



PLANNING FOR ANNUALS

Look around your local nursery for plant combination ideas, and pay attention to commercial plantings around businesses and containers outside restaurants.

Figure 6. Sunflower and bee.

PLANTING

Try planting nursery plants a little closer together than plant tags recommend. This creates a fuller, lush look. Don't plant in straight rows; opt for a more natural appearance.

It is generally not recommended to plant annuals under trees as there may be an imbalance of moisture between what the annual needs and what the tree needs. Maples and rhododendrons will tolerate the moisture that annuals need.

Choosing Nursery Plants

Look for plants with compact foliage, more buds than flowers, and moist soil. Always inspect foliage for unwanted pests like aphids and whitefly.

Growing from Seed

Follow package directions: too many seedlings in a small area won't grow! Many seed companies also offer more information on their internet sites.

Soil

If you are planting containers, buy good-quality potting soil. If you are planting directly into existing beds, try to mulch around the new plants with a compost-like product available at most nurseries. This will help conserve moisture and keep roots cool.

Remember: Transplanting is stressful for a plant. Never plant during hot afternoons.

Photos by Heather Nielsen

REFERENCES

Hessayon, D.G. (1996). *The New Bedding Plant Expert*. Transworld Publishers, London, UK. 144pp.
Harris, M. (1994). *Favorite Annuals*. HarperCollins, Toronto, Ontario. 64pp.
Hodgson, L. (2002). *Annuals for Every Purpose*. Rodale Inc., Emmaus, PA, USA. 406pp.
Edinger, P. and J.H. Sanchez (2002). *Sunset Annuals and Perennials*. Sunset Publishing Corp., Menlo Park, California, 192 pp.



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TOP 10 EASY ANNUALS



A Master Gardener Fact Sheet

TOP 10 EASY ANNUALS

BY HEATHER NEILSEN

An annual is a plant that completes its life cycle within one year (it germinates, flowers and dies). The choices listed in this Fact Sheet are considered easy to grow and are less demanding of water and fertilizer than many other plants.

Figure 3. Begonia.



WHY USE ANNUALS? FOR BEAUTIFUL BLOOMS OR FABULOUS FOLIAGE

Experiment with colors and textures before committing to a more costly perennial planting. Do you really like pink or is white more eye-catching in that dreary back corner? Annuals have a long growth/bloom season, generally right up until frost or longer. Annuals are perfect for filling gaps in your perennial beds, for adding color in a shrub border, attracting beneficial insects or birds in your vegetable or flower beds, or for creating show-stopping containers for your patio or deck.



Figure 1. Alyssum border.

Bloom color: white, multi-hued pinks, lavender-purple.

Bloom time: late spring through frost; year-round in milder climates.

Alyssum (*Lobularia maritima*)

Masses of tiny fragrant flowers attract beneficial insects that love the nectar and also help control aphids and other insect pests (Figure 1).

Seeds: Very easy to grow from seed; start indoors in February, plant out in May or direct-sow seeds in April (also seed in the fall on the West Coast) where plants are to grow.

Site and soil: well-drained, not too rich. Full sun, part shade (may become leggy in shade).

Height: 5–30 cm (2–12 in). **Spread:** 20–30 cm (8–12 in).

Garden uses: containers, hanging baskets, rock gardens, vegetable beds, groundcover.

Tips: Shear back with scissors if flowering stops during hot summer weather. Plant Alyssum at the base of your roses and other plants prone to insect pests.



Figure 2. Alyssum & begonia.

Bloom color: white, red, pink, salmon.

Bloom time: late spring to frost.

Begonia (wax or fibrous) (*Begonia semperflorens* Cultorum Group)

Succulent stems support waxy leaves in greens or bronzes, with abundant blooms of white, red, pink or salmon until frost on these very low-maintenance plants (Figures 2, 3).

Plants: Purchase seedlings to plant out in early June.

Site and soil: humus-rich, evenly moist; some drought tolerance once established. Full sun to deep shade.

Height: 10–30 cm (4–12 in). **Spread:** 15–30 cm (6–12 in).

Garden uses: containers, hanging baskets, groundcover, mass plantings, rock gardens, woodland gardens.

Million-Bells (*Calibrachoa*)

Attract hummingbirds with these wonderful bell-shaped flowers on a bushy, trailing plant that slightly resembles petunias but with smaller, more weather-resistant flowers.

Plants: Purchase nursery plants to plant out when all danger of frost has passed.

Site and soil: full sun to part shade. Average to humus-rich, well-drained soil. Some drought tolerance once established.

Height: 15–25 cm (6–10 in).

Spread: 45–90 cm (18–36 in).

Bloom color: pinks, violets, purple/

blue, magenta, salmon, orange, red.

Bloom time: late spring to late fall. No deadheading required!

Garden uses: containers, hanging baskets, groundcover, mixed border, rock gardens, and wall plantings.

Coleus (*Solenostemon*)

If you need a reliable, eye-catching landscape foliage plant (Figure 4), then Coleus is for you!

Plants: Purchase nursery plants to plant out in June.

Site and soil: full sun (red to purple leaves can tolerate sun) to deep shade; green/pale pink leaves for shade (check plant labels), humus-

rich, well-drained soil.

Height: 15–45 cm (6–18 in).

Spread: 15–30 cm (6–12 in).

Foliage color: shades of green, purple, pink, red, salmon, orange, yellow, white.

Foliage time: late spring until frost.

Garden uses: containers, hanging

baskets, annual hedges, mass planting, mixed border, rock gardens and specimen plants.

Tips: Take cuttings once plants are larger; they root in 3–5 days and may be replanted within 2 weeks. Pinch spikes of lavender-like flowers to promote more bushy growth.

Cosmos (*Cosmos bipinnatus*)

A long-time cottage garden favorite, cosmos are tall with airy foliage and daisy-like blooms (Figure 4). Cosmos are great for cut flowers, they attract butterflies, and the seed heads feed birds in fall. They often self-sow for next year.

Seeds: Easy! Grow direct from seed in garden in late spring or purchase nursery seedlings to plant in late

May. Plant at the back of a border.

Site and soil: full sun, thrives in average to poor, well-drained soil. Do not fertilize.

Height: some species grow to 122 cm (4 ft) or taller!

Spread: 30–45 cm (12–18 in).

Bloom color: pale pink, deep pink, white, orange, brown, or red.

Bloom time: early summer to frost. Deadheading in hot summer promotes better blooming.

Garden uses: containers, cut-flower garden, annual hedge, mass plantings, meadow garden, mixed border, privacy screening.

Tip: Pinch off the growing tip when plant is 15 cm (6 in) tall to help it stay bushy and erect.

Impatiens (*Impatiens walleriana*) (Busy Lizzie)

Easy to grow; attracts hummingbirds; always in flower, even in the darkest corners.

Plants: Purchase nursery plants to plant in warm June soil.

Site and soil: full sun to deep shade; humus-rich, evenly moist but well-drained soil. Some drought tolerance once established.

Height: 15–45 cm (6–18 in).

Spread: varies (see plant tag).

Bloom color: white, pinks, coral, red, multi-hued combinations.

Bloom time: from late spring to hard frost.

Garden uses: containers, hanging baskets, groundcover, mixed border, woodland garden, specimen plant.

Tip: Impatiens look stunning interplanted with hosta, ferns, coleus or other textured foliage plants (Figure 5).



Figure 4. Cosmos and Coleus.

Figure 5. Impatiens container with begonia in background.

Marigolds (*Tagetes*)

You see these naturally drought-tolerant, golden beauties everywhere, a real clue that they are easy to grow. Most common are French Marigolds with their small bushy habit or African Marigolds with larger pom-pom style flowers. Both are from Mexico!

Seed: Grow from seed in late spring, or purchase nursery plants to plant out after last frost.

Site and soil: full sun, part shade; average to poor, well-drained soil. Drought tolerant.

Height: varies by species.

Spread: varies by species

Bloom colors: range from yellows to golden oranges to red-tinged.

Bloom time: summer through early fall.

Garden uses: containers, cut flowers, edging, mass plantings, mixed borders, rock gardens. Vegetable garden mass plantings grown one year then dug into soil at end of season can successively deter harmful soil nematodes for the following few years.

Tip: Deadheading (pinching off spent flowers) can maintain continuous bloom.

Nasturtium (*Tropaeolum majus*)

Fast-growing, entirely edible, peppery-flavored lily pad leaves and colorful flowers are the easiest to grow from seed. Many new varieties and colors are available.

Seed: Direct sow seed in late spring.

Site and soil: full sun to part shade; average to poor well-

drained soil. No fertilizer needed.

Height: varies by species.

Spread: varies by species.

Bloom color: varies by species. No deadheading required.

Bloom time: early summer through fall.

Garden uses: container plants, hanging baskets, cut flower and kitchen gardens, mixed borders, rock gardens, vegetable beds.

Tip: Try growing with Alyssum if aphids are a problem in flower beds. Nasturtiums may be used as an aphid magnet in vegetable gardens.

Sunflower (*Helianthus*)

Garden sunflowers offer an amazing array of heights, colors and blooms, attract beneficial insects (Figure 6) and feed birds in the fall, so what's not to like?

Seed: Direct sow seed in late spring, after last frost. Watch out for slugs.

Site and soil: full sun; average, well-drained soil. Water during hot spells.

Height: 30 cm to 3 m (1–10 ft).

Spread: 30–90 cm (1–3 ft).

Bloom color: shades of yellow, oranges, reds, deep pinks.

Bloom time: mid to late summer, through to frost.

Garden uses: containers, cut flower garden, mass plantings, mixed border, specimen planting and screening.

Tip: Deadhead multi-stemmed varieties in late summer to stimulate more blooming but leave the single-stemmed plants to make seeds for birds.

Sweet Potato Vine (*Ipomea batatas*, *I. purpurea*, *I. tricolor*)

Fantastic foliage plants with large heart-shaped leaves add drama and texture (Figure 7).

Plants: Purchase nursery plants to plant out in mid-June.

Site and soil: full sun to part shade; humus-rich but well-drained soil.

Height: 20 cm (8 in).

Spread: 45–240 cm (18 in–8 ft).

Foliage Color: purple, chartreuse

(lime green), variegated.

Foliage Time: early summer through early fall, year round in Zones 9–10.

Garden uses: containers, hanging baskets, groundcover, rock gardens and specimen plants, on trellises (check plant tags for height). Looks great planted with Coleus.

Tip: Overwinter containers indoors in bright light, keeping well watered.



Figure 7. *Ipomea* (bright green) and coleus (green with red centers).

PERENNIALS FOR ATTRACTING BENEFICIAL INSECTS



The herbaceous perennial border at VanDusen Botanical Garden. PHOTO: Sandra Hewson.

Using perennials for natural pest control is a great idea in the garden because it saves on the cost of chemicals and means that pests can't become resistant to pesticides. You should choose plants that harbour beneficial insects so that they can prey on any pests that arrive. Examples are lupins, which harbour aphids as well as hoverflies that prey on aphids and mealybugs. Shasta daisies harbour pirate bugs and beneficial mites, which prey on thrips, spider mites, fungus gnats, scales and whiteflies.

