

WEED CONTROL IN THE LANDSCAPE¹

by Elton M. Smith

Weeds typically found in the landscape are classified as either annuals or perennials. Annual weeds such as crabgrass or purslane are relatively easy to keep under control by either mulching, cultivation, hand pulling, pre-emergence herbicides or a combination of two or more of these methods. Perennial weeds such as bindweed or nutsedge are much more difficult, if not almost impossible, to control by the above methods due principally to their extensive root systems. Weeds can be controlled prior to or after planting, however, many landscape operators fail to recognize the importance of eliminating weeds, especially perennials, prior to planting.

Eliminating weeds prior to planting

The most successful approach to a weed free landscape is to control perennial grasses, and perennial broadleaved weeds, prior to preparing the area for planting. Spraying the weeds in the area with one of several post-emergence herbicides which will be translocated to the root system for total plant control is one of the most effective methods of control. Examples of such products would be 2,4-D and related products for broadleaf weed control, dalapon for grass control, amino triazole for general weed control, among others. Each of these normally has to be applied more than once and each has a specific waiting period prior to planting. Glyphosate, a very effective and relatively new product for perennial weed control has been submitted to the Federal E.P.A. for label registration for use prior to planting nursery stock.

A number of pre-emergence herbicides (those which control germinating seeds) are labelled for landscape plants and are recommended for use prior to planting. Incorporate into the soil, following tillage, either Eptam or Treflan to control annual and some perennial weeds for a period of 4-6 weeks. Following incorporation to a depth specified on the label, planting of the ornamentals

can begin. The incorporation of these two herbicides have been used extensively by commercial nurserymen and are now being used by landscape contractors to a large extent, especially where maintenance for a specified period of time is in the contract.

Tillage as a method of weed control prior to planting is a successful practice for the control of annual weeds but not effective against perennial weeds. In some cases, tillage only cuts up the root system into smaller pieces and redistributes them. Tillage practices in combination with herbicides have been more effective than either practice alone in clearing an area of weeds.

Preventing weeds following planting

In recent years our industry has made extensive use of mulches to prevent weeds in the landscape. Many types of mulches are available, however, the most popular in the mid-west include hardwood, Cypress and pinebark mulches along with wood chips, peat moss, an assortment of hulls and many inorganic types. These should be applied at least 2 inches deep and renewed annually or as needed. Avoid the use of black plastic near ornamentals as plastic contributes to poor soil moisture relationships.

Some weeds will come through the mulches and these must be hand pulled or sprayed. Seeds will be carried into planting beds by the wind and birds and will often germinate in the mulch itself. Again, hand pulling is the most satisfactory control measure in small areas, however, landscapers are using more and more herbicides such as Paraquat or Phytar 560 in larger areas.

As an alternative to or to be used in combination with mulches are several pre-emergence herbicides that can be applied between or over the plants to control annual weeds for a period of 4 to 8 weeks. Reapplications are usually necessary to achieve season long control depending on selection of herbicide, soil and climatic conditions.

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The soil should be weed free and moist prior to application or the treatment should be followed by rain or irrigation. It's important to know how much area is included in the beds to be treated. Once the area has been calculated, determine the amount of herbicide needed for that area, and apply with equipment that is properly calibrated and in working order. Many types of application equipment are available. Select a sprayer and/or granular applicator that is large enough to complete anticipated needs, is easy to calibrate and clean, and can be serviced locally.

Controlling weeds in established plantings

In commercial grounds maintenance in recent years, the use of both post and pre-emergence herbicides has increased significantly as users gain confidence in safely applying them and as labor costs continue to increase markedly. Herbicides are a useful tool in golf courses, cemeteries, parks, arboretums, school campus areas as well as commercial and residential landscapes.

They can be used to control weeds under trees, to delineate turf areas, in and around sand traps, around grave markers, in patios, driveways, under fences as well as in flower, ground cover, and woody plant beds. Many other uses of herbicides exist in the landscape to reduce maintenance and

labor costs and to more effectively control weeds.

As with any pesticide it's important that the operator understands the advantages and disadvantages of using herbicides in the landscape. The effectiveness of a weed control program is only as successful as the person responsible for selection, calculation, calibration and application of herbicides. All herbicides will control weeds as specified on the label, therefore, it's up to the operator to create the proper conditions necessary to achieve the desired results.

