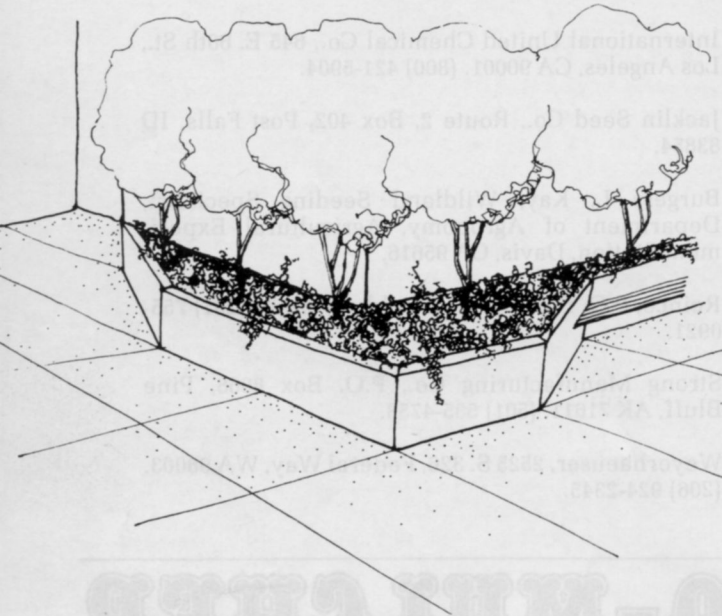


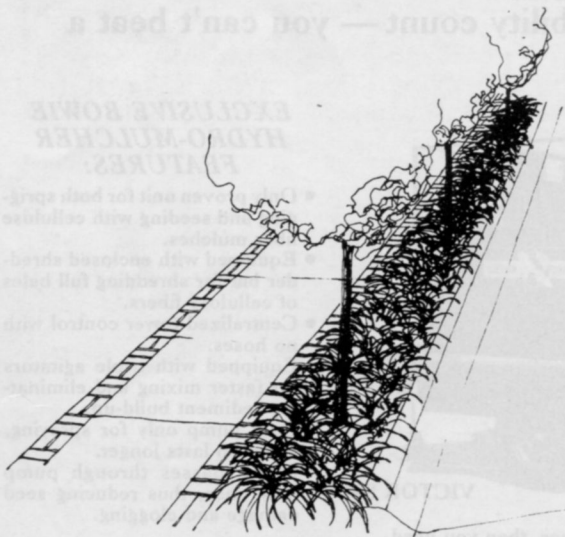
GROUNDCOVERS PROVIDE ALTERNATIVE TO TURFGRASS IN LANDSCAPING

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University of Nebraska-Lincoln



Groundcover eliminates bare ground where mowing is difficult.



Groundcovers unify elements of a planting and provide textural transition.

Strictly speaking, a groundcover is any material which covers the ground, whether it be grass, flowers, plants or mulch. When using a groundcover in landscape design, the term includes any plant lower than three feet in height which, when established, will cover the ground to the extent that underplanting is not required and weeds are excluded.

Groundcovers are associated by many people with a lower maintenance program than that required by turfgrass. This is true only for properly established and maintained groundcover. The initial two to four years demand careful management and in subsequent years a program of pruning, fertilizing, watering and weeding must be practiced in accordance with the species chosen.

In situations where turfgrass is hard to maintain, a groundcover may be the alternative to bare ground or paving. There are groundcovers which thrive in dense shade or intense sun; wet lowlands or dry, rocky soils. On steeply sloping sites where mowing is difficult and erosion control is necessary or where a poor soil structure exists, a groundcover can eliminate mowing and stabilize the soil. Groundcover can provide continuous greenery or color on urban sites which are either very small or inaccessible for the purposes of the constant maintenance required by turf (for example, raised planter boxes or the open space around street trees). On uneven, rocky sites or walls, a twining groundcover can mask irregularities and cover unsightly land features.

The best reasons for choosing groundcovers over turf involves their design characteristics and aesthetic quality. They may be used to unify different areas of the site, acting as a textured carpet between plantings. Groundcovers act as transition plantings between high maintenance/high use plantings and more naturalized areas, and between turf lawns and taller shrubs. They may define space by leading the eye in a particular direction or reinforcing and dramatizing the shape of the underlying land forms. Finally, groundcovers create a high degree of visual interest through contrast with adjacent surfaces and the surrounding plant materials.

