Reasons for Growing Cut Flowers

The first, last and deciding reason for growing cut flowers is for the sheer beauty of it. They are uplifting—both literally and figuratively, high-energy plants. I once read a psychology Master’s thesis documenting that a bouquet in the vicinity is a mood enhancer. Twenty something pages later, my response: “Really, now what are the odds of that?” In addition to the visuals, scented flowers seem to activate nostalgia and memory and by and large, good ones at that. It is not uncommon for someone to remark upon smelling a sweet pea, sweet william, stock or mignonette, “Oh my Uncle Bart or Aunt Dorothy used to garden and grew these flowers…”.

Gardening is both an art and a science. Science is to be understood, mastered, respected and applied (soil science, plant nutrient needs, entomology, pathology, etc). But art or aesthetics (the philosophy of the beautiful) informs and enhances our existence. Just as vegetables are food for the body, flowers can be thought of as food for the soul.

In a more perfunctory vein, cut flowers offer gardeners the ability to have flowers in the garden and in the vase throughout the year (think endless grey days in February and an antidote) at affordable prices. Even in the best of times the cost of cut flowers lies somewhere between a luxury and prohibitive. You can grow your own for pennies per plant with annuals. For the small, diversified grower, cut flowers offer endless niche marketing possibilities, limited only by the bounds of imagination and self-promotion: a CSA flower share, farmers’ market or roadside stand, special events, direct marketing to offices, restaurants, etc.

Cut flowers in the garden also make biological sense. A vegetable garden is a system somewhat out of balance. Most of the vegetables we grow don’t feature flowers prominently, if at all. Showy flowers attract crop pollinators (often winged insects).

Additionally, the concept of using flowers to attract and maintain populations of beneficial insects that in turn aid in controlling detrimental insects (aphids, mites, thrips, moth larvae, scale, mealy bugs, etc.) is now a well-documented sector of entomology. Terms like farmscaping, provision of resources to natural enemies, habitat management to enhance biological control of arthropod pests and the like speak to the confluence of age-old folk wisdom as well as the research-based studies showing that fewer crop pests are found as the diversity of an agro-ecological system increases (see page 10 for information on plants that attract beneficial insects).

Criteria for Selection: What are you looking for in a cut flower?
Longevity (vase life): Simply put, some species of flowers last longer than others. Much of this has to do with the plant’s physiology and anatomy. In general, flowers with waxy parts (leaf cuticle, stems and petals) have longer keeping power. The waxy surfaces reduce moisture loss via transpiration and thus wilting is delayed. Species such as alstromeria, lilies and orchids last as long or longer than three weeks.

Some flowers feature low moisture content and minimal leaf surfaces to lose that moisture. Often referred to as dried flowers or everlastingst, they include statice, helichrysum, xeranthemum, yarrow, and acroclinium. Other species that are longlasting as cut flowers: asters and chrysanthemums (10–21 days). Vase life can be extended with some simple practices, outlined on pages 9–11.

Long, strong stems: Sometimes this is simply a genetic characteristic (sunflowers, stock, ornamental grasses, statice). Adequate potassium fertilizers promote strong stems.

Fragrance: Again, scent activates memory. Just a few sweet peas, carnations or a fruity scented rose or two can enhance the effect of a bouquet, making it more appealing.

Beauty: Well of course. But it’s oh so subjective. I’m drawn to the silver and grey foliage of stachys (lamb’s ear); the soft pastels of sweet peas, nigella, larkspurs and delphiniums; carnations, as a lesson in shades of pink; just about any shade of aster, but only the pure white and velour shades of snapdragons; soft pink and the ma-
Factors that Influence Plant Quality and Vase Life

Long before flowers are cut, their lasting power is influenced by selection and growing conditions in the garden. While it seems a “no-brainer,” growing the right species at the right time of year influences both the quantity and quality of cutting stems, but more specifically the appearance, vibrancy and lasting time in the vase. For instance, cynoglossum (Chinese forget-me-nots), sweet peas, larkspur, nigella and agrostemma prosper fall through spring but burnout, crash and die with warm (>80°) summer temperatures. Similarly, warm season annuals such as sunflowers, tithonia, asters, and zinnias struggle with soil temperatures below 60° (see page 8).

Longevity of cut flowers is also influenced by both anatomy and physiology. In a nutshell, some flowers just last longer than others. Poppies exude a latex liquid that clogs conductive stem pores and causes almost immediate wilt. Lupines and some hideously large dinner-plate dahlias don’t have the “hydraulics” to hold stem water and thus can be difficult. Verbascum (mullein) petals drop within minutes of cutting.

On the other side of the ledger, flowers with bigger, longer, thicker stems are stronger and bend or snap less readily. These species also contain larger conductive vessels (xylem cells) that contribute to greater water uptake and staying power. Stocks, sunflowers, well-behaved decorative dahlias, ornamental grasses and alstromeria come to mind. Slightly less ideal, but still good in the vase: tithonia, carnations, and snapdragons. These amped-up stems also contain more starches and sugars, which help prolong post-harvest metabolism.

A plant-positive, healthy plant approach also yields good cut flower results. Anything that induces stress—heat, cold, nutrient, water, pest, disease, poor soil drainage—affects plant performance and adversely affects the number and quality of blooms.

