

The biggest tournament of the year is only days away. Who needs spurge?

Pesky, hard-to-control weeds like spurge, oxalis or chickweed can be especially embarrassing at a time like this.

Happily, WEEDONE® brand DPC broadleaf herbicide controls those and more than 65 other tough turf weeds. With control that's quick, effective, dependable.

Designed for turf

WEEDONE® brand DPC is a powerful combination of both 2,4-D and dichlorprop in one convenient turf herbicide with the weed-killing performance of more expensive, three-way mixes.

And WEEDONE® brand DPC herbicide won't harm most grass species.

So for golf courses, lawns, parks, athletic fields and other valuable turf areas, WEEDONE® brand DPC could be the only broadleaf herbicide you need.

That simplifies your

inventory and handling. Not to mention budgeting.

WEEDONE® brand DPC is approved for season-long use. So you can spray any time from early spring through late fall. Whenever weeds are actively growing.

WEEDONE® brand DPC herbicide mixes easily with most liquid fertilizers for economical one-trip spraying. Another big plus for turf professionals.

The first name in herbicides

At Union Carbide, we were the first to develop the phenoxy herbicide chemistry turf pros have depended on for nearly 40 years. And, with formulations like WEEDONE® brand DPC we're still working to help make turf weeds the least of your worries.

This year, ask your turf chemical supplier for WEEDONE® brand DPC broadleaf herbicide. And enjoy the tournament.



From the turf care group at Union Carbide

Union Carbide Agricultural Products Company, Inc. Box 12014 T.W. Alexander Drive, Research Triangle Park, N.C. 27709.

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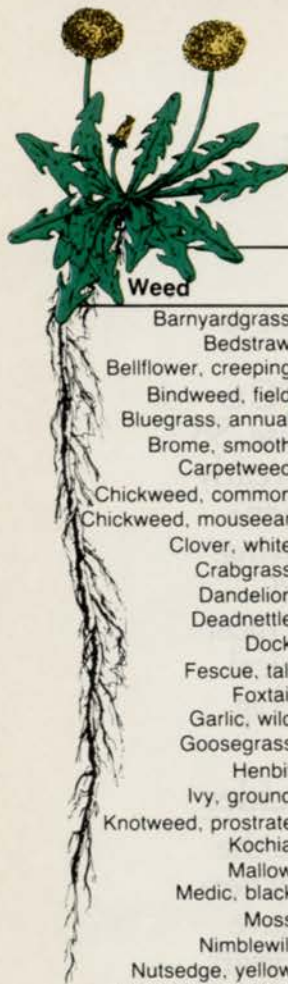


CHART 1
Growth and treatment periods

Weed	SPRING			SUMMER			FALL			WINTER		
	Early	Mid	Late	Early	Mid	Late	Early	Mid	Late	Early	Mid	Late
Barnyardgrass												
Bedstraw												
Bellflower, creeping												
Bindweed, field												
Bluegrass, annual												
Brome, smooth												
Carpetweed												
Chickweed, common												
Chickweed, mouseear												
Clover, white												
Crabgrass												
Dandelion												
Deadnettle												
Dock												
Fescue, tall												
Foxtail												
Garlic, wild												
Goosegrass												
Henbit												
Ivy, ground												
Knotweed, prostrate												
Kochia												
Mallow												
Medic, black												
Moss												
Nimblewill												
Nutsedge, yellow												
Pigweed, prostrate												
Plantain												
Puncturevine												
Purslane, common												
Quackgrass												
Sanbur												
Shepherdspurse												
Sorrel, red												
Speedwell												
Spurge, prostrate*												
Thistle, Canada												
Thistle, musk												
Vervain, prostrate												
Violets												
Waterleaf (nyctelea)												
Woodsorrel, yellow												
Yarrow												

— Active period of plant growth. Varies from year to year and from north to south.
 — Apply preemergence chemicals.
 — Apply postemergence treatments. Approximate periods may vary two weeks from season to season.

* Preemergence herbicide applications should be made a second time in late June or early July.

Fumigants and nonselective herbicides will kill desirable plant material contacted by them. Care must be taken to protect nearby trees and shrubs which cannot be moved.

A number of preemergence herbicides are labelled for ornamentals and two are recommended for use prior to planting. Eptam or Treflan can be incorporated into the soil, follow-

ing tillage, to control annual and some perennial weeds for a period of four to six weeks. Following incorporation to a depth specified on the label, ornamentals can be planted. This method has been used extensively by commercial nurserymen and is now being used by landscape contractors to a large extent, especially where maintenance for a specified period of time

is in a planting contract.

