JUNE

15: 17th Annual Field Day, Pure Seed Testing East Research Facility, Rolesville, NC; (919) 556-0146; (919) 556-0174; www.sgtcs.org

17-19: Southeast Greenhouse Growers Conference, Palmetto Center, Greenville, SC; (800) 453-3070; (706) 883-8215; www.sgtc.org

26-28: The Fertilizer Institute, World Fertilizer Conference, Marriott Marquis, New York, NY; Robin Haier, (202) 675-8250; (202) 544-8123; www.tfi.org

JULY

21-23: Turfgrass Producers International Summer Convention & Field Days, East Lansing Holiday Inn, MI; Tom Ford, (847) 705-9898; (847) 705-8347; www.turfgrassod.org

21-25: ALCA conference, Chicago Hilton O'Hare; Joan Haller, (800) 395-2522; (703) 736-9668; www.alca.org


26-31: Perennial Plant Association Symposium, Lansing, MI; Dr. Steven Still, (614) 771-8431; (614) 876-5238; www.perennialplants.org

27: Midwest Regional Turf Field Day, West Lafayette, IN; Bev Bratton, (765) 494-8039; (765) 496-2926; www.purdue.edu

27-29: Penn Allied Nursery Trade Show, Fort Washington Expo Center, Fort Washington, PA; Sandy Seltzer, (202) 898-1185; (202) 874-2932; (202) 874-4017; www.pennalliedshow.com

AUGUST

1-4: International Society of Arboriculture Conference, Stamford, CT; Lisa Thompson, (217) 355-9411; (217) 355-9516; www.ag.uiuc.edu/~isa

4: Summer Field Day, Midwest Ground Covers, St. Charles, IL; Illinois Landscape Contractors, (630) 932-8443

6-8: TAN-MISSLARK Nursery, Garden, Landscape Supply Show, Texas Association of Nurserymen, Dallas Convention Center, Houston; Amy Prenger, (800) 880-0343; (512) 280-3012; www.growzone.com

9-13: Florida Turfgrass Association Conference & Trade Show, O'Connell Center, Gainesville, FL; Jane Rea, (800) 882-6721

9-11: Soil & Water Conservation Society Annual Conference, Grand Casino, Biloxi, MS; Charlie Persinger, (515) 289-2331; (515) 289-1227; www.swcs.org

18: Univ. of Rhode Island Turfgrass Field Day, Kingston Campus, RI; Dr. Noel Jackson, (401) 874-2932; (401) 874-4017

SEPTEMBER

8-11: RISE Annual Meeting, Beaver Creek, CO; Elizabeth Lawder, (202) 872-3860; (202) 463-0474; www.acpa.org/risex

9-10: Southwest Horticultural Trade Show, Arizona Nursery Association, Phoenix Civic Plaza, Phoenix, Cheryl Goar, (602) 966-1610; (602) 966-0923; www.azna.org

12-16: American Society of Landscape Architects Annual Meeting, Boston; Angela Wilson, (202) 898-2444; (202) 898-1185; www.asla.org

16-18: Florida Nursery & Allied Trade Show, Orange County Convention Center, Orlando, FL; Sabrina Wade, (407) 295-7994; (407) 295-1619; www.fnoga.org

19-22: International Public Works Congress & Expo, Denver, Eastern United States and Canada call (800) 988-9218; Western United States and Canada call (800) 525-9154

OCTOBER

8-9: Associated Landscape Contractors Association of America, Masters in Management for the Landscape Industry seminar, Hartford, CT; Kathy Wemhoff, (800) 395-2522; (703) 736-9668; www.acla.org

20-22: Southwest Turfgrass Annual Conference & Trade Show, Ruidoso, NM, (505) 275-2576; (505) 292-9815

NOVEMBER

3-5: Eastern Regional Nurserymen's Association Expo '99, Atlantic City Convention Center, Atlantic City, NJ; Lynn, (800) 376-2463; (301) 990-9771

4-6: National Arborist Association Tree Care Industry Expo, Convention Center, Indianapolis; Carol Crossland, (800) 733-2622; (603) 672-2613; www.arbitalb.com

7-9: National Irrigation Expo & Technical Conference, Portland, OR; Denise Stone, (503) 736-5442; (503) 736-5431

7-11: Penn State Golf Conference, Nittany Lion Inn, State College, PA; (814) 863-3475; (814) 355-7240; www.psu.edu

