

# Chemical Dealers

continued

Foster & Gardner, (Best Prods., Elanco, PBI-Gordon), Coachella, 714-398-6151  
Larry Fricker Company, (Elanco, Mallinckrodt), Tustin, 714-544-2600  
Interlink Agriculture Chemicals, Inc., (Best Prods., Creative Sales), Modesto, 209-521-2390  
Jack's Orchard Supply, (Best Prods.), Chico, 916-343-4552  
James Grain Company, (Best Prods.), San Jose, 408-293-5732  
L & V Farm Sales, (Best Prods., Elanco), Fremont, 415-792-4031  
(PBI-Gordon), Newark, 415-792-4031  
Los Angeles Chemical, (Best Prods., Elanco, PBI-Gordon), Southgate, 213-583-4761  
J. Harold Mitchell, (Best Prods.), San Gabriel, 213-287-1101  
(PBI-Gordon), San Gabriel, 213-283-7721  
Monterey Chemical Company, (Elanco), Fresno  
Moyer Chemical, (Elanco, Mallinckrodt, Maag, PBI-Gordon), San Jose, 408-297-8088  
Moyer Chemical Company, (Maag, PBI-Gordon), Santa Ana, 714-949-2871  
Nilsen Company, (Best Prods.), Eureka, 707-442-3741  
Northern California Fertilizer, (Best Prods., Elanco, PBI-Gordon), San Jose, 408-292-7957  
Nurserymen's Exchange, (Elanco, Mallinckrodt), San Francisco, 415-392-0078  
Occidental Chemical Company, (Elanco), Lathrop  
Orange County Farm, (Best Prods.), Orange, 714-833-8682  
Orchard Supply, (Best Prods., Elanco, PBI-Gordon), Sacramento, 916-446-7821  
Oxychem Brentwood, (Best Prods.), Brentwood, 415-634-1155  
Oxychem Hughson, (Best Prods.), Hughson, 209-883-4447  
Oxychem Live Oak, (Best Prods.), Live Oak, 916-695-2181  
Oxychem Stockton, (Best Prods.), Stockton, 209-464-8328  
Pennwalt, (Pennwalt), Fresno, 209-435-2500  
Plant Gro Corporation, (Elanco, Mallinckrodt, Velsicol), San Jose, 408-292-4332  
Preston Weed Control Co., (Elanco), Whittier  
PureGro Company, (Elanco), Los Angeles  
(Elanco), Stockton  
Purity Chemical Company, (Best Prods., PBI-Gordon), Santa Rosa, 707-546-2585  
Ramsey Seed Company, (PBI-Gordon), Manteca, 209-833-1721  
Reno Ranch & Sprinkler Supply Co., (Best Prods.), Reno, 702-826-5022  
Ripon Farm Service, (Best Prods.), Ripon, 209-599-2188  
Robinson Fertilizer Company, (Best Prods., Creative Sales, Elanco, Mallinckrodt, PBI-Gordon), Orange, 714-538-3575  
San Joaquin Sulfur Company, (Best Prods.), Lodi, 209-368-6676  
Sanders Plant Foods, (Best Prods.), Santa Maria, 805-937-7191  
Seeley's Nursery, (Best Prods.), Fresno, 209-442-8118  
Sierra Moreno Merc. Co., (Creative Sales), Mountain View, 415-967-4676  
F. F. Smith Company, (Best Prods.), Sacramento, 916-371-7830  
Target Chemical Co., (Best Prods., Elanco, Fisons, Mallinckrodt, PBI-Gordon, Velsicol), Carritos, 213-865-9541  
(Elanco, Best Prods., PBI-Gordon, Velsicol), San Jose, 408-293-6032  
John Taylor Fertilizer, (Best Prods.), Sacramento, 916-443-6591  
Thompson Hayward, (Thompson Hayward), Brea, 714-529-3973; 213-694-2048  
(Thompson Hayward), Fresno, 209-251-7144  
(Thompson Hayward), Yakima, 509-453-5575  
Van Waters & Rogers, (Fisons), San Mateo, 415-573-8000  
Viola Seed Company, (Mallinckrodt), San Francisco, 415-585-8234  
Wilbur-Ellis Company, (Mallinckrodt, PBI-Gordon), Chula Vista, 714-422-5321  
(Elanco, Mallinckrodt), Los Angeles, 213-685-8579  
Winton Ag Chemical, (Best Prods.), Wincon, 209-358-7189  
Yamada Company, (Best Prods.), Gardena, 213-324-1337

## Colorado

American Fertilizer & Chem. Co., (Elanco), Henderson  
Balmco Chemicals Inc., (Fisons), Greeley, 303-356-4400  
Boyd Distributing Co., (Mallinckrodt), Denver  
Denver Wholesale Florists, (Elanco, Mallinckrodt), Denver, 303-399-0970  
Gorby, Inc., (PBI-Gordon), Colorado Springs, 303-598-1539  
Great Western Sugar Company, (Fisons), Denver, 303-893-4600  
L. L. Johnson Distributing Co., (Mallinckrodt), Denver  
Pueblo Chemical & Supply, (PBI-Gordon), Pueblo  
Randall Industries, (Creative Sales), Grand Junction, 303-242-3787  
S.A.J. Turf Products, (PBI-Gordon), Westminster, 303-426-4164  
Swingle, Inc., (Creative Sales), Denver, 303-399-2301  
Thompson Hayward, (Thompson Hayward), Denver, 303-321-3802  
(Thompson Hayward), Grand Junction, 303-245-0408  
United Fruit Growers Assn., (Creative Sales), Palisade, 303-464-5671  
Van Waters & Rogers, (Mallinckrodt, PBI-Gordon, Velsicol), Denver, 303-388-5651