Tillage as a method of weed control prior to planting is a successful practice for the control of annual weeds but not perennial weeds. In some cases, tillage only cuts up the root systems of perennials into smaller pieces and distributes them.

Landscape fabrics are growing in use for low maintenance areas. The black plastic cover has been improved to a knitted fabric which allows water and nutrients through but blocks light and growing weeds. These are useful in mulched beds where plants are spaced out. They are impractical for groundcover areas and they do not control germination of weed seeds in the mulch above the fabric.

The most successful approach to a weed-free landscape is to control perennial grasses and broadleaf weeds prior to planting.

After planting

In recent years, the landscape industry has made extensive use of mulches to prevent weeds in the landscape. Mulches should be applied two-inches deep and renewed to that depth annually. Mulch layers deeper than two inches accomplish little and actually harm shallow-rooted ornamentals which will root into the mulch instead of into the soil.

The most popular mulches are Cypress and pinebark mulches, as well as wood chips, peat moss, and various hulls. Materials which are not composted or inorganic, can rob the soil below of important nitrogen. Composting or sterilization also kills any weed seeds in the mulch.

Preemergence materials can be used in combination with mulches to stop germination of weed seeds in the mulch or those deposited by birds and wind. They control annual weeds for a period of four to eight weeks. Reapplication is usually necessary for season-long control.

Determine the amount of pre-emergence herbicide to be applied by figuring the area of the plant bed, measuring the proper amount for that area, and distributing it evenly in the area.



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Agricultural Experiment Station or U.S. Department of Agriculture. Some well illustrated circulars, bulletins, and books are also available.

Mechanical Control. Hand methods of brush control, although effective, are slow, costly, and laborious. They are practical on small areas or in scattered stands.

Hand methods include grubbing, cutting, girdling, and burning.

Grubbing consists of using a grubbing hoe, shovel, or similar tool to dig enough of the root system out of the soil to kill the plants. The operation is difficult and time consuming, but effective if properly done.

Cutting down brush with axes or saws is most effective on woody species that are killed when the top growth is removed, such as eastern redcedar and blueberry juniper. Species that resprout can be treated with herbicides to prevent resprouting.

Girdling is cutting a ring through the bark and cambium layer to prevent movement of water and nutrients to top growth. Girdling is practical in scattered stands of large trees 6-inches in diameter or greater. It is most effective during the summer months. Herbicides can be applied to the cut ring for improved kill.

Portable chain or power saws and girdlers are available for brush control. They reduce labor, time, and cost in brush removal but have limited use in dense stands or large areas.

Dozing is one of the more widely used methods of brush control. Much clearing is done with straight dozer blades; however, many modifications and attachments are available for specialized clearing jobs.

Ideally, dozing removes brush and large trees by pushing or pulling the plants out with as much of the roots intact as possible. Special attachments to the straight blade include teeth or U-shaped "stingers" to allow cutting the plant off below the ground line and lifting out the roots.

Dozing is most commonly practiced in open stands of large trees and brush or on rocky soils where other mechanical control methods are limited. It is not desirable in dense stands of brush that sprout from the roots after top removal.

Dozed trees can be windrowed or stacked so the brush can be burned or left to decay. The equipment and fuel required for dozing are costly. Dozing heavily damages the turf and grounds.

Mowing and shredding are temporary control methods for weeds and small brush in landscape management. *continued on page 68*

Right-of-Way Weed Control

by R. W. Bovey, USDA-ARS, College Station, TX

Many areas around buildings, ditches, billboards, poles, factories, shops, golf courses, parking areas, parks, industrial plant sites, vacant lots, schools, airports, roadsides, fences, lawns, pipelines, and other public or non-cropland areas may harbor unwanted trees and brush.

If these undesirable woody plants resprout after top removal, they may be difficult to kill and remove and cause unsightly appearance or interfere with the intended use of the property. The landscape manager has many options at his disposal to control and remove undesirable woody vegetation and replace it with desirable cover.

Woody plants can be removed by two primary methods or combina-

tions of these methods which include mechanical or chemical means. The selection of the method depends upon

- 1 size of the area to be cleared;
- 2 size of the brush;
- 3 difficulty of control and kind of brush;
- 4 proximity to valuable vegetation, water sources, and population centers; and
- 5 use to be made of the area following brush removal.

