

Survey of manufacturers of

Company	Product Name	Active Ingredient	Area of Course Labeled for	Weeds Controlled	Cost/Acre
Applied Biochemists	Citrine Plus	Copper Ethanolamine Complexes	Aquatic sites	Filamentous, planktonic, chara algae	\$50
	Weedtrine-D	Diquat dibromide	Aquatic sites	Submerged, floating, emergent aquatic weeds	\$270
	Weedtrine II	Isooctyester of 2,4-D	Aquatic sites	Submerged broadleaf, floating leaf weeds	\$300
Ciba-Geigy	Pennant	Metolachlor	Ornamentals	Barnyardgrass, black nightshade, carpetweed, crabgrass, crowfootgrass, fall panicum, Florida Pusley, foxtails, millet, galinsoga, goosegrass, pigweed, prairie cupgrass, red rice, signalgrass, southwestern cupgrass, witchgrass	N/A
Elanco	Surflan	Oryzalin	All warm-season turf, except greens	Over 50 annual grasses and broadleaf weeds	N/A
	Gallery	Isoxaben	All turf except greens	Over 44 broadleaf weeds	N/A
	Team	Belan & Treflan	All turf except greens	Crabgrass, Goosegrass, Poa Annuua, barnyardgrass, foxtail	N/A
	XL	Oryzalin & Benefin	All warm season turf butgreens	Over 50 annual grasses and broadleaf weeds	N/A
	Balan 2.5 G	Benefin	All turf butgreens	Crabgrass, goosegrass, Poa Annuua, barnyardgrass, foxtail	N/A
Fermenta ASC Corp.	Balan DF	Benefin	All turf butgreens	Crabgrass, goosegrass, Poa Annuua, Barnyard grass, Foxtail	N/A
	2+2	MCPP + 2,4-D amine	Established turf	Post-emergence control of many broadleaf weeds	\$9.50-\$11.50
	Dacthal	Dimethyl tetrachloroterephthalate	Established turf; not for use on bentgrass greens	Selective pre-emergence control of annual grasses and certain broadleaf weeds	\$60-\$75
Hoechst-Roussel	Daconate 6 (MSMA)	Monosodium Acid Methanearsonate	Well established actively growing turfgrass	Post-emergence control of annual grasses, nutsedge	\$5.50-\$6.50
	Acclaim	Fenoxaprop-Ethyl	All, including ornamentals	Crabgrass, goosegrass, barnyardgrass, foxtails; suppresses bermudagrass	\$34
LESCO, Inc.	Avail	Glyphosate	Renovation areas	Non-selective control of many annual, perennial grasses, broadleaf weeds, brush	N/A
	Weedone	2,4-DP, 2,4-D amine	Entire golf course	Most annual, perennial broadleaf weeds	N/A
	DPC Amine	2,4-DP, 2,4-D ester	Entire golf course	Most broadleaf weeds	N/A
	Weedone DPC	2,4-DP, 2,4-D ester	Entire golf course	Most broadleaf weeds	N/A
	Three-Way	Dicamba, MCPP, 2,4-D	Fairways, aprons, tees, roughs	Many broadleaf weeds	N/A
	MSMA 6.6	MSMA	Entire golf course	Many grasses, selected broadleaf weeds	N/A
	Bentgrass Selective	Dicamba, MCPP, 2,4-D	Bentgrass only	Most broadleaf weeds	N/A
	Lescopex	MCPP	Greens and fairways	Grasses, many broadleaf weeds	N/A
	Lescobor	Sodium metaborate tetrahydrate, boron trioxide	Renovation areas	Non-selective control of many grasses, broadleaf weeds	N/A
	A-4-D	2,4-D amine	Entire golf course	Many broadleaf weeds	N/A
	Pre-M 60 DG	Pendimethalin	Entire golf course	Pre-emergent control of a variety of grasses, broadleaf weeds	N/A
	Lescosan 7-G	Benzenesulfonamide	Entire golf course	Pre-emergent control of smooth, hairy crabgrass, redroot pigweed, barnyardgrass, lambsquarters, goosegrass, annual bluegrass, shepherds purse and deadnettle	N/A
