

Unit I – Grasslands and Grassland Plants

Lesson 2: Plant Classification

Grasslands are useful due in part to the wide variety of plants that are found in them. The main feature of grassland agriculture is its dependence on grassland plants. By understanding the different plant types, increasing the benefits to livestock and wildlife from the grassland is possible. A thorough knowledge of the various types and life cycles of these plants is important to grassland management.

Grassland Plant Classification

A grassland may include a great variety of different plant species. All grassland plants can be classified according to two different criteria—life cycle and plant type.

Classification by life cycle divides plants based on their yearly growth and seeding characteristics. Each plant grows in stages which, from beginning to end, comprise its life cycle. A plant's life cycle is closely related to its productivity and is therefore extremely important. Plants can be divided by their life cycles into three categories: annuals, biennials, and perennials.

Annual plants complete their life cycle within one year or growing season. They die after producing seed and will not grow again the next year unless self-seeded or planted again. Corn, cheat, and crabgrass are examples of annual plants.

Biennial plants require two years to complete their life cycle. Generally, the plant produces mainly vegetative growth, including leaves, stems, and roots, in the first year after germination. The plant produces flowers, fruits, and seeds the second year. At the end of the second year, the plant dies. Red clover is an example of a biennial plant.

Perennial plants grow year after year. Perennials produce flowers, fruit, and seeds each year. After they produce seeds, they go into a resting period called dormancy. This process is more noticeable in regions that have cold winter seasons, where perennials may stop growing completely for the winter. During the period of dormancy, the perennial slows down all its natural processes to protect itself from colder temperatures. When spring

comes, its pattern of growth begins again. Many forages and pasture crops are perennials. Trees and shrubs are also perennials.

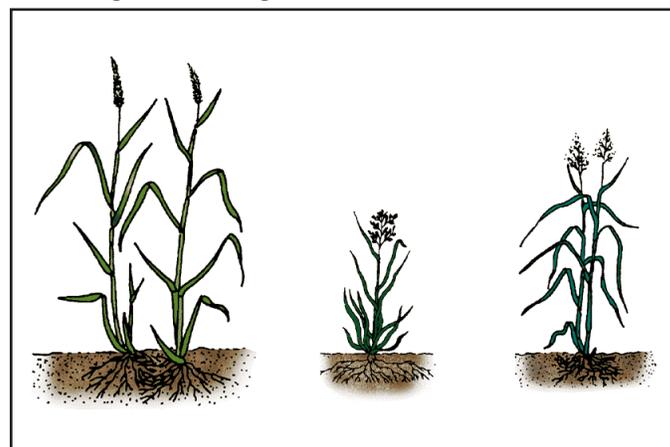
In classification by plant type, plants are categorized according to the physical characteristics of the plant. Each species within a plant type has characteristics that are similar to all other species of the same plant type. Four different plant types are found in grasslands—grasses, legumes, forbs, and woody plants.

Grasses of the Grassland

Grasses are one of the four dominant plant types found in a grassland. They serve many purposes, such as food for livestock and wildlife (orchardgrass, fescue, and alfalfa), food for humans (cereals and grain sorghum), and erosion prevention.

The grasses of the Great Plains are herbaceous, or without woody stems. The stems, or culms, of grasses are usually hollow and therefore resist compaction. Leaves or blades connect directly to the culm at a sheath, which surrounds the stem. All leaf blades have a distinctive parallel venation in which the veins run side by side along the length of the blade of grass. These visual characteristics make it possible to separate the grasses from all other plant species. Notice the characteristics of the grasses pictured in Figure 2.1.

Figure 2.1 – Characteristic Grasses: Indiangrass, Orchardgrass, Switchgrass



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The two major groups of grasses are cool-season and warm-season grasses. Cool-season grasses tend to grow best during the spring and fall. These plants begin their growing season when the soil temperature reaches 40° F, but optimum growth occurs when air temperatures fall in the 59° to 77° F range. They may remain green all winter, but during the summer months they tend to become brown and dormant. They may be annuals or perennials. Examples of cool-season grasses include Kentucky bluegrass, orchardgrass, and smooth brome grass.

Warm-season grasses are just the opposite, in that they grow best during periods of warm temperatures. These grasses are much more tolerant of heat and drought than cool-season grasses. Their growing season begins when soil temperature reaches 60° F, and they grow best during the summer when temperatures are in the 77° to 104° F range. They are dormant in the winter and do not begin to turn green until early summer. They also may be annuals or perennials. Some examples of warm-season grasses are indiagrass, big bluestem, and switchgrass.