Recommended herbicides for use in the landscape

One of the major concerns within the landscape industry is the uncertainty of what herbicide can be safely used on which plants. The lists which follow outline the woody plants, ground covers and flowers that can be treated with specific pre-emergence herbicides. The list includes only those plants with company label listing.

A list is not available for post-emergence herbicides. Therefore, avoid contact with foliage of desired crops and trees or shrubs with green, yellow or red bark. Some post-emergence herbicides such as amino triazole and dicamba have soil residue problems and should be used sparingly near the root zone of plant materials.

TABLES

Table 1. **WOODY PLANTS TOLERANT TO HERBICIDES**

An [X] in the column indicates the herbicide can be safely used for that plant listed.

| | ALANAP | BETASAN | CASORON | CHLORO IPC | DACTHAL | ENIDE | EPTAM | KERB | ORNAMENTAL WEEDER | PRINCEP | RONSTAR | SURFLAN | TREFLAN |
|-----------------------------|--------|---------|---------|------------|---------|-------|-------|------|-------------------|---------|---------|---------|---------|
| Evergreens | | | | | | | | | | | | | |
| Narrowleaf | | | | | | | | | | | | | |
| Arborvitae | X | | X | X | X | X | | | X | X | X | X | X |
| Chamaecyparis | | | | | | X | X | | | | | | |
| Eastern Red Cedar | X | | X | | | X | | | | X | | | X |
| Fir | | | | X | X | | X | X | | | | | |
| Fir, Balsam | | | | X | | | | | | X | | | X |
| Fir, Douglas | | | | | | | | X | | X | | | X |

| | ALANAP | BETASAN | CASORON | CHLORO IPC | DACTHAL | ENIDE | EPTAM | KERB | ORNAMENTAL WEEDER | PRINCEP | RONSTAR | SURFLAN | TREFLAN |
|------------------------|--------|---------|---------|------------|---------|-------|-------|------|----------------------|---------|---------|---------|---------|
| Fir, Fraser..... | | | | | | | | | | X | | | |
| Hemlock..... | | | | X | | X | X | | X | X | | | X |
| Juniper..... | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Pine..... | X | | | X | X | | X | X | X | | X | | |
| Pine, Austrian..... | | | | | | | | | | X | | | X |
| Pine, Japanese Black | | | | | | | | | | | | | X |
| Pine, Mugo..... | | | | | | | | | | X | | | |
| Pine, Red..... | | | | | | | | | | X | | | X |
| Pine, Scotch..... | | | | | | | | | | X | | | X |
| Pine, White..... | | | | | | | | | | X | | | X |
| Spruce..... | X | | | X | X | | X | | | | X | | |
| Spruce, Blue..... | | | | | | | | | | X | | | X |
| Spruce, Norway..... | | | | | | | | | | X | | | X |
| Spruce, White..... | | | | | | | | | | X | | | X |
| Yew..... | X | | X | X | X | X | X | X | X | X | X | | X |
| Broadleaf | | | | | | | | | | | | | |
| Boxwood..... | | X | X | | X | | X | | | | | X | X |
| Cherry Laurel..... | | | | | | X | | | | | | | X |
| Euonymus..... | | | | X | | X | | | X | | X | | X |
| Firethorn..... | | X | X | | | X | | | | | | X | X |
| Holly..... | X | X | X | | X | X | | X | X | | X | | |
| Holly, Japanese..... | | | | | | | X | | | | | | X |
| Japanese Pieris..... | | | | | X | | X | | X | | | | X |
| Leucothoe..... | | | X | | | | X | | | | | | |
| Mahonia..... | | | | X | | X | | | | X | | X | |
| Mountain Laurel..... | | | X | X | X | X | | | | | | | X |
| Rhododendron..... | X | | X | X | X | X | X | X | X | | | | X |
| Deciduous Trees | | | | | | | | | | | | | |
| Ash..... | | | X | | X | X | | | | | X | | |
| Ash, White..... | | | | | | X | | | X | | | | X |
| Bald Cypress..... | | | | | | X | | | | | | | X |
| Beech..... | | | | | | X | | | | | | | |
| Birch..... | | | X | X | X | X | | | | | X | | |
| Birch, European..... | | | | | | | | | | | | | X |
| Chinese Chestnut... | | | | | X | X | | | | | | | X |
| Corktree, Amur..... | | | X | | | | | | | | | | |
| Crabapple..... | | | X | | X | X | | | | | X | | X |
| Dogwood..... | | | X | | X | X | X | | X | X | X | | X |
| Dogwood, Kousa.... | | | | | | | | | | | | | X |
| Elm..... | | | X | | X | | | | | | | | |
| Elm, American..... | | | | | | | | | | X | | | |
| Elm, Siberian..... | | | | | | | | | | X | | | |