Four good ways to attract beneficial insects are:

1. Do NOT use pesticides as most do not discriminate between beneficial insects and pests.
2. Research and plan out your garden to provide the right plants for different beneficials including different flower sizes and blooms for as much of the year as possible. It is always good to mix perennials with annuals to attract beneficials.
3. Provide somewhere for the beneficials to live and hide, e.g. in evergreens, hedge, mulch, mason bee homes.
4. Provide places for the insects to get water without drowning, e.g. saucers containing stones.

There are thousands of perennials available to the gardener. If you put the right plants in the right places they can bring joy – both in the landscape and inside the house as cut flowers – year-round for many years to come.

REFERENCES

Burnie, G. et al. (1998). Botanica. Raincoast Books, Vancouver, BC.

Kitchen Gardener. Attracting Beneficial Insects 26: 12-16. <http://www.taunton.com/finegardening/how-to/articles/attracting-beneficial-insects.aspx>.

Phillips, R. and M. Rix (2002). Perennials. Firefly Books, New York.

Society for Organic Land Care. Plants that Attract Beneficial Insects. Fact Sheet. <http://www.city.stratford.on.ca/naturally/plaatt.asp>.

Sunset Editors. (2001). Western Gardener. Sunset Publishing Corp., Menlo Park, California, USA.



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PERENNIALS



A Master Gardener Fact Sheet

PERENNIALS

BY SANDRA HEWSON

The thousands of perennials available to gardeners provide the backbone of a garden landscape. Perennials are usually described as plants that live for more than two years and can be divided into two main groups:

A spectacular display of perennials at the garden of Joan Bentley (MG). PHOTO: Vic Bentley.

1. woody plants, where either the wood supports year-round leaves (evergreens) or the leaves die back (deciduous), and
2. herbaceous plants whose stems and leaves die off but the rootstock remains year after year.



Figure 1. Orchid, white/pink. PHOTO: Sandra Hewson.

Perennials can be trees as tall as the Coast Redwood (*Sequoia sempervirens*) recorded at over 100 m (330 ft) which would be an upper-storey specimen in a very large landscape. Perennials such as creeping thyme (*Thymus serpyllum*), on the other hand, grow only a few millimetres above ground and are considered groundcovers. While some perennials are considered tender or deciduous in colder climates, they may retain their leaves and grow year-round in warmer climates. Examples of this are indoor plants in BC which are considered outdoor plants in warmer tropical climates, such as orchids (Figure 1).

However, the commonly used term ‘perennial’ describes a herbaceous plant that lives for more than two years and this is the definition used in this Fact Sheet.

TYPES OF HERBACEOUS PERENNIALS



Figure 2. *Helleborus*. PHOTO: Sandra Hewson.

Perennials tend to bloom at particular times of the year and so your landscaping plans should take this into account. Many winter- and spring-flowering bulbs and corms are found under deciduous trees naturally and so do best there in a garden landscape. Not all the examples given here are hardy in all zones of the province, so it is best to check with your local nursery or plant reference guides before planting.

Knowing the original habitat of a perennial helps in providing a good location for it when planning your garden. Here are some examples of flowering perennials:

Primroses (Primulaceae) - From Europe and western Asia, in woods and on shady rocks, usually on heavy soil, need moisture in summer. Winter/spring flowering.

Red-hot poker (*Kniphofia* sp.) - From South Africa, on wet peaty and sandy soils, often in marshes, need wet soils in summer, drier in winter. Summer flowering.

Michaelmas daisies (Asteraceae) - From North America, in woods and meadows, need moist soils in summer. Fall flowering.

Lenten Rose (*Helleborus* sp.) (Figure 2) - From Europe, at the edge of woods, grassy places, in heavy soil. Winter flowering.

Other examples of perennials include vines, shrubs, trees and many groundcovers. For ideas, see the MGABC Fact Sheets on Ornamental Grasses, Groundcovers, Easy-Care Roses, Clematis and Other Climbers, Trees for Small Gardens, and Shade Gardens.

PROPAGATION OF PERENNIALS

One of the best things to do with perennials is to share them with your friends and neighbours, as they will outgrow their space after one to several years. Dividing also helps to keep the plant healthy. Perennials have different kinds of root systems and storage organs depending on their adaptation to the environment.

Bulbs, corms, tubers and rhizomes

Many of the first flowers to bloom in the year come from bulbs or corms planted in the fall. Bulbs



Figure 3. Gladiolus, white/purple. PHOTO: Sandra Hewson.

have everything you would find in a bud: flower and leaves. Examples are narcissus, tulip, ornamental onion (*Allium* sp.) and snowdrops. Most are hardy throughout BC.

A corm is a solid enlarged stem base; examples are crocus, anemone and gladiolus (Figure 3). Gladiolus is rarely hardy in zones lower than 7, where it will need to be lifted and replanted each year.

Iris and cannas are rhizomes, which have swollen stems that grow horizontally. Cannas, like gladiolus, are not hardy in Zone 6 or lower.

Dahlias and gloxinias are examples of tubers. Tubers are plants with underground storage parts that don't fit into the other groups. Check your zone to ensure that they can overwinter.

Within three to four years these plants produce ‘baby’ structures that mature and start to crowd out the original ones. It is then a good idea to dig them up, separate them and give some a new home.

Clumping perennials

Many perennials start with a single crown which then develops into multiple crowns, e.g. grasses, shasta daisies, day-lilies. These crowns can be divided by hand, with forks or even an old drywall saw. Divide them so that there is at least one crown and roots on each piece.

Seed

Perennials can be grown from seed. Some perennials (lupins, rosemary) will flower in the first couple of years, while many can take several years to flower (iris). This is one reason why a large number of perennials are propagated by division.

COMBINING PERENNIALS FOR YEAR-ROUND COLOR IN THE LANDSCAPE

Using herbaceous perennials in the garden landscape can provide year-round color if you plan carefully. You can research which perennials flower at different times of the year or just go to the nurseries each season and pick out the ones that are flowering (and on sale) at the time.

Eye-catching displays can be created by combining different foliage colors, especially where the flowers are insignificant on a perennial. For example, the container in Figure 4 has blue fescue, a crimson bugle (blue flowers late spring), a grey Sedum, green Sedum ‘Herbstfreude’ (copper-red flowers in fall), Hen and Chicks (*Sempervivum*) and a red fountain grass – all perennials. Leaving the fountain grass overwinter will continue to provide height in the container before you cut it back in the spring as new growth appears.

Always choose perennials that suit the conditions in your garden. Remember: right plant, right place. If you put a plant that needs full sun in a shady location it is likely to grow really tall and may not flower. If you put a plant that requires full shade in a sunny location, the leaves tend to go yellow and may even burn and the plant will struggle to flower.

Combine winter- and spring- or fall-flowering bulbs and corms in flowerbeds and containers with other plants to provide year-round interest. Good combinations include snowdrops with azaleas, crocus planted on grassy knolls, and cyclamens with dwarf maples.



Figure 4. Pot of perennials. PHOTO: Sandra Hewson.

CONIFERS

Hedges grown from conifers cannot be cut back severely as they do not readily put out new foliage from old wood and will not recover satisfactorily. The only exception, and therefore the only conifer on our recommended list, is Yew (*Taxus*). There are about seven species and many cultivars, with glossy, dark green leaves or yellow or variegated leaves. Yews make excellent hedges and topiary as they do not grow quickly and need clipping only twice a year. Most yews tolerate exposure, dry soils and urban pollution. Yews are toxic if eaten.

Western Red Cedar – *arbovitae* (*Thuja plicata*)

Western red cedars are tall, conical trees, achieving a height at maturity of 35 m (120 ft) and a spread of 9 m (30 ft). Why then, try to grow them as 8-ft hedges in the average small garden? Well, the original plants are cheap, and with a lot of trimming and hard work they can make an acceptable hedge until they outgrow their purpose.



This Western Red Cedar hedge has been grown well and is being well maintained – for the present. PHOTO: Barry Roberts.

A well-intentioned owner or landscaper has trimmed this Western Red Cedar hedge back to the old wood. It will not grow back and the only solution now is to extract the whole hedge and try again with a more suitable choice of hedge plants. PHOTO: Barry Roberts.

Despite the neatness of this pruning job, the hedge is ruined and will never grow back from the old wood. Again, the only solution is to totally replace the hedge with something more suitable, see Recommended List of Hedge Plants. PHOTO: Barry Roberts.

With a potential spread of 9 m (30 ft), Western Red cedars need to be planted well back from any path. The spreading branches of this hedge have been lopped off and it has been underplanted with smaller cedars to fill the gaps – a quite unsatisfactory arrangement which will result in the whole hedge being dismantled at a later date. PHOTO: Barry Roberts.

REFERENCES

- Brickell, Christopher, Editor (2000). The RHS A-Z Encyclopedia of Garden Plants. Dorling Kindersley, London.
- Building a Hedge. (2007). www.northscaping.com/InfoZone/IS-0130/IS-0130.shtml.
- Cole, Trevor (1975). Hedges for Canadian Gardens. Agriculture Canada, Ottawa.
- Great Plant Picks (2009). www.greatplantpicks.org.
- Grow Me Instead (2009). www.invasiveplantcouncilbc.ca.
- Hessayon, Dr. D.G. (1997). The Tree and Shrub Expert. Transworld Publishers Ltd, London.
- Kelly, John, Editor (1995). The Hillier Gardener's Guide to Trees and Shrubs. Reader's Digest, New York.
- Lancaster, Roy (2002). Perfect Plant Perfect Place. Dorling Kindersley, London.
- RHS AGM Plants. (2009). www.rhs.org.uk/Plants/Plant-trials-and-awards/AGM-plants.



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HEDGES BY BARRY ROBERTS

Hedges are continuous screens of trees or shrubs planted close together at regular intervals, used for giving shelter or seclusion, hiding boundary fences, keeping out people and animals, or dividing up the garden into separate sections.

Cotoneaster lacteus has white flowers in summer, followed by red berries which remain over winter. PHOTO: Barry Roberts.



The intention of this Fact Sheet is to introduce the many different and interesting plants that can be used for hedging. It is beyond the scope of this leaflet to provide planting distances, pest and disease control or hedge maintenance regimes for all hedge plants; please refer to the References for further research.

A **formal hedge** is a continuous line of shrubs in which the natural shape of each plant is lost due to tight clipping.

An **informal hedge** is a line of shrubs in which some, or all, of the natural outline of the plant is preserved. A hedge using flowering plants is usually an informal hedge as regular clipping would remove the floral display.

Ornamental hedges can be formed by using some of the flowering shrubs as hedge plants, especially in less formal parts of the garden. In order to get the full benefit of the blossom and berries of these plants, more space and freedom of growth must be allowed than for a close-clipped hedge. Suitable subjects are to be found in *Berberis*, rose species, *Escallonia*, *Spiraea*, *Weigela*, *Cotoneaster*, *Elaeagnus* and *Pyracantha*.

Before a hedge is planted, the ground must be well prepared by trenching and the addition of well-rotted manure if the soil is poor or shallow. A hedge planted to keep out animals will need to be supplemented by a fence for some time until the hedge is well established, while in exposed situations, as for example, sites near the sea, it is advisable to give the hedge some protection from the wind in the form of wattle hurdles during its early stages of growth. Hedges are much improved and their growth encouraged if the soil is kept free from weeds by frequent hoeing.

EVERGREEN HEDGES



Either as a parterre hedge or as a larger hedge as depicted here, *Buxus sempervirens* is an excellent choice as a hedge plant. PHOTO: Barry Roberts.

