

UNDERSTANDING TURF MANAGEMENT

Species Identification

The 20th in a series by
R.W. Sheard, P.Ag.

The management of turf often requires we know what species of grass we are working with. The manager may wish to know whether his sports field is bluegrass, ryegrass or tall fescue. His records may be misplaced as to what was seeded originally and with time a mixture of species may have become dominated by one species. So what is it?

The answer is obtained through identifying certain vegetative plant parts; then according to their characteristics decide what species you are working with. The plant parts are the root system, the leaf blade, the bud-shoot, the sheath, the collar, the auricle and the ligule.

The root system identification characteristic is based on the presence or absence of stolons or rhizomes. An ability to identify stolons from rhizomes is critical for this step. Stolons are stems which grow along the soil surface or within the thatch layer. New roots and shoots emerge from the nodes on these stems. The stolons may branch at the nodes forming a network of stolons. Rhizomes are also stems, but they grow horizontally below the soil surface. When the stem approaches the soil surface light response stimulates the formation of shoots and roots at a node on the stem and a new plant results from which one or more new rhizomes may emerge.

Generally stolons and rhizomes are much larger in diameter than the fibrous root system, therefore they should not be confused with roots.

The bud shoot or bud leaf is the manner in which the newly emerging leaf emerges. The arrangement of the bud shoot is the basic point from which all identification of grasses commences. The bud shoot may be folded with the margins of the leaves meeting but not overlapping or it may be rolled with the

margins of the leaves overlapping (Fig. 1).

The leaf blade may be used in identifying species on the basis of the shape of the leaf tip. The differentiating characteristic is whether the leaf tip is boat shaped or pointed apex (Fig. 2).

The leaf sheath is that tubular part of the leaf, arising at the node and closely clasping the stem or younger growing leaves upward to where the blade begins. The leaf sheath may be classified as split from the node to emergence of the blade, split at the top but tube-like near the node, or closed the entire distance from the node to where the blade emerges (Fig 3).

The collar is a meristematic band or growth zone which marks the division between the blade and the sheath. The collar may be broad and prominent or narrow, continuous from one margin of the leaf to the other, or divided by a conspicuous midrib. In some species it may be higher on one side of the leaf than the other (Fig 4).

The auricles are appendages projecting from the collar, one from either side. They may be absent or vary in length and shape from long and claw-like to small and rounded or rudimentary (Fig. 5)

The ligule is a tongue-like outgrowth at the junction of the blade and the sheath clasping the culm or bud shoot. It may appear as a fringe of hair or as membranous tissue, or may be pubescent [covered with soft hairs] on the back (Fig. 6).

There are over 7,500 species which belong to the family of plants called *Gramineae*. As turf grass managers in the cool temperate region, however, we need to be concerned with only 16 of these species. They have been discussed in recent articles in this series and for review are listed again.

Kentucky bluegrass (*Poa pratensis* L.)
Canada bluegrass (*Poa compressa* L.)
Rough bluegrass (*Poa trivialis* L.)
Annual bluegrass (*Poa annua* L.)
Supina bluegrass (*Poa supina* Schreb.)

Italian ryegrass (*Lolium multiflorum* Lam.)
Perennial ryegrass (*Lolium perenne* L.)

Tall fescue (*Festuca arundinacea* Schreb.)
Meadow fescue (*Festuca elatior* L.)
Creeping red fescue (*Festuca rubra* L.)
Sheeps fescue (*Festuca ovina* L.)
Hard fescue (*Festuca ovina* L. subsp. *duriuscula*)

Creeping bentgrass (*Agrostis stolonifera* Huds.)
Colonial bentgrass (*Agrostis tenuis* Sibth.)
Velvet bentgrass (*Agrostis canina* L.)
Redtop (*Agrostis alba* L.)

To this list we must add three forage grasses which may invade a turf area and two weed grasses which create control problems. They are:

Brome grass (*Bromus inermis* L.)
Timothy (*Phleum pratense* L.)
Orchard grass (*Dactylis glomerata* L.)
Twitch (quack) grass (*Agropyron repens* L.)
Crabgrass (*Digitaria ischaemum* Schreb.)

To aid in separating the identifying characteristics of each species and deciding on which species you are dealing with botanists have developed an identification key. With the aid of a sharp knife and a small hand lens the plant is systematically examined for the several characteristics listed above until the name of the species is arrived at.