## Connecticut

Cadwell & Jones, Inc., (Elanco, Velsicol), East Hartford, 203-289-9555  
C. B. Dolge Company, (PBI-Gordon), Westport, 203-227-9591

Magovern Company, (Mallinckrodt), Fairfield  
(Mallinckrodt), Wincor Locks  
Muench Co., Inc., (Creative Sales), Stamford, 203-323-9712  
Old Fox Chemical Co., (PBI-Gordon, Velsicol), Hazardville, 203-749-8339  
Emanuel Shemin Horticulturist, (Elanco, PBI-Gordon), Greenwich, 203-531-7352  
Somers Turf Supplies, (PBI-Gordon), Devon, 203-878-2108  
Thompson Hayward, (Thompson Hayward), Cheshire, 203-272-4866  
Turf Products Corporation, (Elanco, PBI-Gordon), So. Windsor, 203-289-3471

## Florida

Apopka Growers Supply, (Elanco, Mallinckrodt, Velsicol), Apopka, 305-886-5555  
Asgrow Florida Company, (Mallinckrodt), Plant City, 813-752-1177  
Atlantic Fertilizer and Chemical Co., (Mallinckrodt), Apopka, 305-889-2111  
(Elanco, Mallinckrodt, PBI-Gordon, Velsicol), Homestead, 305-247-8800  
Bingham Seed Company, (Elanco, PBI-Gordon, Velsicol), Jacksonville, 904-768-1503  
Chase & Company, (Elanco, PBI-Gordon, Velsicol), Sanford, 305-322-4552  
Gulf Shore Turf Supply, Inc., (Mallinckrodt, PBI-Gordon, Velsicol), Pensacola, 904-968-2183  
Hector Agr. Export, Inc., (Mallinckrodt), Miami, 305-621-7581  
So. Agr. Insecticides, (Mallinckrodt), Palmetto, 813-722-3285  
Southern Chemicals, Inc., (Elanco), Sanford  
Southern Mill Creek Prod., (Mallinckrodt), Miami  
(Elanco, Fisons, Mallinckrodt, Velsicol) Tampa, 813-626-2111  
Stephenson Chemical Co., (Velsicol), Jacksonville, 904-355-4901  
Superior Fertilizer & Chem. Co., (Elanco), Tampa  
Swift Chemical Company, (PBI-Gordon, Velsicol), Winter Haven, 813-293-3147  
Thompson Hayward, (Thompson Hayward), Sanford, 305-322-5716  
Tieco Gulf Coast, Inc., (Elanco, Mallinckrodt, PBI-Gordon), Pensacola, 904-434-5475  
Universal Enterprises, (Elanco, Mallinckrodt), Pompano Beach, 305-941-0600  
USS Agri-Chemicals, (Elanco), Davenport  
Woodbury Chemical Company, (Elanco, Fisons, Velsicol), Princeton, 305-247-0524  
(Fisons), Mt. Dora, 904-383-4181

## Georgia

Chemscape, Div. of Chemlawn, (Creative Sales), Norcross, 404-448-2963 800-241-6520  
Dettelbach Pesticide Corporation, (Fisons), Atlanta, 404-237-1862 (0077)  
Georgia Golf & Garden Supply Co., (Elanco, Mallinckrodt, PBI-Gordon), Doraville, 404-448-1410  
Gold Kist, Inc., (Elanco), Atlanta  
Graco Fertilizer Co., (Elanco), Cairo  
Grund Industries, Inc., (Elanco), Zebulon  
Lawn & Turf, Inc., (Elanco, Mallinckrodt, PBI-Gordon), Conyers, 404-483-4743  
Regal Chemical Company, (Elanco, Mallinckrodt, PBI-Gordon, Velsicol), Dunwoody, 404-394-0475  
Southern Mill Creeks Products, (Velsicol), Atlanta, 404-355-6583  
Stephenson Chemical Co., (Elanco, Fisons, PBI-Gordon, Velsicol), College Park, 414-762-0194  
Thompson Hayward, (Thompson Hayward), Albany, 912-436-5787 (Thompson Hayward), Americus, 912-924-6191 (Thompson Hayward), Atlanta, 404-351-0654 404-394-7538 (Velsicol), Atlanta, 404-355-6583 (Thompson Hayward), Camilla, 912-336-5638 (Thompson Hayward), St. Gabriel, 504-642-8391  
Toro Distrib-Atlanta, (Mallinckrodt), Atlanta  
USS Agri-Chemicals, (Elanco), Albany (Elanco), Atlanta  
Woolfolk Chemical Works, Inc., (Elanco, PBI-Gordon), Fort Valley, 912-825-5511

## Hawaii

Brewer Chemical, (Elanco, Mallinckrodt), Honolulu, 808-533-4411  
C. T. Enterprises, Inc., (Velsicol), Honolulu, 808-841-5956  
Frietas Enterprises, (Creative Sales), Makawao, 808-877-5979  
Occidental Chemical Co., (PBI-Gordon), Hilo (Elanco), Honolulu (PBI-Gordon), Kahului (PBI-Gordon), Lihue  
Occidental Chemicals Hawaii, Inc., (PBI-Gordon), Honolulu

## Idaho

Steve Regan Company, (Best Prod., Elanco, PBI-Gordon), Boise, 208-375-1042  
Western Farm Services, (Fisons), Jerome, 202-734-3838  
Wilbur-Ellis Company, (Fisons), Caldwell, 208-459-1631