The choice of groundcover for a given situation is based on: (1) the design characteristics being sought — color, form, texture, shape and size; (2) the intended site and function of the groundcover — transition, visual interest, difficult conditions for turf; (3) the hardiness and adaptability of the plant to the area; the maintenance requirements and amount of available care; and, (4) the availability of the plant. A plant under consideration for use as a groundcover should be evaluated on its ability to spread; for its growing habit, which should be relatively neat and uniform; for its size; and, for the ease with which it can be kept in the area designated for it.

Plants which become scraggly and open with maturity do not make good groundcovers nor do those with dense, twiggy structures which become

collectors of blowing paper and trash. Plants which will rapidly outgrow their boundaries or freely self-sow into surrounding sites are best avoided when choosing a groundcover. Shrubs which reach heights greater than three feet or which must be planted close together to make up for their lack of ability to spread are generally not considered as groundcovers.

There are several categories of plants which include species adaptable for use as groundcovers. Herbaceous plants are chosen for areas where their lack of winter vegetations is not detrimental. Examples of these sites would be parking lot islands or street frontages where woody plants could be damaged by snow removal operations. They are usually rapidly spreading and frequently provide interest through brightly colored flowers or variegated foliage. Woody deciduous plants may be chosen over herbaceous groundcovers in situations where a larger size is required, or where the dieback characteristic of the latter is undesirable. They are good choices for transition between lower ground covers and tall shrubs, and provide visual interest through seasonal variation. Evergreens provide green color throughout the year, although if an evergreen is chosen primarily for its green winter color, a taller variety is desirable, since the prostrate tones will be invisible under the snow in the Great Plains area. Because of their uniformity, evergreens serve well as screening materials or as a backdrop for ornamental groundcovers. They are an effective deterrent to foot traffic. They form a very dense mat when established, spreading to cover rocks and soil and shade out weeds. If the proper variety is chosen for the site, they rarely need pruning. Broadleaf evergreens are chosen for situations in which foliage is desired year-round, but an evergreen it not suitable. They may be planted for visual contrast or as a transition between deciduous and evergreen materials.

Herbaceous Perennials

Basket of Gold (*Alyssum saxatile*) reaches a height of one foot with individual plants moderately spreading to one foot. The fine-textured foliage is gray-green. The most notable



Periwinkle
Vinca minor



Japanese Spurge
Pachysandra terminalis





feature is the bright golden-yellow flower clusters from April through May. Plant in full sun in a well-drained soil. The plant is hardy through most of the Great Plains.

Silver mound (*Artemisia schmidtiana nana*) grows to a height of 8 inches with a spread of 12 inches. Most notable feature is its silver blue foliage. Locate in full sun. The plant is tolerant of droughty soils. Use as an accent plant throughout the central plains. In severe sites protect with a winter mulch.

Snow-in-summer (*Cerastium tomentosum*) forms a dense mat 4 to 6 inches high. The light gray foliage is covered with small white flowers in late spring. Growth is rapid and plant can become weedy. The plant tolerates a hot dry soil which is well-drained. This sun-loving plant should be pruned after flowering to maintain form and density. Hardy throughout the central plains.

Lily-of-the-valley (*Convallaria majalis*) grows to a height of 8 inches in full or partial shade. Fragrant bell-shaped flowers occur in May. This green-foliaged coarse groundcover has a rapid rate of growth, but is easily contained. May not be hardy in hotter, drier parts of the central plains.

Pinks (*Dianthus* species) are familiar to every gardener from their fragrant blooms. 'Aqua' forms a dense 8 inch high mat. Fragrant double white flowers form in early spring. Another lower growing cultivar is 'Siberian.' While present cultivars are sparse flowering, the neat compact habit and attractive blue-green foliage make the plant worth considering. Mow off old foliage on both species in early spring. Both plants are adapted over a wide geographical range.

Mock strawberry (*Duchesnea indica*) forms a dense, low mat 4-6 inches high. Unlike strawberry (*Fragaria*), its flowers are yellow and the bright red fruit are upright thus visible to the viewer. This hardy groundcover tolerates full sun or light shade. Use a mass planting among trees or shrubs in the



FALSE STRAWBERRY
DUCHESNEA INDICA



DIANTHUS SP.

central plains. Similar to mock strawberry, Barren strawberry (*Waldsteinia fragarioides*) has yellow flowers, but not fruit. Plant tolerates light shade.