9-12: New York State Turfgrass Association Conference & Show, The OnCenter, Syracuse, NY; Beth Seme, (518) 783-1229; (518) 783-1258; www.nysta.org

13-16: Green Industry Expo (ALCA, PGMS, PLCAA), Baltimore, Maryland; Eleanor Eller, (770) 973-2019; (770) 598-6071; www.plcAA.org

29-Dec. 2: North Central/Illinois Turfgrass Foundation Expo, (312) 201-0101; (312) 201-0214; www.turf.uiuc.edu

DECEMBER

Dec. 6-9: Ohio Turfgrass Foundation Conference & Show, Columbus Convention Center, Columbus, Ohio; Julie Weller, (614) 760-5442; (614) 760-5431

7-9: New Jersey Turfgrass Expo, Taj Mahal Casino Resort, Atlantic City, NJ; Dr. Richard Caton, (732) 821-7134; (732) 821-8157; www.njturfgrass.org
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National/state internet address:
citi1.volpe.dot.gov/fhwa/omchome.html

STATE PESTICIDE CONTROL AGENCIES

Certification requirements and pesticide use regulations are quite complex and vary from state to state. The U.S. Environmental Protection Agency can be reached at (703) 305-6708. Green Industry regulations are found in The Regulation and Certification of Pesticide Applicators, 40 CFR Part 171. Phone numbers are followed by FAX and internet address if available.

Office in charge of applicator certification

STATE PHONE NO. FAX NO.

Oregon (503) 399-5775; (503) 399-5838
Pennsylvania (717) 782-4443; (717) 782-4852
Puerto Rico (809) 766-5985; (809) 766-5603
Rhode Island (401) 528-4578; (401) 528-4542
South Dakota (605) 224-8202; (605) 224-1766
Tennessee (615) 781-5781; (615) 736-2649
Texas (817) 633-6875; (817) 633-8243
Utah (801) 963-0096; (801) 963-0093
Vermont (802) 828-4480; (802) 828-4424
Virginia (804) 281-5120; (804) 281-5121
Washington (360) 753-9875; (360) 753-9024
West Virginia (304) 347-5935; (304) 347-5617
Wisconsin (608) 829-7530; (608) 829-7540
Wyoming (307) 772-2305; (307) 772-2011

Iowa (515) 281-8591; (785) 296-2263; (785) 296-0673; record@kda.state.ks.us
Kansas (785) 296-2263; (785) 296-0673; record@kda.state.ks.us
Kentucky (502) 564-7274; (502) 564-3773
Louisiana (504) 925-4578; (504) 925-3760; carol@lafd genitala.us
Maine (207) 287-7598; (207) 287-7598
Maryland (410) 841-5710; (410) 841-2765; settingme@mdata.state.md.us
Massachusetts (617) 772-3000; (617) 727-7325; (508) 727-3000; john@mass.org
Michigan (517) 335-4540; (517) 335-4540; rosena@met.state.mi.us
Minnesota (612) 297-7175; (612) 297-2271; user@met.state.mi.us
Mississippi (601) 325-3390; (601) 325-3390
Missouri (573) 751-2462; (573) 751-0005
Montana (406) 444-2944; (406) 444-5409; agri@mt.gov
Nebraska (402) 471-2341; (402) 471-2341
New Jersey (609) 984-6647; (609) 984-6555
New Mexico (505) 646-2143; (505) 646-5975; garcy@nmsu.edu
New York (518) 457-7482; (518) 485-8366
Ohio (614) 728-6200; (614) 728-4235; dwbilde@agri.state.oh.us
Oregon (503) 986-4647; (503) 986-4735; acreswell@doe.state.or.us
Pennsylvania (717) 787-4843; (717) 733-3275; tarc@pdda005.pdda.state.pa.us
Puerto Rico (809) 796-1710; (809) 796-4426
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South Carolina (864) 664-2150; (864) 664-2178; a.carver@com.com
S. Dakota (605) 773-3724; (605) 773-3481; sbryan@doe.state.sd.us
Tennessee (615) 360-0130; (615) 360-0757; agplant@mail.state.tn.us
Texas (512) 451-7200; (512) 451-9400
Utah (801) 538-7188; (801) 538-7188; agrain@state.ut.us
Virginia (804) 786-3798; (804) 786-3798; pesticid@morskinfinfo
Washington (360) 902-2015; (360) 902-2035; mtucker@agw.wa.gov
West Virginia (304) 558-2209; (304) 558-2209
Wisconsin (608) 224-4551; (608) 224-4656; @vehel.dat.cp.state.wi.us
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Spring is the time to initiate new growth for turfgrass, and the time to get some needed nutrition back to lazy turf. After winter dormancy, both warm- and cool-season turf begins growing. For northern turf, spring and fall represent the peak seasons for shoot and root development, when temperatures range between 50° and 75°F. Root initiation occurs first in early spring, when soils begin to thaw. Active shoot development follows, as temperatures climb between 60° and 75°F.

