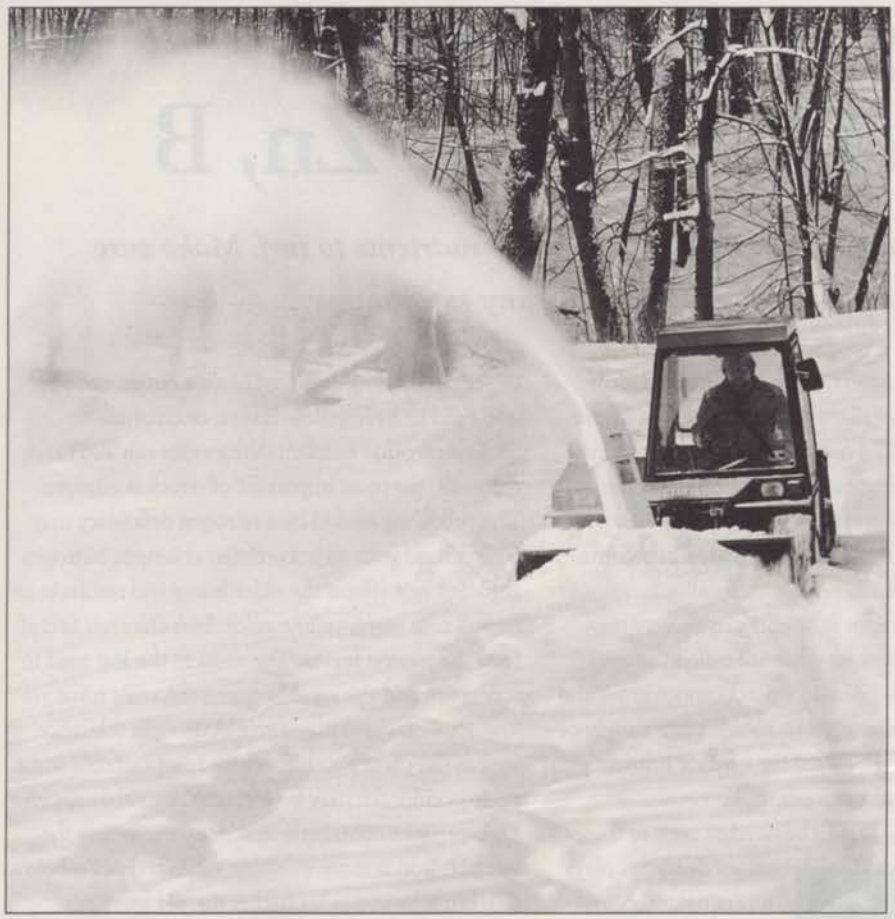


when they arrive to a snow filled lot, instead of a neatly plowed and accessible parking area. Your own liability problems can get sticky if the lot is not open on time.

Prepare for the unexpected surprises, and talk to your competitors, and you won't miss a beat when the snow falls!

—John Allin is the owner of The Allin Companies, Erie, Pa. The organization uses more than 75 units to plow, move and stack snow. The Erie area regularly receives annual snowfall in excess of 250 inches.

New snow and ice management assn. needs members

The Snow & Ice Management Association opened for business in June with headquarters in Erie, Pa.

The main goal of SIMA is to encourage the participation and affiliation of people who are in the snow and ice management business, whether they are contractors or property and facility managers.

The SIMA is a not-for-profit corporation. Its goals over the next few years include establishing a member newsletter and magazine, and providing information on purchasing, networking, training, general business, subcontracting, safety, legislation and customer management.

For more information on SIMA, phone (814) 456-9550 or write SIMA, 1903 West 8th St., Suite 150, Erie, PA 16505.

The right way to salt

"Sensible Salting," as defined by the Salt Institute, of Alexandria, Va., includes the following:

—personnel training;
—good equipment;
—calibration of spreaders;
—use of automatic controls;
—adequate, covered storage;
—proper maintenance around storage areas;
—attention to environmental concerns.

Only use the amount of salt you need to get the job done, advises the institute. Early application to roads will prevent snow and ice from bonding to the road surface.

Apply salt in a windrow or full width. The institute advises that the application be no wider than the truck that is spreading it. Brine formed from salt and water will run to other parts of the road and will be spread by traffic.