Where space is limited, an evergreen honeysuckle such as *Lonicera nitida* (box honeysuckle) makes a neat, close-growing hedge. Although the effect is thin for a year or two after planting, the mature hedge will be floriferous and fragrant. Trim hedges twice during summer.

Privet, *Ligustrum amurense* (Amur privet): its dense upright form certainly makes it a satisfactory hedge but its roots are apt to be troublesome by their habit of invading adjacent borders, unless grown alongside a lawn or path. Trim hedges twice during summer.

Boxes (*Buxus*) are ideal for formal hedging and topiary as they are tolerant of repeated clipping. Dwarf varieties are available for edging and for use as groundcovers. Will grow well in any fertile soil and are particularly tolerant of chalky soils. As *Buxus* is appreciated for its extreme neatness it should be trimmed at least twice per year. There are many cultivars of *Buxus microphylla* and *B. sempervirens* from which to choose. *Buxus sempervirens* 'Suffruticosa' is compact, very slow growing, and therefore excellent as a formal hedge.

HEDGES

A Master Gardener Fact Sheet



Tigridia pavonia, a frost tender cormous member of the iris family. PHOTO: Vic Bentley.

Non-flowering problems typically indicate overcrowding (called 'bulb blindness', accompanied by stunted leaves), pest infestations, rots, drought and undersized (immature) stock.

Mice, voles and squirrels can be diggers and eaters. Gaging such as chicken wire over the top of the planted bulbs can protect them if these pests are a problem in a specific area.

Spidermites, thrips, Narcissus flies and bulb maggots can be a problem for some of the summer bloomers.

Bulbs are prone to rots in wet soil, or in heavy clay soil that lacks drainage. Powdery mildew can attack leaves in a mild wet spring.

Following organic gardening practices can considerably reduce these problems.

REFERENCES

Anonymous (1997). *Bulbs: a photographic guide to more than 500 bulbs by type, size, season of interest and color*. Cavendish Books, North Vancouver, BC. ISBN 0929050711.

Brennan, Georgeanne and Mimi Luebbermann (1993). *Beautiful Bulbs. Simple Secrets for Glorious Gardens Indoors and Out*. Chronicle, San Francisco. ISBN 0811844412

Hobbs, Jack (1994). *Best bulbs for temperate climates*. Timber Press, Portland, OR. ISBN 0881922935.

McDonald, Elvin (1997). *The 100 best bulbs: a practical encyclopedia*. Random House, New York. ISBN 0679760296.

Proctor, Rob (1993). *The Indoor Potted Bulb: Decorative Container Gardening with Flowering Bulbs*. Simon & Schuster, New York. ISBN 0671870335.

Veseys Bulb Catalogue (2010). <http://www.veseys.com/ca/en/store/springbulbs>. Veseys, York, PEI, Canada.



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BULBS



A Master Gardener Fact Sheet

BULBS

 BY KIM HAMMOND

A bulb is technically a modified stem and its growing point. These are covered by concentric layers of overlapping fleshy scales, which are modified leaves.

Tulips at Skagit Valley, Washington.
PHOTO: Barry Roberts.



Figure 1. Ornamental onion (*Allium giganteum*). PHOTO: Janet Sawatsky.



Figure 2. Ornamental onion (*Allium karataviense*). PHOTO: Vic Bentley.



Figure 3. Gladiolus. PHOTO: Sandra Hewson

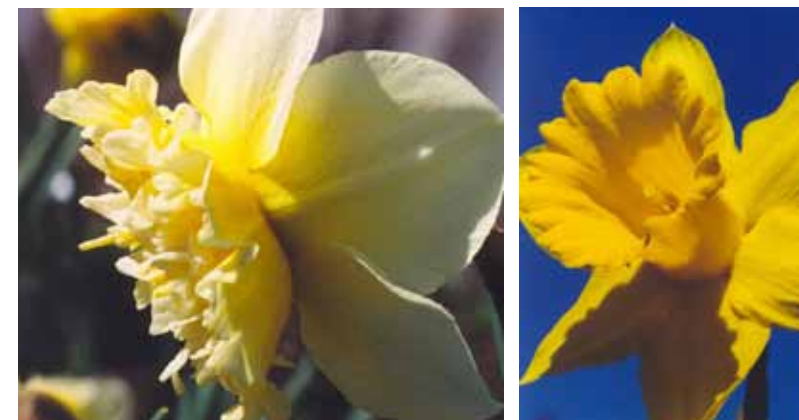
There are four types of bulbous plants. The true bulb contains a fully formed plant in dormancy consisting of the scales, a basal plate (which will form the roots) and a papery covering called a tunic, as seen in daffodils, hyacinths, tulips and onions (Figures 1, 2). A corm is formed from the swollen bases of stems, and new corms are formed each year. Corms are usually smaller, flatter and harder than bulbs (and hard to tell which end is up, so plant them sideways); examples are crocuses, gladioli (Figure 3) and Watsonia. Unlike bulbs and corms, tubers store their nutrient reserves in fleshy roots (dahlias, orchids and tuberous begonias are examples), and rhizomes look like swollen underground stems, such as iris and lily-of-the-valley.

Most bulbs originated in the mountains of Turkey, which is why fall-planted

bulbs such as crocus, tulips, daffodils (Figures 4, 5) and snowdrops prefer cold winters, plenty of water in spring and warmish to hot summers.

When buying bulbs make sure they are plump, hard, have strong growing points, are free of mold, have no obvious signs of damage and still have their papery brown tunics on.

LEFT: Figure 4. Daffodil (*Narcissus 'Ice King'*). PHOTO: Vic Bentley. RIGHT: Figure 5. Daffodil (*Narcissus 'King Alfred'*). PHOTO: Vic Bentley.



PLANTING

In the BC climate, bulbs are planted in the fall when temperatures have dropped consistently to 13°C and below. September to November, depending on your zone, is typically when bulbs are planted and many gardeners use leaf fall as their marker. Each bulb has its individual requirements for soil, light, moisture, warmth and planting site and the packaging usually indicates these. Bulbs in general prefer an acidic soil (pH 7.0 and slightly higher) and require good drainage. Irises tolerate alkaline soils.

Longer-lasting summer-planted bulbs are showy and are excellent choices for filling in spots between flowering shrubs. While most bulbs are planted in sunny locations, those such as bluebells, snowdrops and lily-of-the-valley prefer some shade. But, note that shade-loving and woodland bulbs deteriorate quickly if kept too dry for too long.

Planting depth should be at least three times the diameter of the bulb at its largest girth. Loosen the soil to the correct planting depth. Stir in bone meal or rock phosphate and “seat” the bulb into the soil with a gentle downward push, pointy side up. If the soil is heavy clay, then lay a bed of sand down to seat them in. If planting in a particularly sandy soil, add compost or plenty of organic matter to the soil to increase nutrient availability. Gently add your top layer of soil so as not to disturb the bulb placement, tap surface with the back of a rake to reduce air pockets, and water in well. Label the spot and/or mark in your garden plan what was planted where.

Naturalizing

Bulbs can be naturalized in lawns, in flowerbeds

for color from early spring through to fall, or in pots or containers for creating focal points, bringing fragrance to a patio or for creating mass displays of color.

Bulbs that naturalize well will indicate so on their label. Most often used are daffodils. Mass planted, they produce smaller mini-bulbs called bulblets and offsets; each year these bulblets increase in size and number. Eventually these too will flower and then start the process all over again. Adequate water and fertilizer are required. Because fall-planted, spring-blooming bulbs need a summer dormancy period in order to bloom well the following year, they need protection from the wet or be in very well-drained soil. Naturalizing in lawns is possible if the above conditions are met. If planning to naturalize daffodils in an existing lawn, use a bulb planter to make a hole in the lawn. Mix some bonemeal with some of the soil from the core of the bulb planter and place in the bottom of the hole. Position the bulb and the rest of the soil from the bulb planter and then take the cap of lawn and replace it over the hole. Fill any gaps with soil and water in well.

Forcing

Bulbs such as paper whites, amaryllis (Figure 6) and hyacinths are often used for forcing. Each bulb type has a cooling requirement. Forcing is a trick to make the bulb flower ahead of time. Many bulbs are purchased as ‘prepared’, which means they have been pre-chilled and need only eight weeks or so in the refrigerator (or any place cool and dark), followed by bright indirect light in a cool room to fill the house with fragrance. Those bulbs that are unprepared will

need longer cool and dark time to flower properly (up to 12–16 weeks). Bulbs to be forced can be planted with the ‘shoulders and noses’ out of the soil.

Layered planting

Multi-planting is a method of layering bulbs in a pot for long-lasting blooms over a period of time. Reading labels for the best combinations of heights, colors and bloom times is essential. Prepare your pot with good-quality potting soil and bonemeal (or rock phosphate if you prefer). Fill the pot two-thirds full of soil. Plant the latest-blooming, tallest variety first with flattened side of the bulb to the outside of the pot. Cover with a layer of soil. Then plant the next bulb type that is slightly shorter and blooms a little earlier in the season. Follow with a layer of soil. Then finish with early spring bulbs like snowdrops or crocus (or both). When spring sun warms the soil, the succession of blooms will take you right

CARE AND PROPAGATION

All bulbs require the foliage to die back naturally, so that nutrients stored in the leaves return to the bulb and replenish its food stores for next year’s growth and bloom. If seed is needed for self-sowing to increase the bed size or if you are collecting seed, then wait to shear the faded leaves (usually 6–9 weeks after flowering). If seed production is not desired, then remove only the flower stalk at the base as soon as the bloom fades. Deadheading improves the vigor of the plant.

Division of over-crowded bulbs is required when performance deteriorates. Lift when completely dormant, check for damage and rot, separate and replant. Mix in smaller bulbs (offsets) with larger for a natural effect or plant smaller bulbs elsewhere until they reach flowering size. Division of bulbs from offsets (formed from the main parent bulb) is done in early spring every third year or so. Tease these away from the parent bulb and repot or replant.

Bulblets need several years to flower once separated from the parent plant in the dormant season. Replant them in rows in a sheltered part of the garden and keep them moist until of flowering age.

Bulbils are often found on many of the lily family

through the season until it is time to lift the bulbs and store them for winter planting. If blooming finishes early enough in the season, the pot can be used for flowering annuals.



Figure 6. Amaryllis. PHOTO: Jenny Newman.

in the axils of the leaves. These simply need to be pressed into the soil, covered very lightly and kept moist. The following autumn, pot them into the permanent bed or into pots.

Collecting seeds from bulbs is often a time-consuming project (up to 3–5 years) but it’s free! Seed capsules ripen at the flower tip, or at the base of the stems. Once the pods are dry and brown they will split easily to reveal the contents. Store in a cool, dry, dark place until sown. Autumn is best for seed collection from most varieties. Lilies are the exception, as some varieties may need a cold period to produce a shoot.

Scaling is another way to propagate lilies as well as some other varieties of bulbs. If the bulb to be propagated is of the scaly type, then carefully separate a scale with a piece of the basal plate to provide the root system, then place in a plastic bag with perlite. If stored at 21°C in the dark for 3 months, then placed in the fridge for a further 6–8 weeks, bulblets will form at the base of each scale. Pot up, keep them moist and in the shade. Protect them during the winter and plant them out the following spring. Scaling is best done in early summer before root growth begins.