Control methods

It is essential that problem plants be accurately identified so the proper control methods can be used. If the species cannot be identified, consult the local county agent, extension specialists, or personnel from the State

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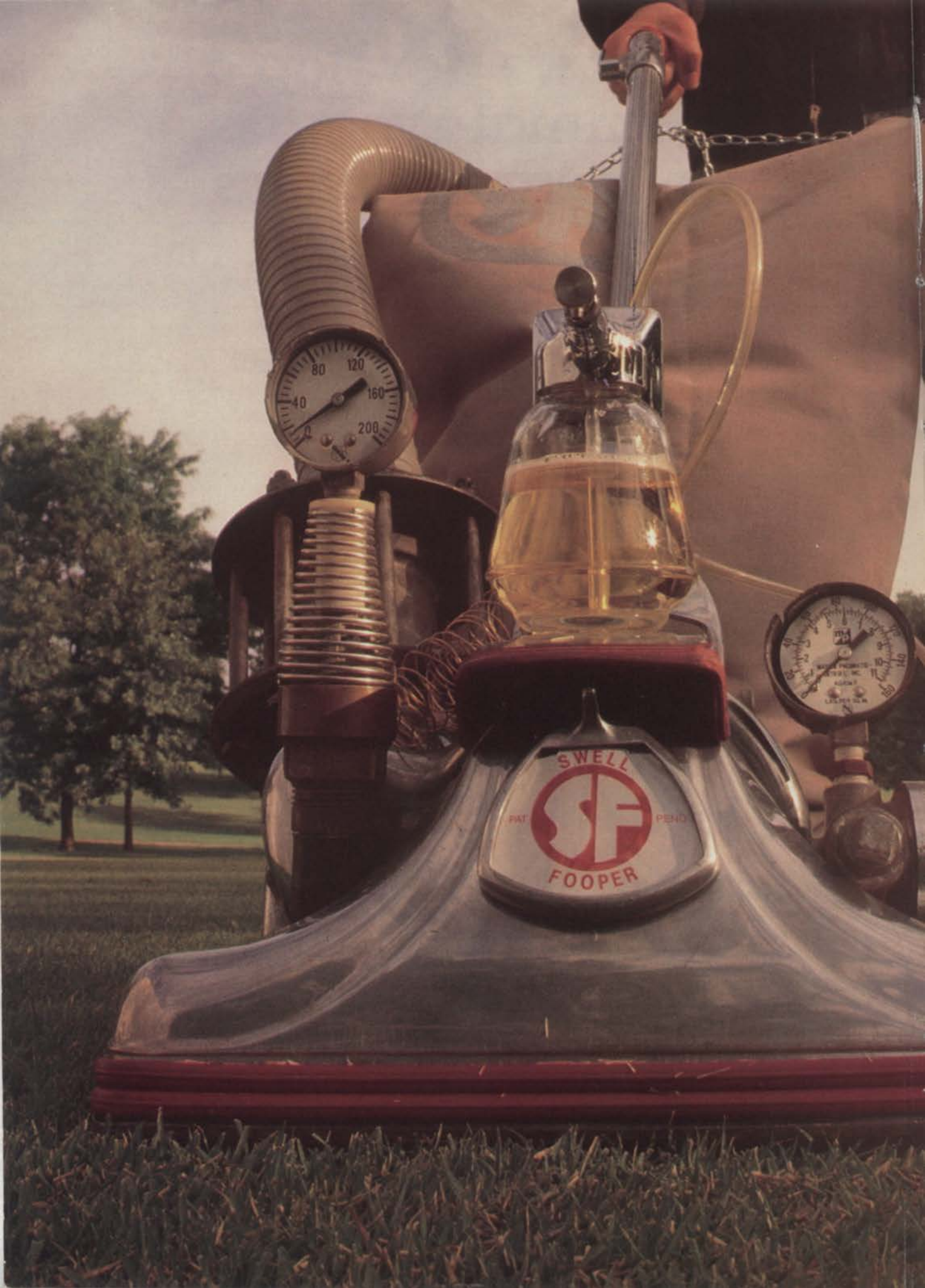
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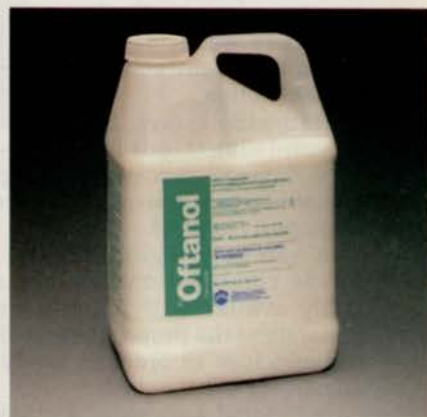
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ment. Repeated mowing, once or twice a year, is needed for maintenance on most weed-infested areas.