AN IDENTIFICATION KEY FOR TURF SPECIES

- 1.0. - Folded in the bud shoot.
 - 1.1. - Auricle present.
 - 1.1.1. - Lower leaf sheath reddish, back of leaf shiny. Perennial ryegrass
 - 1.2. - Auricle absent.
 - 1.2.1. - Ligule membranous.
 - 1.2.1.1. - Blade narrow, prominently ridged on upper surface.
 - 1.2.1.1.1. - Ligule less than 0.5 mm or absent, sheath split, leaves waxy, plant tufted. Sheep fescue
 - 1.2.1.1.2. - Ligule over 0.5 mm, sheath closed, leaves not waxy, plant not tufted. Red fescue
 - 1.2.2. - Ligule absent to very short.
 - 1.2.2.1. Without rhizomes.
 - 1.2.2.1.1. - Sheath keeled or with prominent ridge like a boat keel running down base of leaf which gradually tapers to apex. Canada bluegrass
 - 1.2.2.2. - With rhizomes.
 - 1.2.2.2.1. - Sheath not keeled, leaf parallel sided, with abruptly pointed and boat shaped tip. Kentucky bluegrass
 - 1.2.3. - Ligule rounded or pointed, more than 1.0 mm long.
 - 1.2.3.1. - With stolons.
 - 1.2.3.1.1. - Tapered and boat shaped leaf tip, sheath rough, blade glossy under surface. Rough bluegrass
 - 1.2.3.2. - Without stolons.
 - 1.2.3.2.1. - Parallel side leaf with tip abruptly pointed and boat shaped. Annual bluegrass
 - 1.2.3.2.2. - Leaf blade wide and taper pointed, stem base flattened. Orchardgrass
- 2.0. - Rolled in the bud shoot.
 - 2.1. - Auricles present.
 - 2.1.1. - Auricle blunt to claw like and with minute marginal hairs, very shiny underside, strongly ribbed upper side of leaf. Tall fescue
 - 2.1.2. - Auricles without marginal hairs, leaf soft and less shiny, margin of leaf harsh or slightly rough or jagged to finger when slid lengthwise down edge near leaf base. Meadow fescue
 - 2.1.3. - Margin of leaf smooth, auricle small, rarely reaching 1/4 distance around stem, ligule over 1 mm. Italian ryegrass
 - 2.1.4. - Sheath, collar, and blade with short soft hairs, rhizomes prominent which are white and pointed. Quack grass
 - 2.2. - Auricles absent.
 - 2.2.1. - Ligule membranous.
 - 2.2.1.1. - Leaf sheath closed, its margins united except for a small V-shaped notch near the collar, leaf sheath and blade hairless, "W" marking of wrinkled tissue near middle of leaf, rhizomes present. Bromegrass
 - 2.2.1.2. - Leaf sheath split, hairless and compressed with ridge or keel down the back. Crabgrass
 - 2.2.2. - Ligule 1.5 mm or longer with prominent notch on either side, enlarged or bulbous base to stem.
 - 2.2.2.1. - Ligule without notch, rhizomes present. Timothy
 - 2.2.2.2. - Ligule shorter than 1.5 mm, rhizomes slender and short. Redtop
 - 2.2.2.3. - Stolons present. Colonial bentgrass
 - 2.2.2.4. - Stolons present, ligule tends to be pointed. Creeping bentgrass
 - 2.2.2.4. - Stolons present, ligule tends to be pointed. Velvet bentgrass

It is important to remember that the key is based on contrasting pairs of statements. If the first statement is not true then you move on to the next statement at the same level in the key.

Let us take an example. The first characteristic listed in the key is the bud shoot. As there are only two possibilities the first step is to determine whether the sample is folded in the bud shoot or rolled in the bud shoot. Let us assume that it is folded (1.0). The alternative

statement is rolled in the bud shoot (2.0.). The second step is to determine whether the sample has auricles. Let us assume that it does not (1.2.). The third step is to examine the shape of the ligule. Let us assume that ligule are hard to see or absent (1.2.2). Further examination reveals the plants have very prominent rhizomes (1.2.2.2.) and for confirmation that the leaves are not tapered but parallel sided and boat shaped at the tip. Following these observations through the

key reveals that the plant you have examined is Kentucky bluegrass.

Practice is necessary to develop skills in using the key. Some initial short cuts can often save time, such as to examine the plant for rhizomes or stolons. Broad leaf species will often turn out to be quack grass or forage grasses. Crab grass in August can easily be identified by its particular seed head, even under two inch mowing.