USE LEAST-TOXIC AND NON-TOXIC TREATMENTS...continued

cultivate soil to control them. Blast aphids off plants with a strong stream of water.

- Catch some pest insects with traps. Hang yellow sticky traps to catch whiteflies on house plants; band deciduous trees with sticky bands in the fall to catch winter moths before they lay eggs.
- Apply heat to control weeds in hard surfaces. Pour boiling water on weeds in patios and driveways (Figure 4) or make a quick pass with a hand-held flamer.

Biological Controls

Most insect pests have natural enemies, such as other insects, spiders and birds that keep their numbers below damaging levels. As described above, a safe, inviting garden will bring these native species into your yard.

Some species are also reared commercially for sale. Only a few are useful outdoors for gardens: aphid midges (*Aphidoletes aphidimyza*) and insect parasitic nematodes (different species are sold for control of weevils or European chafer in lawns). There are also effective biological controls available for spider mites, greenhouse whitefly, mealybugs and soft brown scale in hobby greenhouses.

Pesticides

Most pesticides are chemicals, but a few are microorganisms (e.g., bacteria, such as *Bacillus thuringiensis* or BTK). Many municipalities have bylaws restricting the use of pesticides on lawns and gardens to low-risk pesticides such as soaps, horticultural oils, acetic acid and botanical extracts.

To use them correctly it is important to understand how these low-risk treatments work. For example, BTK only affects caterpillars, while corn gluten meal prevents weed seeds from germinating, but doesn't kill weeds. Also, if mixed incorrectly, soap and oils can kill plants and any of them can kill beneficial species.

If you need to use a pesticide as a last resort, use the information from your inspections to target the pesticides only where and when needed.



Figure 4. Boiling water kills weed seedlings. PHOTO: Linda Gilkeson.

FOLLOW-UP

Whether or not you applied some kind of control, keep checking on the pest situation and making notes. Those notes will tell you when to expect a problem and how well your treatments worked. This information will help you decide whether you took the right course or whether, next time, you need to try something different.

Above all, use this information to plan for prevention and to be better prepared next year.

REFERENCES

Gilkeson, Linda A. (2006). *West Coast Gardening: Natural Insect, Weed and Disease Control*. Trafford Press. 154 pp.



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NATURAL PEST MANAGEMENT



A Master Gardener Fact Sheet

NATURAL PEST MANAGEMENT

BY LIDA GILKESON, PhD

Using a natural approach to pest management is effective because it is based on the way natural ecosystems work.

Larvae of this hover fly (*Syrphid*) prey on aphids. PHOTO: E. Cronin.



PREVENTION IS KEY

With a little care in design and maintenance of your garden, it is possible to prevent many insect, disease and weed problems. Not only does this give good results, but it is usually less work and less expensive than controlling pests after they become a problem.

Start with Healthy Plants

Healthy plants have an array of natural defences against insects and diseases. These include tough cuticles on the leaves that deter insects or fungal attack, chemical compounds in the foliage that repel insects, and immune systems that recognize and isolate pathogens.

To grow healthy plants:

- Choose plants adapted to the soil and the microclimate in your yard. Don't plant shade-loving plants in full sun, or vice versa.
- Correct any growing conditions that you can control: soil drainage, irrigation, soil pH and nutrients.

- Choose cultivars resistant to diseases. You can buy roses resistant to powdery mildew, black spot and rose rust; apples resistant to apple scab; grapes resistant to powdery mildew, and many other disease-resistant garden plants.
- Manage for an appropriate growth rate. Fast growth is desirable for vegetables, but not for woody plants. Trees that grow too quickly may have soft shoots that are more susceptible to sucking insects and some diseases.

Encourage Beneficial Insects

There are thousands of species of predatory and parasitic insects. To reap the benefits of these free pest control agents in your garden:

- Avoid using insecticides. Even the least toxic insecticides, such as soap, will still kill beneficial insects.



Figure 1. Sweet alyssum flowers attract aphid predators to the rose garden. PHOTO: Linda Gilkeson.

- Attract them to your garden. In most species of beneficial insects, it is only the immature stage that is predatory. You can lure parents of these hungry juveniles into your garden by growing flowers with a rich supply of nectar or pollen. When they have food, they live longer, lay more eggs and stay in your garden to search for aphids, caterpillars and other hosts where they can lay their eggs.

The most attractive plants have small flowers that suit the mouthparts of tiny parasitic wasps, lady

MAKE SURE PROBLEMS ARE CORRECTLY IDENTIFIED

There is no point in taking action unless you know what the problem is. Plants are more often damaged by poor growing conditions – such as extreme heat or cold, nutrient deficiencies, sunscald or injury – than by pests. Therefore it is essential to identify a problem correctly before you can decide whether or not you need to take action.

Sometimes diagnosing the cause is easy, such as when you find a caterpillar chewing on a leaf (Figure 2). But most of the time you don't see an obvious culprit. There are leaf diseases that look like sucking-insect damage, physical injuries that look like plant diseases, mites so small you can't see them with the naked eye. On top of that, many beneficial insects could be mistaken for pests because they are found on damaged leaves...where they are busy searching for the pests!



Figure 2. This rose sawfly looks like a caterpillar. PHOTO: Linda Gilkeson.

beetles, hover flies, etc. There are many useful plants in the carrot, cabbage, aster and mint families. Some of the best plants for beneficial insects are dill, parsley (in flower the second year), yarrow, cilantro, sweet alyssum (Figure 1), candytuft, calendula, thyme, lovage, daisies and goldenrod. Even weeds such as wild carrot, dandelions and chickweed are good insect plants.

Grow a variety of plants so flowers are available from early spring to late summer. Mix them among vegetables, or use them as edging plants or in rock walls.

Diagnosing Problems

- **Look for the pest.** Using a magnifying glass, inspect the upper and lower surfaces of leaves and nearby shoots and branches. If no suspects are visible, it may be because they hide at night or have finished feeding and crawled away. For general symptoms, such as wilting, check stems and trunks for borer holes and disease cankers.
- **Look for characteristic damage.** Many pests leave behind clues such as excrement pellets (caterpillars), slime trails (slugs) or sawdust (borers).
- **Consider the host plant.** Many insects and disease organisms attack only specific plants. Many common problems can be quickly identified through the host plant and characteristic damage or symptoms.
- **Check growing conditions.** Extreme weather or poor growing conditions can stress plants and cause symptoms that look like pest damage. For example, dead spots on leaves caused by sunscald look like disease, while shoots distorted by frost injury look like aphid attack.

Keep an Eye on the Problem

Get a magnifying glass to help you get a close look. Check regularly and keep notes (or sketches or photos) so that you will know whether damage is continuing or increasing. If damage isn't getting worse, whatever caused the problem may no longer be present. If it is getting worse, your regular check-up will help you decide whether you should take action.

DECIDE WHETHER TREATMENT IS NEEDED

It is important to distinguish between damage that ruins a crop or makes an ornamental plant unsightly, and damage that doesn't really affect the harvest or the appearance of plants. What is considered 'damage' can also be a matter of taste, especially when it comes to tolerating weeds in lawns.

An important consideration is the size of a pest population and whether it is increasing. There is

a big difference between a few leaves with holes and a large population of caterpillars defoliating a whole plant. Many potential pests are naturally kept in check by weather conditions, natural enemies and diseases. A small infestation of insects or a few diseased leaves may never expand to damaging proportions—which is why it is a good idea to take time to follow the progress of a problem before you reach for the spray bottle.

USE LEAST-TOXIC AND NON-TOXIC TREATMENTS

When you do need to take action, there are many effective methods for controlling pests that do not involve using pesticides.

Physical and Mechanical Controls

- Use barriers to stop insects from laying their eggs on vegetables. Floating row covers (Figure 3) or window screening can keep carrot rust fly away from carrots and leafminers off spinach and chard.

- Mulch soil to prevent weeds from germinating. Smother germinating weeds with organic mulches, such as leaves or straw, or use black landscape fabric covered with bark mulch or gravel.
- Physically remove and destroy infested plant material. Prune out tent caterpillar nests and diseased or infected branches, pull weeds or



Figure 3. Floating row covers prevent insect attacks. PHOTO: Linda Gilkeson.

IMPLEMENTATION

In planning placement of hardscapes such as decks, patios, driveways, walls and other structures, remember that they may be expensive to move or remove. Keep in mind the long-range plans for your garden space before committing to hardscapes.

On the other hand, lawns, trees, shrubs and planting beds can be changed with less expense (but not always less labour).

Building permits may be required for retaining walls and storage structures, and possibly other features. Always check with the local municipality or district before beginning construction. If you intend to do most of the installation work, several of the references at the end of this Fact Sheet provide



Outdoor room (Evans garden). Source: L. Sears.

detailed construction information and many ideas.

If you prefer to hire a landscaper, the BCLNA (British Columbia Landscape Nursery Association) provides a checklist for 'Hiring a Landscape Professional' and listings of local certified firms (see www.bclna.com).

And, finally, the work does not have to be done all at once. Start with hardscapes and major trees and shrubs. Gradually complete other areas of the garden; this is usually done in the order of most-used first. Beds of annuals and containers full of flowers and grasses can provide colour and interest until final plantings are in place. It is advisable to keep progressive drawings to guide you in the installation sequence.



Ducks (Young garden). Source: L. Sears.

REFERENCES

Better Homes and Gardens (1991). Step-by-Step Landscaping. Meredith Corporation, Des Moines, IA. ISBN 0-696-02558-2.

Black & Decker (2000). The Complete Guide to Creative Landscaping. Creative Publishing International, Inc., Minnetonka, MN. ISBN 0-86573-579-4.

Brookes, John (1984). The Small Garden. Marshall Cavendish Books Ltd., London, UK. ISBN 0-85685-238-4.

Brookes, John (2007). Garden Design. Darling Kindersley Ltd., London, UK. ISBN 978-0-75662-891-8.

Edinger, Philip and Eds. of Sunset Books (2000). Garden Designs. Sunset Books, Menlo Park, CA. ISBN 0-376-03187-5.

Hale, Gill (2000). How to Feng Shui Your Garden. Hermes House, Anness Publishing Limited, London, UK. ISBN 1-84038-777-7.

McHoy, Peter (2001). The Complete Garden Planner. Hermes House, London, UK. ISBN 1-84038-714-9.

Stevens, David (1998). Gardens for Living. Frances Lincoln Limited, London, UK. ISBN 0-7112-1242-2.