If you've ever wondered how long it takes the salt to start working, the institute estimates it takes 20 to 30 minutes.

Storage

Outside stockpiles should be properly shaped, in either windrows or conical shapes, piled on impermeable pads and covered. Proper drainage will keep the salt dry and protect the surrounding area.

Temporary covers can include:

—tarpaulin; —polyethylene;
—polyurethane; —polypropylene;
—rubberized polyethylene.

Types of under roof storage areas:

—shed; —pole-type;
—quonset; —barn-type.
—dome-type;

The Salt Institute has made available literature on salt for snow and ice control. For more information, contact the institute at 206 North Fairfax St., Fairfax Plaza, Suite 600, Alexandria, Va. 22314; (703) 549-4648.

The micro-nutrients: Fe, Mg, Mn, Ca, Zn, B

It is not usually necessary to apply micro-nutrients to turf. Make sure they're really needed before spending any extra money.

by BILL KNOOP, Ph.D. / Technical Editor

All plants need nutrients to live and grow. The list of plant nutrients is split between those called macro-nutrients—So named because they are used by plants in the greatest amounts—and those called micro-nutrients (Table 1), which plants use in very small amounts.

The fact that plants need such small quantities of each of these six minor nutrients can be very misleading. They are among what are called the essential plant nutrients, because a plant cannot grow and complete its lifecycle without an adequate supply of even one of them. The need for a minor nutrient may be measured in parts per million.

No matter how small, the need of each of these minor nutrients plays a very necessary and vital role in plant growth. It would be convenient if a specific part of the plant growth process could be assigned to each nutrient, but it just doesn't work that way. The roles of these nutrients can be described in a very general way, but truly where and how they function in plant growth is very complex.

TABLE 1. PRIMARY PLANT NUTRIENTS AND THEIR SOURCE

Macro-Nutrients	*Primary Source*
(N) Nitrogen	Fertilizer, Soil
(K) Potassium	Fertilizer, Soil
(P) Phosphorus	Fertilizer, Soil
(S) Sulfur	Soil
(Mg) Magnesium	Soil
(Ca) Calcium	Soil
Micro-Nutrients	*Source*
(Fe) Iron	Soil
(Mn) Manganese	Soil
(Zn) Zinc	Soil
(Cu) Copper	Soil
(Mo) Molybdenum	Soil
(B) Boron	Soil
(Cl) Chlorine	Soil
Others	*Sources*
(O) Oxygen	Water, Carbon Dioxide
(H) Hydrogen	Water
(C) Carbon	Carbon Dioxide

The role of **iron (Fe)** is most easily understood. While not a part of chlorophyll in the plant, sufficient quantities must be present in order for the plant to produce the chlorophyll. Plants that cannot obtain enough iron tend to have yellow leaves, or chlorosis.

Several other nutrient deficiencies can also cause chlorosis, the most important of which is nitrogen. The yellowing caused by a nitrogen deficiency may be confused with an iron-related chlorosis. Nitrogen chlorosis first affects the older leaves and results in an overall pale green-yellow color. Iron chlorosis first affects the newest leaves. The veins in the leaf tend to stay green and the areas between the veins turns yellow. Iron may also play a role in drought tolerance, as well as the plant's ability to take head and cold stress.

Iron chlorosis may be corrected by either applying a product containing iron or by correcting the soil pH. Iron is more available when soil pH is below 6.0, but it becomes limited as the pH increases.

Iron sulfate is the most common remedy for iron chlorosis. If iron sulfate is added to a high-pH soil (over 7.0), it may quickly be changed to an unavailable form in the soil. The best way to make sure iron gets to a plant in a high-pH soil is to use an iron chelate. The chelated form of iron helps keep it available to plants in high-pH soils. In fact, chelated forms of most minor nutrients are available. They are very costly, but it's the only way of making sure the nutrients will get to the plant and not get tied up with other chemicals in the soil.

Magnesium (Mg) is a part of chlorophyll. When it is in low supply, the plant may also end up with yellow leaves. A magnesium deficiency is not very common, but it can become a problem in soils below a pH of 6.0 or over a pH of 8.5. It may be rather difficult to tell the difference between a nitrogen deficiency, an iron deficiency or a magnesium deficiency. The only practical way to correct any chlorosis is to first apply nitrogen and if there is no green-up, apply iron, and finally if those two do not have any effect, then apply magnesium. Two very common sources of magnesium are Epsom salts and dolomitic limestone.

bobcat

Do It All

Write or Call
For a Free 30-Page
BobCatalog Buyer's Guide.
For an Automated FAXED
Response Call:
1-800-662-1907
(Ext. 701)

With more than 30 attachment choices, you *can* **Do It All**. Bobcat® attachments are designed, tested and manufactured to Melroe quality standards, and backed by our worldwide dealer network.

