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Growing with the green industry

I have the great fortune and pleasure to return to the green industry as executive editor of Advanstar Communications' four Landscape Group publications: Landscape Management, TurfGrass Trends, Athletic Turf Maintenance & Technology, and now, Golfdom. These four publications offer golf course, landscape, lawn and grounds managers complete coverage of the technical, managerial and business information you need to know.

I love the green industry, which is why I am glad to be back. I love the way it is so diverse and so dynamic. The green industry is the place where biology and business meet, but it's more than that. It's an industry full of terrific people who are savvy in business, skilled in growing plants, creative in marketing, innovative in applying research to technology and often, just plain fun. It's an industry of low-end, high-end and middle-of-the-road organizations, most who work to make our environment a more beautiful and enjoyable place to be.

One of the best things about being part of the Advanstar Landscape Group is the fact that things are happening here and they're happening at breakneck speed. We're busier than a mowing manager in May planning new products and additions to our publications for 1999.

We recognized the shared interests and differences of profession in this industry a while back. That's when we took TurfGrass Trends under our wing and introduced Athletic Turf Maintenance & Technology to that very important segment of the market. Now we're ready to make some more dramatic changes:

► One of the most exciting changes for us will happen with the January 1999 issue of Landscape Management, where we'll focus exclusively on the needs and interests of lawn, landscape and grounds managers. Landscape Management's beautiful graphics and coverage won't go away; we're just adding more coverage of:
  ► In-depth, practical information on managing your business,
  ► Ideas for operating your organization efficiently, day by day,
  ► Articles that explain how to grow healthy plants and healthy businesses,
  ► Realistic industry data that give a true picture of how our markets work, not just shot-in-the-dark numbers.

Why are we doing this? Because our second big step is to reintroduce Golfdom magazine in February, a publication that was the Bible of the golf industry for years. This high-end guide to the business of golf will debut with Pat Jones as publisher/editor. Pat's years of experience in the golf industry, extensive network of contacts and business and editorial expertise make the reappearance of Golfdom an exciting prospect.

► We're publishing Athletic Turf Management & Technology four times a year in 1999, and we're looking forward to covering truly innovative and practical athletic field management editorial under the knowledgeable guidance of Ron Hall, editor in chief.

► TurfGrass Trends will also undergo some tweaking as we expand our reach into the market and refine our focus on making the latest research useful to turf managers in all markets.

► Finally, we're already starting to beef-up our internet site (www.landscapegroup.com) to supplement our publications with useful coverage of products and management, article abstracts and archives, technical guides, news updates as they happen and much more.

In the midst of all our planning, we're also packing for those winter events that draw this industry together, like the GIE Show and others. We hope to see you there and find out what types of information you like best.

If you don't want to wait, please call us at 800/225-4569 or e-mail me at sgibson@advanstar.com. We want your input as we continue to expand our coverage to you, the best people in the green industry. LM
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WEED IDENTIFICATION GUIDE

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


STRUCTURAL CHARACTERISTICS OF A GRASSY WEED
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
MONOCOTS Annual

SANDBUR

DIAGNOSTIC TIPS:
A mostly prostrate, narrow-leaved 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-leaved 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
GOOSEGRASS
aka silver crabgrass

A narrow-leaved dense prostrate summer annual

Leaf color is darker green than most annual monocots

Collar area has sparse long hairs

Seedhead has 2-13 branches which are white to silver in color

BARNYARDGRASS
aka billion dollar grass, watergrass

A very wide-bladed semi-prostrate summer annual

Stems may be branched at nodes and frequently bent upright

Seedhead has multiple short perpendicular branches

Seeds are coarse with short burrs

GOOSEGRASS
aka silver crabgrass

A narrow-leaved dense prostrate summer annual

Leaf color is darker green than most annual monocots

Collar area has sparse long hairs

Seedhead has 2-13 branches which are white to silver in color

BARNYARDGRASS
aka billion dollar grass, watergrass

A very wide-bladed semi-prostrate summer annual

Stems may be branched at nodes and frequently bent upright

Seedhead has multiple short perpendicular branches

Seeds are coarse with short burrs
CHEATGRASS
aka chess, rye bromegrass

A narrow-leafed, mostly erect winter annual

Underside of leaf is often hairy

Seedhead is open with multiple semi-erect branches carrying 1-4 seed clusters

Seeds look like cultivated wheat or rye

GREEN FOXTAIL
aka green bristlegrass

A wide-leafed mounded summer annual

Leaf blades are limp, bright green and sharply pointed

Stems bent upright at nodes

Seedhead cylindrical with tufted pale green seeds

**STRUCTURAL CHARACTERISTICS:**

- **Leaf in bud:** rolled
- **Collar:** broad, bottom pinched
- **Ligule:** short, toothed