| | ALANAP | BETASAN | CASORON | CHLORO IPC | DACTHAL | ENIDE | EPTAM | KERB | ORNAMENTAL WEEDER | PRINCEP | RONSTAR | SURFLAN | TREFLAN |
|----------------------------|--------|---------|---------|------------|---------|-------|-------|------|----------------------|---------|---------|---------|---------|
| Goldenraintree | | | X | | | | | | | | | | |
| Hackberry | | | X | | | | | | | | | | |
| Hawthorn | | | | | X | | | | | | | | |
| Honeylocust | | | | | | | | | | X | | | X |
| Linden | | | X | | | | X | | | | | | |
| London Planetree | | | | | | | | | | | | | X |
| Magnolia | | | X | X | X | | X | | X | | | | |
| Maple | X | | X | X | X | X | X | | | | | | |
| Maple, Norway | | | | | | | | | | | | | X |
| Maple, Red | | | | | | | | | X | | | | X |
| Maple, Silver | | | | | | | | | | | | | X |
| Maple, Sugar | | | | | | X | | | | | | | X |
| Mountain Ash | | | X | | | | | | | | | | |
| Oak | | | X | | X | X | X | | | | | | |
| Oak, Pin | | | | | | | | | | | | | X |
| Oak, Red | | | | | | | | | X | X | | | X |
| Oak, Scarlet | | | | | | | | | | | | | X |
| Poplar | X | | X | X | X | X | | | | | | | |
| Redbud | | | | | X | X | | | | | | | X |
| Russian Olive | | | X | | X | X | | | | X | X | | |
| Sassafras | | | | | | | | | X | | | | |
| Sweetgum | | | | | X | X | | | | | | | X |
| Sycamore | | | | | X | X | | | | | | | X |
| Tuliptree | | | | | X | X | | | | | | | X |
| Tupelo | | | | | | | | | | | | | X |
| Walnut | | | X | | X | X | | | | | | | X |
| Willow | | | X | | X | X | | | | | | | X |
| Deciduous shrubs | | | | | | | | | | | | | |
| Abelia | | X | | | X | | | | | | | | |
| Azalea | X | X | | | X | X | | | X | | | | X |
| Azalea, Mollis | | | X | | | | | | | | | | |
| Barberry | | | X | X | X | X | X | | | X | X | X | X |
| Beautybush | | | X | | | X | | | | | | | |
| Cinquefoil | | | | | X | | | | | | | | X |
| Cotoneaster | | | X | | X | X | | | X | X | X | X | X |
| Currant | | | | | | X | | | | | | | |
| Deutzia | | | X | | X | | | | | | | | X |
| Euonymus, Winged | | | X | | X | X | X | | | | | X | X |
| Flowering Almond | | | X | | | | | | | | | | |
| Flowering Quince | | | X | | | | | | | | | | |
| Forsythia | | | X | X | X | X | | X | | | X | X | X |
| Hibiscus | | | | | | X | | | | | | | |

