

## Course Focus

### AGSC 454 - Agrostology

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Students in Range Science, Land Resources, and the various Biology degree options often have to learn how to identify grasses and grass-like plants (the “graminoids”) as part of their studies of vegetation and restoration. AGSC 454 is designed to introduce students to about 150 of the most common graminoids that inhabit riparian, shrub-prairie, and disturbance-prone settings in Montana. Because almost 450 graminoid species are known from Montana, this course is designed to familiarize students with how to use taxonomic keys so that they can leave the course being able to potentially identify the many graminoids previously never seen. In order to use taxonomic

keys successfully, however, students have to know how to sight identify, at least to some degree, a given plant not just to the species, but also to the genus, tribe (which is important for the grass family), or family. This is why about 150 common Montana graminoid species are introduced in AGSC 454. The ability to sight-identify common species to family, tribe, genus, and species actually facilitates the use of taxonomic keys with unknown graminoid specimens. Such ability helps to create mental landmarks in the otherwise difficult and bumpy landscape of the world created by taxonomic keys. Without such mental landmarks, taxonomic keys are impossible to use. The taxonomic keys used in AGSC 454 are those in the “Manual of Montana Vascular Plants” by Peter Lesica. In addition, a smartphone app, Montana Grasses, is being developed by High Country Apps (<http://www.highcountryapps.com/>), and this will be available for class use (and by the general public) by summer 2014. This app will initially include over 100 of the most common graminoid species in Montana.

Students meet once a week on Monday afternoons during the fall semester. Confining the class to this time often enables people with full-time jobs to take the course (e.g., students who work for environmental consulting companies). The noon hour “lecture” is spent introducing the plant families, tribes, genera, and species that will be studied that afternoon. For lecture and lab, students are given about 15 plant specimens that were collected during the previous summer when the grasses and grass-like plants were in flower. The afternoon is then spent mostly indoors preparing a reference set of plant species for that day. During early part of the fall semester, part of the lab is held outdoors where students can see about 30 graminoid species in fall conditions, which are still intact enough to study the important reproductive and vegetative features.

Photographs of all of these species are taken so that the habitat and habit, as well as close-ups of important diagnostic traits can be readily accessed via a collection on [www.flickr.com](http://www.flickr.com/photos/plant_diversity/collections/72157628191237539/). These photographic collections are arranged by family and then by genus (e.g., [http://www.flickr.com/photos/plant\\_diversity/collections/72157628191237539/](http://www.flickr.com/photos/plant_diversity/collections/72157628191237539/)). For the grass family, they are organized by tribe and then by genus ([http://www.flickr.com/photos/plant\\_diversity/collections/72157630341509474/](http://www.flickr.com/photos/plant_diversity/collections/72157630341509474/)). These photos augment the approximately 150 plants species given to the students during the

semester. Students can opt to make a taxonomically organized reference collection from these graminoid specimens, which can be taken with them at the end of the semester. Such a collection should be invaluable to those students working on Montana vegetation.

It is my hope that students who leave AGSC 454 will be able to make first-hand observations of the plant world and realize for themselves that there is not much of a difference between native and introduced graminoid species and that introduced grasses (e.g., smooth brome, timothy, Garrison creeping foxtail, etc.) are often the most invasive of all plants yet seldom attract the attention of citizens concerned about exotic invasives.



These sorts of ecological, morphological, and taxonomic detail that student learn in AGSC 454 are exemplified in these photos.

This photo is a close-up of the leaves and stems of western wheatgrass (*Agropyron smithii* or *Pascopyrum smithii*). The clasping auricles, the small finger-like projections wrapping around the stem at the base of the leaf blade, are distinctive to many grasses in the wheatgrass tribe (Triticeae), including barley and wheat.



Close-up of the spikelet detail of western wheatgrass (about six of which occur in this view). The most diagnostic feature of this grass species is the long stout glumes with long narrowing tips that are slightly curved. The ecologically and morphological similar thickspike wheatgrass (*Agropyron dasystachyum* or *Elymus lanceolatus*) differs in having glumes that lack these long curved tips.