Understanding Weed ID and Terminology

Proper weed identification is critical for effective weed control. A key component of proper herbicide application is making sure the herbicide in the tank will control the weeds in your field. Without properly identifying the weeds, time, money and product can be wasted trying to control a weed that may not be controlled by that herbicide.

Many farmers get nervous when trying to identify weeds, as most weed id books are written using terminology that often appears to be in a foreign language. This factsheet aims to explain the basics of weed id and terminology and make it easier for a farmer to identify their own weeds.

1. Grasses:

Differentiating between grass species can be frustrating at best and often challenging. However, there are some common features that can help narrow down which species you are looking at.

Grasses have several major vegetative structures that are mentioned in weed id books that often help with plant identification.

Collar Region:
The area in which a grass leaf meets stem is called the **collar** region. There are several structures in this area that can help identify grasses. The **ligule** can be a membranous sheath, a fringe of hairs or absent like it is for barnyard grass. The ligule is attached to the leaf right where it meets the stem. In some species, there are protrusions, called **auricles,** that wrap around the stem like fingers where the leaf meets the stem. These structures are only present in some species like quackgrass or perennial rye-grass. Grass leaf blades are actually attached to the stem at a swollen structure called the **node**. The node is located below where the leaf actually meets the stem. The **leaf sheath** is leaf material that surrounds the stem between the node and the collar region.

Growing grasses can show a characteristic called **vernation**. The new leaves of the grass emerge rolled or folded which can help differentiate species.

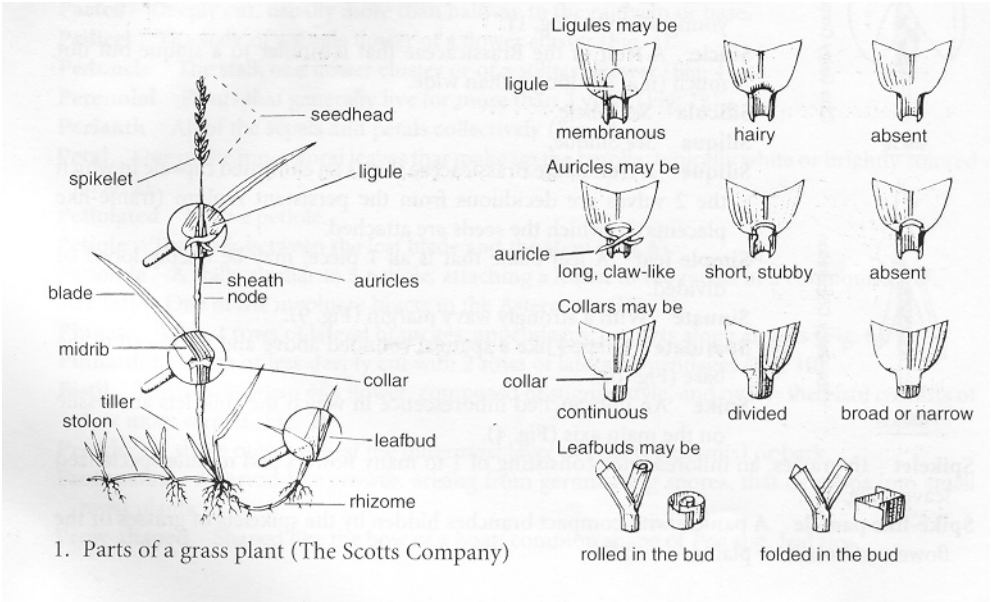
Rhizomes and Stolons:
Root systems can also help identify the species. Annual grasses tend to have more shallow fibrous roots. Perennial grasses can have fibrous root systems as well, but some have very distinctive underground stems called **rhizomes** (ie. Quackgrass). **Stolons** are above ground rhizomes and can be found in species like Bermuda grass. Both of these structures allow the grasses to spread vegetatively, either above or below the ground.

Grass Flowers:
Often grasses can be very difficult to differentiate by vegetative structures, so you often must look at the flowers. However, grass flowers are very small and compact and can be very intimidating especially when trying to differentiate the parts. Grass flowers generally have three different types of **bracts** (small specialized leaves associated with the flower) that surround and protect the flower. The **glumes** can surround individual flowers like redtop or surround multiple flowers (**spikelet**) like annual bluegrass. Inside the glumes are two other bracts the **palea** and the

lemma, these are the upper and lower bracts that surround the true flower. Weed Id books will often describe these structures, which vary greatly between species.

The **inflorescence** is the entire flowering structure of the plant. It is made up of spikelets that are arranged in many ways. This is a key way in identifying mature grasses. A **spike** is an inflorescence that is formed when the individual spikelets are attached directly to the axis without an intermediate stalk. An example of this type of structure would be quackgrass. A **panicle** is a branched inflorescence, usually pyramid shaped. The appearance of a panicle can vary greatly from single spikelets at the end of short branches or many spikelets clustered all along the branches. Witchgrass is a good example of a grass with a diffuse panicle.

<u>Figure 1: Grass Morphology</u> (*Weeds of the Northeast, Cornell University Press, 1997*)



1. Parts of a grass plant (The Scotts Company)

2. Broadleaf Weeds:

Broadleaf weeds are numerous and varied in their appearance and growth habit. There are some common morphological structures that can help narrow down the weed to a family group which can help great in identification.

Seedlings:
When a plant germinates from a seed, the first leaves that emerge from the ground are called **cotyledons**. The shape of these 'false leaves' can be very distinctive and help narrow down the plant to species or at least family very quickly. For example, many plants in the mustard family (ie. Wild radish) have **kidney shaped** cotyledons. When looking at the cotyledons combined with the first true leaves the id can be easier. For example the cotyledons of wild buckwheat are long and **linear**, very similar to many other plants, but the first true leaf is arrow shaped, making it very distinctive.