Goutweed or bishops weed (*Aegopodium podagraria variegatum*) rapidly forms a dense mat 8 inches high. This groundcover tolerates shady and poor, droughty soils. Due to its invasive habit, goutweed can become a serious pest. Locate where growth habit is readily controlled. Mow two or three times a year to maintain a uniform attractive appearance. Plant is very hardy and adapted throughout Great Plains.

Cinquefoil (*Potentilla* species) — low growing types — spread rapidly to form a dense mat three to six inches high. Where soils are dry and hot, and a colorful, neat, low-growing groundcover is required, consider this group. *P. verna* grows to 3-6 inches high with one-half inch flowers of bright yellow. *P. verna nana* forms 3" mounds. *P. tridentata* has white flowers in midsummer, dark shiny green leaves on the upper surface and is a taller, coarser groundcover than *P. verna*.

Speedwells (*Veronica* species) form a mat four to six inches high. Attractive blue to bluish rose flowers are produced in May. Plant in full sun to partial shade in moist or dry soils. Woolly speedwell (*V. incana*) has attractive silvery gray foliage with deep blue 12-inch flower spikes in summer while creeping speedwell (*V. repens*) has fine, dark, green, narrow foliage (moss-like) with bright, clear blue flowers in June. These speedwells are adapted to the southeastern part of the central plains and are not reliably hardy in the hotter, drier sections of the central and southern Great Plains.

Wild strawberry (*Fragaria vesca* 'Americana') spreads rapidly to form a dense mat 6 to 9 inches high. Plant tolerates sun or shade in a moist well-drained soil. Plant may require winter protection in exposed sites. Gives a woody effect to a landscape.

Hosta or plantain lily (*Hosta* species) is a large diverse group of long-lived herbaceous perennials. They thrive in semi-shade and are comparatively free of disease and insects. Hostas are grown primarily for their rich luxuriant foliage. Many newer varieties have varying degrees of foliage and have larger more fragrant flowers. One cannot rely on the specific names in this genera and many like types go by different specific names. Plant is hardy throughout the Great Plains.

Himalayan fleecflower or Border Jewel (*Polygonum affine*) produces a wide mat 4-6 inches high. Plant is adapted to a wide range of soil types and tolerates full sun or shade. Flowers are rosy in hue, on dense, three-inch spikes in May. This species is more refined and less invasive than other members of this genus.

Fleecflower (*P. Reynoutria*) is a fast and rank growing plant. Showy clusters of red buds opening to pale pink flowers are produced in later summer. Plant is invasive and should not be planted near flower borders. Both of the polygonum species are hardy throughout the Great Plains.

Daylily (*Hemerocallis* species) is a highly diverse group with varieties from 12 inches to 6 feet high. Daylilies are adapted to a wide range of soil

and climatic zones as well as being free of serious disease and insect pests. Highly attractive and fragrant flowers occur from May through September or later. Plant is drought tolerant, but apply moisture before and during bloom improves flower quality, size, and number. Plant in full sun in a well-drained soil.

False salvia (*Lamium maculatum*) and yellow archangel (*L. galeobdolon*) grow 6 to 8 inches high. Both species are fast growing and form a low dense mat. False salvia has marbled foliage and rose-pink flowers occur in spring through early summer. Leaves turn pink or pinkish purple in fall. Yellow archangel has silvery marked foliage and does better in shade. Lamiums are excellent groundcovers and deserve more extensive use. Protect in the more severe areas of the central plains.

St. Johnswort (*Hypericum* species) spreads rapidly to form a mat 6-15 inches high depending on species. *Hypericum calycinum*, a semi-evergreen species, grows 12-15 inches high. Bright, yellow, 3-inch flowers in mid to late summer.

Creeping St. Johnswort (*H. repens*) reaches 6" but dies to the ground in winter. Yellow flowers occur in July. This species more hardy than *H. calycinum* and is adapted to the entire geographical range discussed. Plant in full sun. These groundcover tolerate dry soils although occasional watering is recommended.

Woody Deciduous Groundcovers

Dwarf Cutlead Stephanandra (*Stephanandra incisa* 'Crispa nana') is grown for its graceful, deeply cut foliage. The June flowers are white and inconspicuous. It prefers a moist soil in a semi-shaded to shady location. In the Plains area it should be cut to the ground each spring, whereupon it will grow to a height of 2' and spread to form a dense mat.