The general goal is to establish a large vegetative plant early in the growth cycle. This is done primarily with water and nitrogen (sunshine is assumed). A bigger vegetative plant gives rise to more and bigger flowers. However, this doesn’t mean that the lushest plants, grown under the warmest conditions, yield the highest-quality cutting stems. Sometimes it’s good to remember the difference between maximum and optimum, or as rock idol John Meyer intones in his hit song Gravity, “Twice as much ain’t twice as good and can’t sustain what one half could.” Although he was intoning about matters of the heart, it is still a good guide when it comes to sustainability.

Thus, after initial plant establishment, growing flowers under a “leaner, meaner” regime yields the best cut flowers. Too much nitrogen and water, coupled with too warm temperatures too long into the growth cycle yields plant that are too succulent and prone to pest and disease damage, as well as easily bruised leaves and stems. These flowers also wilt more quickly after cutting.

Many annual cut flowers are precocious, that is, they tend to bloom before full vegetative establishment, giving rise to a few small, short-stemmed flowers. A technique called “pinching and pumping” that we use in the Chadwick Garden works to deter this trait. The plants are pinched back 2–3 nodes at about the 6–8 leaf stage and then “pumped up” with a shot of quickly soluble nitrogen (e.g., fish emulsion, manure tea, etc.). The pinched stem will throw a number of basal or lateral shoots, each of which will give rise to one or more cuttable stems/flowers, the net result being a snapdragon, zinnia, etc., that gives rise to 6–8 or more moderately long-stemmed flowers. The “pumping” part promotes further vegetative growth and delays premature blooming. Note: several species do not respond to “pinching and pumping,” namely asters, larkspurs, and sunflowers.

The nutrient potassium also contributes to long, strong stems and thus vase life. Beyond compost, two organic products that aid in cut flower production (used pre-planting) are Sustane (4-6-4) and Dr. Earth Flower Fertilizer (5-7-3). Phosphorus contributes to flower production in plants as well as to early root growth.

A Thumbnail Sketch of Annual Flowers

For many gardeners, annuals equals flowers, and lots of them in every conceivable shape, color and size. Annuals are plants that complete their life cycle in one season, or portions of two. They are, as a class of plants, extremely willing to grow, quick to mature (10–16 weeks) and easy to cultivate. Seed is relatively cheap and germinates both at a high percentage (>80%) and quickly (14–21 days, and many in 7–14 days).

Annuals generally offer a profusion of blossoms. Some are ephemeral in length of bloom—agrostemma, asters, stock, *Annni magus* (false Queen Anne’s lace), cynoglossum; while most are yeoman-like regarding both the number of blossoms and longevity of the bloom period—dahlias, zinnias, mignonette and venidium.

As a class, annuals produce more flowers over a longer period than either biannuals or perennials. One of the principal reasons for their demise at season’s end has to do with their exuberance and freedom of blooming, as producing flowers is a calorically exhaustive expenditure for plants and thus “expensive” in terms of energy use. The showy nature of flowers is primarily an advertisement to pollinators, which are rewarded for a visit with food: protein (in the form of pollen) and carbohydrates (in the form of nectar), the two basic building blocks of any diet. In return, the flower gets pollinated and sets seed to scatter on the ground and perpetuate the species.

continued on page 8
Fall/Winter Calendar

Friends Annual Meeting
Monday, November 8, 5:30 pm - 8 pm
Farm Center, UCSC Farm
Join us for the Friends of the Farm & Garden’s annual meeting as we review highlights of the past year’s activities, look forward to 2011 events and projects, and vote on 2011 Board officers and by-law changes (see page 4). Business meeting from 5:30–6:30 pm; potluck dinner from 6:30–8 pm. Please RSVP to 831.459-3240 or casfs@ucsc.edu by Wednesday, November 3. Last name A–L: Please bring a main dish or drink to share; last name M–Z: please bring a salad, side dish or dessert to share. Bring a flashlight for the walk back to your car.

“Fruit Trees 101”: Basic Fruit Tree Care
Saturday, January 8, 10 am - 2 pm
Louise Cain Gatehouse, UCSC Farm
Taught by Chadwick Garden manager Orin Martin and OrchardKeeper founder Matthew Sutton, this class will cover the basics of fruit tree care: selection, planting, irrigation, pest management, and basic winter pruning. More detailed pruning classes will be offered on January 29 and February 12 (see at right). $15 for Friends’ members; $20 general public, payable at the workshop. Dress for the outdoors and bring a snack. Heavy rain cancels.

Fruit Tree Q&A Session
Saturday, January 15, 10 am - 12 noon
ProBuild Garden Center, 235 River St., Santa Cruz (formerly Lumbermens/San Lorenzo)
Bring your fruit tree questions to this free Q&A session with fruit tree experts from the UCSC Farm & Garden. Learn about varieties that perform well on the Central Coast, along with fruit tree care tips. Note the location: ProBuild Garden Center in Santa Cruz. Friends’ members receive a 10% discount on plant purchases.

“Fruit Trees 101”: Basic Fruit Tree Care
Saturday, January 22, 10 am - 2 pm (tentative date, to be confirmed in November)
Sierra Azul Nursery and Gardens
2660 East Lake Ave. (Hwy 152), Watsonville
763-0939, www.sierrazul.com
A repeat of the January 15 workshop, this time at the Sierra Azul nursery, located across from the Santa Cruz County Fairgrounds. A Q&A session with Sierra Azul staff will follow the workshop. Heavy rain cancels.