- **Leaf in bud:** rolled
- **Collar:** narrow, continuous
- **Ligule:** hairy

**DISTRIBUTION:**

- Indigenous states
LARGE CRABGRASS
aka hairy fingergrass

A wide-bladed prostrate summer annual

Leaves are hairy on both surfaces with a prominent midrib

Older nodes are often branched and rooted where contacting soil

Seedhead open with 4-6 slender branches

STRUCTURAL CHARACTERISTICS:

Leaf in bud: rolled
Collar: broad top pinched
Ligule: tall toothed & pointed

DISTRIBUTION:

Indigenous states

RESCUEGRASS
aka prairiegrass, rescue brome

A wide-leaved winter annual or biennial

Leaves are hairy at edges and on upper surface

Seedhead is open with bending slender side branches

Seed clusters look like cultivated wheat or rye

STRUCTURAL CHARACTERISTICS:

Leaf in bud: rolled
Collar: broad bottom pinched
Ligule: tall toothed & pointed

DISTRIBUTION:

Indigenous states
**SMOOTH CRABGRASS**
aka fingergrass

A narrow-leaved prostrate summer annual
Leaves are not hairy except sparsely haired in collar area
Stems branch at nodes, but do not root
Seedhead has 2-6 slender upright branches

**STRUCTURAL CHARACTERISTICS:**

- Leaf in bud: rolled
- Collar: broad bottom pinched
- Ligule: tall rounded

**DISTRIBUTION:**

[Map of Indigenous states]

---

**STINKGRASS**

A narrow-leaved annual
Leaves are dull on upper surface and glossy on underside
Collar area has sparse long hairs
Plant has a very disagreeable odor when cut or damaged

**STRUCTURAL CHARACTERISTICS:**

- Leaf in bud: rolled
- Collar: narrow continuous
- Ligule: hairy

**DISTRIBUTION:**

[Map of Indigenous states]
**MONOCOTS Annual**

**WITCHGRASS**
An erect wide-bladed summer annual
Leaves are densely haired on both surfaces
Emerging seedhead is fountain-like
Mature seedhead is large and very open with slender branches carrying single seeds

**STRUCTURAL CHARACTERISTICS:**
- Leaf in bud: rolled
- Collar: broad continuous
- Ligule: hairy

**DISTRIBUTION:**
- Indigenous states

**YELLOW FOXTAIL**
An erect wide-bladed summer annual
Upper leaf surface has long hairs in collar area
Leaves are often slightly twisted in an open spiral

**STRUCTURAL CHARACTERISTICS:**
- Leaf in bud: rolled
- Collar: narrow top pinched
- Ligule: hairy

**DISTRIBUTION:**
- Indigenous states
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MONOCOTS Annual

**DOWNY BROME**
aka *drooping bromegrass*

An erect narrow-bladed winter annual
Leaves have dense soft hairs on both surfaces
Seedhead is open with drooping branches
Seed clusters are tufted and look like cultivated wheat or rye

**STRUCTURAL CHARACTERISTICS:**

- **Leaf in bud:** rolled
- **Collar:** narrow bottom pinched
- **Ligule:** medium toothed & pointed

**DISTRIBUTION:**

- Indigenous states

---

**FALL PANICUM**
aka *smooth witchgrass*

A very wide-bladed mostly prostrate summer annual
Leaves may be hairy on upper surface, are glossy beneath and sharply pointed
Stems branched at nodes and bent upright
Seedhead is open with multiple very slender branches

**STRUCTURAL CHARACTERISTICS:**

- **Leaf in bud:** rolled
- **Collar:** broad continuous
- **Ligule height:** hairy

**DISTRIBUTION:**

- Indigenous states
**WILD OAT**
aka *wild oats*

An erect wide-bladed annual
Plant often turns brown in summer as seed matures
Collar area has sparse short hairs
Stems are stiff
Seedhead is open with multiple branches carrying many single drooping seeds

**STRUCTURAL CHARACTERISTICS:**
- **Leaf in bud:** rolled
- **Collar:** narrow bottom pinched
- **Ligule:** tall toothed

**DISTRIBUTION:**

![Indigenous states](image)

