Herbicide soil persistence can affect overseeding and reestablishment efforts. Read the pesticide label for more information concerning potential effects on seed.

A complete weed control program includes both pre-emergence and post-emergence herbicides, as well as cultural practices.

The primary pre-emergence herbicides for grassy and broadleaf weeds in cool-season turf are benefin, bensulide, DCPA, pendimethalin, oxadiazon, and siduron.

Siduron is the only pre-emergence herbicide that can be applied near time of seeding. Bensulide and DCPA can be applied in the spring following a fall seeding.

Pre-emergence herbicides should be watered in so the chemical can form a barrier in the soil prior to weed seed germination.

The resulting chemical barrier should not be disturbed during key weed germination periods.

The herbicides should be applied two weeks prior to the expected weed seed germination period. Second applications may be necessary to provide control over the entire germination period. Contact your local university or industry turf specialist for germination times of primary weeds. Also, see the germination map for crabgrass and annual bluegrass in this guide.

Post-emergence herbicides. The primary post-emergence herbicides for grassy weeds in turf are the arsonates; MSMA, DSMA, CMA, and MAMA. Treated areas should not be reseeded for a month or more after application. See pesticide labels for details.

Bentgrass and fescue are more sensitive to arsonates than other cool-season grasses. CMA is the safest for bentgrass.

Weed foliage should be sprayed while still young (two- or three-leaf stage), if possible. The effectiveness of arsonates improves with temperature, so rates need to be increased for temperatures below 80 degrees F.

A new post-emergent herbicide for annual grass control has been introduced this season.

Acclaim offers a wider window of post-emergence control than the arsonates with less potential for turfgrass injury.

The primary post-emergence herbicides for broadleaf weeds are 2,4-D,
2,4-DP, dicamba, and MCPP. Formulations of these products, such as Trimec and Weedone DPC, provide increased effectiveness on hard-to-control species. Turflon-D (triclopyr plus 2,4-D) is effective on some of the more difficult-to-control broadleaf weeds, such as knotweed and yellow woodsorrel.

These herbicides should not be applied until a new lawn has been mowed at least three times. The target weeds should be actively growing for the proper interval between applications.

Winter annuals can be sprayed early in the year, followed by summer annuals and perennials. Fall treatment for perennials is possible.

The temperature at applications should be at least 60 degrees F. Applications during extreme heat or drought can cause severe damage to desirable turf.

Two treatments of post-emergence herbicides are generally necessary to control broadleaf weeds. See labels for the proper interval between applications.

Occasionally, a landscape manager or sod producer chooses to fumigate a seedbed prior to planting to reduce weed seed, control insects and disease, and eliminate off-type grasses.

Methyl bromide (Dowfume), metham (Vapam), dazomet (Mylone), and Vorlex are used for pre-plant fumigation. See labels for delay period following treatment and before seeding.

Renovation of turf stands is gaining acceptance, especially since the development of glyphosate (Roundup).

During renovation all existing vegetation is killed, and the area is reseeded in a matter of weeks without major cultivation. Glyphosate is deactivated within a few days after application. Ammonium, cacodylic acid, and dalapon can also be used, but the delay period for seeding may be from four to eight weeks.

Progress is being made in selectively killing annual bluegrass in perennial ryegrass, Kentucky bluegrass, and bentgrass fairways.

Late-summer and early-fall applications of ethofumesate (Progress) are particularly promising.

Late-season applications of mefliumide and flurprimidol have also reduced annual bluegrass competition in cool-season turfs.

### HERBICIDE MANUFACTURERS

- **American Cyanamid**  
  1 Cyanamid Plaza  
  Wayne, NJ 07470  
  (201) 831-2000.

- **The Andersons**, PO Box 119  
  Maumee, OH 43537  
  (419) 893-5050.

- **Applied Biochemists**  
  5300 West County Line Rd.  
  Mequon, WI 53092  
  (414) 242-5870.

- **BASF Wyandotte**  
  100 Cherry Hill Rd.  
  Parsippany, NJ 07054  
  (201) 263-3400.

- **Ciba Geigy Corp.**  
  PO Box 18300  
  Greensboro, NC 27419  
  (919) 292-7100.

- **W.A. Cleary Chemical Corp.**  
  1049 Somerset St.  
  Somerset, NJ 08873  
  (201) 247-8000.

- **Crystal Chemical Co.**  
  1523 North Post Oak Rd.  
  Houston, TX 77055  
  (713) 682-1221.

- **Dow Chemical USA**  
  PO Box 1706  
  Midland, MI 48640  
  (517) 636-1105.

- **Drexel Chemical Co.**  
  2487 Pennsylvania St.  
  Memphis TN 38109  
  (901) 774-4370.

- **E.I. Du Pont de Nemours**  
  1007 Market St.  
  Wilmington, DE, 19898  
  (302) 774-1000.

- **Elanco Products Co.**  
  Lilly Corporate Center Indianapolis, IN 46285  
  (317) 261-3759.

- **PBI/Gordon Corp.**  
  1217 West 12th St.  
  Kansas City, MO 64101  
  (816) 421-4070.

- **Hopkins Agric. Chem. Co.**  
  PO Box 7532  
  Madison, WI 53707  
  (608) 222-0624.

- **ICI Americas, PO Box 751**  
  Wilmington, DE 19899  
  (302) 575-3000.

- **Lebanon Chemical Corp.**  
  PO Box 180  
  Lebanon, PA 17042  
  (717) 273-1685.

- **Monsanto Co.**  
  800 North Lindbergh Blvd.  
  St. Louis, MO 63167  
  (314) 694-1000.

- **Nor-Am Chemical Co.**  
  3509 Silverside Rd.  
  PO Box 7495  
  Wilmington, DE 19803.  
  (302) 575-2000.

- **Ortho Div., Chevron**  
  575 Market St.  
  San Francisco, CA 94105  
  (415) 894-7700.

- **Pennwalt Corp.**  
  Three Pkwy.  
  Philadelphia, PA 19102  
  (215) 587-7000.

- **Regal Chemical Co.**  
  PO Box 900  
  Alpharetta, GA 30021  
  (404) 475-4837.

- **Rhone Poulenc Inc.**  
  Agrichemical Div.  
  PO Box 125  
  Monmouth Junc., NJ 08852  
  (201) 297-0100.

- **Rohm & Haas Co.**  
  Independence Mall West  
  Philadelphia, PA 19105  
  (215) 592-3000.

- **OM Scott & Sons**  
  Proturf Div.  
  Marysville, OH 43041  
  (513) 544-0011.

- **SDS Biotech**  
  7528 Auburn Rd.  
  Painesville, OH 44077  
  (216) 357-3000.

- **Stauffer Chemical Co.**  
  Agricultural Chem. Div.  
  Westport, CT 06881  
  (203) 222-3294.

- **Union Carbide**  
  Agricultural Products  
  T.W. Alexander Drive  
  Research Triangle Park, NC, 27709.  
  (919) 549-2000.

- **Uniroyal Chemical**  
  320 Elm St  
  Naugatuck, CT 06770  
  (203) 723-3000.

- **Velsicol Chemical Corp.**  
  341 E. Ohio  
  Chicago, IL 60611  
  (312) 670-4665.

- **Vertac Chemical Corp.**  
  5100 Poplar Ave.  
  Suite 2414  
  Memphis, TN 38137  
  (901) 767-6851.

- **Vineland Chemical Co., Inc.**  
  1611 W. Wheat Rd.  
  PO Box 745  
  Vineland, NJ 08360  
  (609) 691-3535.