Other Fruit Tree Series Winter Workshops –
In-Depth Winter Pruning, Pome Fruits (Apples, Pears)
Saturday, January 29, 10 am - 2 pm, UCSC Farm
$15; $20 (rainout date = February 5)

In-Depth Winter Pruning, Stone Fruits (Plums, Peaches, Nectarines, etc.)
Saturday, February 12, 10 am - 2 pm, UCSC Farm
$15; $20 (rainout date = February 19)

Fruit Tree Grafting, taught in collaboration with the California Rare Fruit Growers
February 26 (tentative date)
$15 Friends of the Farm & Garden members; $20 general public; free for members of the CRFG
Please note: this event’s date, location, and time have not been finalized; please check casfs.ucsc.edu or call 831.459-3240 in November for information on this class.

Also coming up …
Camp Joy’s 34th Annual Wreath Sale!
Sunday, November 21, 11:00 am–3:00 pm
131 Camp Joy Road, Boulder Creek
Visit Camp Joy Gardens for their annual Open House and Harvest—dried wreaths, garlic, candles, honey, other crafts for sale and yummy treats to sample and buy. Support Camp Joy with your holiday shopping and enjoy autumn at the farm. For more information call 338-3651.

If you’d like more information about these events, need directions, or have questions about access, please call 831.459-3240, email casfs@ucsc.edu or see our web site, casfs.ucsc.edu
Please note that we cannot accept credit card payments for classes or merchandise (cash or check only).
Co-sponsored by the Center for Agroecology & Sustainable Food Systems at UC Santa Cruz, and the Friends of the UCSC Farm & Garden.
**Harvest Festival Draws an Enthusiastic Crowd**

One of the hottest days of the year didn’t deter one of the biggest crowds ever to take part in the annual Fall Harvest Festival at the UCSC Farm, sponsored by the Friends of the UCSC Farm & Garden and the Center for Agroecology & Sustainable Food Systems.

Those attending enjoyed a day of great music, apple tasting and the ever-popular apple pie contest and apple juice making, cooking workshops, a composting workshop, a talk on apple varieties, an herb walk and farm tours, lots of kids’ activities, visits to the Life Lab Garden Classroom, along with campus and community information booths and wonderful food. The youth empowerment group “Food, What?!” also held a wonderfully successful sunflower harvesting fundraiser as part of the day’s events.

Funds from Measure 43, the Sustainable Food, Health and Wellness Initiative, helped support this year’s Harvest Festival and made it possible to offer free admission to UCSC students. Passed last spring by UCSC undergraduates, Measure 43 generates funds from student fees to support a variety of activities and student grants related to food systems and food choices at UCSC. Thanks to Measure 43 support and the hard work of interns from the Food Systems Working Group, a record number of undergraduates turned out for this year’s Harvest Festival.

Business sponsors are also a key to making the Harvest Festival a success, and we very much appreciate the support of our top sponsors, New Leaf Community Markets and Stonyfield Farm.

Other generous business sponsors included Veritable Vegetable, Glaum Egg Ranch, Jacobs Farm/Del Cabo, Companion Bakers, and Camp Joy.

We also received generous product and gift certificate donations from numerous local businesses: The Bagelry, Black China Bakery, Bookshop Santa Cruz, The Buttery, Charlie Hong Kong, EcoGoods, Farmhouse Culture, Gayle’s Bakery, Happy Girl Kitchen, Herbert Family Organic Farm, Peaceful Valley Farm and Garden Supply, the Santa Cruz Farmers’ Markets, the Herb Room, and Staff of Life. Jim Rider of Rider and Sons provided organic apples for making apple juice. Many thanks to all of these businesses for their support.

Special thanks to Scott and Candy Berlin of UCSC Dining and to Mark Langlais of the College 8/UCSC Bakery for their contributions, as well as to College 8 for providing the sound system, and to the UCSC Office of Physical Education, Recreation, and Sport (OPERS) for their support. People Power provided free valet bike parking for the event and generous volunteers helped make it all happen.

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**Note Regarding the Summer 2010 Food Storage Article**

As a follow up to her article “Easy Ways to Keep Produce Fresh” (Summer 2010 News & Notes), author Sue Tarjan notes that low-acid foods like garlic shouldn’t be stored in olive oil at room temperature because of the risk of botulism, as the oil surrounding the produce creates an anaerobic environment.

Although such foods can be stored in the refrigerator for a limited time, if they won’t be used quickly then it’s best to store them in single-serving containers in the freezer.

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**Friends of the Farm & Garden’s Annual Meeting**

**Monday, November 8, 5:30 – 8 pm**

**Farm Center, UCSC Farm**

Please join us at the Farm Center on the UCSC Farm for the Friends’ annual meeting and potluck dinner, where we’ll look back on highlights of 2010 activities and preview “coming attractions” for 2011, as well as vote on the slate of officer nominations for the Friends of the Farm & Garden Board and proposed by-law changes (see below).

*Last name A–L:* Please bring a main dish or drink to share; *last name M–Z:* please bring a salad, side dish or dessert to share. Bring a flashlight for the walk back to your car.