Rose Acacia (*Robinia hispida* 'Macrophylla') is a spreading shrub of 3' or so in height, well-adapted to dry soil and bank plantings. This variety is larger than the species in all its parts. It produces showy, fragrant, dark rose-colored flowers similar to clusters of peat blossoms in June. Because of its rapidly spreading habit it should be planted either where it can be easily contained, or where it will be allowed to naturalize.

Yellowroot (*Xanthorhiza simplicissima*) withstands soil conditions ranging from heavy clay to dry, sandy banks. It tolerates full sun to part shade. It is planted for its handsome foliage, which turns shades of orange in the fall. The brownish purple flower cluster appearing in the spring are not significant. Ultimate height is 2-3'.

Hancock Coralberry (*Symporicarpus x. chenaulti* 'Hancock') is a good cultivar of the Coralberry, *S. orbiculatus*. It reaches a height of 2-2½' and suckers readily. Pruning in the spring produces an abundance of flowers and fruit. The fruit, which is its primary attribute, is clustered along the stem,

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and is white on the shady side and pink on the sunny side. It is tolerant of nearly all soil and sun conditions.

Fragrant Sumac (*Rhus aromatica*) bears small yellow flowers in May, followed by red berrylike fruit, but is grown primarily for its capacity to spread rapidly by underground stems and its yellow to red fall coloring. It is a good choice for bank planting, and tolerates dry, poor soils and full sun to partial shade. It will reach a height of three feet, but can be cut to within six inches of the ground in early spring to keep it in bounds. Its hairy, dust-catching foliage can be either a detriment or an asset, given a particular situation.

Kelsey Dogwood (*Cornus sericea* 'Kelsey') will spread by underground stems to form a mat no taller than 24". Its outstanding feature is the bright red new twigs, although it also displays white flower heads 2½-3" across in late May, white berries in the summer, and reddish summer foliage. It is tolerant of sun or partial shade, and performs best in moist to wet soils.

Bronx Forsythia (*Forsythia viridissima* 'Bronxensis') will reach a height of 2' and a spread of 5'. It blooms in mid-April with greenish-yellow flowers an inch long. The fall color is a beautiful, bronze-purple and the foliage persists well into the winter. This is a good groundcover for bank planting. The Arnold Dwarf Forsythia is also a good

groundcover, reaching a height of 3' and rooting readily wherever the arching branches touch the soil. It does not flower well, so should be planted for its habit only.

Black Chokeberry (*Aronia melanocarpa*) is a good choice when a shrubby groundcover of natural habit is called for. It tolerates many soils, but grows best in shady, wet areas. It displays white flowers in May, and black or purple berries and brilliant red fall coloring. The height is 1½-3'.

Cranberry Cotoneaster (*Cotoneaster apiculata*) is so named for its profuse red berries, borne in the fall following the small pink flowers in mid-April. The recurved branches and low height — 18-24" — require no pruning. It is a good plant for banks and is tolerant of almost any soil. Full sun to partial shade promotes the best growth. A similar species, *C. horizontalis*, reaches a height of 3'. All cotoneasters are susceptible to fire blight and red spiders and do not transplant well bare root.

Running Serviceberry, Juneberry (*Amelanchier stolonifera*) appears best in a naturalized setting where it can sucker freely. The delicate white flowers appear for a brief time before the leaves in early spring. The foliage turns many shades of orange and red in the fall.

Blue Mist Spirea (*Caryopteris x clandonensis* 'Blue Mist') should be cut to the ground each spring to encourage new growth. The silvery foliage is

Continues on page 68

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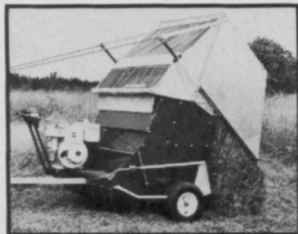


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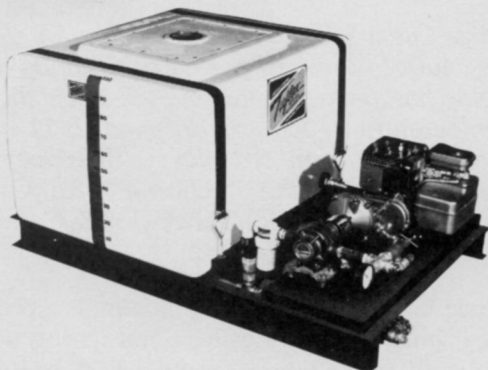
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Groundcovers from page 66

reminiscent of that of the willow family in texture. The sprays of blue flowers appear in August when few shrubs are blooming. It does well in sunny, dry locations reaching a height of 18-24".