---

**SOUTHERN CRABGRASS**
aka *summergrass*

A wide-bladed prostrate summer annual
Leaves may be hairy on upper surface
Stems will root at nodes
Collar area has sparse long hairs
Seedhead has 2-9 slender branches

**STRUCTURAL CHARACTERISTICS:**
- **Leaf in bud:** rolled
- **Collar:** broad
- **Ligule:** medium toothed & pointed

**DISTRIBUTION:**

![Indigenous states](image)
MONOCOTS  Perennial

DALLISGRASS  aka paspalum

A warm-season coarse semi-erect spreading perennial
Collar area has hairs on upper leaf surface and at leaf edges
Seedhead has 3-7 right-angled slender branches
Roots may have short rhizomes

DISTRIBUTION:

STRUCTURAL CHARACTERISTICS:

Leaf in bud: rolled
Collar: broad
Ligule: tall

BROOMSEDGE

A very narrow-leaved erect perennial
Collar area has hairs on upper leaf surface and on leaf edges
Seedhead is upright with white feather-like tufts

DISTRIBUTION:

STRUCTURAL CHARACTERISTICS:

Leaf in bud: folded
Collar: narrow continuous
Ligule: short with hairs

Indigenous states
QUACKGRASS

An erect narrow-leafed aggressive perennial
Leaf is rough on upper surface
Collar area has claw-like fleshy appendages (auricles) that clasp stem
Plant develops multiple rhizomes from base of plant
Seedhead is a single slender spike

JOHNSONGRASS

A very wide-bladed aggressively spreading prostrate perennial
Collar area has short hairs on upper surface near ligule
Spreads by multiple ¼-inch-thick rhizomes
**MONOCOTS** Perennial

**NIMBLEWILL**

A very short-leafed stemmy spreading perennial herb

Leaves are short

Spreads by very slender stolons

On frequently mowed sites, plant often looks stemmy in fall

Turns off-white during winter

Collar area has long hairs at leaf edge

Seedhead has single, very slender spike

**STRUCTURAL CHARACTERISTICS:**

- **Leaf in bud:** rolled
- **Collar:** medium top pinched
- **Ligule:** short

**DISTRIBUTION:**

Indigenous states

---

**KNOTGRASS**

A prostrate spreading perennial

Collar area has short hairs at leaf edges and near ligule

Seedhead has two slender upright branches

**STRUCTURAL CHARACTERISTICS:**

- **Leaf in bud:** rolled
- **Collar:** broad bottom pinched
- **Ligule:** tall rounded

**DISTRIBUTION:**

Indigenous states
MONOCOTS Perennial

YELLOW NUTSEDGE
aka yellow nutgrass

A very rapidly growing erect perennial herb
Spreads by rhizomes with underground tubers
Leaves are v-shaped with a prominent midrib tapering to a sharp point
Stems are triangular
Seedhead is semi-open, carrying yellow seeds

DISTRIBUTION:

PURPLE NUTSEDGE
aka purple nutgrass

Rapidly growing erect perennial herb
Spreads by rhizomes with underground tubers
Stems are triangular
Leaves are v-shaped, tapering to a sharp point
Seedhead is open, carrying dark or purple seeds

DISTRIBUTION:

Indigenous states
Dicot weeds

In a universe of hundreds of dicot weeds, a limited number can tolerate repeated mowing of managed turf sites. In order to provide a broader representation of turf weeds, we have included a select number of these dicot weeds. Those presented herein were chosen for their ability to survive in turf, often as a continuing pest. Several of the species can persist even at fairly short mowing heights; others are active in cool weather.

Identifying a dicot weed

Unlike the prototypical size and shape of monocot weeds, the shape and vegetative growth habits of many dicot weed groups are visually unique. Also, the distinctive traits of monocots—seedheads, ligules and collars—are not always present, making visual identification more important.