## Illinois

George J. Ball, Inc., (Elanco, Mallinckrodt), West Chicago, 312-231-3500  
Behm & Hagemann, Inc., (Creative Sales, Elanco), Peoria, 309-674-5153  
Chicago Toro-Turf-Irrigation Co., (Elanco, Mallinckrodt), Itasca  
Arthur Clesen, Inc., (Elanco, PBI-Gordon), Wheeling, 312-537-2177  
George A. Davis, Inc., (Elanco, Mallinckrodt, PBI-Gordon, Velsicol), Chicago, 312-763-6363  
Drake-Scruggs Equipment, Inc., (PBI-Gordon), Springfield, 217-753-3871

Fister/Warren, (Creative Sales), Des Plaines, 312-296-4450  
Florist Products, Inc., (Elanco, Mallinckrodt), Des Plaines, 312-437-5103  
C. D. Ford & Sons, (PBI-Gordon), Geneseo, 309-944-4661  
Illinois Lawn Equipment (Mallinckrodt), Orland Park  
Geo. Keller & Sons Co., (Creative Sales), Quincy, 217-222-3161  
Lake Cook Farm Supply Co., (Creative Sales, Elanco), Des Plaines, 312-824-6665  
W. B. McCloud & Company, (Elanco), Schaumburg  
Olsen Distributing Co., (Creative Sales, PBI-Gordon), Barrington, 312-381-9333  
Paarberg Chemicals, (Elanco), South Holland  
Permalawn, Inc., (Creative Sales), Evanston, 312-864-5045  
Planter's Aide, Inc., (Creative Sales), Melrose Park, 312-345-4390  
Professional Turf Specialty, (Elanco, Mallinckrodt, PBI-Gordon), Bloomington, 309-829-5031  
Scruggs-Drake Equipment, Inc., (PBI-Gordon), Decatur  
Leon Short & Sons, Inc., (Elanco, Mallinckrodt, PBI-Gordon, Velsicol), E. Peoria, 309-694-1493  
Siemer Milling Co., (Creative Sales), Teutopolis, 217-857-3131  
Thompson Hayward, (Thompson Hayward), Chicago, 312-847-2000 (Thompson Hayward), Park Ridge, 312-299-2074 (Thompson Hayward), Rockford, 815-965-0909  
Toro Distributing, (Velsicol), Itasca, 312-773-2110  
Turf Management Supply, (Creative Sales, PBI-Gordon), Rockton, 815-624-7578  
USS Agri-Chemicals, (Elanco) Chicago Heights (Elanco) East St. Louis  
V-G Supply Company (Elanco, PBI-Gordon, Velsicol), Morton Grove, 312-965-3400  
Vaughan's Seed Company, (Elanco, Mallinckrodt, Velsicol), Downers Grove, 312-969-6300  
Weeds, Inc., (Elanco), Palos Heights

## Indiana

Cory Orchard Supply Company, (Creative Sales, Elanco, PBI-Gordon), Indianapolis, 317-634-7963  
Desco Chemical, (Creative Sales, Mallinckrodt), Indianapolis, 317-293-8183 (Elanco, Creative Sales, PBI-Gordon), Nappanee, 219-773-7781  
Indiana Seed Company, (Elanco), Noblesville  
Kenney Machinery Corp., (Elanco, Mallinckrodt, Velsicol), Indianapolis, 317-293-4793  
Kova Fertilizer, (Elanco), Greensburg  
M.G.R. Feed Co., Inc., (Creative Sales), Hammond, 219-932-4588  
Riley Lawn & Golf Equipment, (Elanco, Mallinckrodt, Velsicol), Indianapolis, 317-291-2280 (Velsicol), Fort Wayne, 219-484-9605  
Seedkem, Inc., (Creative Sales, Elanco, Mallinckrodt, PBI-Gordon), Evansville, 812-424-2401  
Thompson Hayward, (Thompson Hayward), Indianapolis, 317-357-8436  
Turf Specialties, (Mallinckrodt), Fort Wayne  
USS Agri-Chemicals, (Elanco, Velsicol), Jeffersonville, 812-282-0471

## Iowa

Aidex Corporation, (Elanco), Council Bluffs  
W. R. Anderson Distributing Co., (PBI-Gordon), Sioux City, 712-252-1604  
Baer Ag Supply, (PBI-Gordon), Waukee, 515-987-4763  
Big Bear Turf Co., (PBI-Gordon), W. Des Moines, 515-225-1271  
Big Bear Turf Inc., (Velsicol), Des Moines, 515-243-1271  
Brayton Chemical Inc., (Elanco, PBI-Gordon), 319-752-6324  
Foster's Inc., (Creative Sales, Elanco, PBI-Gordon), Waterloo, 319-235-6548  
Hawkeye Seed Company, Inc., (PBI-Gordon), Cedar Rapids  
Leisure-Aid, (PBI-Gordon), Council Bluffs, 712-366-2441  
Little Wheels Ltd., (Elanco, Mallinckrodt, PBI-Gordon, Velsicol), Iowa City, 319-354-1357  
Mann Chemical & Orchard Supply Co., (Elanco), Woodbine  
May Seed & Nursery Co., (Creative Sales), Shenandoah, 712-246-1020  
Meyer Equipment Co., (PBI-Gordon), Elkader  
Mount Arbor Nurseries, (Elanco), Shenandoah  
Rest Haven Turf Service, (Elanco, PBI-Gordon), W. Des Moines, 515-279-8861  
Thompson Hayward, (Thompson Hayward), Davenport, 319-322-3511 (Thompson Hayward), Des Moines, 515-266-1191  
Tri-State Toro, (PBI-Gordon), Davenport, 319-326-4416  
Trusty Supplies, (Creative Sales), Council Bluffs, 712-322-2539