For warm-season turf, late spring through summer represents the optimum time for development, as temperatures reach between 75° and 90°F. Nutritional programs often coincide with these peaks. Nature alone helps stimulate spring green-up, but most turfgrasses need additional fertilization to achieve maximum growth potential. Spring fertilization is especially critical on recreational turf areas, such as soccer fields which receive intense traffic from increasing play each season. Without additional fertilization they often become severely worn and weed-infested.

To get turf started

For cool-season turf, "starter type" formulations are popular choices. These products supply nitrogen, phosphorus and potassium in ratios which are desirable for spring shoot and root growth. Unlike high nitrogen formulations which promote mostly top growth, starter types contain higher proportions of phosphorus (i.e., a 1:2:1 ratio).

The added phosphorus helps initiate root development and early turf establishment of new seedlings.

Go easy on nitrogen

Nitrogen is the most important element in a turfgrass fertilization program. However, there are limits to its use.

When turfgrasses are overfertilized with spring N, excessive top growth—which requires extra mowing—and shallow rooting result. There is also a greater threat of nitrate leaching, a higher incidence of disease and reduced environmental stress tolerance, including summer drought.

In most situations, avoid applications of more than one pound of N/1000 sq. ft. when using "fast release" or highly water-soluble nitrogen.

When using only fast-release nitrogen sources, light applications, ¼ to ½ pounds of N/1000 sq. ft., are more desirable, and should be applied more frequently.

This spoon-feeding approach has become increasingly popular on golf course putting greens.

Fast-release/slow-release

A widely used strategy in the spring is to fertilize with products that have a combination of fast- and slow-release nitrogen sources. Fast-release nitrogen stimulates earlier green-up and growth which is often sought in recreational and landscaped settings. Slow-release nitrogen sources,
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NUTRITION

whether synthetic or natural organic, last eight to 15 weeks, are less likely to burn the turf and will release nitrogen more uniformly than inorganic N sources.

Turf managers often must strike a balance between which combinations to use in each situation.

Sometimes this requires supplementing small amounts of fast-release nitrogen into the spring application.

Late/dormant application an alternative
A late fall or dormant fertilization can provide a successful alternative to an early spring application. This strategy is primarily used by athletic field managers to:

- accelerate spring green-up and growth;
- help distribute the workload more evenly over the year;
- avoid traffic damage to soft, wet turf.

One major concern with late fall fertilization is the increased potential of nitrate leaching during the winter. Using lighter rates of slow-release nitrogen will help reduce this threat. However, this strategy will generally be slower to stimulate growth in cold spring soils.

Soil pH affects nutrient availability
The soil pH has a considerable influence on the availability of most nutrients. Phosphorous is an example of a nutrient that is most available when the soil pH is between 6.0 and 7.0. However, in highly acidic soils with pH of less than 5.0, phosphorous gets "tied up" with iron and aluminum to form complexes which are unavailable to turfgrasses.

Maintaining near neutral soil pH values also favors the activity of beneficial soil microorganisms and the release of nitrate from nitrogen fertilizers.

In highly acidic soils, toxic concentrations of aluminum, iron and manganese may develop and cause impaired rooting (roots will appear short, brown and spindly) a decrease in overall turf vigor, shoot growth, drought tolerance and recuperative potential.

Choose the right fertilizer products for the job

Quickly available or water-soluble sources provide a rapid growth response under good growing conditions and include:

1. **Urea**, which is a water-soluble organic compound that contains 45% N.
2. **Inorganic salts** such as ammonium nitrate, ammonium sulfate, potassium nitrate, calcium nitrate and ammonium phosphates.
3. **Methylol ureas**, formed by reacting urea with formaldehyde have produced growth responses similar to other water-soluble sources but vary based on formulation. Examples of such products include:
   - **Form-U-Sol**, which has 28% N, of which 67% is urea and 33% is methylol urea;
   - **CoRon** is 28% N, has 50% urea and 50%methylol urea. It is an aqueous solution and its release is dependent upon microbial activity, but due to the relatively high urea content, it has shown to be effective in cool-seasons on turfgrasses.
   - **Nitro-26**, which is 26% N with 30% urea and 70% methylol urea.