Vegetable gardens: <http://home.howstuffworks.com/designing-a-vegetable-garden.htm>



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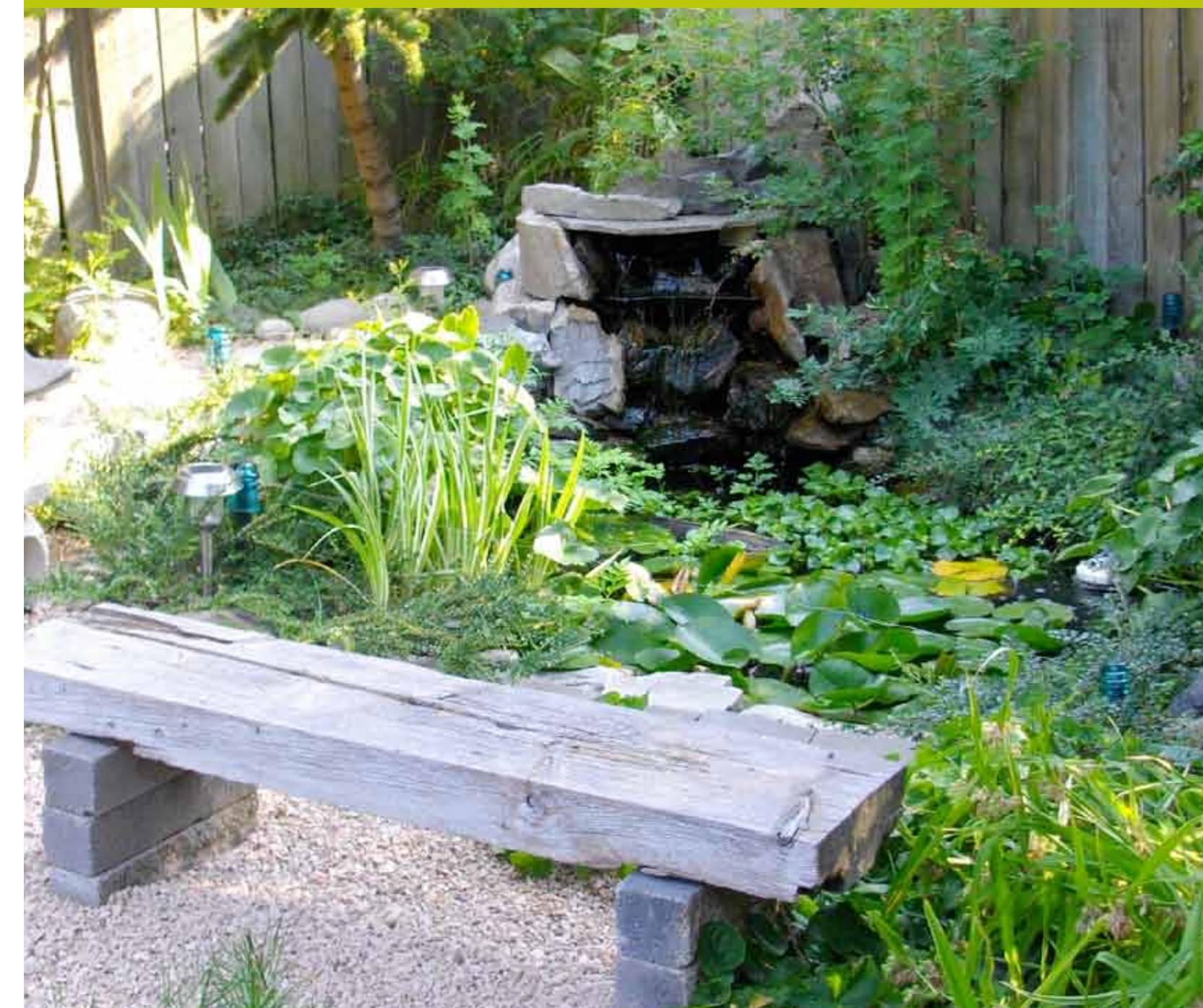
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BASICS OF LANDSCAPE DESIGN



A Master Gardener Fact Sheet

BASICS OF LANDSCAPE DESIGN

BY LINDA SEARS

Perhaps you are thinking of renovating your garden, or perhaps you have just completed construction of a new home and wish to convert a blank lot into a verdant paradise. In both cases, an understanding of a few principles and practices necessary to design a landscape that suits your needs can be beneficial.



Calm corner with water and bonsai plants (Peterson garden). Source: L. Sears.

PLANNING

Planning a garden entails asking many questions. What plants and trees do you like? Will they grow in your soil and climate zone? What colors do you like, or dislike? Does your taste in landscape style complement your house, your lot size and shape, your neighborhood, and your budget? Are you knowledgeable enough to choose appropriate plant species? Will you do the hard work of installation yourself, or hire someone to do it? Are you prepared to maintain the landscape of your choice?

The land surrounding our homes can accommodate many needs: a patio, deck or shaded area for outdoor living; a lawn for playing or simply green serenity; flower beds for display or cutting; a vegetable garden to feed your family; a composting area; a parking area for an RV or boat trailer; storage space such as a shed for tools and bicycles; a utility area to hide garbage and recycling containers; private corners and hot tubs for relaxing; pools for water interest; dog runs; children's play areas, and perhaps even a space for a chicken coop if permitted by municipal regulations.

If it seems impossible to fit everything into the available space, then your imagination must come into play. Consider maximizing the space; for example, a deck, balcony or patio can hold small trees, shrubs, flowers, vines and vegetables in containers, and even a composter. Composters can also be kept under a kitchen sink. Storage in a shed, garage or carport can change with the seasons: patio furniture, bikes, lawn mowers and other warm-weather gear can spend the winter in cramped quarters, but in the summer they will be removed and more space will be provided for access to gardening tools and equipment.

Rather than a large pool as a water feature, consider a small waterfall on a deck, perhaps on a house wall, simply to introduce the look and sound of running water.

Plan ahead for different uses of selected spaces in the future. Today's lawn and play area for your children and pet dog can become a vegetable garden in mid-life, then be converted back to play areas for grandchildren when your back does not allow you to garden.

If you have more space than a city lot, such as an acreage, then you will likely wish to keep entertaining and play areas close to the house, vegetable and flower beds further away, and storage and utility zones furthest removed.

Most landscape planners make a scale drawing of the available space surrounding a house, noting the sunny, shady, windy, wet or sloped areas to suggest the final choice of plants or hardscapes. This is important in determining how you will use a space. Why fight nature?



Steps and pathway interplanted with succulents (Roulston garden). Source: L. Sears.



LEFT: Hand-made clay bread oven (Evans garden). Source: L. Sears.



RIGHT: Vegetables in containers on patio. Source: L. Sears.

Don't plant wind-susceptible plants in a windy area, or arid-zone plants in the low, boggy part of your land. Nor is there any reason to plant a large tree just where it will shade your vegetable garden, or block the best view from your property. When choosing trees, shrubs or hedging material, also remember that access to a driveway or lane is important for extra vehicles and for easy delivery of garbage cans to the pick-up point, and remember to provide convenient access to utility meters (and do not block meters with large plants). On the plan you should note any views that you wish to screen or leave clear to enjoy.

Some homeowners have found that a change in their landscaping has led to a change in their home's access to the garden, so those who like long-term planning

STYLE

Ideas on how to plan your garden can be found in your neighborhood, on garden tours, and on visits to large public gardens. Few gardeners can resist looking at garden design books, or considering how that lovely tree, shrub or flower might fit into their scheme. If they find an illustration that appears to be appropriate, then the desired plan might work. Or, it might not. This is why planning is critical, to prevent unwise plant purchases. While a random mixture of xeriscaping, woodland bog, Versailles formality and prairie-style wildflowers may be fun to create, it may not reflect what you really intended to have.

Listed here are a few landscape styles to start you on your way. These are simply indicators of 'styles'; every gardener will want to add and subtract, or introduce other appealing elements.

might consider adding access doors from a dining room, family room or master bedroom in the future.

Thus, the first step is to look at your available space and determine where you want to place your private areas and your public areas. Consider whether your street-side garden (public) will be the same style – or fulfill the same needs – as your back (private) garden. An effective landscape plan not only indicates use areas, it also defines the order in which work needs to be done: hardscapes first, and then plants. 'Hardscapes' are hard surfaces such as patios, decks, retaining walls, fences, paths and driveways. Not everything can be completed in one season, so be prepared to divide the work into two or more years to achieve your final vision.

Formal – think of Versailles and gardens of large estates. These generally cover large areas, but the essentials can be scaled down and reproduced in symmetric plantings bordering entrance ways and pathways, urns holding architectural plants or topiary, and structured herb gardens. Fountains, niches containing statues, covered seating arbors and paved paths are typical.

English country garden – usually a mixture of perennials and annuals bordering a lawn or pathways, with all-season interest in the form of flowers, foliage or bark. If space permits, then large deciduous trees on swaths of lawn are appropriate, as are ponds and waterways such as creeks. Distant vistas are important.

Whimsical – for those who collect garden ornaments, or like to display pottery, tiled surfaces and perhaps antique garden furniture, this is a style that expresses one's artistry.

Commercial – consists of evenly spaced trees, shrubs and grasses, on flat land or a berm, with piles of mulch surrounding the plants and irrigation heads.

PLANT CHOICES

The ideal perennial plant choices would be those that require no maintenance, but unless you plant an entire garden in native species and let them grow as nature intended, that will not happen. So, in choosing plants, consider the following:

- Check the size of the plant at maturity. Don't plant trees or shrubs that are too big for their location, because they may interfere with utility wires or block out a view or become a pruning headache.
- Density – one approach is to plant heavily and thin out later. Another approach is to live with the gaps until plants reach their mature width and height. Decide which you prefer.
- Remember to account for plants that self-seed or are spread by birds or are naturally encroaching through root extensions. You may establish a

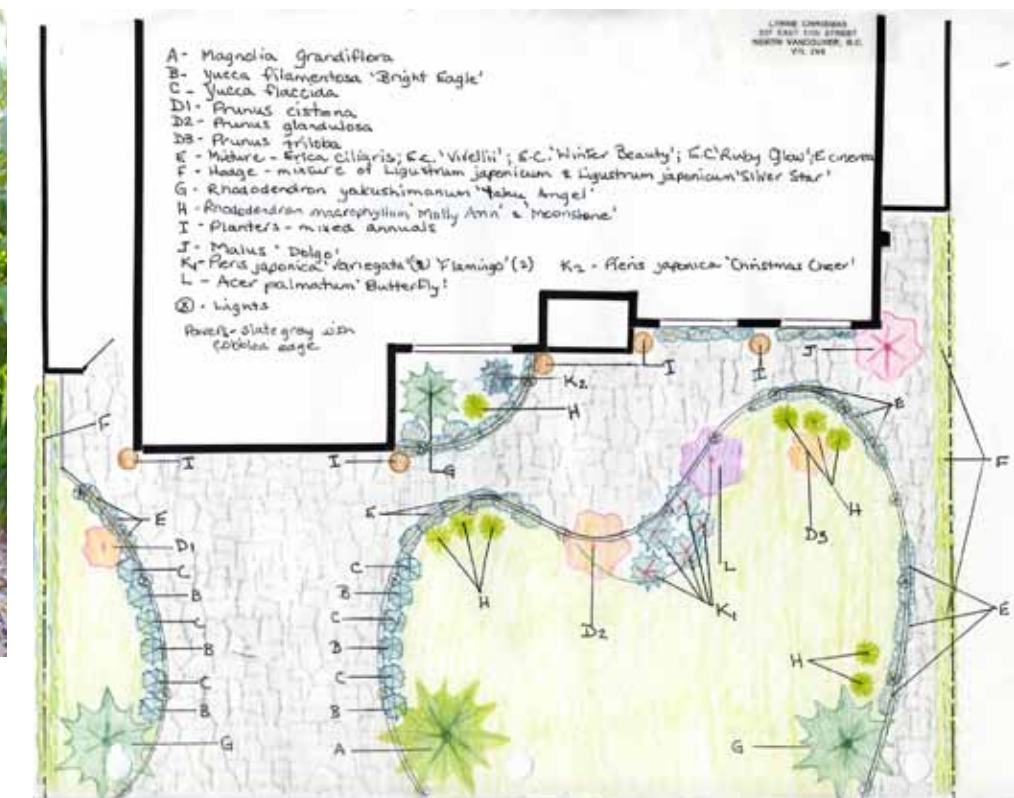
Natural – no, this does not mean overrun with local weeds! Many gardeners choose to use a mixture of native species and trees, shrubs, grasses, vines or annuals that blend well and do not compete for nutrients. The goal is to highlight certain plant features and to ensure that all foliage and flowers are complementary.

plant because you anticipate that it will spread, or you may choose another plant that will be easier to control. Do your homework.