Free parking will be available at the Campus Facilities parking lot (turn right at first light on campus, Ranch View Road, and walk back across Coolidge to the gravel road that leads to the UCSC Farm). Please RSVP to 831.459-3240 or casfs@ucsc.edu by Wednesday, November 3.

**Officer nominations for 2010–2011**

- **President:** Daniel Paduano
- **Vice President:** Matthew Sutton
- **Treasurer:** Don Burgett
- **Secretary:** Tana Butler

Apprentice Housing Project Dedicated at Fall Celebration

This year we reached a milestone in our 43-year history with the building of permanent housing for trainees in the Apprenticeship Program. We celebrated the successful completion of the Apprentice Housing Project with a dedication on the morning of September 26th, the same day as our annual Harvest Festival.

A crowd of 50—including donors, campus dignitaries, Friends of the Farm & Garden, staff, and current and former apprentices—gathered to hear inspiring words from CASFS Director Patricia Allen and Garden Manager Orin Martin followed by a heartfelt thank you on behalf of the apprentices from second-year apprentice Maggie Cheney. A ceremonial ribbon-cutting was next, with Farm Garden Manager Christof Bernau pacing out 100 feet of irrigation T-tape from the field-side spool, and donors invited to take a pair of Felco shears to help cut the tape (see photo below). The highlight for many participants was the housing tour led by apprentices who opened up their rooms and shared their stories of why they came to the apprenticeship and what they planned to do with their training. Participants then had the option of going on a special farm tour or joining the Harvest Festival activities.

The nine four-room redwood and canvas cabins, shown below, were completed in time for the initiation of the 2010 Apprenticeship program on April 11, 2010. Thirty-six apprentices moved into these cabins on the edge of the organic farm fields that they work daily as part of their training program. The staff and apprentices have been very pleased with the cabins, which are sturdy, beautiful, and well-designed for privacy.

“The cabins allow us to be able to connect with the land, day and night, in a way we would never be able to if we lived off campus.”

—2010 apprentice Hannah S.

In supporting this project, donors and other contributors understood that they were doing more than funding buildings: they were helping to secure the Apprenticeship Program’s future. The Grow a Farmer Campaign and other fundraising efforts brought in $475,737 from five foundations, 37 businesses, 19 restaurant events, and 501 individual donations. Hundreds of others contributed in-kind donations, products from their farms, volunteered at events, or worked through their networks to spread the word that help was needed. The outpouring of support received for this project demonstrates to us how many people care deeply about the program’s training of new organic farmers and gardeners.

While the housing project laid a solid foundation for the future of the Apprenticeship, the Grow a Farmer Campaign has helped to expand our network of support in important ways. The housing campaign caught the eye of Kathy Larson, Vice President of Sustainability for Frontier Natural Products Co-op in Norway Iowa. The company not only donated to the housing campaign, but also made a $130,000 gift to endow an annual Apprenticeship scholarship.

continued on next page
“This is the premiere sustainable and organic training program in the U.S. During my visit in August, I was impressed with the quality of the program – and even more so with the apprentices enrolled in the program.”

—Kathy Larson, Vice President of Sustainability, Frontier Natural Products Co-op

We are incredibly grateful for all the donations and other contributions that helped build the Apprentice Housing Project. In the Fall 2009 issue of the News & Notes (available online at casfs.ucsc.edu/publications) we listed the donors and contributors who had supported the project to date. During the construction phase of the project, we received two additional donations that were critically important. Big Creek Lumber gave an in-kind donation of over $5,000 worth of redwood for the cabins. Pacific Domes, an Oregon-based international company founded and run by former apprentice Asha Deliverance, designed and manufactured the canvas panels, donating the equivalent of half of the cost the work, for an in-kind contribution of $24,000. All of the donors to the Apprentice Housing Project will be acknowledged on a signboard at the site of the housing to be erected this winter.

— Ann Lindsey

Apprenticeship Receives Funding for New Undertakings and Ongoing Work

In August the Apprenticeship Program received a $100,000 gift from the Foundation for Global Community to support the further development of the six-month Apprenticeship, the 12-month advanced apprenticeship, an Apprenticeship alumni website, and other efforts to improve and extend the Apprenticeship’s training. A previous $100,000 gift from the Foundation for Global Community funded the first-ever Apprenticeship alumni survey and an assessment of the program by a team of evaluators (see more on page 11). The survey results and evaluation report will be used to help guide the educational development work to be undertaken with this gift. We are grateful to be a recipient of one of the last gifts from the Foundation for Global Community, as this foundation will close its doors at the end of 2010.

In October CASFS received a new $40,000 grant from an anonymous foundation for the Apprenticeship’s education and training work. For ten years this foundation has helped to support the core Apprenticeship operating budget—including staff salaries and benefits—some of the hardest funding to raise consistently. We are grateful for this ongoing support for our annual training program.

Other gifts to the Apprenticeship this year that we have not yet acknowledged in previous issues of the News & Notes:

- An anonymous $10,000 gift for the development of a networking and resources website for former apprentices;
- A $5,000 gift for an apprentice scholarship from a former apprentice;
- Recent Grow a Farmer contributions from restaurant, farm, and other businesses including Heath & Lejune, Raintree Nursery, Ristorante Avanti, Xocal Healthy Chocolate, Bread and Roses Farm, Evan Jerkunica, and River Street Café. For more on the Grow a Farmer campaign, see www.growafarmer.org. For more on how you can become a part of this year’s Grow a Farmer campaign, see www.growafarmer.org.