Melroe Company
P.O. Box 6019
Fargo, ND 58108-6019 • (701) 241-8700

MELROE
INGERSOLL-RAND

Circle No. 118 on Reader Inquiry Card

Manganese (Mn) also is a part of chlorophyll, and its deficiency may result in a chlorosis. Any manganese deficiency is very rate and not usually a problem at all.

The other three minor nutrients, **copper (Ca), zinc (Zn)** and **boron (B)**, are needed in extremely small quantities, so most any soil contains them in adequate amounts. There is a greater chance that these chemicals can reach toxic levels in the soil than because of a low supply.

Testing tips

Many soil testing labs do not routinely test for these minor nutrients. Others may test for them, but only report their levels if they are extremely high or low. If you are concerned about possible minor nutrient problems, get your soil tested but make sure the lab is able to make the determination.

TABLE 2. THE INFLUENCE OF PH ON THE SOLUBILITY OF THE NUTRIENTS REQUIRED FOR PLANT GROWTH

Nutrient	*Most soluble pH range*	*Least soluble pH range*
Nitrogen	6.5-8.0	5.5 and lower
Phosphorus	6.5-7.2	less than 6.5, over 7.2
Potassium	6.5-8.5	6.5 and lower
Calcium	7.0-8.5	6.5 and lower
Magnesium	7.0-8.5	6.5 and lower
Sulphur	6.5-8.5	6.5 and lower
Iron	3.5-6.0	greater than 6.0
Manganese	4.5-6.5	greater than 6.0
Boron	5.0-7.0	less than 5.0, over 7.5
Zinc	5.0-7.0	greater than 6.0
Copper	5.0-7.0	greater than 6.0

A soil test can be a valuable first step when developing any fertility program. Depending on the test selected, it can determine the level of essential plant nutrients in the sampled soil, describe any salt problem, determine the pH and identify the soil's texture class.

The soil should come from the plant's rootzone. In most cases, this is just a few inches deep. The sample should represent a fairly uniform area. A sample shouldn't be made up of soil from a sandy area together with soil from a high clay area. These two soils should be treated separately.

Test tees, fairways separate from greens

On golf courses, greens wouldn't be included with tees or fairways, but soil from all 18 greens could be put together into one sample if all the greens had basically the same construction.

There may be enough variation in soils across a golf course that each fairway can be sampled separately. It even may be that a front lawn will be different from the back.

One single soil test may be of limited value. It's important to know the soil pH because of its impact on nutrient availability. The soil texture class information is needed to determine the rate of material needed to adjust pH.

Table 2 shows the influence of pH on nutrient solubility.

Any minor nutrient problem is fairly rare. Only if soil pH is very high or very low can a problem be expected. Even then it's rare. The only other situation that may suggest any minor element is when plants are grown in nearly pure sand. All-sand putting greens and football fields are areas that may need special consideration in developing the fertility program.

It is not absolutely necessary to automatically apply a fertilizer containing these minor nutrients to most landscapes. This is especially true if the grass clippings are allowed to stay on the lawn. All the nutrients contained in the leaves will be returned to the soil and eventually returned back to all the plants in the landscape. There is no question that when minor elements are needed, they are needed. Just make sure they are really needed before spending any extra money. It doesn't make sense to add extra materials to the landscape that are not needed.