- Be prepared for deaths. Not all plants will agree with your choice of location, and not all plants purchased will be in the best of health. Attrition does occur, so be prepared to deal with it.
- Consider how much water a plant needs. Are you prepared to install irrigation to that plant and to its neighbors? Alternately, are you prepared to hand water to keep the plants healthy? Or will you rely on rainfall alone?
- You may choose to select plants because they will attract wildlife. Be certain that you select attractants that are the kind you want, and not the kind you don't want.



LEFT: Shaded arbor with a view (Roulston garden). Source: L. Sears.



RIGHT: Landscape plan for a residence. Source: Lynne Christmas.

SHRUBS FOR EVERY SEASON

Some shrubs have more than one season of interest, providing flowers, fruit, coloured foliage and interesting bark. A small selection of the many available is listed below.

Spring: *Forsythia* species, *Ribes sanguineum*, *Camellia japonica*, *Fothergilla* species, *Spiraea thunbergii*, *Pieris* 'Forest flame'.

Summer: *Ceanothus*, *Buddleia alternifolia*, *Cistus* species, *Cotinus coggygria*, *Escallonia*, *Lavandula*, *Potentilla*, *Fuchsia*, *Hydrangea* species.

Fall: flowers of *Abelia grandiflora*, *Hibiscus syriacus*, *Calluna* species, berries of *Callacarpa*, *Cotoneaster*, *Pyracantha*, coloured foliage of *Enkianthus*, *Fothergilla*.

Winter: blooms (often fragrant) *Viburnum bodnantense*, *V. tinus*, *Arbutus unedo* (flowers and berries at the same time), *Corylopsis*, *Hamamelis mollis*, *Mahonia aquifolium*, *Jasminum nudiflorum*, berries of *Nandina domestica* and *Pyracantha* whose berries are one of the last to be harvested by birds.

PLANTING SHRUBS

Most shrubs today are container grown. It is best to plant in late fall, winter or early spring on the Coast and when the ground is workable in the Interior. Dig a hole larger than the pot size, work in a little compost (organic matter) and soak the plant in water for at least an hour before transplanting. The roots should be gently teased out so that none are circling or strangling the plant. Place in hole, fan out the roots, backfill with native soil and water well. Mulch with leaf mould or bark chips which will help prevent moisture loss and weed growth. Fertilizer to help transplant shock may be applied. Shrubs in rich soil with a good water supply will grow to their maximum

REFERENCES

Brenzel, K.N., ed. (2001). *Sunset Western Garden Book*. Sunset Publishing Corporation, Menlo Park, California.
Brickell, C., T. Cole and J.D. Zuk, eds. (1996). *The A-Z Plant Directory*. The Readers Digest.
Hessayon, D.G., ed. (1999). *The Tree and Shrub Expert*. Transworld Publishing Ltd., London, UK.
Phillips, Roger and Martin Rix, eds. (1989). *Shrubs*. Random House.
Pojar, Jim and Andy MacKinnon, eds. (1994). *Plants of Coastal British Columbia*. Lone Pine Publishing, Vancouver.



Hydrangea asperia

size; those with poor soil or inadequate water for their needs will be much smaller. Drought-tolerant shrubs must have two seasons of regular watering to get their roots established.

PLANTING SHRUBS

Shrubs require very little maintenance. An annual slow-release granular fertilizer (such as 6-8-6) may be applied in spring. Every few years a fresh layer of mulch may be added. Pruning requirements may be minimal: simply cut out any dead, diseased or damaged branches. With hedges, if it is a flowering type, you will lose the majority of its flowers by extreme pruning. Letting your hedge plants grow into their natural shape also prevents them from accumulating snow that they cannot shed quickly, which can damage the leaves and branches. For evergreen hedges, prune when the plant is dormant and before it produces leaf or flower buds. The best time for this is usually from late winter to early spring, after the snow and freezing temperatures are past. Never prune your hedge when it is growing fresh leaves, flowering in the spring or losing leaves in the fall. If you must prune in summer, do so later in the season after flowering is over.



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The Master Gardeners Fact Sheets are provided to the gardening public as part of the MGABC's education activities.

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SHRUBS



SHRUBS BY SHELAGH HORNER

Kalmia latifolia. PHOTO: Shelagh Horner

Shrubs require much less maintenance than other plants in a garden, once they are established. A shrub is a perennial plant that grows several woody stems at ground level. Once fully grown they can reach 5–6 m (15–20 ft) in height or can be just 15 cm (6 in) high. Sub-shrubs are woody only at the base and die back annually.



Figure 1. Coloured leaf foliage. Clockwise: *Nandina domestica*, *Santolina chamaecyparissus*, *Brachyglottis*, *Elaeagnus x ebbingei* 'Gilt Edge', *Hebe*, *Prunus lusitanica* and *Phormium cookianum* 'Variegatum'. PHOTO: Shelagh Horner.



Figure 2. *Pyracantha coccinea*. Berries last a long time in winter. PHOTO: Shelagh Horner.



Figure 3. *Buddleia davidii* attracts wildlife, especially butterflies. PHOTO: Shelagh Horner.

Shrubs create a framework in the garden. They come in many different shapes and sizes – erect, prostrate, bushy, mat or weeping in habit. They may be evergreen (keep their leaves all year round) or deciduous (lose their leaves in winter). Many different colours of foliage are available from golden, coppery, purple, maroon to variegated greens and yellows, with a variety of leaf shape (Figure 1). Leaf colour can lighten up a dark area. Many flowering shrubs produce berries (Figure 2), and flowers from shrubs vary in shape, size and scent, while providing interest throughout the year. Shrubs can be used to create a wind barrier, increase privacy and cut down on weeding.

WHERE TO PLACE YOUR SHRUBS

Shrubs are generally considered the middle layer of plantings in a garden. Shrubs can be situated under trees, in a shrub border, in a mixed border, as a hedge, as a single feature in the garden or in planters. There are shrubs that favour wet, dry, clay, rocky, acidic or alkaline soil and those that tolerate sun, shade, wind, industrial sites and coastal areas. Some attract wildlife such as birds and butterflies (Figure 3).

Forest edges

Suitable shrubs include *Magnolia*, *Cornus*, *Rhododendron*, *Philadelphus*, *Prunus* and *Viburnum*. Some ornamental Ilex may be included but not Ilex aquifolium as it is very invasive.

Under large deciduous trees and mixed forest

These include *Rhododendron* (large-leaved varieties can tolerate more shade than small-leaved varieties), *Camellias* and *Magnolias*. Early flowering deciduous shrubs such as *Hamamelis* (witch hazel) that flower before their leaves come out also do well. The other most shade-tolerant shrubs for the understory are *Mahonia nervosa*, *Corylopsis*, *Enkianthus* and *Hydrangea*.

A Master Gardener Fact Sheet



Figure 4. *Hibiscus syriacus* 'Red Heart'. PHOTO: Shelagh Horner.

Shrub border

These shrubs should be planted close enough to fill the space, but not overcrowded. Place taller ones at the back and smaller, more delicate, ones at the front. More sun-loving shrubs are better here, such as *Syringa*, *Deutzia*, *Hibiscus* (Figure 4), *Philadelphus* (native), *Weigela* and *Ribes* (native). These should be mulched and could be underplanted with bulbs.

Mixed border

Shrubs can be placed in a border with trees, mixed perennials or annuals to create interest all year round, using height, width, leaf colour, bloom, evergreen and deciduous types. The winter silhouette of a deciduous shrub can be eye-catching. Each shrub is placed for effect and more unusual or rare shrubs can be used. This type of border is more labour intensive.



Figure 5. *Aucuba japonica* lightens up a dark corner. PHOTO: Shelagh Horner.

Hedges

Hedges create walls to section off areas, to screen unwanted views, to direct foot traffic and for ornamental reasons. A hedge can be a low edging surrounding a herb or vegetable bed or dividing a special area of garden, e.g. *Buxus* 'Suffruticosa' (boxwood), *Lavandula* (lavender) or *Santolina* (lavender cotton). Something higher and evergreen can hide a structure such as a fence, propane tank or shed, e.g. *Escallonia*, *Ilex crenata* (Japanese holly), *Lonicera nitida* (boxleaf honeysuckle), *Nandina* spp. (Heavenly bamboo), *Osmanthus delavayi*, *Prunus laurocerasus* (cherry laurel), *P. lusitanica* (Portugal laurel) and *Photinia*. Barrier hedges can be created by using prickly shrubs like *Pyracantha* (Firethorn), *Berberis* (barberry) or *Rugosa* roses. **See Master Gardener Fact Sheet 'Hedges'.**

Groundcovers

Creeping shrubs can be used as groundcovers. It is best to plant a group of three, five or seven. Always note the final size of the shrub so you don't plant them too close together. Some suggestions are *Calluna* and *Erica* (heathers), *Cotoneaster dammeri*, *Hypericum calycinum* (St. John's wort, which can become invasive), *Euonymus fortunei* or some of the low shrub roses.

A dark corner

Gold and variegated leaf shrubs can brighten a dark part of the garden. Try *Aucuba japonica* 'Gold Dust' female (Figure 5) or *A. japonica* 'Mr. Goldstrike' male. Female and male plants are needed to get red berries; these are also drought and pollution tolerant. *Ligustrum*



Figure 6. *Symphoricarpos albus* will hold a dry bank. PHOTO: Shelagh Horner.

ovalifolium 'Aureum' (golden privet) and *Elaeagnus pungens* 'Maculata' would also work.

Planters

These can create quite an impact but special care must be taken to see that the planter is well drained, yet given sufficient water during dry periods. An individual plant may be used or a combination of small shrubs with different foliages can be put together. Suitable evergreens for a shady planter may be *Aucuba japonica*, *Buxus sempervirens*, *Daphne odora*, *Euonymus fortunei*, *Lonicera nitida* 'Baggesen's gold', *Osmanthus heterophyllus* 'Goshiki', *Pieris japonica* and *Skimmia japonica* subsp. *reevesiana* 'Rubella'. Suitable shrubs for a sunny planter could contain *Rosmarinus officinalis* and *Yucca filamentosa*, which comes in a green or gold/green tone. Annual flowers and bulbs may be tucked into these planters to add seasonal change.

On a bank

It is best to plant shrubs (from 1-gallon containers) 1 meter (3 ft) apart in staggered rows to hold a bank. Always mulch after planting. Suggestions for a moist bank include *Cornus alba* or *C. stolonifera*

(red twig dogwood, a native), and *Salix lanata* (woolly willow). For regular drainage, try *Cotoneaster*, *Lonicera piliata*, *Juniperus horizontalis*, and for a dry bank *Hypericum calycinum* (St. John's wort) and *Symphoricarpos* (snowberry, a native plant) (Figure 6).