## Kansas

Bartels & Shores, (PBI-Gordon), Wichita, 316-262-5141  
Champion Turf Equipment, Inc., (PBI-Gordon), Wichita, 316-943-0283  
Chem-Trol, Inc., (Elanco), Kansas City  
Landsco Corp., (PBI-Gordon, Velsicol), Salina, 913-825-0578  
Rhodes Chemical Co., (Creative Sales, Fisons, PBI-Gordon, Velsicol), Kansas City, 913-432-2424  
Swecker-Kripp, (Creative Sales, PBI-Gordon), Topeka, 913-234-5652  
The Industrial Fumigant Co., (Fisons), Olathe, 913-782-7600  
Thompson Hayward, (Thompson Hayward), Kansas City 913-321-3131 (Thompson Hayward), Wichita, 316-263-1244  
Robert Wise Company, (Creative Sales, PBI-Gordon), Wichita, 316-838-1474

## Kentucky

Bunton Seed Company, Inc., (Elanco, PBI-Gordon), Louisville, 502-584-0136

## Chemical Dealers

Calvert Tree & Landscaping, Inc., (Creative Sales), PeWee Valley, 502-425-0838  
Jack Dayton & Son, (Mallinckrodt), Louisville  
George W. Hill & Co., Inc., (Creative Sales, Elanco, Mallinckrodt, PBI-Gordon, Velsicol), Florence, 606-371-8423  
Ky-Inna Turf Supply Company, Inc., (Elanco, Mallinckrodt, PBI-Gordon), Louisville, 502-491-8400  
Premium Seed Company, (Mallinckrodt), Louisville, 502-582-3897

### Louisiana

Johnnie Bayles Supply Co., Inc., (StaGreen), West Monroe  
Burlap Sales Company, (Elanco), New Orleans  
Chem-Ag, Inc., (Elanco), Lafayette  
Savvy Chemical Company, (Velsicol), Metairie, 504-835-5926  
Southern Specialty Sales Co., Inc., (Elanco, Mallinckrodt, PBI-Gordon), New Orleans, 504-486-6101  
Tammany Turf & Supply, Inc., (PBI-Gordon), Covington, 504-892-5011  
Thompson Hayward, (Thompson Hayward), New Orleans, 504-866-3601 (Thompson Hayward), Shreveport, 318-424-7723  
USS Agri-Chemicals, (Velsicol), Covington, 504-892-2955  
Al Wyche Distributor (Elanco), Plain Dealing  
Wyche Golf Course and Specialty Co., (PBI-Gordon, Velsicol), Baton Rouge, 504-925-2986 (PBI-Gordon, Velsicol), Plain Dealing, 318-226-4484

### Maine

Yexas, Inc., (Elanco, PBI-Gordon), South Portland, 207-799-2241

### Maryland

Adams Equipment, Inc., (Mallinckrodt), Baltimore (Mallinckrodt) Silver Spring  
Ag-Chem, Inc., (Elanco), Girdletree  
Agrotec, Inc., (Mallinckrodt), Salisbury, 301-749-8496  
Cornell Chemical & Equipment Co., Inc., (Elanco, Mallinckrodt, PBI-Gordon, Velsicol), Baltimore, 301-247-1525  
G. L. Cornell Company, (Elanco, Mallinckrodt), Gaithersburg  
Meyer Seed Company, (Elanco), Baltimore  
Summit Chemical Company, (Elanco), Baltimore  
Vaughan-Jacklin Corporation, (Elanco, PBI-Gordon), Landover

### Massachusetts

Jas. P. Brown Company, (Mallinckrodt, Velsicol), Worcester, 617-757-7462  
Bruckman, Inc., (Elanco), Lawrence  
The Clapper Company, (Elanco, Mallinckrodt, PBI-Gordon, Velsicol), West Newton, 617-244-7900  
Tom Duffy, (Creative Sales), Norwood, 617-769-4300  
Farm Bureau Association, (Elanco, Mallinckrodt, PBI-Gordon), Waltham  
Griffin Greenhouse Supplies, Inc., (Elanco, Mallinckrodt), Tewksbury, 617-944-0519  
Grounds Equipment Company, (PBI-Gordon), Newton Center, 617-244-7541  
Tom Irwin Company, (Elanco, Mallinckrodt, Velsicol), Burlington, 617-273-0143  
Magovern Company, (Mallinckrodt), Pittsfield  
R. F. Morse and Son, Inc., (Elanco, PBI-Gordon), West Wareham, 617-295-1553  
Railroad Weed Control, Inc., (Elanco), Westfield  
Richey & Clapper, Inc., (PBI-Gordon), Natick, 617-235-6568