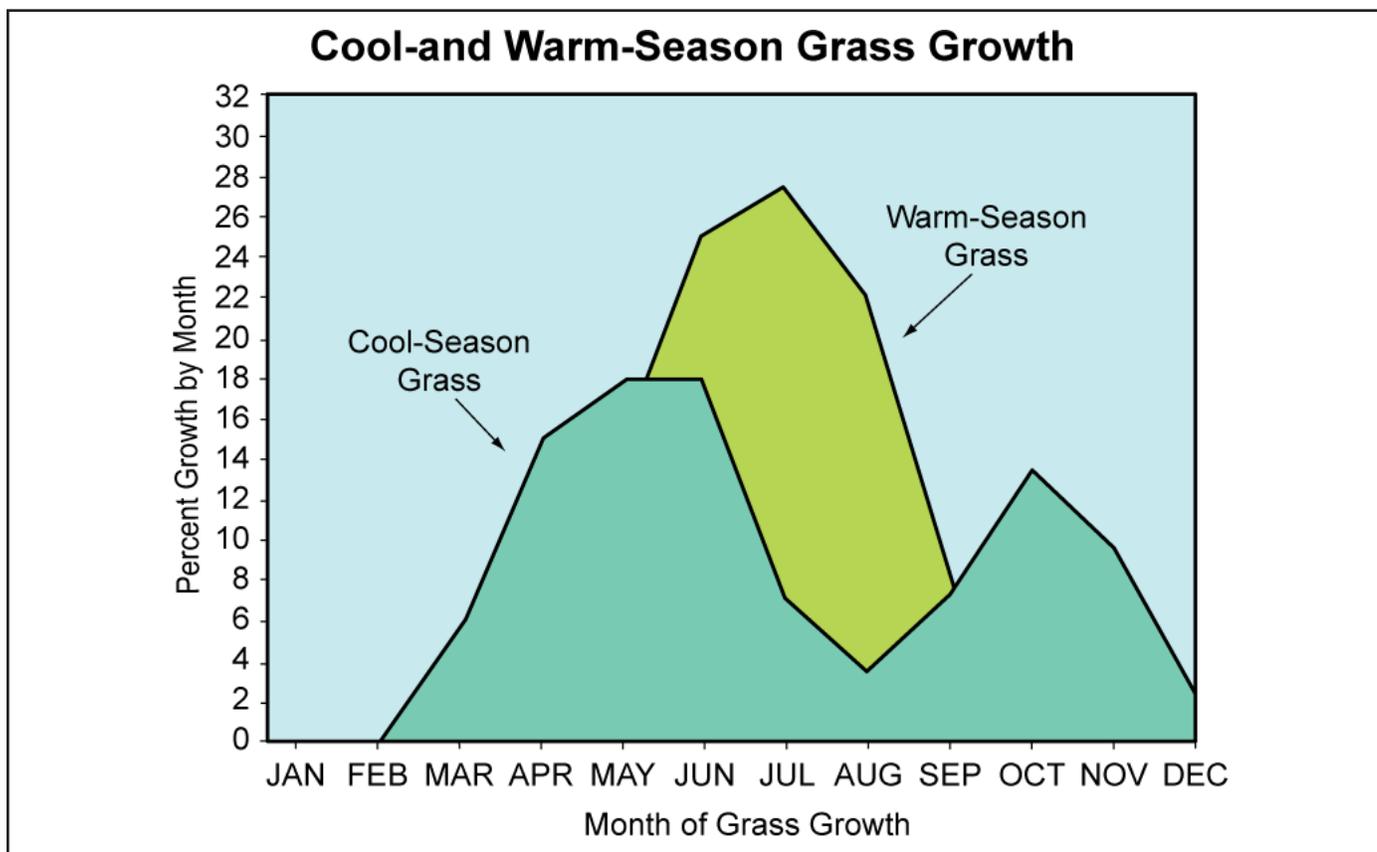
Missouri has the right climate and amount of annual rainfall for both cool-season and warm-season grasses. Figure 2.2 shows how the growth periods of these two grass types complement each other and extend the length of green pasture production in Missouri.

Legumes

Legumes and grasses together make up the dominant plant types found in grasslands. Both are used as forage crops and therefore are beneficial to agricultural production. Figure 2.3 shows characteristic legumes. Examples of legumes include soybeans, alfalfa, clovers, and birdsfoot trefoil.