	Lescosan 4-E	Same as 7-G	Entire golf course	Same as 7-G	N/A
	Dacthal 5-G	Dimethyl Tetrachloroterephthalate	Entire golf course	Pre-emergent control of crabgrass, other annual grasses, some broadleaf weeds	N/A
Mobay	2.5 Benefin	Benefin	Established turf	Annual grass weeds	N/A
	TFC	Chlorsulfuron	Spot control of tall fescue	Kentucky bluegrass, fine fescue, bentgrass, bahiagrass, bermudagrass	N/A
Monsanto	Sencor 75	Metribuzin	All bermudagrass with mowing height of 1/2 or more	Numerous broadleaves; grasses: Poa Annuua, goosegrass,	\$8
	Roundup	Glyphosate	Bare ground renovation and trimmed edges	Wide range of annual and perennial grasses, broadleaf weeds and brush	\$40-\$100
PBI/Gordon	Rodeo	2,4D/MCPP	Turf	Broadleaf weeds only	N/A
	Expedite	Dichlobenil	Around markers, trees, shrubs	Pre- and post-emergence control of annual and perennial grasses and broadleaf weeds	N/A
	Expedite	Fluazifop	Around shrubs, trees, ground, cover, flower beds; not turf	Post-emergence control of unwanted grasses	N/A
	Super TRIMEC	Phenoxyacetic and phenoxypropionic acids & dicamba	Everywhere but carpetgrass, St. Augustinegrass or bentgrass	Broadleaf weeds, including spurge, oxalis and ground ivy	\$11
	TRIMEC Classic	2,4-D, MCPP, dicamba	All cool season grasses	Many broadleaf weeds	\$8
	TRIMEC	2,4-D, MCPP, dicamba	Bentgrass greens, tees, fairways; St. Augustinegrass, centipede	Wide spectrum of broadleaf weeds	\$8
	TRIMEC Southern	MCPP, 2, 4-D, dicamba	All Southern turfgrasses	Wide spectrum of broadleaf weeds	\$8.75-\$13
	TRIMEC Plus	2,4-D, MCPP, dicamba & MSMA	Kentucky bluegrass, Bermuda	Crabgrass, yellow nutsedge, barnyardgrass, goose, dallise, johnson, ground ivy, spurge, oxalis and others	\$25-\$41
	Bensumec LF	Bensulide	Bentgrass, most other turfgrass dichondra,, ornamentals	Poa Annuua, crabgrass, barnyardgrass, goosegrass, foxtails, several broadleaf weeds	\$1.50 ft.
	Rhone-Poulenc	Chipco Ronstar G & 50WP	Oxadiazon	all areas except tees and greens	Most annual grasses; somebroadleaf weeds
Chip. Weedone		2,4-DP, 2,4-D amine	Entire golf course	most broadleaf weeds	N/A
DPC Amine		2,4-DP, 2,4-D ester	Entire golf course	Most broadleaf weeds	N/A
Chip. Weedone DPC Ester		2,4-DP, 2,4-D ester	Entire golf course	Most broadleaf weeds	N/A
Riverdale Chemical	Riverdale Series	2,4-D, MCPA, MCPP, 2,4-DP	Entire golf course	Most broadleaf weeds	Variable
Rohm and Haas	Kerb 50-W	Pronamide	Fairways, roughs, tees	Poa Annuua, bluegrass	Variable
O.M. Scott.	Proturf Series	Various	Entire golf course	Crabgrass, goosegrass, barnyardgrass, Poa Annuua, spurge, oxalis, chickweed, dandelions	Varies
Valent U.S.A.	Diquat	Dibromide	Landscape areas, cart paths, edges of lake	Post-emergence control of undesirable above-ground grass and broadleaf weed growth	N/A
W.A. Cleary	Weedone DPC	Butoxyethyl ester of	Fairways, greens	Most annual and perennial broadleaf weeds	\$9-\$12
	2,4-D and 2,4-DP	MCPP	Fairways, greens	Selected broadleaf weeds	\$6.40
	Cleary's MCPP	MCPP-2,4-D	Fairways	Selected broadleaf weeds	\$8.95
	MCPP-2,4-D	Anhydrous disodium methanearsonate	Fairways, greens	Selected grasses, broadleaf weeds	\$20-\$60