### Michigan

Agrico Chemical Company, (Fisons), Saginaw, (517) 323-2125  
American Horticultural Supply, (Mallinckrodt), West Bloomfield, (313) 626-2623  
Billings Feed Store (Elanco) Royal Oak  
Burdick Seed Company (PBI/Gordon) Saginaw (517) 753-3406  
J. J. Dill Company (Elanco, Mallinckrodt, PBI/Gordon, Velsicol) Kalamazoo, (616) 349-7755  
Fergusons Lawn Equipment (PBI/Gordon, Mallinckrodt), Traverse City, (616) 946-2440  
Grower Service Corporation (Fisons), Saginaw, (517) 323-2125  
Haviland AgriChemical Company (Elanco), Grand Rapids L & E Chemical Company (Elanco), Royal Oak  
Lawn Equipment Company (PBI/Gordon, Mallinckrodt), Royal Oak (313) 398-3636  
W. F. Miller Company (Elanco, PBI/Gordon) Birmingham, (313) 647-7700  
J. Mollma & Son, (Creative Sales, Elanco, Mallinckrodt, PBI/Gordon), Grand Rapids, (616) 245-0533  
Parmender & Andre (PBI/Gordon, Velsicol), Grand Rapids, (616) 458-1546  
Smith-Douglas (Elanco), Holland  
Terminal Sales Corporation, (Elanco, PBI/Gordon, Velsicol), Detroit, (313) 491-0606  
Turf Supplies, Inc., (Creative Sales, Elanco, PBI/Gordon), Taylor, (313) 291-1200

### Minnesota

Agricultural Services, Inc. (Elanco), Minneapolis  
The Castle Chemical Co., Inc. (PBI/Gordon), Minnetonka, (612) 890-1083

R. L. Gould, Inc. (Elanco, Mallinckrodt, PBI/Gordon, Velsicol), St. Paul (612) 484-8411  
Habco, Inc., (Elanco) Hopkins  
Johnson Floral Supply, Inc. (Elanco), St. Paul  
Johnson Wholesale Florists (Mallinckrodt), Minneapolis (612) 781-2686  
Minnesota Toro, Inc., (Mallinckrodt, PBI/Gordon), Minneapolis, (612) 475-2200  
Northrup King & Company, (Elanco, Mallinckrodt), Minneapolis (612) 781-8011  
Rosen Livestock-Ag. Chem. Div., (Elanco), Fairmont  
Tesman Seed & Chemical (Elanco), Eagan  
Thompson Hayward (Thompson Hayward), Minneapolis, (612) 332-5394

### Mississippi

Beach Cycle & Supply Co., (Velsicol), Gulfport (601) 863-2377  
Delta Purchasing Federation (Elanco), Greenwood  
MFC Services (AAL), (Elanco), Jackson  
Southern Seed Company, Inc. (Elanco, PBI/Gordon), Jackson, (601) 372-8132  
Thompson Hayward (Thompson Hayward), Greenville, (601) 335-3395; Jackson, (601) 969-3177  
The Was Company (Elanco), Amory

### Missouri

Bartels & Shores Chemical Company, (Elanco, PBI/Gordon, Velsicol), Kansas City, (816) 471-0727  
Beckman Bros., Inc., (Elanco), Olivette  
Beckman Turf & Irrigation Supply Company, Inc., (Elanco, PBI/Gordon, Velsicol), Chesterfield, (314) 532-3649  
Champion Turf Equipment, Inc., (PBI-Gordon, Mallinckrodt), Kansas City, (816) 333-8000/(PBI-Gordon), Springfield, (417) 681-2551  
Crown Chemical Company, (Creative Sales, Elanco, PBI/Gordon, Mallinckrodt, Fisons, Velsicol), St. Louis, (314) 533-0999  
J. C. Ehrlich Company, (Elanco), St. Charles  
A. H. Hummert Seed Company, (Elanco, Mallinckrodt), St. Louis, (314) 771-0646  
Kitten & Bear Chemical Company, (Elanco, Fisons, PBI/Gordon), St. Louis, (314) 865-2000  
Landsco, (PBI/Gordon, Velsicol), Grandview, (816) 765-4777  
Link's Nursery, Inc., (Elanco, Mallinckrodt, Velsicol), St. Louis, (314) 432-8592  
Outdoor Equipment Company, (PBI/Gordon, Mallinckrodt), St. Louis, (314) 966-3911  
Patterson Chemical Company, Inc., (Creative Sales), Kansas City, (816) 842-8211  
Pest Control Supplies, (PBI/Gordon, Fisons), Kansas City, (816) 421-4696  
Robison's Lawn & Golf, Inc., (Elanco, PBI/Gordon, Mallinckrodt), Grandview, (816) 765-3333  
Standard Seed Company, (PBI/Gordon), Kansas City, (816) 842-3838  
Stuppy Greenhouse Supply Company, (Elanco, Mallinckrodt), North Kansas, (816) 842-3071  
Thompson Hayward, (Thompson Hayward), St. Louis, (314) 389-4740  
Veatch Chemical Company, Inc., (Fisons), St. Louis, (314) 832-0056

### Montana

Midland Implement Company, (Mallinckrodt), Billings  
Mr. Turf, (PBI/Gordon), Helena  
Turf Aid Distributing Company (PBI/Gordon), Billings, (406) 656-8008

### Nebraska

Big Bear Equipment, Inc. (PBI/Gordon, Velsicol), Omaha, (402) 331-0200  
Central Chemical (Creative Sales), Kearney, (308) 234-1326  
Cornbelt Chemical Company (Elanco, PBI/Gordon), McCook, (308) 345-5057  
John Housley Nursery Sales (Creative Sales), Elkhorn, (402) 289-2626  
Jirdon Agri-Chem, Inc., (Creative Sales, Elanco, PBI/Gordon), Morrill, (308) 436-2166  
Leisur-Aid (Creative Sale, PBI/Gordon), Omaha, (712) 366-2441  
Midwest Toro (Elanco, PBI/Gordon, Mallinckrodt), Omaha, (402) 331-0500  
Pioneer Chemical Company, (Creative Sales), North Platte, (308) 532-5867  
Simplot Soil Builders (Elanco), Waterloo  
South of Sugar Factory (Fisons), Scottsbluff, (308) 632-4155  
Thompson Hayward (Thompson Hayward), Omaha, (402) 331-4525  
Tri Valley Corporation (Elanco, PBI/Gordon), Omaha, (402) 334-7211  
The Yard Company, (PBI/Gordon), Omaha, (402) 333-7576