Choosing a lab

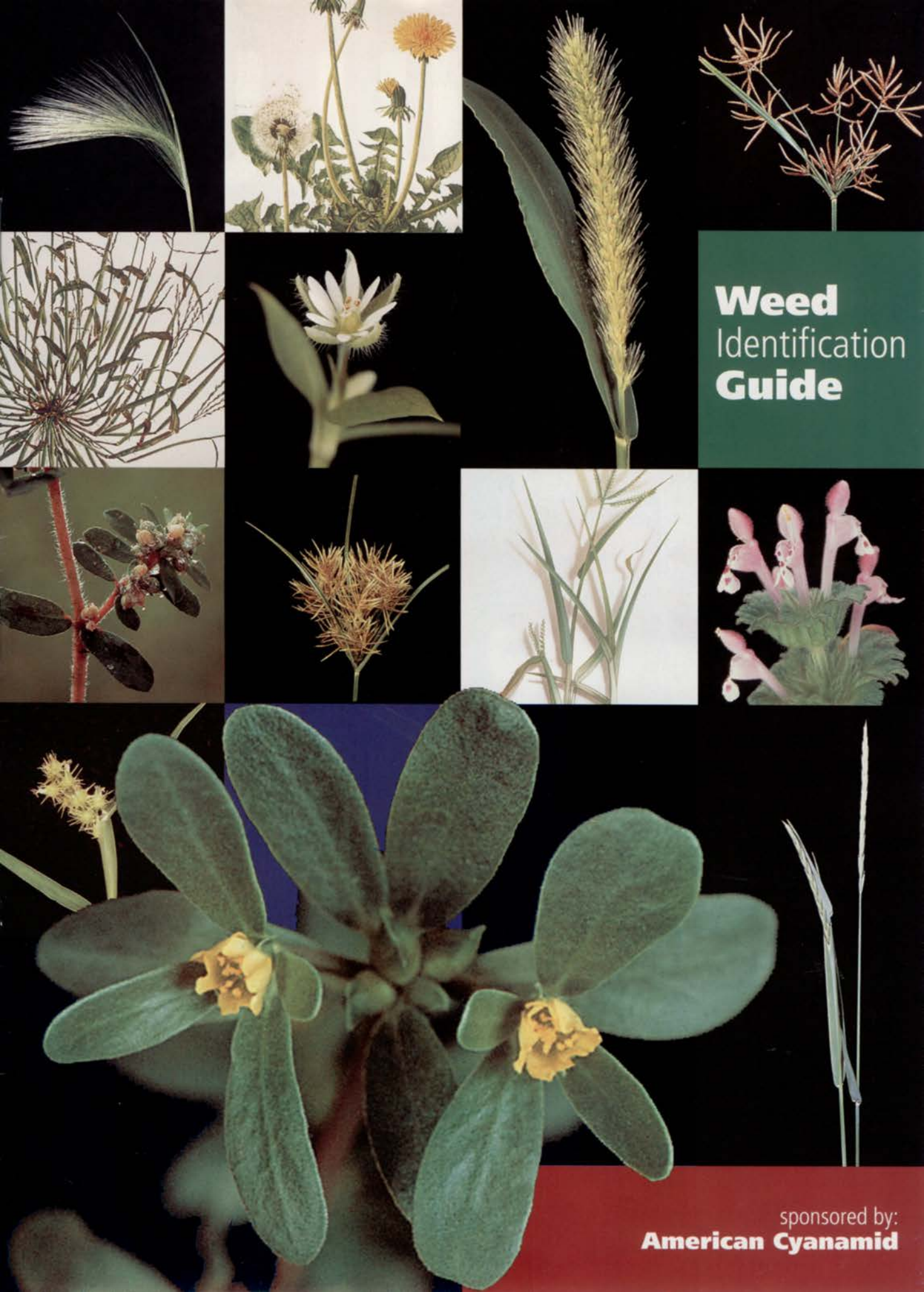
If the soil sample was sent to 10 different labs there might be 10 slightly different analyses of the soil. Not all labs have the same analytical equipment nor do they use the same techniques. It does not make sense to compare results from different labs. Pick a dependable lab and stick with it.

Every state has a land grant university with a soil testing lab. Information for soil testing is available from the local office of the cooperative extension service.

Test in January-February

In order to get the most dependable test results possible, test when the system is fairly stable, usually January and February. At these times, the last fertilizer application was done weeks before, and the next application is weeks away.

A soil test every two or three years at the same time of the year should be sufficient. **LM**



Weed Identification Guide

sponsored by:
American Cyanamid

PENDULUM

When it comes to season-long control of crabgrass, goosegrass, oxalis, spurge and many other troublesome weeds, PENDULUM® herbicide gets down to business. No other preemergent turf herbicide can match its spectrum of weeds controlled and cost-effectiveness. • PENDULUM brand Pendimethalin also offers greater flexibility than ever before, with a complete preemergent product line that includes sprayable formulations, combination fertilizer products and *now* a 2% granular formulation. • When you consider cash rebates available to you from American Cyanamid, it's easy to see that PENDULUM really does mean business. Smart Business. • To learn more about the rebate offer or for the name of the PENDULUM distributor nearest you, call 1-800-545-9525, Ext. 931.