Mower types vary, but most consist of sharp rotary blades. Heavy duty shredders can be used on large brush and small trees, three- to four-inches in diameter.

Disking. Large disk plows or tandem disks will destroy stands of small brush. They may also destroy the grass stand. Disking is limited to tillable soils. Disking prepares a good seedbed, although compaction by a cultipacker, roller, or other implement may be desired. The operation is expensive.

Cost of mechanical treatments is usually closely correlated with degree of soil disturbance and size and density of brush to be removed. Dozing, disking, and grubbing are among the most effective mechanical brush control treatments, but are the most costly to perform, while mowing is less expensive. Hand methods, such as sawing, axing or grubbing, are sometimes effective, but are slow, costly, and laborious.

Chemical Control. Herbicides are an important means of weed and brush control. Compared to mechanical practices, herbicides are usually less expensive, less damaging to the environment, and often more effective.

Herbicide sprays, however, are subject to drift and may damage susceptible crops or valuable vegetation on nearby areas if improperly applied.

A variety of herbicides and herbicide combinations are commercially available. It is necessary to understand the properties and effects of herbicides in order to safely and effectively use them.

Individual herbicides and combinations of herbicides are used for weed and woody plant control. After manufacturing, technical (pure) herbicide must be formulated with other ingredients to prepare usable products for ease of handling and to obtain the desired effects.

Since very small amounts are sometimes required per unit of land, uniform application is essential. Herbicides are formulated as liquid con-

centrates, wettable powders, and granules or pellets. It is important to know the characteristics and precautions to be taken when using herbicides.

Characteristics of Herbicides

Phenoxy herbicides, such as 2,4-D, 2,4-DB, dichlorprop, and MCPA have

grasslands or grass crops. Rates of 0.25 to 2 pounds per acre effectively control many broadleaf plants.

The phenoxy compounds are relatively inexpensive and easy to apply. They are usually marketed as liquid concentrates as salts or esters.

The ester formulations are often more effective as foliar sprays on trees and brush than the salts. Amine formulations commonly available include dimethylamine, triethylamine, diethanolamine, trimethylamines, triethanolamine, and others.

Other inorganic salts of the phenoxy that have been sold include the ammonium, sodium, potassium, and lithium salts. Salts are sprayed in water carriers.

Esters are classified as high volatile or low volatile, depending upon how readily they vaporize. Low volatile esters should be used in areas where sensitive crops or vegetation are grown.

The concentration of the active ingredient, the "acid equivalent," is indicated on the label as pound-per-gallon. If a herbicide concentrate has an acid equivalent of 4 pounds per gallon, then 1 gallon of the concentrate contains 4 pounds by weight of the parent acid, regardless of formulation. Usually the most concentrated formulations cost less per pound and are more economical to use than weaker concentrates.

The phenoxy compounds are readily absorbed by leaves and are translocated throughout the plant along with the products of photosynthesis. Oil soluble formulations, usually esters, applied in kerosene or diesel oil will penetrate the bark of most woody plants, and can be used as basal sprays or foliar sprays to individual plants.

Phenoxy herbicides, however, are more commonly applied broadcast to large areas containing dense stands of brush. These herbicides are sprayed on above-ground parts and foliage since they are not effective at economical rates as soil-applied herbicides.

Organic arsenicals. The organic arsenicals include DSMA, MSMA, and cacodylic acid and are available as liquid concentrates. These compounds

continued on page 72

Calculating Rates and Quantities

Granular Materials

Example—A landscaper needs to treat 4,000 sq. ft. of Juniper with 4% RONSTAR granules at 4 lbs. aia. How much RONSTAR is required?