Coastal areas

The following shrubs can tolerate breezes and salty air with minimal summer rain: *Arbutus unedo*, *Choysia ternate*, *Elaeagnus*, *Escallonia*, *Hippophae rhamnoides*, *Lavandula*, *Santolina*, *Tamarix* and *Yucca*.

ATTRACT WILDLIFE

We all love to attract wildlife to our gardens – birds, bees and butterflies but perhaps not deer! Shrubs that have small inflorescences will attract beneficial insects. Those with tubular flowers will attract hummingbirds and bees, those with fall fruits will attract a variety of birds and only a fence will keep out the deer. Some shrubs are regarded as deer tolerant (mainly native shrubs) and may last untouched for some years; however, when deer are starving they will eat anything.

TABLE OF SUGGESTED SHRUBS FOR ALL ZONES IN BC.

Plant	Zone	Exposure	Bloom	Uses
Deciduous				
<i>Berberis thunbergii</i> f. <i>atropurpurea</i> 'Rose Glow' [W]	6	sun; pollution tolerant; any soil	deep purple foliage; yellow flowers, red berries, thorns	barrier hedge; topiary
<i>Buddleia davidii</i> [W]	3	sun; drought tolerant	Long-season purple blooms	informal hedge; feature plant
<i>Callicarpa bodinieri</i>	7	sun/shade	purple flowers, violet berries in fall	back of border; flower/berry arrangements
<i>Cornus alba</i> 'Elegantissima'	2	sun/shade; needs moisture	variegated leaves; red stems when cut back in spring for winter color	hold bank; water's edge
<i>Corylopsis glabrescens</i>	6	sun/shade	yellow winter blooms, gold fall color	shrub border
<i>Cotinus coggygria</i> 'Royal Purple'	5	sun; drought tolerant; well-drained soil	purple foliage; feathery blooms; good fall color	shrub border; feature
<i>Cotoneaster hupehensis</i> [W]	5	sun/shade	white blooms, long-lasting red berries in fall/winter	shrub border
<i>Deutzia</i> 'Mont Rose' [W]	7	sun/part shade	purple-pink blooms summer	low hedge; shrub border
<i>Disanthus cercidifolius</i>	5	sun/shade	red, orange, burgundy fall color; heart-shaped leaves	shrub border
<i>Enkianthus campanulatus</i> [W]	6	sun/part shade	bell-like pink blooms; red fall color	feature; shrub border
<i>Euonymus alatus</i> 'Compactus'	4	sun/part shade; any soil	red fall color; corky bark	hedge; specimen
<i>Fuchsia magellanica</i> [W]	5	sun/part shade	bell-like pink, red, purple blooms in summer/fall	hedge; feature
<i>Hibiscus syriacus</i> [W]	5	sun	white or blue blooms in late summer	feature
<i>Hydrangea macrophylla</i> 'Blue Wave'	6	sun/part shade; moist soil	large flower blooms dry on shrub for winter interest	feature; container; border
<i>Hydrangea quercifolia</i> 'Snow Queen'	6	part shade	conical white bloom; good fall color	feature
<i>Kolkwitzia amabilis</i> [W]	5	sun/part shade; well-drained soil	clusters of bell-shaped pink to deep pink blooms	shrub border; specimen
<i>Philadelphus</i> 'Belle Etoile' [W]	4	sun/part-shade; drought tolerant	white fragrant blooms summer	border/hedge
<i>Physocarpus opulifolius</i> 'Diablo' [W]	4	sun/part-shade; drought tolerant; any soil	purple leaves; white bloom spring; interesting seed heads	feature; back of border
<i>Potentilla fruticosa</i> [N]	2	sun; drought tolerant; any well-drained soil	yellow, white, pink or orange all summer	ground cover; edging; bank
<i>Ribes sanguineum</i> [W] [N]	6	part-shade; drought tolerant	tubular clusters deep-pink blooms early spring, black berries	feature; border
<i>Spiraea thunbergii</i> [W]	4	sun/shade; drought tolerant	white sprays bloom spring, good fall color	border
<i>Symphoricarpos albus</i> [W] [N]	3	sun/shade; drought tolerant	white bloom; white berries	bank
<i>Viburnum bodnantense</i> 'Dawn'	7	sun/shade	fragrant pink winter bloom	back border, near gate
<i>Viburnum plicatum</i> f. <i>tomentosum</i> 'Summer Snowflake' [W]	4	sun part-shade; any soil	white tiers of bloom all summer	feature; border; good for small garden
<i>Weigela florida</i> 'Variegata' [W]	5	sun; any soil	tubular pink blooms in spring; variegated foliage	feature; border

(W: attracts wildlife; N: native)

Plant	Zone	Exposure	Bloom	Uses
Evergreen				
<i>Abelia</i> [W]	6	sun/shade	pink blooms late summer/fall	hedge
<i>Arbutus unedo</i> [N]	6	sun/shade; drought tolerant; good drainage	white blooms/orange strawberry fruit in fall/winter	winter interest/coastal; container
<i>Arctostaphylos uva-ursi</i> [W] [N]	2	sun; drought tolerant	pink spring bloom	groundcover
<i>Artemisia arborescens</i> 'Powis Castle'	7	sun; drought tolerant; good drainage	sub-shrub/silver, feathery aromatic foliage	border
<i>Aucuba japonica</i> 'Gold Dust' female; 'Mr Goldstrike' male	6	shade; drought tolerant; pollution tolerant	green-gold foliage; red berries with male/female plant	container; under trees; dark corner
<i>Buxus sempervirens</i> 'Suffruticosa'	6	sun/shade; drought tolerant	small glossy green leaves	low hedge; topiary; container
<i>Ceanothus thyrsiflorus</i> 'Victoria' [W]	8	sun; drought tolerant	glossy green foliage, blue blooms	hedge/screen; windbreak; container
<i>Choysia ternata</i> [W]	8	sun; drought tolerant	fragrant glossy green leaves, white blooms	shrub border/planter
<i>Cotoneaster dammeri</i> [W]	5	sun/shade	as above	groundcover; bank
<i>Daphne odora</i> 'Aureomarginata' [W]	3	sun; good humus soil	variegated leaf; fragrant purple bloom spring	container
<i>Elaeagnus</i> x <i>ibbingei</i> 'Giit Edge'	6	part/full shade; drought tolerant	gold edge, green leaves, fragrant blooms November	hedge/winter flower arrangements
<i>Escallonia</i> [W]	7	sun; drought tolerant; any soil	glossy green leaves; pink/white blooms all summer	hedge; border; salt tolerant
<i>Euonymus fortunei</i> 'Emerald 'n Gold'	5	sun/part shade; drought tolerant	glossy variegated green-gold foliage, pink tones in winter	groundcover rockery; planter
<i>Euonymus fortunei</i> 'Silver Queen'	5	sun/part shade; drought tolerant	white-green foliage, pink tones in winter	hedge; border; container
<i>Ilex crenata</i> 'Mariesii'	5	part shade; drought-tolerant	small glossy green leaves	planter; rockery
<i>Lavandula angustifolia</i> [W]	5	sun; drought tolerant; well-drained soil	sub-shrub; silver foliage; fragrant purple blooms	edging hedge; container
<i>Lonicera nitida</i> 'Baggesen's Gold'	6	sun/part shade; drought tolerant	golden, small-leaved, arching form	hedge, container, topiary
<i>Mahonia</i> x <i>media</i> 'Charity' [W]	7	sun/part shade; drought tolerant	large holly-shaped leaves, fragrant, golden spring blooms; black berries in fall	specimen
<i>Nandina domestica</i>	6	sun/part shade; drought tolerant	elegant, bamboo-like shrub. white blooms, red berries, good fall color	hedge; container; specimen
<i>Osmanthus delavayi</i> [W]	7	part shade	white fragrant blooms spring	container/border
<i>Osmanthus heterophyllus</i> 'Goshiki'	7	part shade	variegated holly-like leaves, pink tinged	container/hedge; topiary/border
<i>Pieris japonica</i> [W]	6	semi-shade	white or pink bloom spring	feature/hedge; container/border
<i>Pyracantha coccinea</i> [W]	6	sun/part-shade; drought tolerant; any soil	white blooms/red berries-long lasting	barrier hedge; wall/fence
<i>Rosmarinus officinalis</i>	7	sun; drought tolerant; well-drained soil	blue blooms, fragrant leaves	container; border/hedge
<i>Sarcococca hookeriana</i> var. <i>hookeriana</i>	7	shade/deep shade; drought tolerant	white fragrant blooms, winter; black berries	under eaves; near entrance; container/border
<i>Skimmia japonica</i> subsp. <i>reevesiana</i> 'Rubella' [W]	7	shade/deep shade; drought tolerant; pollution tolerant	white/pink bloom; long-lasting red berries	under trees; mixed border; containers
<i>Viburnum davidii</i> [W]	7	heavy shade; pollution tolerant	white tubular flowers/blue berries	border
<i>Yucca filamentosa</i> 'Color Guard'	5	sun; drought tolerant	cream/green foliage, tall white spike bloom	container; border; bank

Benefits of adding OM

The proper percentage of OM in soil (5–20%) may be small in volume but is extremely large in importance. OM is an excellent soil conditioner for problem soils because it improves poor drainage in clayey soils and water-holding capacity in sandy soils. When OM is added to soils, the pores created store air and water, which reduces water run-off as well as the need for irrigation. OM supplies balanced slow-release nutrients to plants, buffers against effects of low or high pH, and helps control weeds when used as mulch.

Basically, OM is the universal medicine for improving soils. Garden soil requires a continuous soil-improvement program. Add OM as a soil amendment, mulch or as a side dressing annually or semi-annually.

Some good OM amendments include: compost, aged composted manure, sawdust/wood chips, decomposing ground bark, alfalfa pellets, and green manures grown and tilled under such as legumes, fall rye, clover, buckwheat crops, etc.

Soil Organisms

Soil organisms include bacteria, fungi, moulds, protozoa, nematodes, mites, arthropods and earthworms. They are involved in transforming OM and soil minerals into vitamins, hormones, disease-suppressing compounds and nutrients required for plant growth. Healthy populations of soil organisms

means healthy soil so it is important to encourage them. Avoid unnecessary or excessive cultivation as it destroys beneficial fungi and kills worms by destroying their permanent burrows or cutting them. Avoid unwarranted fertilizer or pesticide use, dry soil conditions and overwatering. Add OM to your soil as this is food for soil organisms.

TOP SOIL

Most gardeners think of topsoil as black, fertile, loamy or silty mineral soil containing OM. This type of natural topsoil is difficult to find in BC, and natural topsoil can be infested with annual and perennial weed seeds.

Topsoil purchased by gardeners is usually manufactured and is composed of mixtures of sandy to clayey subsoils, wood wastes, and perhaps manure, peat, compost or fertilizers all mechanically mixed. Soils manufactured with OM but without mineral soils (clay, silt, sand) are not suitable for topsoil but would be an excellent amendment for existing soil.

Know what you are buying. Topsoil should have a medium texture and soil clods should break easily into smaller bits. Darker soil indicates a high OM content; a light grey or beige color indicates low OM content. White crystals at or near the surface suggest salty soil. Avoid mixtures with over 35% sand and 20% coarse wood wastes, and add extra nitrogen fertilizer if there is a large percentage of sawdust.