### Nevada

Clark County Wholesale Mercantile Co., (Best Products, Elanco, PBI/Gordon), Las Vegas, (702) 382-7700  
Las Vegas Fertilizer Company, Inc. (PBI/Gordon), No. Las Vegas, (702) 649-1551

### New Hampshire

Turf Specialties, (Mallinckrodt), Greenland  
Turf Specialty, Inc., (PBI/Gordon), Hooksett, (603) 485-7866

### New Jersey

Blanken Industrial Weed Company, (Elanco), Maplewood  
Chamberlin & Barclay, (Elanco), Cranbury

Ferti-Soil Company, (Elanco, PBI/Gordon, Mallinckrodt, Velsicol), Rahway, (201) 843-6655  
D. Gangeri & Son, Inc. (Elanco), Englewood  
Green Hill Turf Supply, Inc., (Elanco, PBI/Gordon, Velsicol), Freehold, (201) 462-2349  
Good-Prod. Sales, Inc., (Creative Sales, Elanco), Kenilworth, (201) 245-5055  
JEP Sales, Inc., (Elanco, PBI/Gordon), Yardville, (609) 585-2300  
Johnson Products, Inc., (Elanco), Linden  
Lawn King Morris/Passaic Counties, (Elanco), Pine Brook  
Levitt's Plant Food Supply, (Elanco), Pine Brook  
Lofts Pedigreed Seed Company, Inc., (Elanco, PBI-Gordon), Bound Brook, (201) 358-8700  
McLaughlin, Inc., (Elanco), Medford  
Meskers, Inc., (Elanco, Mallinckrodt), River Vale, (201) 573-1212  
Orange Garden Supply Company, (Elanco), Orange  
Pierson's Mill Company, (Elanco, PBI/Gordon, Mallinckrodt, Velsicol), Maplewood, (201) 763-6633  
Raycroft Distributors, (Elanco), Shrewsbury  
Reed & Perrine, (Elanco), Tennent  
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Agricultural Products Company (Elanco), Mesquite  
Albuquerque Chemical Company, Inc., (PBI/Gordon, Mallinckrodt), Albuquerque, (505) 247-2321  
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Layman's Landscaping (Creative Sales), Albuquerque  
Roswell Seed Company, Inc., (PBI/Gordon), Roswell, (505) 622-7701

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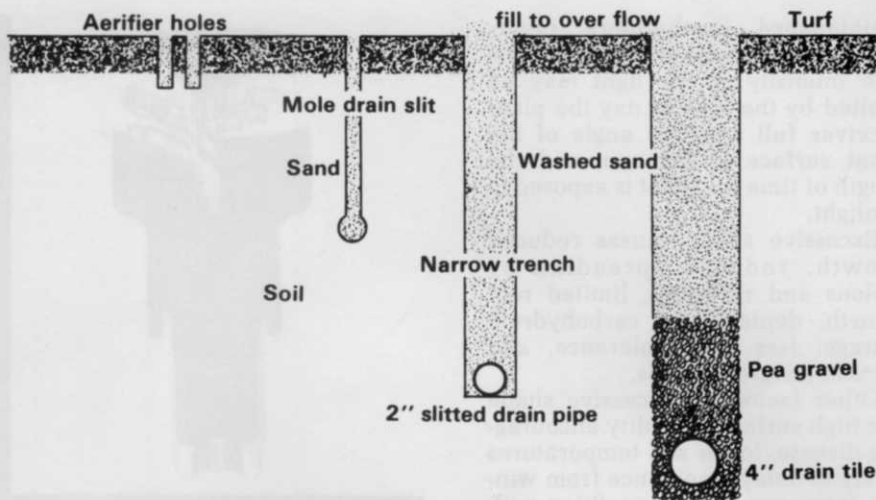
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## Drainage

Waterlogged or submersed turfgrass can be severely damaged in less than two weeks, longer during dormancy. Standing water should be eliminated by filling in low spots, grading to control surface runoff, or installation of drainage tile. If drain tile is the choice, they should be installed in a branched pattern 15 to 30 feet apart with a minimum slope of .5 to 1 percent, at a depth of two to three feet, shallower in sandy soils. The best backfill is washed sand to the surface. If the subgrade is relatively impervious to water, but lower layers are fine, drilling or shallow slit trenches may solve the problem.

If major modification of the root-zone is planned, subgrades can be sloped toward spaced tile or perforated plastic pipe for even distribution of drainage. Rootzone designs usually call for coarse sand over the tile with a layer of topsoil on top mixed to specified texture.

Drainage may also be impaired by thatch, hydrophobic soils, and hard water. Thatch removal, soil aeration, and water conditioners can im-



Types of trenches. Turf will grow over sand to conceal drainage trenches.

prove infiltration. Depth of topsoil affects drainage since shallow layers of topsoil will tend to saturate faster than deeper layers.

For proper surface drainage slopes should be more than one percent but no more than 20 percent.