herbicides for golf courses

Application Suggestions

Apply early season, when water temperatures reach 60 F; 4 to 6 treatments necessary per year
 Apply early season, when water temperatures reach 60 F; 1 or 2 applications necessary per year
 Apply early season, when water temperatures reach 60 F; 1 or 2 applications necessary per season
 Liquid: Apply 2-4 pints/acre, preferably as a directed spray in a min. 15 gal. water per acre; apply before grass, broadleaf

weeds or yellow nutsedge emerge, or after existing weeds or nutsedge plants have been removed — apply once more if necessary

Herbicide should be applied only to established plantings; it will not control established weeds; applications should be made at least 90 days apart

Used on creeping and colonial bentgrass, Kentucky bluegrass, numerous fescues; perennial ryegrass, Bahiagrass parodi, Bermudagrass, centipedegrass, St. Augustinegrass, and zoysiagrass; can be applied in the fall

N/A
 N/A
 N/A
 N/A

Apply in spring or fall when weeds are actively growing
 Apply in early spring before weed seed germination; one application normally enough, but a second may be necessary at half the rate

One or more applications may be necessary; consult label for additional directions

Should be applied post-emergence, when undesirable grass has one leaf and five tillers

Apply to vigorously growing plants any time after emergence; delay mowing and other cultural practices for 7 days after application; rain or irrigation within 6 hours of treatment may cause a need for retreatment
 Apply 3-4 pints in 25-100 gal. water/acre; treatment at this rate may injure bent, St. Augustine, centipede, carpet grasses and newly seeded turf; DO NOT use on bentgrass tees and greens; can be applied any time weeds are actively growing
 Apply 3 to 4 pints in 25-100 gal. water/acre; treatment at this rate may injure bent, St. Augustine, centipede, carpet grasses and newly seeded turf; can be applied any time weeds are actively growing
 Apply 1.2 to 1.5 oz. in 5 gallons of water per 1,000 sq. ft.; apply as a foliar spray when weeds are young and actively growing; not recommended for bentgrass greens
 Mow turf to 1 to 1-1/2 inches before treatment; apply 1 oz. to 2 to 3 oz. surfactant and 5 gallons of water/1,000 sq. ft.; DO NOT apply to St Augustinegrass, DO NOT reseed for 2 weeks, DO NOT water for 24 hrs.
 Apply 3 to 4 pints in enough water for sufficient coverage; second application for hardy weeds should be made in 3 weeks; spring, early fall applications on actively growing weeds are most effective

Established greens, apply 4 pints in 30-40 gal. water/acre; established fairways, apply 4 to 6 pints in 30-40 gal. water/acre; DO NOT apply in temperatures above 90 F

May be applied as dry granular or water spray; for water application, dissolve up to 3 pounds per gallon; may be used any time during the growing season, but weeds are easier to control when they are young and actively growing

Apply 1 to 2 quarts in enough water for sufficient coverage per acre; DO NOT use on dichondra or creeping grasses except on a spot basis; newly seeded turf should not be treated
 Application must be made before germination; use only on well-established turf with thick and uniform stand; DO NOT apply to dichondra or bentgrass

Product should be applied only to well-established turf; see label for individual rates
 Same as above; on crabgrass product must be thoroughly watered in
 Apply uniformly at a rate of 210 pounds per acre before weeds germinate; one spring application normally provides season-long control

Apply 1 to 2 weeks before weed germination; optimum control is achieved when product is watered in; see label for individual rates
 Apply when desired turf is not under any stress; apply 2.76 to 5.33 oz. per acre; adequate moisture is required to activate the herbicide

For dormant turf, use 2/3 pounds in 40 gallons of water per acre in uniform broadcast spray; for actively growing turf, use 1/3 to 2/3 pounds in 40 gallons of water only when actively growing and not under stress — may repeat once after 1 week

One application of this non-selective herbicide controls most labeled weeds; repeat application required for new weeds that germinate and emerge after initial application; no soil residual