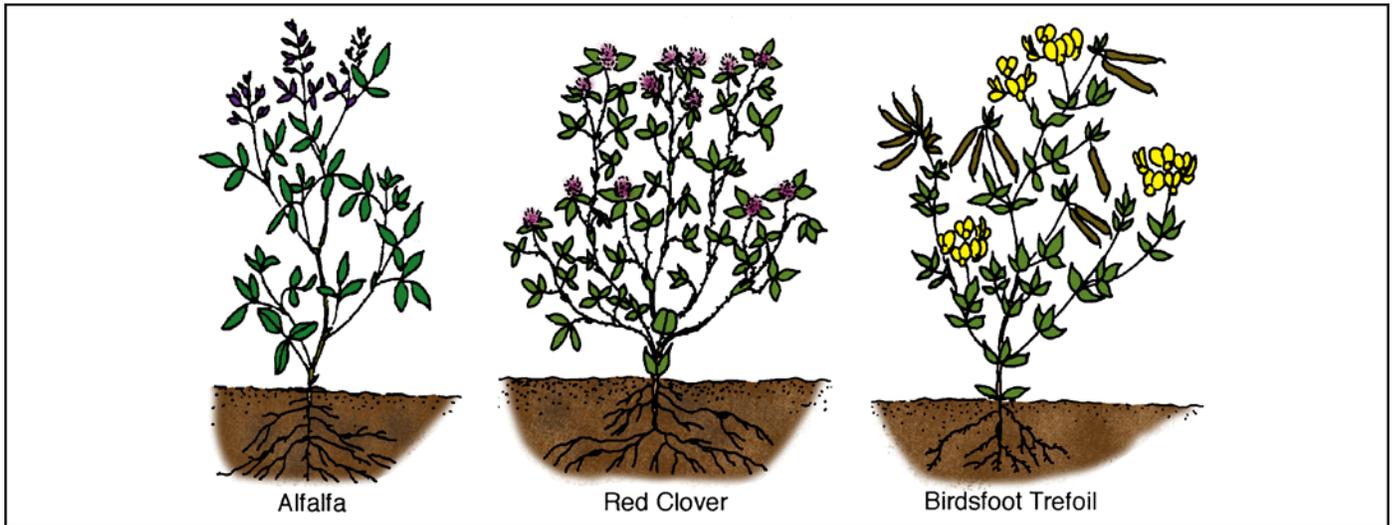
Legumes have several identifying characteristics. One characteristic of legumes is the fruit or pod that they produce. This pod has one chamber, with seeds lined in a single row. The seed number and size varies for different plants. All legumes have leaves that are alternate in arrangement on the stem and are connected to the stem

Figure 2.2 – Cool- and Warm-Season Grass Growth



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Figure 2.3 – Characteristic Legumes



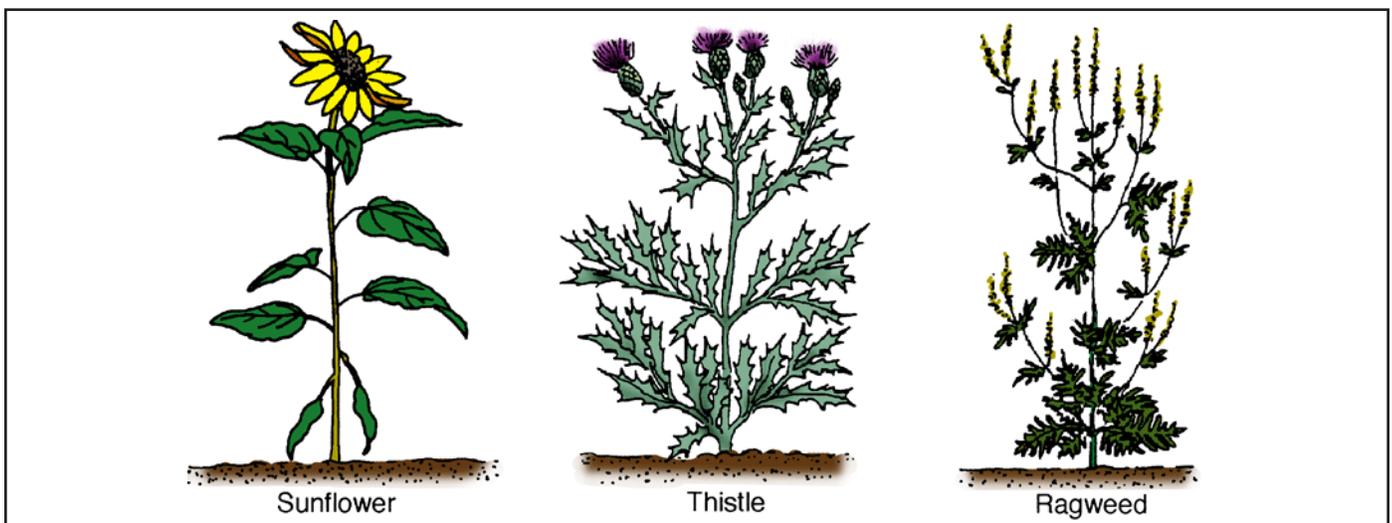
by a stalk called a petiole. Unlike the grasses, venation in a legume consists of a network of veins rather than veins that run parallel to each other. Legumes may be annuals, perennials, or biennials.

