers and leaves, and reducing evaporation from the soil surface.

You should be able to identify insects and know their life cycles so that measures are applied at the right time to control the pest. Make a habit of checking each bed several times a week to try and catch insect outbreaks early. Make integrated pest management (IPM) a central part of your pest control strategy. A goal of an IPM program is to attain an acceptable level of pest control with the minimum use of pesticides. Monitoring and record keeping are essential components of IPM.

The most important factors in controlling disease are to start with healthy plants and practice good sanitation. Your fields should be free of weeds and crop debris. Water early in the day so that any germinating fungal sports will be killed by the sun. Use a plant spacing that allows for adequate air movement through the crop. Dry foliage reduces the incidence of leaf spots and botrytis. When harvesting, disinfect your tools frequently, particularly when working between different crops or production areas. If it can be avoided, never move from a diseased section to a healthy section. Boots and clothing can trap spores and weed seeds and then move them to new areas. Be familiar with the major diseases of each crop; know when outbreaks are most likely to occur and recognize early disease symptoms.

Harvest

The stage of harvest varies with each species. The proper stage of flower openness is a critical factor in vase life. Flowers cut at an advanced stage of development will have a shorter vase life. Alternatively, flowers harvested too tight may never open. Either problem will not attract repeat customers. Table 4 lists the stage of harvest for many crops. Several other factors play a role in when flowers are harvested, such as the plant species, cultivar, weather conditions, distance to the market place, and end use.

Generally, harvesting should be done early in the morning after the dew has dried. The stems are still filled with water and the cooler morning temperatures prevent heat build-up within the flower bunches. When harvesting, keep in mind that a high-quality product is essential for success and grade accordingly. A clean, sharp knife or clippers should be used for cutting. Once stems are cut, they should quickly be placed in a clean bucket filled with tepid, clean water and preferably a floral preservative. Full buckets should be placed in a cool, shady spot, or even better, in a cooler until they are marketed. Freshly cut flowers should be left in the floral preservative solution for a minimum of 2 to 3 hours before they are sold.

Post Harvest

Sleeves, either clear or decorated, are an important part of post-harvest care. They minimize mechanical damage and tissue water loss. If properly used, sleeves can give the perceived image of higher product quality. Look for sleeves which have air ventilation holes and are easy to use.

Floral preservatives help to maintain the quality of flowers and help to extend their vase life. With some species, they're critical in flower development. Preservatives contain a combination of ingredients which extend vase life by supplying a food source, reducing pH, and reducing bacterial action. It is the combination of the proper stage of harvest, high quality water, floral preservatives, and cooling which all interact to prolong vase life and consumer satisfaction. One final note, cut flowers must never be stored with fruits or vegetables. Most release ethylene gas which causes accelerated flower ripening and premature petal drop.

Table 4. The stage of development to harvest cut flowers

Crop	Stage of Development
Achillea	leading cluster open, showing pollen
Aconitum	several flowers open, up to ½ of the flowers
Ageratum	flowers just opening
Agrostemma	one to two flowers open
Allium	⅓ to ½ of the flowers open, showing colour
Alstroemeria	one to two flowers per bract open
Amaranthus	½ to ¾ of the flowers open
Ammi	⅔ to ¾ of the flowers open
Anaphalis	⅓ of the flowers open
Anemone	after the bud is fully developed, allow to open & close, cut the following day
Anethum	⅔ of the crown open
Antirrhinum	⅓ of the spike open
Aquilegia	several flowers open, up to ½ of the flowers
Asclepias	⅔ of the crown open
Aster novi-belgii	several flowers open
Astilbe	½ to ⅔ of the flowers open

Table 4. The stage of development to harvest cut flowers (cont'd)