Slowly-available, slow-release or water-insoluble sources are released based on manufacturing processes. These include:

1. **Urea formaldehyde (UF)**: Also called Nitroform, Ureaform, Blue-Chip, etc.

Contains 38% N. Nitrogen release is based on activity index of various forms of water-insoluble nitrogen (WIN).

2. **FLUF** is a flowable form of UF that contains about 18% t N, of which 20-25% is water insoluble and thus has less burn potential than soluble sources.

3. **Nutralene** is a methylene urea product with about 40% N.

4. **Isbutyldiene diurea**, also called IBDU, contains 31% N. Its rate of N release is dependent upon the hydrolysis of the product.

Coated N sources are made by coating urea or complete fertilizer prills with an impermeable or semipermeable coating.

1. **Sulfur-coated urea (SCU)** is produced taking prilled urea and spraying it with molten sulfur.
2. **Polymer-coated urea (PCU)** products are coated with some type of plastic polymer coatings to reduce the rate of N release.

Natural organic fertilizers include sewage sludges, composted manures and tankages, hydrolyzed poultry feathers. Green-Releaf is composed of a biostimulant growth complex with minor fertilizer elements and plant extract concentrate added.

Dr. Gil Landry, University of Georgia

Keep potassium levels high
Potassium plays a vital role in plant nutrition, and deserves more attention in many fertility programs.

Keep potassium levels high during the growing season. It enhances turf tolerance to various environmental and biological stresses, including cold, traffic, disease and drought tolerance.

A nitrogen to potassium ratio of 3:2 has generally been considered desirable. However, higher potassium ratios to nitrogen, such as 1:1 or 1:2 have improved stress tolerance in some cases, even when soil tests indicate potassium levels are adequate. LM
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Build cool-season weed strategy on healthy turf

Turfgrass that is established and maintained properly is turfgrass that won’t provide an opportunity for weeds to muscle their way in and spread.

By FRANK S. ROSSI, Ph.D.
Cornell University

The coexistence of turfgrass and weeds is the basis of the age-old tip for controlling weeds in turf: maintain a healthy, dense stand of turf that prohibits weeds from establishing.

This is based on two important ecological concepts-space and competition. Therefore, the foundation of a turfgrass weed management program must be to implement management programs that favor the competitive advantage of turf, while minimizing bare areas where weeds can invade.

These ecological principles will always work in your favor as a turf manager if the proper decisions are made during turfgrass establishment regarding site preparation, soil modification, turf selection and establishment procedure.

The primary cultural practices of mowing, watering and fertilizing should also focus on maximizing root growth. A healthy root system will always make turf more forgiving of environmental, biological and traffic stress. For example, maintaining a higher than usual height of cut (3” or greater) will promote deep rooting and shade the soil surface. Irrigating judiciously will encourage weed seed germination. Finally, fertilizing cool-season turf in the fall will maximize energy production under cooler temperatures. Still, if turf

PREEMERGENCE HERBICIDE EFFICACY RATINGS

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Crabgrass</th>
<th>Goosegrass</th>
<th>Annual bluegrass</th>
<th>Common chickweed</th>
<th>Henbit</th>
<th>Lawn burweed</th>
<th>Corn speedwell</th>
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<tbody>
<tr>
<td>atrazine (Aatrex)</td>
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<td>benefin (Balan)</td>
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<td>benefin+oryzalin (XL)</td>
<td>G-E</td>
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<td>benefin-trifuralin (Team)</td>
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<td>bensulide (Betasan, PreSan)</td>
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<td>oxadiazon (Ronstar)</td>
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<td>pendimethalin (Pre-M)</td>
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1E=Excellent, >89% control; G=Good, 80 to 89% control; F=Fair, 70 to 79% control; P=Poor, <70% control; L=Listed on the label; — = Data not available.

These are relative ratings and depend on many factors such as environmental conditions, turfgrass vigor or health, application timing, etc., and are intended only as a guide.