Evergreen Groundcovers

Juniper species (*Juniperus chinensis*, *J. horizontalis*, *J. Procumbens*) includes a great variety of sizes, shapes, and colors of evergreen groundcovers. None of the junipers are tolerant of shade but perform admirably in dry soils on sunny sites and under city conditions. Most are susceptible to bagworms, scale, red spider mites, and twig blight. The most well-known of the chinensis varieties is the Pfitzer, of which the compact form reaches a height of 3'. There is a gold-tipped variety available which displays pale, yellow new growth — the best of these is *J. chin.* 'pfitzeriana aurea'. The gold color is more pronounced in heavy clay soils. The Sargent Juniper, *J. chin.* 'sargentii', is one of the best spreaders forming a mat 8-10' wide and attaining a height of only 10-12". Its color is grey-green.

The most familiar horizontalis variety is the Andorra Juniper, *J. horizontalis plumosa*. This feathery, flat-topped juniper turns an unusual silvery plum-pink color in the winter. The variety 'Youngstown' is more compact, reaching a height of only 10-15". The Bar Harbor Juniper has steel-blue summer foliage turning a silver-plum in the winter and reaches a height of 10-12". The lowest of the horizontalis junipers is the Blue Rug, *J. horiz.* 'Wiltoni', which is only 5-10" tall and readily covers rocks and banks. The Hughes juniper, *J. horiz.* 'Hughes' is a 12" groundcover with silver-tipped, bluish green foliage. The Tamarix juniper, *J. sabinata tamariscifolia*, has a mounded form and reaches 12" in height. All of these junipers do well when purchased as container plants. The Dwarf Japanese Garden juniper, *J. procumbens nana*, is distinguished from the other groundcover junipers by its blue-green color and predominantly needled foliage.

Woody Broadleaf Evergreen Groundcovers

Wintercreeper (*Euonymus* species) is one of the most versatile broadleaf evergreens for the Great Plains region. The Purpleleaf Wintercreeper, *E. fortunei coloratus*, spreads rapidly by putting down roots from its prostrate stems, which then hold the soil. It is planted for its purple-bronze winter foliage color. *E. fortunei* 'Acutus' has dark green foliage which it retains through the winter. The Longwood strain of miniature evergreen bitter-sweet; *E. fortunei* 'Longwood' is similar to the Kew Wintercreeper in that it has the smallest leaves of any of the wintercreepers, which makes it suitable for small scale areas. Longwood is hardier than Kew in the Great Plains. The Bigleaf Wintercreeper or Evergreen Bittersweet, *E. fortunei radicans*, is valued for its uniformity of growth and rapid increase. All of the wintercreepers do well in sun or shade although some winter sun protection is helpful in preventing burning. They are not par-

Continues on page 70

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Groundcovers from page 68

ticular as to soil and moisture conditions. However, all are susceptible to scale, which must be controlled by a dormant oil spray if it is not to devastate the planting.

Dwarf Oregon Holly-Grape (*Mahonia repens*) has holly-like foliage which turns a bronze-red in autumn. It bears spikes of bright yellow flowers in early May followed by blue-black fruit similar to small grapes. In the plains area a north exposure is preferred to prevent burning of the foliage by the winter sun.

Baltic ivy (*Hedera helix*) climbs by aerial rootlets when planted against a wall, but may be easily maintained as a dense, dark-green groundcover. It should be planted in a north or east location to hold the foliage color through the winter as it burns in the winter sun and wind. Conditions of shade, moisture, and organic material in the soil will encourage the best growth. The variety 'Thorn-dale' withstands winter well.

Hall's Japanese honeysuckle (*Lonicera japonica halliana*) is a semi-evergreen vine which can become rampant if not pruned regularly, but because of its rapid growth habit is a good choice for large areas and banks. Its white flowers turn yellow with age. It is tolerant of nearly all soil conditions including dry soil, and grows well in sun or shade. It should not be planted where it can climb into trees or shrubs.