Crop	Stage of Development
Astrantia	main flowers open
Buddleia	½ flowers are open, but before fading
Bupleurum	⅓ of the flowers open
Calendula	flower petals opening to fully open
Callistephus	flower petals opening to fully open
Campanula	½ of the flowers open
Carthamus	flower head open
Celosia	½ to fully open
Centaurea cyanus	well-developed colour, flowers beginning to open
Centaurea macro	flowers ⅓ to ½ open
Centranthus	first flowers fully open
Chelone	several flowers well advanced
Chrysanthemum leuc.	almost fully open
Chrysanthemum parth.	⅔ of the flowers open
Cirsium	main flowers open
Consolida	several flowers open, up to ⅓ of the spike
Convallaria	½ of the flowers open
Cosmos	leading flower open but not yet flattened
Craspedia	completely open
Crocosmia	several flowers showing colour with ½ open
Dahlia	leading flower ¾ to fully open
Delphinium	⅓ to ½ of the spike open
Dianthus barbatus	⅓ to ½ of the flowers open
Echinacea	petals expanding, full colour
Echinops	½ open, showing full colour
Emilia	first flowers fully open
Erica	½ of the flowers open
Erigeron	lead flower open
Eryngium	⅓ to all of the flowers showing colour
Eustoma	several flowers open
Freesia	first bud almost open, several buds showing colour
Gentiana	several buds open
Gladiolus	one to five buds showing colour
Godetia	several flowers open
Gomphrena	showing colour, but not fully open
Gypsophila	⅓ to ½ of flowers open, but not over-mature and brown
Helenium	several flowers open
Helianthus	leading flower half open to fully open
Helichrysum	flower ½-open, hat-shaped
Heliopsis	leading flower open
Helipterum	several flowers open
Hydrangea	½ of the flowers open
Ilex	before fruit mature
Iris	buds coloured, petals closed
Kniphofia	several flowers open, plus most showing colour
Lathyrus	several flowers open, up to ½
Lavatera	flowers uncurling or just beginning to open
Liatrus	⅓ of the flowers open or top 3 to 5 cm
Lilium	buds coloured and swollen but not open
Limonium	¾ to fully open white flowers
Lobelia	⅓ of the flowers open
Lunaria	pods fully developed
Lupinus	⅓ to ½ of the flowers open
Lychnis	several flowers open
Lysimachia	⅓ to ½ of the flowers open

Table 4. The stage of development to harvest cut flowers (cont'd)

Crop	Stage of Development
Malva	single flower open
Matthiola	⅓ to ½ of the flowers open
Monarda	almost open flowers
Narcissus	pencil to goose neck stage
Nerine	oldest buds almost open
Nigella	several flowers open; pods purple-bronze
Ornithogalum	several buds with colour
Paeonia	bud loose, swollen, coloured
Phlox	⅓ to ½ of the flowers open
Physalis	fruit fully coloured
Physostegia	several flowers open
Platycodon	2 to 3 flowers open
Ranunculus	buds beginning to open
Rudbeckia	fully open flowers
Saponaria	several flowers open
Scabiosa	fully open flowers
Sedum	fully open flowers
Sidalcea	one flower open
Solidago	½ of the flowers open
X *Solidaster*	⅓ of the flowers open
Trachelium	½ to ⅔ of the flowers open
Triteleia	several flowers open
Trollius	half-open flowers
Tulipa	buds half coloured, but not open
Verbena	main crown with full colour
Veronica	one spike ½ open
Xeranthemum	several flowers open
Zinnia	fully open flowers

Labour

Outdoor cut flower production is management and labour intensive. The major components of production all require trained labour, for example planting, weeding and harvesting. The larger the production area, the more labour you will require. If you have a crop which flushes, such as daffodils or tulips, you must have a large, instant labour force available at harvest. Decide whether you want to have full-time workers for the duration of the production season or if you want to do most of the work yourself, supplemented with occasional contract or causal labour during extra busy times.

Conclusion

Field grown cut flowers offer an almost endless variety of crop choices and alternatives. Before starting a commercial operation it is essential to thoroughly investigate crop and market alternatives. Knowing your area's climate, combined with good crop and market knowledge, will help you to narrow down your crop alternatives. The final crop mix may be a combination of annuals, biennials, perennials, woody cuts, bulbs and ornamental grasses. The key to a long cash-flow period is staggered production. A thorough knowledge of weed control, plant diseases and insect pests is needed to produce a clean, damage-free crop for the market. The crop's selling price and returns must at least cover the expenses of the field preparation, cuttings, seeds, plugs, planting, harvesting, labour and your own wages. It would also be nice if there was some additional profit. If your operation doesn't cover these, you should re-examine your crop mix and production methods. Maybe a change in crops or market focus will improve the returns.

Further Reading

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