| | ALANAP | BETASAN | CASORON | CHLORO IPC | DACTHAL | ENIDE | EPTAM | KERB | ORNAMENTAL WEEDER | PRINCEP | RONSTAR | SURFLAN | TREFLAN |
|-----------------------------|--------|---------|---------|------------|---------|-------|-------|------|----------------------|---------|---------|---------|---------|
| Honeysuckle..... | | | X | X | X | X | | | | X | X | | X |
| Hydrangea..... | | | | X | X | X | | | | | | | |
| Hypericum..... | | | | | | X | | | | | | | |
| Lilac..... | X | | X | X | X | X | X | | | | X | X | X |
| Mockorange..... | X | | X | X | X | X | | | | | | | |
| Mockorange, Lemoine..... | | | | | | | | | | | | | X |
| Nandina..... | | | X | | | | | | | | | | |
| Peashrub..... | | | X | | | | | | | X | | | |
| Photinia..... | | | X | | | | | | | | | X | |
| Privet..... | X | X | X | X | X | X | | | | | X | X | X |
| Rose..... | | | X | X | X | X | | | X | | X | | X |
| Spirea..... | | | X | X | X | X | | | X | | | | |
| Spirea, Vanhoutte... | | | | | | | | | | | | | X |
| Virburnum..... | | | | X | X | X | X | | | X | | | X |
| Virburnum, Doublefile | | | | | | | | | | | | | X |
| Weigela..... | | | X | | X | X | | | | | | | X |

Table 2. Ground Covers Tolerant to Herbicides.

An [X] in the column indicates the herbicide can be safely used for that plant listed.

| | BETASAN | DACTHAL | ENIDE | EPTAM | ORNAMENTAL WEEDER | PRINCEP | RONSTAR | SURFLAN | TOK | TREFLAN |
|----------------------|---------|---------|-------|-------|----------------------|---------|---------|---------|-----|---------|
| Ajuga..... | X | | | X | | | | | | |
| Boston Ivy..... | | X | | | | | | | | |
| Cotoneaster..... | | X | X | | X | X | X | X | | X |
| English Ivy..... | X | X | X | X | X | | | | X | |
| Euonymus..... | | X | X | | X | | X | X | | X |
| Honeysuckle..... | | X | X | | | | | | | X |
| Juniper..... | X | X | X | | X | X | X | X | | X |
| Myrtle..... | X | | X | X | | | X | X | X | |
| Pachysandra..... | X | | | X | | | | | | |
| Pachistima..... | | X | | | | | | | | |
| Potentilla..... | | | | | | | | | | X |
| Sedum..... | X | | | X | | | | | X | |
| Stonecrop..... | | | | | | | | X | | |
| St. John's Wort..... | X | | X | | | | | | | |

Table 3. Flowers Tolerant To Herbicides

An [X] in the column indicates the herbicide can be safely used for that plant listed.

| | BETASAN | DACTHAL | ENIDE | EPTAM | ORNAMENTAL WEEDER | TREFLAN |
|-----------------------------|---------|---------|-------|-------|----------------------|---------|
| Achillea | | | | | | X |
| Ageratum | | X | | X | | X |
| Alyssum | X | X | | X | | |
| Amaranthus | | | | X | | |
| Aster | X | X | X | X | | X |
| Baby's Breath | | X | | | | |
| Bachelor's-Button | X | | | | | |
| Balsam | | | | X | | X |
| Begonia | | | | X | | |
| Bell Flower | | X | | | | |
| Bleeding-Heart | | X | | | | |
| Bugloss | | X | | | | |
| Calendula | X | | | | | X |
| California Poppy | | | | | | X |
| Calliopsis | | | | | | X |
| Campanula | X | | | | | |
| Candle Larkspur | | X | | | | |
| Candytuft | X | X | | | | |
| Carnation | | | | | | X |
| Celosia | | | | | X | |
| Centaurea | | | | | | X |
| Chrysanthemum | | X | X | X | X | X |
| Columbine | | X | | | | |
| Coleus | | X | | | | |
| Coreopsis | | X | | | | |
| Coral Bells | X | X | | | | |
| Cosmos | | X | | | | X |
| Dahlia | X | X | X | X | X | X |
| Daffodil | X | | | | | |
| Daisy | X | | | | | |
| Daylily | | | | X | X | |
| Delphinium | | X | | | | |
| Dianthus | | | | X | | X |
| Evening Primrose | | X | | | | |
| Fernleaf Yellow | | X | | | | |
| Feverfew | | X | | | | |
| Forget-Me-Not | | X | | | | X |
| Four O'Clock | | X | | | | X |
| Foxglove | | X | | | | X |
| Gaillardia | | X | | | | X |