Formula

$$\text{lbs. aia} \times \frac{\text{sq. ft. to be treated}}{44,000 \text{ sq. ft./acre}} \times \frac{100}{\% \text{ granular}} = \text{lbs. required to treat area}$$

Calculation

$$4 \text{ lbs. aia} \times \frac{4,000}{44,000} \times \frac{100}{4} = 9.1 \text{ lbs. 4\% granular RONSTAR}$$

Wettable Powders

Example—A landscape firm needs to treat 4,000 sq. ft. with 50% DEVRINOL wettable powder at the rate of 10 lbs. aia.

Formula

$$\text{lbs. aia} \times \frac{\text{sq. ft. to be treated}}{44,000 \text{ sq. ft./acre}} \times \frac{100}{\% \text{ powder}} = \text{lbs. required to treat area}$$

Calculation

$$10 \text{ lbs. aia} \times \frac{4,000}{44,000} \times \frac{100}{50} = 1.8 \text{ lbs. 50\% DEVRINOL W.P. to be mixed in enough water to cover 4,000 sq. ft.}$$

Liquid Concentrate

Formula

$$\text{lbs. aia} \times \frac{\text{sq. ft. to be treated}}{44,000} \times \frac{1}{\text{lbs. active ingredient/gallon}} = \text{gallons required to treat area}$$

Calculation

$$2 \text{ lbs. aia} \times \frac{22,000}{44,000} \times \frac{1}{4} = .25 \text{ or } \frac{1}{4} \text{ gal. TREFLAN to be mixed in enough water to cover } \frac{1}{2} \text{ acre}$$

been used for over 30 years and are effective for the control of many weed and brush species. They are used to produce changes and shifts in plant cover for crops, pastures, lawns, or wildlife habitat.

The phenoxy herbicides are not toxic to livestock or man at dosages labeled for weed control and disappear rapidly from the soil, vegetation, and water. They do not accumulate in the food chain.

Susceptible vegetation, especially broadleaf plants, may be damaged from spray drift or from volatilization. Following label instructions and making applications during favorable weather should prevent drift and volatilization problems.

The phenoxy herbicides selectively control broadleaf weeds in



New Du Pont Landscape Fabric. It lets water through to give you healthier beds with less work.

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Call 800-441-7515 for the name of the nearest distributor and more information about DuPont Landscape Fabric. Or write DuPont Company, Room G40955, Wilmington, DE 19898.



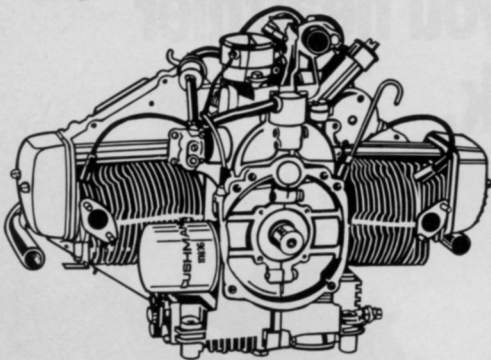
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That's why we created the Cushman Grass Grooming System. With it, you can cut, catch, dump and resume cutting without interruption.



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At the heart of our Grass Grooming System is the Cushman Front Line™ mower.

And at the heart of the Front Line is a remarkable new 22-hp gas engine.

It gives you the power to maintain blade speed through tall grass, dense weeds and other conditions that might stop other mowers.

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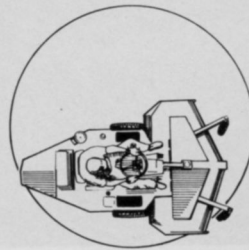
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Dual traction assist pedals provide a tight, zero turning radius.

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When it's filled, just back the Front Line up to a truck or container, engage the hydraulic control and the Grass Caddy hopper lifts 4½-feet above the ground and dumps.

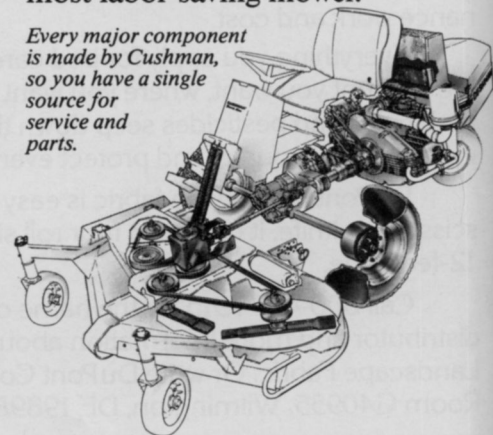
In seconds, you're back on the turf mowing again. And you've never once left the driver's seat.



The Grass Caddy collects up to 16 bushels between dumps.

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