Leaves:
When describing leaves, ID books can describe several characteristics. If a leaf has an **entire** margin, that means the edge of the leaf is smooth, not divided or toothed. Purslane is a plant that has entire leaf margins. Leaves are also described as **toothed or serrated**. The first leaves of common groundsel are described as having toothed margins. The more mature leaves of this plant are often described as **deeply divided**. This is where lobes are created on the leaf. Finally, **compound** leaves are leaves that are made up of small leaflets or groups of small leaflets. Tufted vetch is a good example of this type of leaf formation.

How leaves present themselves on the stem can also be a great clue for identification. Leaves can be **opposite** on the stem, meaning that two leaves emerge at opposite side of each node on the stem. Common chickweed is a good example of a plant with opposite leaves. They can also occur in **alternate** formation, whereby only one leaf emerges from each node. Redroot pigweed leaves emerge from the stem in alternate formation. Finally leaves can emerge from the stem in a **whorled** formation. This is where multiple leaves emerge from the node all the way around the stem like you see in cleavers.

Stems and Associated Characteristics:
Characteristics on the stem can also help identify the plant to a family group. If a plant has a **square stem** there is a good chance that it is in the Lamiaceae or mint family. Creeping Charlie or Ground Ivy has a square stem. There are other plants outside of this family that do have square stems, but it is a common characteristic of mint family plants.

Beside shape, the hairiness of a leaf or a stem can help differentiate plants. Velvetleaf has very short soft hairs that cover the entire leaf and stem. Cleavers has recurved prickles on the stem that allow it to cling to other plants. Some plants have coatings on the leaves, for example lamb's quarters will have a gray **mealy** coating that will appear on young leaves and the underside of leaves.

An **ocrea** is a thin membraneous sheath that grows out from the node on a stem. This structure only appears on plants in the Polygonaceae family. So you can see this structure in plants like smartweed, wild buckwheat, curly dock and sheep sorrel.

Flowering structures:

Flowering structures are very critical for identifying plants. Understanding the terms for the basic structures can be a great help when reading a weed Id book.

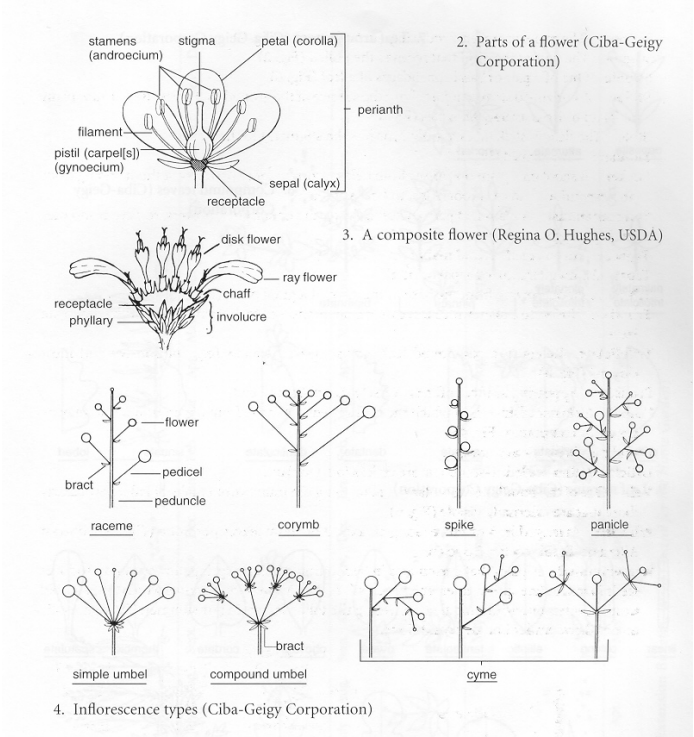
Most broadleaf flowers have **petals**, these are inner floral leaves that are typically white or bright colored. For example, the flower of common chickweed has five white petals that are each deeply divided so it appears as 10 petals.

Some people become confused when discussing flower structure of the Asteraceae family. This is one of the largest plant families and contains many common plants like dandelion, daisy, Canada thistle, among others. These flowers are actually dense composite inflorescence. There are two main flowers; the **ray** flower and the **disc** flower. In a daisy, for example, what appears to be white petals, are actually appendages to the ray flower. The yellow flowers in the middle are disc flowers that are tubular, symmetrical flowers. So an Asteraceae plant has many florets in each composite head. This can be seen when the flowers mature and each one produces a seed (ie. Dandelion)

Plants in the carrot family have a very distinctive flower shape. Plants that have an umbel usually fall within this family. **Umbels** are a type of inflorescence that has stalks (**peduncles**) of the same length and arise from the same point. Wild carrot or Queen Anne's Lace is a good example of this inflorescence type.

The mustard family also has a distinctive flower and seed formation on the plant. Flowers are often distributed on a **raceme**, an elongated inflorescence in which stalked flowers arise from an unbranched central axis. As the flowers mature you will see long slender fruit (**siliques**) or fruit that is about as long as it is wide (**silicle**) growing off the central axis.

Figure 2: Broadleaf Flowering Structures (*Weeds of the Northeast, Cornell University Press, 1997*)



3. Resources

This factsheet just brushes the surface of weed identification. To properly identify weeds it is important to get a good weed ID book and get to know it. Most books published today have great plant characteristic descriptions, descriptive plant keys, colorful and clear photos as well as easy to read text. Below are a couple of resources that are very appropriate for agriculture in Nova Scotia.

Weeds of the Northeast
Uva, Neal and DiTomaso; Cornell University Press 1997

Identication Guide to the Weeds of Quebec
Conseil des productions vegetales du Quebec inc. (CPVQ) 1999

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