## Shade

Turfgrass cannot be healthy under conditions of light stress. It requires enough light for photosynthesis to produce the needed quantity of carbohydrates for plant growth and



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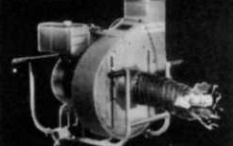
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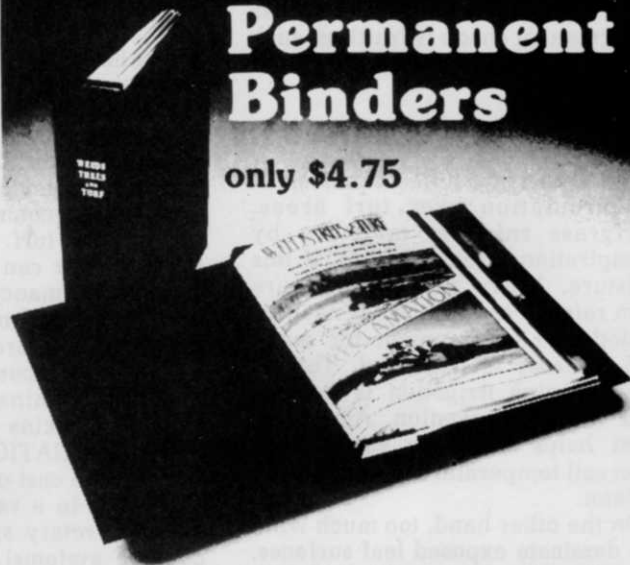
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maintenance. Furthermore, plants prefer blue regions of light to others. The intensity of the light may be limited by the time of day the plant receives full sun, the angle of the plant surface to the sun, and the length of time the plant is exposed to sunlight.

Excessive shade causes reduced growth, reduced spreading by stolons and rhizomes, limited root growth, depletion of carbohydrate storage, less wear tolerance, and thinner turfgrass stands.

Other factors of excessive shade are high surface humidity encouraging disease, lower soil temperatures likely to delay emergence from winter dormancy, and competition with trees for nutrients. Creeping red fescue and velvet bentgrass are most shade tolerant of cool season turfgrasses. *Poa trivialis*, creeping bentgrass, and tall fescue have fair shade tolerance. Kentucky bluegrasses are notably shade intolerant, however, some cultivars exhibit improved shade tolerance such as Glade and Warren's A-34.

St. Augustinegrass is followed by zoysiagrass in shade tolerance in warm season turfgrasses. Bermudagrass is also notably shade intolerant.

Removal of lower branches and thinning of limbs is one alternative to removing entire trees to obtain more light. Use of turfgrass in areas of permanent shade is fruitless, such as northeast corners of buildings or walls.

### Air Circulation

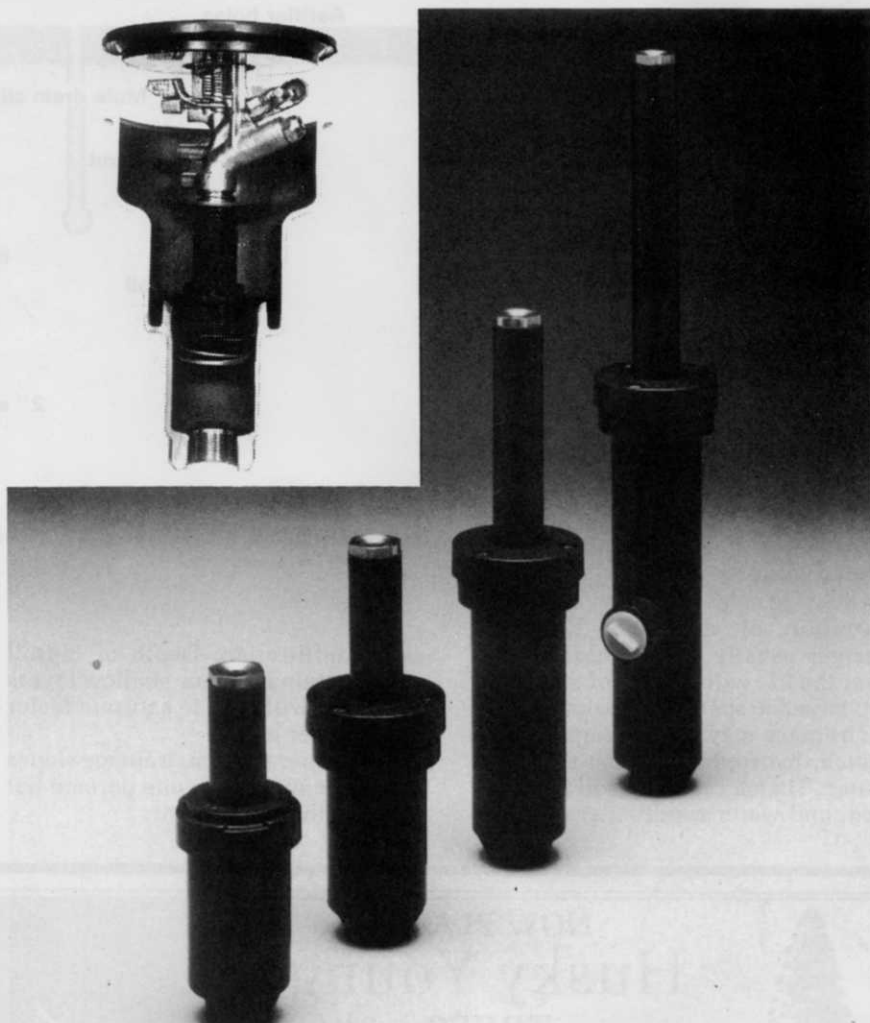
Trees and structures can restrict air circulation over turf areas. Turfgrass releases moisture by transpiration through leaves. If this moisture, heavy dew or moisture from rainfall or irrigation is not controlled, the environment for many turf diseases is improved. That is why morning irrigation is favored over evening irrigation. Air movement helps moderate early afternoon soil temperatures for grasses in full sun.