Evergreen

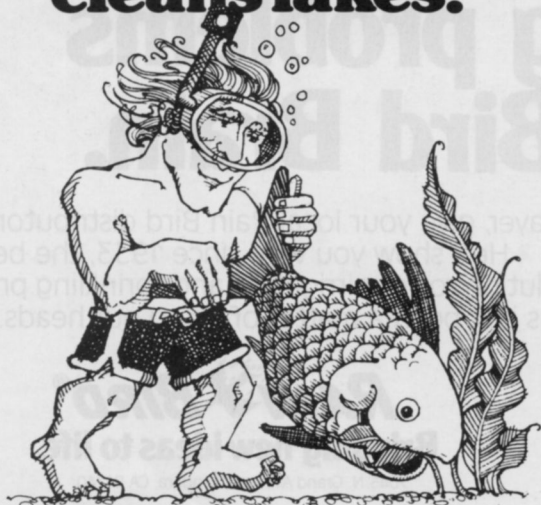
Carpet Bugle (*Ajuga reptans*) grows 4 to 12 inches high. While classified as evergreen or half evergreen in the mildest protected areas of the central plains, in most sites the foliage dies to the ground. The plant spreads rapidly by creeping stems. Cultivars bearing blue, purple, white and red flowers in spring are available as are cultivars with bronze, variegated, and variegated with splashes of burgundy. This latter cultivar, Burgundy Glow, requires a site protected from wind and sun or foliage colors will wash out or brown. One of the most popular cultivars is Bronze Beauty which performs well in sun or shade. Don't plant ajuga in poorly drained soil or root and crown rots will develop.

Periwinkle (*Vinca minor*) is one of the best carpet forming groundcovers where conditions are favorable. Most cultivars grow 3 to 6 inches in height although 'Bowles' reaches 8 inches and tend to clump more than other cultivars. The species forms blue flowers from April through May, while 'Alba' produces white ones. Periwinkle does best in a protected area in shade.

Evergreen candytuft (*Iberis sempervirens*) forms a dense mat 6 to 12 inches high. The plant is attractive throughout the year and particularly in spring (April and May) when it produces white, flat flower clusters. Plant in full sun or light shade, in a well-drained soil. Plant is not drought tolerant but requires regular watering. Cultivars such as 'Christmas Snow,' 'Snowflake,' and 'Little-Gem,' grow less rapidly than the species. Tends to do better in the eastern half of the central plains although it is sufficiently temperature hardy with mulch in the western half.

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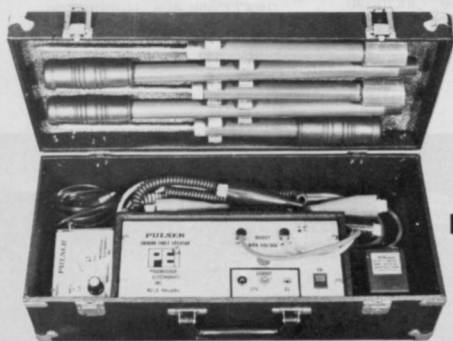
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European wild ginger (*Asarum europaeum*) grows to a height of 6 inches. This plant is adapted to moist soils high in organic matter in deep shade. The leathery, kidney-shaped foliage is an attractive, glossy, deep green. Protect from drying winter and summer winds. A highly recommended groundcover where adapted. Hardy throughout the area if proper environmental conditions are provided.

Japanese spurge (*Pachysandra terminalis*) spreads slowly to form a mat 6-8 inches tall. Spurge does best in moist acidic soils in full shade under Norway Maples. Well-drained soils high in organic matter should be provided. Prune back plants before growth begins in spring. A variegated cultivar 'Silver Edge' is available. Additional winter protection is required for the variegated types. The plant is hardy where planted in an appropriate site, although winter mulch is required in western and northwest parts of the central plains.

Stonecrop (*Sedum* species) spread slowly to form a mat or a clump-form 3-15 inches high. Low growing (mat types) may winter burn in exposed places. Cold hardy throughout the central plains. It has abundant flowering and requires little care. Where low maintenance is desired, sedums are choice groundcover. *Sedum acre* — mat former with yellow flowers. *S. sexangulare* — less vigorous than *S. acre*, but otherwise similar. *S. spurium* 'Dragon's blood' grows 4 inches tall with dark red flowers in early summer.

Establishment and Maintenance

To establish a groundcover prepare the site as follows: first remove all sod. Then till to a depth of six to 10 inches. If possible improve soil structure and thus drainage by the addition of soil amendments, such as coarse sawdust, ground corn cobs, rotted manure, pine needles, shredded hardwood bark, shredded tree leaves, compost or other readily available and inexpensive amendment. One-third of the mix should be organic matter. To obtain this mix, apply a 2-3" layer of the amendment to the soil surface. Incorporate to a six-inch depth. Don't "pocket-modify" a soil, i.e., modify planting hole; either modify the entire groundcover area or don't modify.