We are grateful for all of your support for the training of new organic farmers and gardeners!
Winning Recipe in the 2010 Harvest Festival
Apple Pie Contest

The apple pie contest is always a popular part of our annual Harvest Festival, drawing delicious and beautiful entries each year.

This year’s winners are Olivia Radovich and Max Harrison. New to pie baking, they turned to a much-loved family recipe for inspiration.

Olivia explains, “This recipe came from my great grandmother Margarete Peterson who passed it down to my grandmother Pete Glosten who passed it down to my mother Barbara Radovich who passed it on to me and my sister! My mother would always make this pie during the holidays because all the relatives request it. It’s famous in my family!”

Margarete’s Apple Pie

Preheat oven to 450º
Keep butter, egg, and water cold in refrigerator until ready to use.

Pie Crust:
3 cups flour (we used pastry flour)
1 teaspoon salt
1 1/4 cups shortening (or butter, which is what we used)
Mix flour and salt together, then cut in shortening just until it forms pea-sized chunks (you can use the “pulse” setting on a food processor for this step)
While preparing the next step, keep this dough in the fridge
1 egg (cold)
1 Tablespoon apple cider vinegar
4 Tablespoons cold water
*Max’s touch: few drops of vanilla extract
Mix together with fork and then add to dough above pulsing until just moist. Then pull together with hands to form a ball.

Filling:
5–6 cups sliced apples (we used a combination of Golden Delicious and Jonagolds)
1 1/2 cups sugar
1 Tablespoon cornstarch
1/4 teaspoon cinnamon (optional, which we opted for)
1/8 teaspoon nutmeg (also optional, which we didn’t)
Roll out the dough and lay it out in the bottom of the pie pan. Use a lattice or top crust (as desired). Right after adding the filling put the pie in the oven (so the crust won’t get soggy).
Cook for 10 minutes at 450º
Turn down to 350º and cook for 40–45 minutes
Enjoy! Tastes amazing with vanilla ice cream!
**Cut Flowers – from page 2**

By harvesting the flowers, the gardener is thwarting a plant’s effort to set seed; the plant’s response is to produce more flowers and try again. Your dividend is an extended harvest period. Conversely, if flowers are not cut, the plant tends to slow its flower production (mission accomplished) and pump energy into seed production.

**What Grows When?**

The British, a nation of gardeners, have formulated an annual flower classification system based on cold tolerance. It consists of three classes: hardy, half hardy, and tender.

Hardy (H) annals are species that can tolerate a reasonable degree of cold (10–20ºF) when young. Even the seeds of some species can survive moderate winters outside and germinate early in the spring, a scatter garden approach.

Half hardy (HH) annuals are usually damaged or killed by continued exposure to cold temperatures (<40ºF) and light frosts. However, like hardy annuals they tolerate and grow well vegetatively during those interminable, endless (or so it has seemed during the last two years) cool, wet, gray days of spring. And along with hardy annuals they catapult forward in size and then bloom best cool, wet, gray days of spring. And along with hardy annuals they can also be sown (under cover) in late January–March, transplanted in late March–April and offer a succession of bloom June–July.

Tender annuals are best seeded in the greenhouse in March and early April and transplanted in May, give rise to blooms June–August. Successive sowing in July of tender annuals and some hardy and half hardy annuals can carry bloom into the fall, even until Thanksgiving.

Tender (T) annuals usually hail from tropical and semi/subtropical origins. Thus, the mention of the word frost will cause seeds to rot and foliage to blacken and shrivel. They are to the flower garden as corn and beans are to field production and should not be seeded or transplanted before daily soil temperatures average >60º during a good portion of the day. This usually occurs May 1–June 1 in Santa Cruz.

In the Santa Cruz area, any hardy annuals and some half hardy annual flowers can be sown in late summer into early fall, transplanted and overwintered, and will reward the gardener with early spring–early summer bloom, from March–early June. These same species can also be sown (under cover) in late January–March, transplanted in late March–April and offer a succession of bloom June–July.

Herbaceous perennial flowers are any non-woody plant living for 3 or more years. To the degree perennial implies permanence without effort it is a misnomer. Perennials are not magic plants that come up unbidden year to year. However, this class of plants, often no more than the selected and reselected wildflowers of the meadows,

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**Useful Hardy (H) and Half Hardy (HH) Annual Cut Flowers**

**Hardy**

- Calendula
- Centaurea (Cornflower)
- Clarkia
- Cynoglossum (Chinese Forget Me Not)
- *Dianthus barbatus* (Sweet William)
- Godetia
- Larkspur
- Nigella
- Scabiosa (Pincushion Flower)
- Snapdragon
- Statice
- Sweetpeas
- Sweet mignonette

**Half Hardy**

- Canterbury Bells*
- Didiscus
- *Gypsophila elegans* (Annual Baby’s Breath)
- Iberis (Candytuft)
- Linaria
- Saponaria (a bigger Gypsophila)
- Stocks