N/A
 N/A

N/A

Product is best when applied in cool weather and should not be applied when temperatures exceed 85 F; do not irrigate for 24 hrs. after application; 2 to 3 pints per 20 to 260 gal. water per acre
 Apply to actively growing weeds; avoid spraying during long excessively dry or hot periods unless irrigation is available; do not irrigate for 24 hrs. after application; 3-1/4 to 4 pints in 20 to 260 gal. of water per acre
 Apply to actively growing weeds; use reduced rates when soil is quite warm; do not apply when air temp. exceeds 80 F; 1 oz./1,000 square feet for greens; 3 to 4 pints per acre on other areas
 Apply to young and actively growing weeds; not during hot or dry periods or when grass is entering or emerging from dormancy; do not apply below 50 F or above 85 F; mix in 5 to 300 gal. water/acre
 Do not apply when temperatures exceed 80 F for bluegrass and 90 F for Bermudagrass, or during drought or other stresses on the grass; 1 to 1-2/3 gal. in 50 to 100 gal. water/acre for Bermuda

Apply prior to germination of unwanted vegetation; do not reseed within 4 months of application. 15 to 20 pints in 80-100 gal. water/acre for crabgrass only; see label for other rates and split applications

Apply pre-emergent to weed seeds for season-long control; normally late winter, early spring

Apply as needed any time weeds are actively growing

Apply as needed any time weeds are actively growing

Cost and amount of product necessary will vary with the product and type of weed
 One application necessary; low-pressure ground sprayer with 20-50 gallons of water is preferred; cost will vary with rates
 Some pre-emergence products should be applied before weeds sprout; some broadleaf weed applications for when the weed is actively growing

Apply 1 to 2 quarts plus 8 to 16 oz. ORTHO X-77 Spreader (non-ionic) per 100 gal. water; apply to young weeds; re-treatment may be necessary; avoid contact with food crop foliage or ornamental plants
 Apply 3 to 4 pints per acre in 25-100 gal. water; treatment at this rate may injure bentgrass, St. Augustinegrass, centipedegrass, carpetgrass, newly seeded turf
 On established greens, 2 quarts in 30-40 gallons of water/acre; on established fairways, 3 quarts in 30-40 gallons of water/acre
 On established fairways, 2 quarts in 30-40 gallons of water/acre
 For Crabgrass control, 2 or 3 applications of 1.82 gallons in 10-20 gallons of water/acre; dallisgrass, 2 or 3 applications of 3/63 gal. in 10-20 gal. water; for crab-dallisgrass control on primarily fescue or bentgrass, 1.09 gal. in 10-20 gal. water

Good cultural practices best weed defense

BY NEIL MATTHEWS

The Main function of weed control is to favor the desired turfgrass species over all other plant varieties, including broadleaf weeds and undesirable grasses.

"Weeds appear only when a 'hole' or weak spot, has been opened in the turf," says Dr. Thomas Watschke of Penn State University. "Many times, that weak spot is caused by improper management or cultural practices or outside factors such as traffic."

Some of the cultural practices likely to go wrong include:

- Improper mowing height and/or frequency.
- Improper irrigation (too much or too little).
- Improper rate and timing of fertilizer applications.
- Compaction.
- A pH balance that's too high or low.
- Thatch.
- Chemical injury.

"When a weed infestation is detected, the first question the superintendent should ask is how the weed got there," says Watschke. "Then, he should determine the species of weed infesting his course. Only then can he determine how to improve or add cultural practices to alleviate the situation."

Watschke adds that a good weed control program should remedy the offending management practice first because it will increase the efficacy of the herbicide selected.

A common problem that's often not considered, according to several experts in the field, is trimming.

String trimmers are used to scalp the ground next to obstacles. This scalping severely weakens the turf, opening up the bare ground for weed infestations. To remedy this situation, it is recommended that turf be left at two to three inches after trimming.

After cultural and management practices are in order, herbicide selection can begin.

There are a great many herbicides, each of which serves a distinct purpose. Some are used to clear an entire area of plants to prepare the area for reseeding. Others "select" a small number of weeds to control.

Similarly, prices vary greatly, according to the amount of herbicide needed for an individual job, the function of that herbicide and manufacturer costs.

As for the future of herbicides, all manufacturers believe environmental issues will lead the way. Government regulation and member/player concern about all pesticides will lead to new packages, new formulations and greater care in the use of chemicals.

Documentation will be the key for superintendents in the future. Superintendents will have to document movement of chemical products from the supplier through disposal of the product's package.

O.M. Scott's Sue Young might have said it best: "All manufacturers — and superintendents — are looking for herbicides that are more effective and more cost-effective," she said. "But the real issues concern user and environmental safety."

A list of herbicide producers, their addresses and telephone numbers is on page 29. All these companies were surveyed; some did not respond.