Where economically feasible fumigate the soil to eliminate weed seed, soil insects, and disease organisms. Check with your local county extension office for the recommended soil fumigants for your area.

Take a soil test to determine pH and the present phosphorus and potassium levels. Based on these tests, appropriate recommendations will be made for your site and groundcover. The amount of nitrogen required will depend on the specific groundcover grown, soil type and site characteristics, but normally 4-5 pounds of 5-10-5 fertilizer per 100 square feet is recommended.

Spacing of plants depends on desired or available capital for purchasing plants and growth rate of specific groundcovers used. As expected, the closer the spacing the sooner the ground is totally covered. Once this occurs weed control is generally unnecessary.

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Weed Control

Controlling weeds in newly planted groundcovers accounts for the high maintenance during the first two to four years. Several approaches to weed control are available. These include hand cultivation, soil sterilization, mulches, and herbicides. Usually a combination of the above methods is used.

If used in sufficient quantities (3-5 inch layer), organic mulches will control or reduce weed infestations and thus reduce hand labor. Unfortunately this amount of mulch and the application of it can be costly. Further, additional amounts of organic matter must be added yearly to maintain an effective layer.

Preemergence herbicides (triflan and dacthal) will reduce weed problems. Read and follow label direction carefully; some groundcovers will not tolerate these herbicides and all of them will be injured by excessive amounts.

Research at the University of Delaware indicates root dipping in activated charcoal will allow use of increased amounts of herbicides and more phytotoxic ones to obtain more effective weed control.

Watering

Maintain adequate soil moisture during establishment. Moisture stress during these initial 2-4

years will slow establishment. After the mat is formed, water to the requirements of the specific groundcover. Regardless of the groundcover grown, allow the water to penetrate deeply, i.e., wet the entire root zone. If feasible, water early in the day to allow foliage to dry before nightfall. Avoid brief, light sprinkling.

Pruning

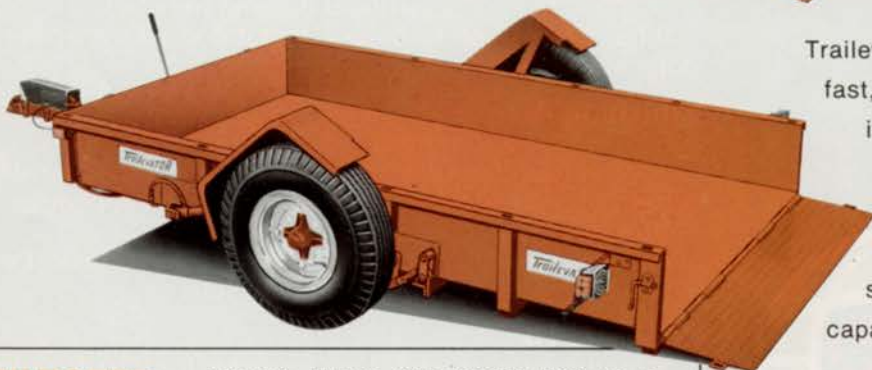
Initial pruning is done to encourage branching in those groundcovers with basal buds such as vinca (long-trailing, branch types) but not ajuga. Once established minimal pruning is required. Prune to remove dead or unhealthy tissue; maintain desired density and form; keep planting within bounds; and aid in rejuvenating a planting.

Winter Protection

Select groundcovers for your site carefully. Adapted species and cultivars are less likely to suffer winter injury. Soils properly amended and ones that drain well reduce the amount of root and crown rots that predispose groundcovers to winter injury. Use a coarse mulch after the ground freezes to lessen the likelihood of heaving and desiccation. Don't allow salts used to melt ice to contaminate the soil or severe injury to the plants and soil structure will occur. **WTT**

ONE MAN handling

TRAILEVATOR the hydraulic elevating trailer that lifts its own load in seconds...



Trailevator lowers to ground level for fast, 'roll aboard' loading, then lifts its own load to hauling position in seconds. Lowers and lifts without uncoupling from towing vehicle. Saves time, saves money. Four models, two capacities: 3,000 lbs. and 2,000 lbs. Bed sizes up to 5'-10" x 10'.

TILTSTER, the low bed trailer that tilts...

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