Most legumes have the unique ability to take nitrogen from the air between soil particles and change it into a form of nitrogen that plants can use. This process is known as nitrogen fixation and is carried out by symbiotic bacteria found in nodules on the roots. This nitrogen helps decrease fertilizer needs, reduce costs, increase yields, and enrich the soil.

Forbs

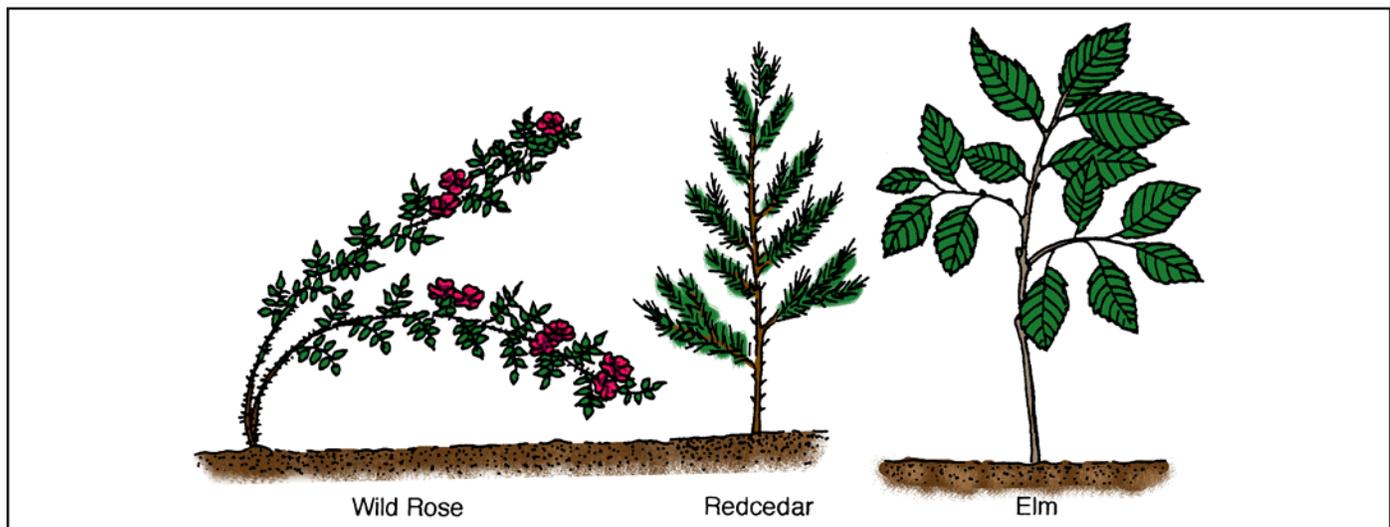
Herbaceous (or not woody) plants that are neither grasses or legumes are called forbs. Most forbs are broad-leaved, making it possible to distinguish them from grasses or grasslike plants. Forbs are not usually cultivated for agricultural production, but they commonly appear in both pastures and native plant habitats. Many forbs have value as wildlife food and cover or for prevention of soil erosion. Others are considered to be noxious weeds. Forbs may be annuals, perennials, or biennials. Some examples of forbs are sunflowers, thistle, and ragweed, which are pictured in Figure 2.4.

Figure 2.4 – Characteristic Forbs



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Figure 2.5 – Characteristic Woody Plants



Woody Plants

Woody plants are probably the easiest plants to identify in the grassland because of their tough, woody (nonherbaceous) stems. They are either shrubs, vines, or trees. Woody trees found in grasslands are almost always immature due to the nature and use of the grassland. They are kept small by animals that graze on terminal branches, by fires that stunt growth, by mechanical cutting, or by chemical treatments carried out to maintain the grassland. Woody plants are perennials. Examples of woody plants found in grasslands include wild rose, redcedar, and elm, shown in Figure 2.5.

Summary

Understanding plant types and life cycles will help in managing a grassland for many purposes. Grassland plants may be annuals, biennials, or perennials; they may also be grasses, legumes, forbs, or woody plants. They are important for the whole grassland habitat and its many uses.

Credits

Barnes, Robert F., Darrell A. Miller, and C. Jerry Nelson. *Forages, Volume I: An Introduction to Grassland Agriculture*. 5th ed. Ames: Iowa State University Press, 1995.

Coambes, Howard, John Jennings, and David E. Pitts. *Grassland Evaluation Contest Study Guide*. University of Missouri-Columbia: Instructional Materials Laboratory, 1997.

Hitchcock, A.S. *Manual of the Grasses of the United States*. 2nd ed. 2 vols. New York: Dover Publications, Inc., 1971.

Humphrey, John Kevin. *Plant Science*. University of Missouri-Columbia: Instructional Materials Laboratory, 1991.

Rodekohl, Sherie, and Debi Waeckerle. *Landscaping and Turf Management*. University of Missouri-Columbia: Instructional Materials Laboratory, 1990.