ILLUSTRATIONS OF VEGETATIVE CHARACTERISTICS USED FOR GRASS IDENTIFICATION

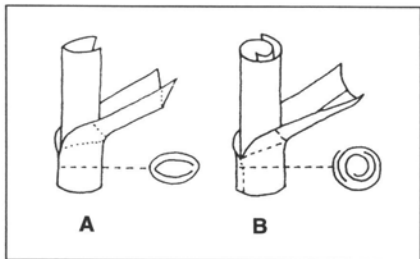


FIGURE 1: The Bud Shoot (A = folded, B = rolled)

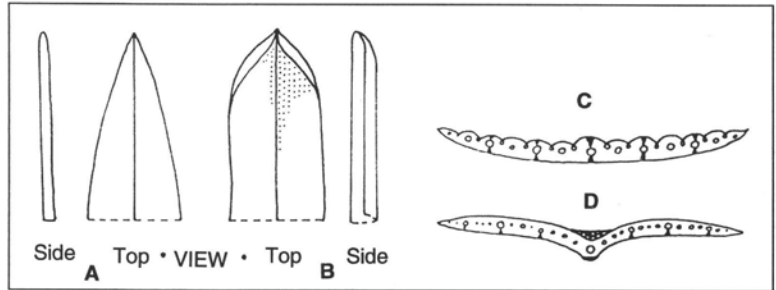


FIGURE 2: The Leaf Tip and Surface
(A = tapered, B = boat-shaped, C = ridged but not keeled, D = not ridged and keeled)

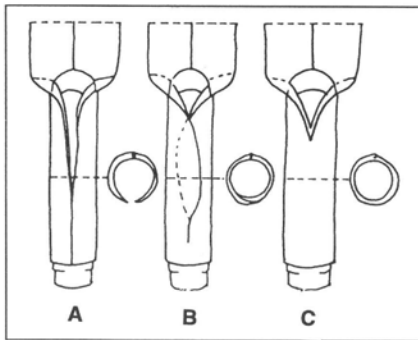


FIGURE 3: The Leaf Sheath (A = split, B = split with margins overlapping, C = closed)

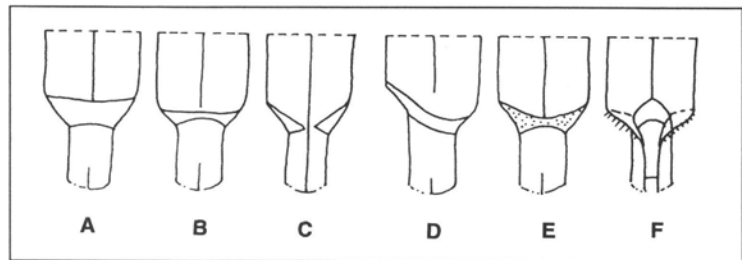


FIGURE 4: The Collar (A = broad band, B = narrow band, C = divided by midrib, D = Oblique, E = Pubescent, F = ciliate, note: A - E are back views, F is a front view)

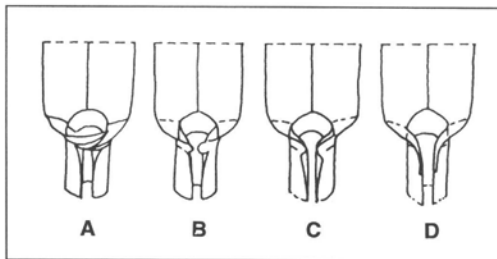


FIGURE 5: The Auricle (A = claw like, B = rounded, C = rudimentary, D = absent)

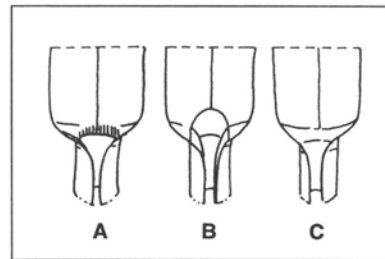


FIGURE 6a: The Ligule Types, (A = fringe of hair, B = membranous, C = absent)

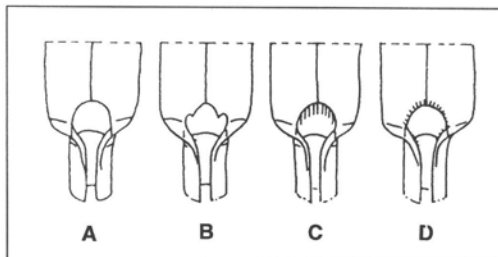


FIGURE 6b: The Ligule Margin (A = entire, B = notched, C = lacerate, D = ciliate)

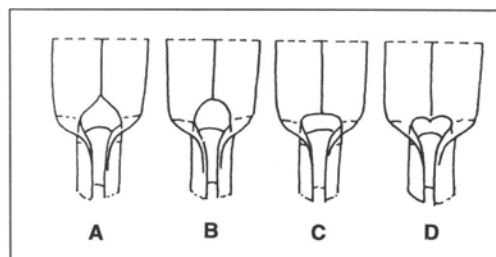


FIGURE 6c: The Ligule Shapes (A = acute, B = rounded, C = truncate, D = marginate)