*biannual species

**Tender Annual Cut Flowers**

- Ageratum
- Amaranthus
- Asters
- Calliopsis
- *Carthamus* (Safflower)
- Celosia
- Cosmos
- Dahlia
- Gomphrena
- Marigold
- Phlox
- *Rudbeckia* (perennial treated as annual)
- Salpiglosis
- *Salvia coccinea*
- *Salvia farinacea* (tender perennial often treated as annual)
- *Salvia horminum/viridis* (annual Clary sage)
- Sunflowers
- Tithonia
- Venidium
- Zinnias

**Easy to Grow, Florific Perennial Cut Flowers**

- Alstroemeria
- Asters (Michaelmas Daisies, *Aster novi-belgii*)
- *Aster alpinus*
- Aquilegia spp. (Columbines)
- *Campanula persicifolia*
- *Caryopteris clandonensis*
- *Catanache caerulea* (Cupid’s Dart)
- *Centaurea montana*, *C.dealbata*, *C. macrocephala*
- *Chrysanthemum* spp.
- Coreopsis
- Delphiniums
- *Dianthus* spp. (Carnations)
- *Echinacea*
- *Echinops ritro* (Globe Thistle)
- *Erigeron* (Fleabane)
- *Eryngium planum* (Sea Holly)
- *Helenium*
- *Heliopsis*
- *Heuchera rubescens* (Coral Bells)
- *Lilium* spp.
- *Limonium caspia* and *L. tatarica* (Statice species)
- *Nicotiana sylvestris*
- *Physostegia virginiana* (basically a perennial snapdragon)
- *Stachys lanata* (Lamb’s Ear)
- Perennial cornflowers
mountains, marshes and woodlands of the temperate and Mediterranean climates of the world, offer ease of care once established. With a few well-timed inputs, a spring weeding or two, a top dressing of compost, and average garden watering, these plants will reward you with intriguing architectural form and foliage as well as more sophisticated flower shapes and more subtle hues of color than their annual counterparts. Compare the delphinium to the marigold, the tiger lily or columbine to the petunia. I rest my case …

Perennials expend part of their resources developing a crown (a fleshy storage organ), bulb, corm, tuber or rhizome. These are organs that allow them to go dormant, overwinter and issue forth new roots and shoots each spring. In most cases, these organs can be divided/separated every few years, offering the bonus of new and free plants. Because of this partitioning of resources, perennials usually offer fewer flowers over a shorter bloom period.

Ideal Time to Cut

The time of day flowers are cut is critical. Basically, heat, sun and wind are anathema (Greek for: thing devoted to evil) and ensure quick wilting. Cutting early in the morning or late afternoon (dusk) contributes to a long vase life. The cut flower industry has invested mega millions of dollars and research into which time period is optimal. Essentially, they both work as they are times of minimum transpiration, when plants are not losing moisture at a high rate.

Advantages of Morning Cutting

The plants are most turgid, or supplied with water, having had all night to recover from the moisture losses of the previous day. They also have cooler core temperature in the morning. All other factors being equal, vegetables, fruit and flowers with a cool (<50º) core temperature have greater post-harvest keeping power. Plant tissues are approximately 90% water (think of plants as merely supported columns of water). Taking flowers when they are well supplied with water keeping them supplied with water and helping them to continue to absorb more water is imperative to keeping them fresh and extending vase life.

The only disadvantage of early morning cutting is the presence of dew or fog on flower petals. This can lead to both injury and loss of true color. That assumes that you, as a gardener, are servants of the seasons and the morning’s early light and early rising is not an issue. If not, perhaps a career change …

Advantages of Late Afternoon/Evening Cutting

Cutting at dusk or early evening takes advantage of high sugar levels in the plant, a byproduct of a day’s worth of photosynthesis. These sugars keep the flower’s metabolism going and contribute to vase life. The main disadvantage of afternoon or evening cutting is a high core temperatures and low turgidity. These can be overcome by refrigerating the flowers (34º–50ºF) and/or “pulsing” them. Pulsing involves placing the stems in deep, warm, tepid (90–100ºF) water for one hour and then plunging them into cold water (40ºF). In phase one (warm water) the stems rapidly absorb water and achieve maximum turgidity. This is based on the age-old precept: biological and chemical reactions happen more quickly at higher temperatures (up to a certain threshold). During phase two (cold water plunge) core temperature is reduced and thus transpiration (water loss) slows. There are those who say having a cut flower operation without a refrigeration unit is like having a restaurant without a kitchen. And yet we here at the Farm & Garden persist and push onward. Direct marketing has its perks, garden to kitchen table in less than 8 hours.

How to Cut

Cutting is best done with high quality, bypass (not anvil) hand shears. Or as Mr. Chadwick used to intone, secateurs (hey it’s just French for scissors, but it does have a certain cachet and thus some “old timers” still persist with it). The best of the lot are the Felco brand. They come in assorted shapes, sizes and configurations. I’m partial to the old #2 or the slimmer, longer nosed #11.

It’s important to use a sharp blade to minimize the crushing of stem cells. The lasting power of flowers in the vase is predicated on continued uptake of water from the vase up through the stem, to the bloom, and out into the atmosphere via transpiration from leaves and petal—a

continued on next page
pressure gradient that keeps the flowers turgid. It is the xylem cells in the stem that create the sieve-tubes to facilitate this flow. Don’t crush them!