On the other hand, too much wind can desiccate exposed leaf surfaces, increase the chance of winterkill, and prevent adequate moisture from reaching the soil.

As mentioned earlier, shortage of carbon dioxide on the soil surface is rarely a problem.

### Irrigation

If fine turf is the objective, irrigation of some form should be included



Spray heads have fewer moving parts than rotary heads (inset) but are initially more expensive.

in the site plan. Discussion with the customer or landscape architect will establish the commitment by the owner for fine turf. Without irrigation the customer can expect periods of summer dormancy, eventual transition to more drought tolerant and low fertility tolerant grasses such as tall or red fescue, and less control over seed germination after planting.

James Watkins writes in his book *TURF IRRIGATION MANUAL* that the relative cost of irrigation system choices is in a ratio of 4:2:1 (spray systems; rotary systems; and quick coupler systems). He advises that cost is only one consideration and each type of system should be evaluated for a particular site.

At the least, an irrigation design consultant should evaluate site drawings for approximate cost and water requirements. A well may be needed or a pump system for a lake. Today, irrigation installation is considerably less disruptive to a site.

Vibratory plows and plastic pipe greatly reduce turf damage.

Drip irrigation is an alternative to shrub heads for some sites. The drip lines cannot withstand surface disturbance. If an underground system is installed for the turf, an extra zone for shrubs may be more practical than a separate drip system.

Extra care during seeding or sodding is required around irrigation heads. Heads should be properly installed to prevent puddling around heads and to assure clearance of turf after installation. Controls, pumps and valves should be secured to prevent vandalism or theft.

The landscape contractor should find a reputable irrigation designer to handle subcontracts. A good relationship will help the installation look its best for a long period of time. The customer must be clearly apprised of the maintenance needs of the irrigation system and the proper use for good turf care.



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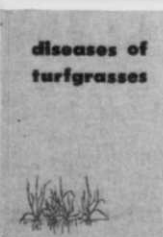
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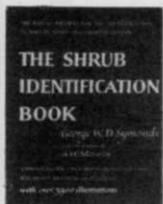
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### Soil Preparation

The most common state of a site when the contractor arrives is the topsoil has been replaced and rough graded. It is not unusual for the contractor to see the need for further grading, backfilling curbs, foundations, and perhaps trenches that have settled; and additional topsoil where needed.

If topsoil has not been replaced, the contractor has the opportunity to

amend and mix the topsoil to optimum conditions. A soil shredder or mixer can simplify this task. He also has the opportunity to grade the subsoil for improved drainage if necessary.

Musser and Perkins of Pennsylvania State University recommend in TURFGRASS SCIENCE that the topsoil mix consist of one part peat, four parts sand, and five parts topsoil. It should be well mixed and

spread to a depth of at least six inches.

If topsoil is already in place, amendments can be added and mixed with a cultivator. Overworking the soil can break down aggregates and destroy the soil texture. Also, soil preparation should not be attempted in wet weather to prevent compaction. Limestone and phosphorus do not leach readily and should be incorporated with the top-

### Seeding Rates Recommended.

Type	Seeds/lb. (in thousands)	Seeds/in.	Germ. Rate	Lbs. Seed/1,000 sq. ft.	
				Beard	Musser
Bahiagrass	170	7-9	80%	6-8	4-8
Bentgrass					
Creeping	7,900	30-50	85%	0.5-1	1-1.5
Colonial	8,750	30-60	85%	0.5-1	1-2
Velvet	11,800	40-80	90%	0.5-1	1.5
Bermudagrass (hulled)	1,800	12-20	85%	1-1.5	2
Bluegrass					
Kentucky	2,200	15-25	75%	1-1.5	2-3
Rough	2,500	18-25	80%	1-1.5	2-4
Centipedegrass	400	10-15	—	4-6	—
Fescue					
Chewings	546	15	85%	3.5-4.5	3-5
Creeping Red	550	15	85%	3.5-4.5	3-5
Tall	225	10-15	85%	7-9	4-8
Perennial Ryegrass	225	10-15	—	7-9	5-6
Zoysiagrass	1,400	20-30	—	2-3	—

### Turfgrass Tolerances.<sup>1</sup>

Type	Shade	Wear	Drought	Cold	Heat	Salt
Bahiagrass	—	good	high	poor	—	—
Bentgrass						
Creeping	good	poor	poor	high	medium	good
Colonial	medium	poor	poor	good	medium	poor
Velvet	high	—	poor	good	medium	—
Bermudagrass	poor	high	high	poor	high	good
Bluegrass						
Kentucky	poor	medium	medium	good	medium	poor
Rough	good	poor	poor	high	poor	—
Centipedegrass	medium	poor	poor	poor	high	poor
Fescues						
Chewings	low	—	—	—	fair	—
Creeping Red	high	medium	good	medium	fair	poor
Tall	good	good	good	medium	good	medium
Perennial Ryegrass	medium	medium	fair	poor	fair	medium
St. Augustine	high	medium	fair	poor	high	good
Zoysiagrass	good	high	high	medium	high	good

1. Rated by James Beard, Texas A & M University, College Station, Texas