REFERENCES

Agriculture & Agri-Food Canada (1998). The Canadian System of Soil Classification, Third Edition. Research Branch, Ottawa.

BC Ministry of Agriculture and Land. Soil Fact Sheets. Contact Resource Management Branch, Tel: (604) 556-3102, Email: Geoff.HughesGames@gems7.gov.bc.ca.

Campbell, Stu (1980). Improving Your Soil. Updated and revised. A Storey Country Wisdom Bulletin.

Gough, N.A. et al. (1994). Soil Management Handbook for the Okanagan and Similkameen Valleys. [www.agf.gov.bc.ca/.../610000-6_Soil_Mgmt_Handbook_Okanagan.pdf].

Colorado State University Extension. Colorado Master Gardener Program. Garden Notes [http://cmg.colostate.edu/gardennotesbynumber.shtml].

Magdoff, Fred and Harold van Es (2000). Building Soils for Better Crops, Second Edition. Handbook Series, Book 4. Sustainable Agriculture Research and Education (SARE).

Stell, Elizabeth P. (1998). Secrets to Great Soil. Storey Publishing, USA. ISBN-10: 1-58017-008-0.

Toronto Master Gardener Factsheets. (2006). Soil pH. Soil Fertility [www.factsheets.torontomastergardeners.ca].



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IT'S ALL ABOUT THE SOIL

A Master Gardener Fact Sheet

IT'S ALL ABOUT THE SOIL

BY LESLIE WELCH

A healthy garden is built upon healthy soil, so get to know your soil. Does it have adequate drainage? Is it overly acidic or alkaline? Is it fertile? Healthy plants are less likely to have pest and disease problems.

The best soil is loam, a combination of approximately equal amounts of sand, silt and clay, to which generous amounts of compost should be added annually. PHOTO: Leslie Welch.



Figure 1. Clayey soils resist breaking down and stay in a ball. PHOTO: Leslie Welch.



Figure 2. This soil texture test shows 90% sand, 8% silt and 2% clay. There is no dark organic layer. This soil will have problems holding water and plant nutrients. PHOTO: Leslie Welch.

WHAT IS SOIL?

Soil is comprised of many elements, including mineral particles, organic matter (both living and dead), and soil pores containing air and water. A 'good' soil has 45% minerals, 5% organic matter (OM), and 50% soil pores (containing 25% water and 25% air).

PHYSICAL CHARACTERISTICS

Soil Texture

Soil texture is determined by the combination of the three types of mineral soil particles: sand, silt and clay. You can test your soil texture with several methods:

Simple Feel Test: Rub your soil between your fingers. If it feels gritty, it is sandy. If it feels smooth or floury, it is silty. If it feels sticky, it is clayey.

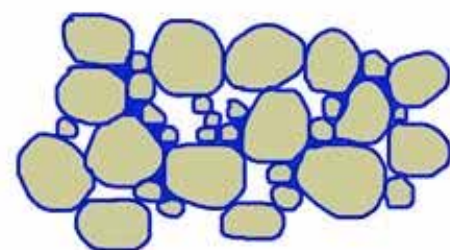
Ball Squeeze Test: Squeeze a moistened ball of soil between thumb and fingers. Sandy soils are coarse, break with slight pressure, or don't form a ball. Silty loams stay together but change shape easily. Clayey soils resist breaking down and stay in a ball (Figure 1).

Mason Jar Soil Test: Fill 1/3 of a jar with your topsoil, add 5 ml (1 tsp) of dish soap and fill with water to the top of jar. Screw on lid, shake vigorously, and let settle for 1–2 days. Discount any rocks and gravel at bottom of jar. The particles will settle in the jar as follows: sand, silt, clay and finally the OM. Measure and record the height of each layer (Figure 2). Divide the height of each layer by the total height of the three layers (excluding rocks and gravel) and multiply by 100. Plot your clay and sand percentages on the Textural Soil Triangle (Figure 3) to determine your soil texture.

If your soil has more than 25% OM, it is an organic soil. If it has less than 25% OM, it is a mineral soil, which could be (1) a sandy soil, which has poor water-holding capacity and is low in nutrients, (2) a silty soil, which has better water-holding capacity than sand, has more nutrients than sandy soil and better drainage than clay, or (3) a clayey soil, which is highest in nutrients, but

RIGHT: Figure 3. Soil textural triangle showing percentages of clay and sand in the main textural classes of soils; the remainder of each class is silt. Agriculture & Agri-food Canada Website, Texture, Soil [www.agr.gc.ca].

BELOW: Figure 4. The size of pore spaces between soil particles plays a key role in plant growth and in soil texture and structure. Colorado State University Garden Notes #213 (with permission).



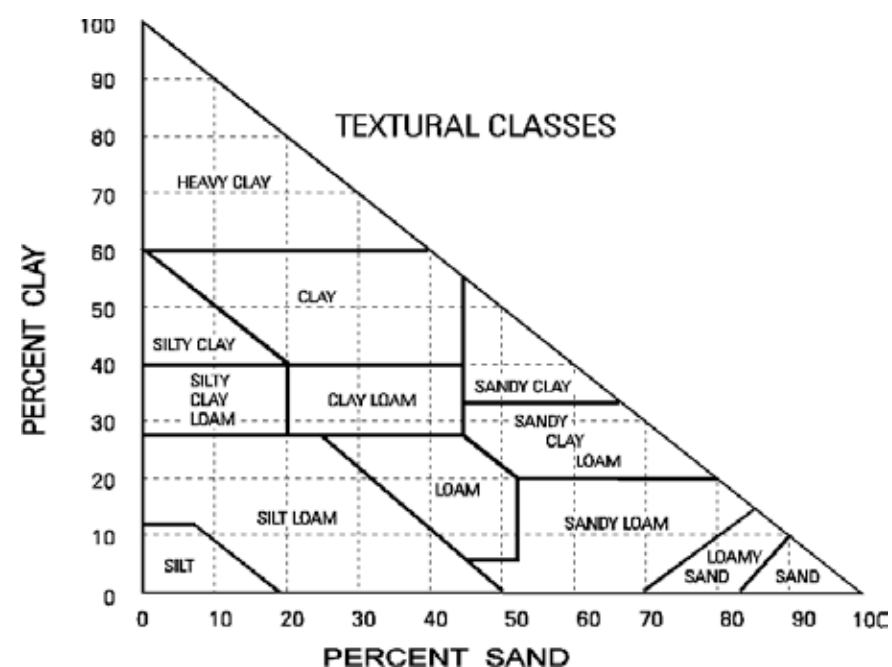
has poor water drainage, restricts root growth and is difficult to till. The best soil is loam, which is a combination of approximately equal amounts of sand, silt and clay.

Soil Structure

This describes the way soil hangs together, or how the soil particles clump into crumbs or clods (aggregates). Loose crumbs ensure ample small and large pore spaces (Figure 4). Water fills small pores, and carries dissolved nutrients to plant roots. Air fills the large pores to provide oxygen to plant roots to aid in plant respiration. Organic matter, in partnership with a healthy soil organism population, is the main agent behind good structure. The lack of pore spaces in clay soil restricts the infiltration and movement of water, thus causing poor drainage and no oxygen for the roots. In sandy soils, the lack of small pore space limits their ability to hold water and nutrients.

CHEMICAL CHARACTERISTICS

The degree of acidity or alkalinity of the soil is measured by pH. A pH of 7 is neutral; anything below that is acidic; anything above that is alkaline. Very alkaline soils will not support most plants, as micronutrients are less available to them. Neutral soils are fine for most plants other than the acid-loving plants such as rhododendrons which prefer a pH of 5–7.



Acidic Soils: In areas of high rainfall (Lower Mainland and Vancouver Island) elements such as calcium and magnesium tend to be washed from the soil resulting in acidic soil. Acidic soils are also found in some areas of Central BC. Diseases such as club root, which affects cabbages, turnips and broccoli, thrive in acidic soils. The use of lime (calcitic limestone, dolomite limestone, wood ashes) on such soils replaces the calcium and raises the pH and helps prevent club root. Liming also increases the activity of micro-organisms, which break down OM faster, and results in improved soil structure. However, potato scab increases with liming, so don't lime where potatoes grow.

Alkaline Soils: In areas of low rainfall (South Central Interior and some areas of Central Interior) mineral compounds may become concentrated in large quantities, leading to the development of alkaline soils (Figure 5) and occasionally saline soils. Sulphur (powdered sulphur, aluminum sulphate, and iron sulphate) is used to lower pH or increase the acidity of soil.

It is difficult to change pH levels permanently, as liming acidic soil and adding sulphur to alkaline soils helps only temporarily. Soil amendments such as pine needles, peat moss (acidic) and manure (alkaline) can make small changes. A better plan is to add OM which can act as a buffer against extreme pH levels. Always follow product instructions for liming soil or adding sulphur.

Nutrition

The primary nutrients required by plants are nitrogen, phosphorus and potassium. Secondary nutrients are calcium, magnesium and sulphur. Micronutrients or trace nutrients include iron, chlorine, copper, manganese, zinc, nickel, molybdenum and boron (only needed in very small or trace amounts). To top up your trace elements, add kelp every few years. A quick fix for nutrient-starved plants is a liquid seaweed foliar spray. Some nutrients are not accessible to plants, because highly acidic or alkaline soils can chemically bind certain nutrients. In general, nutrients are most available around the neutral pH zone; however, adding OM can help to offset more extreme pH levels. It is never wrong to add OM to your soil.

To determine the nutrient content of your soil, you can send a soil sample to a lab for testing, or test it with a do-it-yourself kit. Or, you can respond to your plants' needs and fertilize as needed. An old farmer's rule is to watch your spinach and chickweed. If they are healthy and green, then your soil has balanced nutrition.

Slow-release fertilizers are always preferred as there is less chance of burning your plants, polluting ground or surface water, or destroying soil life as can happen with quick-release fertilizers. Natural organic fertilizers are always slow-release and include rock phosphate and other minerals, plant products such as alfalfa

meal, and animal by-products like bone or fish meal. Follow the product directions carefully (especially with chemical fertilizers).

If you have corrected your soil drainage and texture problems, are adding good OM or semi-annually, and are using a slow-release fertilizer as needed you will likely not experience plant nutrition problems except in extreme situations (e.g. saline soil).

BIOLOGICAL CHARACTERISTICS

Soil biomass includes roots, plants, micro-organisms, macro-organisms, dead organic matter (detritus) and humus. The living components of soil include bacteria, fungi and moulds. The dead parts in soil include roots, leaves, thatch, bodies and excrement of organisms, and organic matter.

What is organic matter?

Organic matter (OM) is very important to soil health. It consists of any material of biological origin such as decaying plant parts, soil organisms or animal wastes, and dead matter that is still identifiable (e.g. leaves, kitchen wastes). Fully decomposed OM is called compost, and the end product of composted OM is called humus. Humus is a rich, coffee-colored, stable material that can last up to hundreds of years. Humus molecules attract and hold mineral particles that can last up to hundreds of years. Humus molecules attract and hold mineral particles and water and have lots of nooks and crannies for soil microbes. Thus, humus improves soil structure and helps to make nutrients available to plants.



Figure 5. Clayey soil in the Southern Interior of BC. Note the gravel and rocks as well. The grey color is typical of clayey, alkaline soils low in organic matter. PHOTO: Leslie Welch.