What to cut

Vase life is aided by cutting flowers before pollination occurs. Usually at, as the floral technicians say, “full petal color differentiation” and at some degree of opening, shy of full. If cut too early, flowers tend to wilt quickly or fade before they can open fully in water. A pet peeve in this regard is dutch iris as sold in flower shops. They are cut in tight bud revealing only a hint of color and they wilt in the vase 5–7 days later before full opening, never given the opportunity to let their full fleur-de-lis flag fly. But generally, the less fully open a flower is at cutting, the longer the vase life. Note: using the same species of flower at varying degrees of openness in the same bouquet will give you a substantially varied silhouette/look: today, tomorrow and 4–5 days down the line. That is, some of the flowers are perfect today, some will open fully in 1–2 days and then in 3–5 days.

It is also critical to distinguish between flowers that are at pre- and post-pollination stages. Plants are all about resource allocation, that is, putting resources where it is profitable until it isn’t and then putting them somewhere else that is now profitable. Profitable equals toward perpetuation of the species. Because flowering is a calorically exhaustive event, within hours of pollination, resource allocation shifts from alluring, shiny petals to plumping up the seed embryo. It’s all about the next generation. Thus pollinated flowers quickly lose their sheen and petals drop within a few days. This is an important search pattern for cut flower gardeners to master.

While it is incredibly species specific, here is a general guide regarding stages of development or degree of opening at which to cut flowers. When in doubt, earlier is better than later (piles of petals on that good table cloth) and when in serious doubt, about half open wins the day.

Development stage/degree of opening

- Spike or raceme flowers (larkspurs, snapdragon, delphinium, stock, mignonette, etc)—Cut with approximately 1/3–1/2 florets* open. They open base to tip.
- Composite / daisy flowers (calendula, cornflowers, sunflowers)—Cut just as the petals are “lifting off the face” or half to fully open. Petals should be above horizontal.
- Sweet peas—1/2 florets open
- Alstromeria—4–5 florets open
- Carnations, cornflowers—At paint brush stage (a cool image – check ‘em out!)
- Scabiosa—Tight bud (it’s called the pin cushion flower) to half petal open
- Yarrow—An exception to the daisy rule. Cut only when all florets are fully open and pollen is visible or they tend to wilt badly.

- Anemones and ranunculus—Showing good color but in tight bud
- Roses—Full color, tight bud, sepals at least horizontal.

*Floret = an individual flower on a spike or stem.

Floral Preservatives

Floral preservatives can aid in prolonging vase life. Unfortunately most commercial preservatives are laced with heavy metals (aluminum, copper, silver, etc) and nasty but effective germicides. They also contain a sugar source. As such they are serious environmental pollutants. The theory behind their trade secret formulae is simple:

- A sugar source to feed and prolong flower metabolism in the vase.
- The metals and germicides alter pH and kill yeasts, molds, bacteria and fungi that clog the stem’s conductive tissues and cause wilting.

A safe, simple organic, home floral preservative:
- 1/4 tablespoon sugar per quart of water
- 1/4 tablespoon bleach (eco-bleach works as well) per gallon of water

Probably the highest and best use of citric acid-based “soda pop” (7-Up, Sprite, Fresca, etc.) is as a floral preservative. It contains plenty of sugar and some citric acid to modify pH. Put it in your vases, not your kids.

Factors/conditions that promote & prolong vase life

- A clean cut on the stem bottom at a 45º angle. This keeps the bottom of the stem up off the bottom of the vase and the conductive pores open and clean.
- Start with clean containers; every 2–3 days change the water, clean the container, and re-cut the stems.
- Keep bouquet in moderate light with cool temperatures and high relative humidity
- Strip off any leaves below the water line
- Condition flowers in cool and dark for 1-2 hours before arranging
- Cut flowers in cool time of day and place immediately in cool water and shade. The deeper the water (6-8”) the cooler the core temperature.
- Do not jam a high number of flowers into the cutting bucket in the garden
- Use an organic floral preservative (see above)
- Cut flowers partially open (see list at left)

Flowers That Attract Beneficial Insects

As mentioned in the introduction, flowers can attract a variety of beneficial insects to the garden. Flowering plants provide shelter, habitat, moisture and nutrition to various predators and parasitoids. Predators tend to chew pests with their mandibles (jaws) or pierce with tube-like mouth parts and suck their innards. Common garden predators that can be “farmed” with flowering plants include minute pirate bugs, big eyed bugs, assassin bugs,
Article on Apprenticeship Survey Results Published

In 2009 the Center for Agroecology & Sustainable Food Systems (CASFS) undertook a comprehensive survey of Apprenticeship alumni both to document the impacts of the program and to get suggestions for ways to improve the Apprenticeship. The survey was designed to address several basic questions: Is the Apprenticeship accomplishing its goal of contributing to a more sustainable food system? To what extent did the program contribute to alumni’s activities? A grant from the Foundation for Global Community and the US Department of Agriculture provided support for the survey and analysis.

The survey found that, thanks to the skills, knowledge, confidence, networks, and support the Apprenticeship provides, program graduates are making a major contribution to creating a more sustainable food system. This is reflected in the significant number of alumni involved in a wide range of sustainable food and agriculture efforts, and particularly in teaching others about food production and sustainable food systems.