| | BETASAN | DACTHAL | ENIDE | EPTAM | ORNAMENTAL WEEDER | TREFLAN |
|---------------------------|---------|---------|-------|-------|----------------------|---------|
| Gazania..... | X | | | | | |
| Geranium..... | | X | | | | |
| Gladiolus..... | X | X | | | | X |
| Gold Dust..... | | X | | | | |
| Golden Marguerite..... | | X | | | | |
| Golden Tuft..... | | X | | | | |
| Iris..... | | X | | | X | |
| Ixora..... | | | | | | X |
| Lavendercotton..... | | X | | | | |
| Lily..... | | X | | | | |
| Lobelia..... | | | | | | X |
| Lupine..... | | X | | | | X |
| Marigold..... | X | X | X | X | X | X |
| Morning Glory..... | | X | | | | X |
| Mother-of-Thyme..... | | X | | | | |
| Nasturtium..... | | X | | | | X |
| Nicotiana..... | | | | | | X |
| Pansy..... | X | | | X | | |
| Peony..... | | X | | | X | |
| Periwinkle..... | | | | | | X |
| Petunia..... | | X | X | X | | X |
| Phlox..... | | | X | | | X |
| Pink Health..... | | X | | | | |
| Pinks..... | | X | | | | |
| Poker Plant..... | | X | | | | |
| Portulaca..... | | | | | | X |
| Primrose..... | X | | | | | |
| Purple Cone Flower..... | | X | | | | |
| Ranunculus..... | X | | | | | |
| Rudbeckia..... | | | | | | X |
| Salvia..... | | X | X | | | X |
| Scabiosa..... | | | | | | X |
| Scarlet Sage..... | | X | | | | |
| Shasta Daisy..... | | | | | | X |
| Snapdragon..... | | X | X | | X | X |
| Snow on the Mountain..... | | | | | | X |
| Strawflower..... | | X | | | | |
| Stock..... | | | | | | X |
| Stone Crop..... | | X | | | | |
| Sundrops..... | | X | | | | |
| Sunflower..... | | X | | | | X |
| Sweet Alyssum..... | | | | | | X |

| | BETASAN | DACTHAL | ENIDE | EPTAM | ORNAMENTAL WEEDER | TREFLAN |
|--------------------------|---------|---------|-------|-------|----------------------|---------|
| Sweet Pea..... | X | X | | | | X |
| Sweet William..... | | | X | | | X |
| Tulip..... | X | | | | | |
| Verbena..... | | X | | | | |
| Virginia Spiderwort..... | | X | | | | |
| Violet..... | | X | | | | |
| Wall Flower..... | X | | | | | |
| Wormwood..... | | X | | | | |
| Zinnia..... | X | | X | X | X | X |

Remember — when using herbicides

- Thoroughly read the label and follow all directions.
- Since environmental conditions vary, herbicides do not always result in similar results from year to year.
- A trial plot in a small section of the landscape is suggested the first time herbicides are used prior to treating the entire area.
- If herbicides are spilled on skin, wash thoroughly with soap. If swallowed, come in

- contact with eyes, or absorbed to the point of showing symptoms, call a doctor immediately.
- For more information contact your local County Cooperative Extension Service Office.

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ABSTRACT

DeGraaf, R.M. and J.W. Thomas. 1976. **Wildlife habitat in or near human settlements.** p. 54-62. *In* Trees and forests in or near human settlements. J.W. Andresen [ed], Univ. of Toronto Press, Toronto, Ontario.

Much has been written in the last eight years about the need for the wildlife profession to consider wildlife in urban and suburban environments. In this paper, we will discuss songbird populations and habitat associations in urban and suburban environments. Songbirds are prime candidates for urban wildlife management because they introduce color, sound, and movement into the environment. A review of responses of urban bird populations to urbanization shows that the number of species decreases substantially, while the number of some species increases. Species favored by urbanization tend to be omnivores or species which nest on or in buildings. Species which nest near or on the ground tend to be rapidly eliminated. Evidence is presented which indicates that breeding success may be insufficient to maintain populations. Habitat research has shown that species have individual requirements for a complex of vegetation layers, many of which are absent from urban environments.