We suggest the following process for identifying dicot weeds:

• Look for a sample flower if available
• Leaves: check for identifying characteristics (size, shape, notches, venation or coloration)
• Stems: check how the leaves are held (opposite or alternate), shape and color
• Flowers: check color, size and composition (single, double or compound)
• Location: take note of the conditions in which the weed is growing (shade, compacted soil, etc.)
• Distribution: confirm that this weed species has been identified in your state

DANDELION aka common dandelion

A large rosette-type perennial herb
Leaves growing from plant base are long, narrow and deeply notched
Points of leaf lobes point backward toward base of plant
Has large, slightly mounded yellow flowers on hollow stems
Mature seedhead is a round puffball with seeds that are easily dislodged

DISTRIBUTION:

Indigenous states
**HENBIT**
aka *dead-nettle*

A mostly erect winter annual or biennial

Leaves are similar to mint: rounded, toothed, heavily veined with soft hairs on top, held opposite on square stems

Single flowers are trumpet-shaped, pale purple and project from ends of stems

Seen primarily in spring, dying with heat

**KNOTWEED**
aka *prostrate knotweed*

- A persistent low-growing summer annual

- Prefers compacted soil of pathways and along drives

- Leaves are blue-green, up to 1 inch long and $\frac{1}{2}$-inch wide

- Small single white to pink flowers are found at the junction of the leaves and the stem

**DISTRIBUTION:**

![Indigenous states map]
DICOTS

PURSLANE
aka common purslane

A prostrate, succulent summer annual

Leaves are shiny green, wedge-shaped, thick and up to 1 inch long

Stems are thick, fleshy and purple to brown in color

Plants are very drought-resistant

Small, single yellow flowers may appear in the leaf clusters at end of stems

COMMON CHICKWEED
aka starwort, winterweed

A low-growing winter annual

Plant prefers shaded moist sites

Opposite small leaves are carried on tender stems

Stems may root at leaf nodes

Small compound flower composed of 5 pairs of two pale purple petals

Plants die back with summer heat, but can survive year round at cool sites

DISTRIBUTION:

Indigenous states
**DICOTS**

**SPOTTED SPURGE**

A prostrate fleshy summer annual herb

Leaves are opposite, oblong, and up to ¼-inch long

Upper leaf surface has a purple to brown blotch along center vein

Hairy stems produce a milky-white sap when broken

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**ACKNOWLEDGMENTS**

This guide was written and compiled by Chris Sann of Turf Information Group, Inc., Wilmington, Delaware.

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Graphic design and execution and illustrations by LANDSCAPE MANAGEMENT graphic designer Lisa Bodnar and Dan Beedy.

The "LANDSCAPE MANAGEMENT Weed Identification Guide" presented as a service to the green industry by American Cyanamid of East Hanover, N.J. and LANDSCAPE MANAGEMENT magazine of Cleveland, Ohio.

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**DISTRIBUTION:**

[Map showing the distribution of Spotted Spurge, with indigenous states highlighted.]
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Level of control

- ★ Medium
- ★ Medium—High
- ★ High
- ★ Not registered

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Managing holly leaf miner

We have had a problem managing holly leaf miner. What is the best strategy for managing this pest? Do they have two generations like birch leaf miners?

—PENN SYLVANIA

Unlike the birch leaf miner, which has two generations, the holly leaf miner has only one generation per year. Holly leaf miner eggs are laid on the under-surface of leaves. The adult female makes “pin-prick” holes with her ovipositor and lays eggs around early May. Eggs hatch into larvae, which feed very slowly and remain inside the mines all summer. They do not feed to any extent until late winter and early spring. They then pupate in the leaves and the small black and gray flies emerge.

Ideally, applications of insecticides such as Orthene should be provided in early May against the egg-laying adults. The birch leaf miner is active earlier so don’t try to treat both problems at the same time of year.

Consider using sticky pheromone traps to monitor the adult activity. This will help fine-tune your treatment timing. The use of phenology (blooming of indicator plants) may also help fine-tune your treatment timings. When red buds produce flowers, the adult activity also can be found.

Depending on how extensive the feeding damage is, it may be a good idea to fertilize, water and mulch to help improve plant health. If the feeding damage is extensive, it can weaken the plant considerably.

Read and follow label specifications, and treat as needed.

Fertilize in the fall

When is the best time to fertilize a lawn in the fall? How much nitrogen needs to be used to get a good result?

—OHIO

For your area, generally the best time to apply turf fertilizer is in early September at the rate of one pound of actual nitrogen per 1,000 square feet. And again treat in late October or early November at the rate of one to two pounds of nitrogen per 1,000 square feet. Some people may prefer to apply only once in the fall. In this situation apply one pound at the end of September or in early October. The first number on the fertilizer bag is nitrogen. This number represents the percentage of actual nitrogen (by weight) in the bag of fertilizer material you have. From this total actual fertilizer material, calculate the 1 to 2 lb. ai (active ingredient) nitrogen needed.