CASFS social issues researcher Jan Perez, who developed and coordinated the survey, recently published her results in a new online publication, the Journal of Agriculture, Food Systems, and Community Development. The article, entitled “Achieving program goals? An evaluation of two decades of the Apprenticeship in Ecological Horticulture at the University of California, Santa Cruz,” was co-written with Damian Parr, an Apprenticeship graduate and currently a post-doctoral student at UC Davis; and Linnea Beckett, a UCSC graduate student researcher. The paper is currently available online at www.agdevjournal.com/inaugural-issue.html. An article on the study appears in the UCSC News, news.ucsc.edu/2010/09/casfs.html. The UC Food Blog also picked up the story: ucanr.org/blogs/blogcore/postdetail.cfm?postnum=3516

Via email

Apprenticeship grads Nate Frigard and Jen Smith sent an update on their farming efforts in Massachusetts:

“Jen and I are really excited to announce that we have been awarded a long-term lease opportunity at the new Northampton Community Farm in Northampton, Massachusetts. It is a long story, but the short of it is that we submitted a proposal to start a community based CSA farm where as many members can come to the farm as possible. Our hope is to grow a successful business that raises bountiful vegetables and connects with the community in real ways. We have always found that farms can be a positive force in our communities when the land is cared for and when it is shared among its stakeholders.

First and foremost we’d like to thank you all for supporting us over the years and for teaching us and for helping us grow as people and as farmers. This farm that we build in Northampton, Massachusetts will be not just our farm, not just Northampton’s farm, but a farm that each of you helped to build and will always be welcomed to.

We will be leasing 35 acres of prime river bottom soil about a 12-minute bike ride from downtown Northampton. While we have yet to negotiate the lease its terms will be secure for us in the long term… that is if we live for the next 99 years or so (it will be a 99 year lease). We will begin modestly, tilling 10 acres our first year, and we will grow over the seasons to meet the growing demand for local food in Northampton and around Massachusetts.

We will be working towards getting a lease signed and getting a loan this fall to help us buy the equipment that we’ll need to launch our farm next season. At the same time we will be working with an organization called Grow Food Northampton (GFN) which is working to buy the land as a community resource and then to lease it back to us. They are well on their way to raising the money to buy what will become the Northampton Community Farm. If anyone wants to give them some financial support you can check them out at www.growfoodnorthampton.org. They are great people who have a great vision for this land and this community.”

In the News

Articles on the new employee garden managed by Apprenticeship grad Kat Goodwin for the Chesapeake Energy Company in Oklahoma City appear in Natural Awakening OKC magazine, and online at blog.regionallowfoodbank.org/?p=757. More than 350 employees are participating in the gardening effort, located on a full city block near the company’s offices, where they produce food for themselves and for local food pantries.Goodwin coordinates the effort and teaches classes to beginning gardeners.

Apprenticeship grad Doron Comerchero founded and directs the farming-based youth empowerment program “Food, What?!” in conjunction with Life Lab, based at the UCSC Farm. After attending the program’s fall fundraising dinner, writer Victoria Tatum profiled “Food, What?!” on the Civil Eats blog, civileats.com/2010/10/12/food-what-empowers-youth.

Apprenticeship grad Tina Poles has developed a seed-saving and seed study publication for school educators, based on her work as director of the Occidental Arts & Ecology School Garden Program. The 91-page publication is available for free download at www.oaec.org/sites/default/files/A-Handful-of-Seeds_0.pdf.
soldier beetles, ladybugs, lacewings, and some syrphid flies. Parasitoids include some species of flies, such as tachnids, and tiny, non-stinging wasps, including *Trichogramma* spp. Parasitoids tend to lay their eggs in or on other insects. When the eggs hatch, the resulting larvae become predators of their egg hosts.

Members of certain plant families (some of which are excellent cut flowers) provide easily accessed food for beneficiais via pollen and nectar:

- **Apiaceae family** (carrot, dill family)
  - *Ammi majus* – white lace flower
  - Angelica
  - Dill/Anise/Coriander
  - *Didiscus* – blue lace flower
- **Asteraceae family** (sunflower family)
  - *Calliopsis*
  - Coreopsis
  - *Aster*
  - *Cosmos*
  - *Mexican sunflower* (*Tithonia*)
  - *Sunflowers* (*Helianthus*)
  - Yarrow (*Achillea*)
- **Brassicaceae family** (cabbage family)
  - *Alyssum*
  - Iberis (candytuft)
  - Stock
  - *Scabiosa*
- **Dipsaceae family** (scabiosa family)
  - *Dipsacus* (Teasel)
  - Scabiosa

Also the flowers of *Sambucus* spp. (Elderberry), which are attractive on the plant, in the vase, and attract winged beneficials. The same is true of species of *Eriogonum* (Buckwheat) of which there are many California natives, as well as the annual cover crop species.

Orin Martin will teach a cut flower workshop in June 2011; details will be announced in a future issue of the *News & Notes* and on the Center for Agroecology & Sustainable Food Systems website, casfs.ucsc.edu. If you’re interested in a weekly cut flower bouquet from the Alan Chadwick Garden at a great price, the Farm & Garden will be selling bouquet shares in 2011 via the Community Supported Agriculture (CSA) program. Call 831.459-4661 or email farmcsa@ucsc.edu for details.