CYANAMID

Agricultural Products Division
Specialty Products Department
One Cyanamid Plaza, Wayne, NJ 07470

*Trademark, American Cyanamid Company. ©1996

MEANS BUSINESS

Circle No. 103 on Reader Inquiry Card

INTRODUCTION

Successful weed identification is a combination of timing and user-friendly data. Timing in relation to the maturity of the plant (the older, the easier) and user-friendly data, meaning an identification guide that is designed to facilitate the identification process. Both were considered in the design of this guide.

Timing: When identifying either monocot (grassy) weeds or dicot (broadleaf) weeds, studying a mature or flowering sample is very important. All of the most easily identifiable traits—flowers, seeds, leaves and roots—are present then, so take some time to find a mature specimen to examine.

User-friendly data: For ease of use, this guide concentrates on those plant characteristics that differentiate one species from another rather than those traits each has in common. These differences are represented visually with added text to refine the distinctions between similar plants.

Understanding the terms used in this guide

Understanding the parts of a grass plant are essential to accurately identify monocot weeds. In the example shown, pay particular attention to the seedhead, the ligule and the collar. They are the plant parts which have the most differentiating traits.

Abbreviations

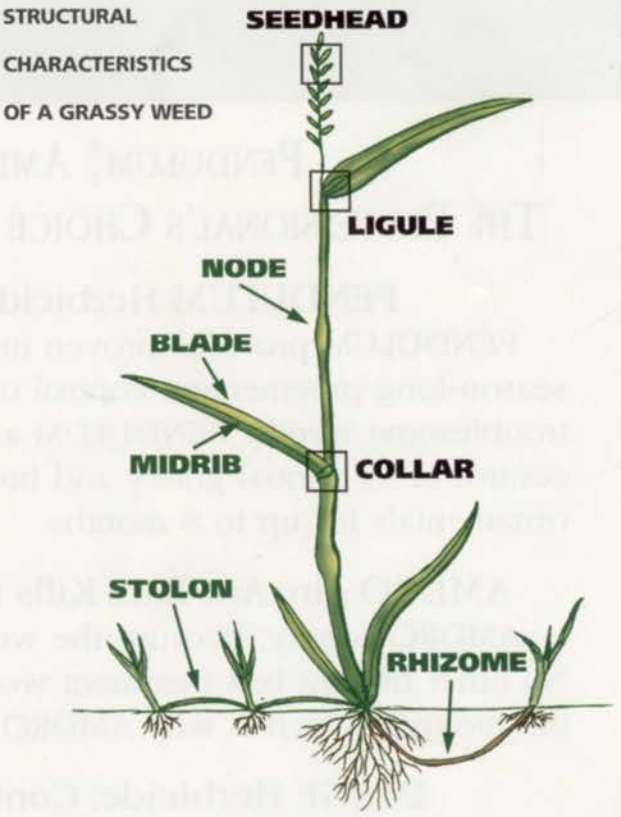
aka = "also known as" (different common names are popular in different parts of the U.S.)

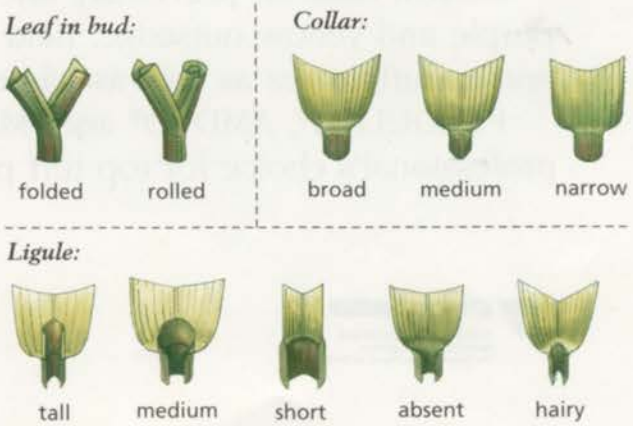
Further help

The use of this guide was designed to help managers substantially reduce the number of possible weed species identifications. However, variations in a plant's vegetative characteristics or distribution may require that managers forward samples to their local extension service for confirmation. American Cyanamid's local technical representatives can also be contacted for further help.