If the application is done correctly, the agronomic benefit will be great. This would include greater and deeper root system development, heat and drought tolerance in the summer and earlier green-up in the spring. Reports also indicate that insect, disease and weed activity may be less severe. In general, it’s a good agronomic practice to implement a fall fertilization program.

Mammal pests

What is the best way to manage skunks and raccoons? These animals are digging the lawns and causing extensive damage. The problem is severe close to the wooded areas.

—NEW YORK

Skunks and raccoon can cause extensive damage to lawns. They dig the lawns in search of underground food such as grubs, earthworms, periodical Cicada nymphs and other soil-inhabiting insects.

Where feasible, try to capture them using traps. Make sure that you have the proper traps designed for their use. Also check with your county or state regulatory agency to see whether it is all right to capture them. After catching, make sure the animals will be relocated or dealt with as per regulatory guidelines. Be careful when moving them from place to place. Some of them may carry contagious diseases.

Also consider using grub control measures to keep the possible food source under control. Make sure that proper insecticide is used at the proper timing. In spite of using insecticide for grub control, sometimes these animals may still visit the lawns in search of other food sources.

Again, in this situation the best option is to use traps. LM
new tree pest is causing concern in the northeastern states. It's a borer called the Asian longhorned beetle (*Anoplophora glabripennis*). This rather dramatic looking beetle seems to attack just about any hardwood. There is potential for a lot of damage, both for tree survival and for tree strength. The main area of concern in the United States is the northeast and midwest.

The Asian longhorned beetle, native to Japan, China and North Korea, most likely traveled to this country burrowed in raw wood used in shipping and packing materials.

The beetle is quite distinctive in appearance with black and white striped antennae 1.5- to 4-in. long and a 1- to 1.5-in. bullet-shaped body, shining coal black with scattered white spots. Don't confuse this beetle with the white-spotted sawyer, which also has long antennae but is a dull bronzy-black without the shininess, the distinct scattered white spots or striped antennae.

In China, this pest seems to prefer stressed trees. Some of the signs of an attack are heavy sap flow from wounds and large sawdust accumulation at tree bases or where branches meet the main trunk. Exit holes that are 3/8 in. or larger in the bark are obvious and can be scattered anywhere on the trunk, branches and exposed roots. Yellowing leaves and leaf drop are other indicators that the pest is present.

The boring occurs not only under the bark but also into the sapwood and heartwood of the tree or branches. The young larvae bore into the inner bark, feed for awhile and bore into the tree's heartwood to pupate. The adult beetle then chews its way out, thus leaving the hole.

The best time to spot the adult beetles is from May to October. The beetles normally stay close to their host trees, although the adults can fly up to 3,000 feet. Humans provide the easiest modes of transportation for the beetles; they can hitch a ride on vehicles moving through infested areas or be spread in infected firewood or tree litter.

There is no efficient biological or effective chemical control of the beetle at this time. The only proven method is to cut and burn all infested trees. When the temperatures drop below 60°F, the trees can be cut to the ground and destroyed. Cooler weather also reduces the possibility of the adults flying to other areas.

The beetle seems to prefer the softer hardwood trees that are easier to bore into. Some species of trees that have been attacked include: black locust, pear, boxelder, plum, Chinese elm, silver maple, corkscrew willow, sugar maple, horsechestnut, sycamore maple, hybrid poplar, weeping willow, Lombardy poplar, white mulberry and Norway maple.

Although the Asian longhorned beetle prefers the softer hardwood trees, it may attack others. And in China, where poplars are grown commercially in plantations, sugar maple is used as a trap tree. The maples appear to be a preferred host and attract the beetles.

We don't need to be filled with horror and fear about this borer but be aware of this pest and its significance. If you see something really unusual get a sample and have it identified.


If you think you have found this beetle, call your Animal and Plant Health Inspection Service (APHIS) Plant Protection and Quarantine (PPQ) State plant health director at the number listed below: CT 203/269-4277; DE 302/677-4093; IL 708/299-0024; IN 317/654-7792; ME 207/945-0479; MD 410/224-3452; MI 313/942-9005; MN 612/334-4194; NH 603/666-7445; NJ 609/259-8649; NY 518/438-3896; OH 216/552-4869; PA 717/782-3419; RI 401/828-9025; VT 802/828-4490; VA 804/771-2042; WV 304/372-8590; WI 608/264-5096.