Sources

Information was compiled from the Scotts "Guide to the Identification of Grasses," the Southern Weed Science Society's "Weed Identification Guide," A.S. Hitchcock's "Manual of the Grasses of the United States" and the extension department at Cornell University.





LOOK OUT FOR NUMBER ONE THIS SEASON

PENDULUM®, AMDRO® AND IMAGE®
THE PROFESSIONAL'S CHOICE FOR TOP TURF PERFORMANCE.

PENDULUM Herbicide with pendimethalin.

PENDULUM provides proven turfgrass tolerance and excellent season-long preemergent control of crabgrass, goosegrass and other troublesome weeds. PENDULUM also provides gentle over-the-top control of 45 annual grassy and broadleaf weeds in over 260 labeled ornamentals for up to 8 months.

AMDRO Fire Ant Bait: Kills the Queen. Kills the Mound.

AMDRO is easy, because the worker ants do the killing for you. No other fire ant bait treatment works as fast and effectively to kill the mound. Which is why AMDRO is the undisputed market leader.

IMAGE Herbicide: Control the Uncontrollable.

IMAGE controls previously uncontrollable summer weeds like purple and yellow nutsedge, field sandbur, and dollarweed in warm season turfgrasses as well as winter weeds like wild onion and garlic.

PENDULUM®, AMDRO® and IMAGE®. The professional's choice for top turf performance.

CYANAMID
Agricultural Products Division
Specialty Products Department
One Cyanamid Plaza, Wayne, NJ 07470

Circle No. 104 on Reader Inquiry Card

Monocot weeds

Because of natural variations within grasses and differences that occur under varying environments, the illustrations included herein are meant to be representative but not definitive. Users need to consider all of the information—seedhead, in-bud, ligule, collar, descriptive text, tips and distribution—to accurately identify a weed.

As you proceed, keep in mind that you should not rely on an individual characteristic to be conclusive, rather total the number of similar characteristics between the sample and the guide to help narrow the number of possibilities.

The monocot weed species illustrated herein were selected for their likelihood of appearing in turf and their latest reported distribution.

Identifying a monocot weed

Once a mature sample has been selected, check each of the listed plant parts as follows:

- seedhead—size, shape, openness and number, size and shape of branches and seeds
- in-bud—cut through a leaf stem and determine if it is folded or rolled
- ligule—remove a leaf from its stem and with a hand lens check the size, shape and texture
- collar—lay the leaf flat, underside up and check the size, shape and top and bottom edges
- tips—check for additional vegetative plant characteristics
- distribution—confirm that this weed species has been identified in your state

ANNUAL BLUEGRASS
aka *Poa annua, poa*

DIAGNOSTIC TIPS:

Very persistent self-seeding winter annual or biennial

Short, narrow leaf blades with parallel edges and boat-shaped tip

Some leaf blades wavy

Germinates in late summer/early fall

Shallow-rooted, dying under heat or moisture stress

STRUCTURAL CHARACTERISTICS:

Leaf in bud: folded

Collar: narrow top pinched

Ligule: medium pointed

DISTRIBUTION:

Indigenous states

SANDBUR

DIAGNOSTIC TIPS:

A mostly prostrate, narrow-leafed summer annual that likes sandy soils

Distinctive yellow seedhead contains 6-20 large, sharply-burred seeds

Burred seeds can cause painful injury to unprotected feet or ankles

STRUCTURAL CHARACTERISTICS:

Leaf in bud: folded

Collar: broad bottom pinched

Ligule: hairy

DISTRIBUTION:

Indigenous states

FOXTAIL BARLEY

aka *squirreltail barley*

DIAGNOSTIC TIPS:

A narrow-leafed prostrate summer annual

Leaf blades coarse to touch, often with sparse, stiff hairs

Seedhead is a single tufted spike

Seed has a 2-3-inch-long hair at pointed end

STRUCTURAL CHARACTERISTICS:

Leaf in bud: folded

Collar: broad bottom pinched

Ligule: tall toothed

DISTRIBUTION:

Indigenous states