Forage and Rangeland Production

Important Grasses and Legumes

The wide range of topographic and climatic conditions in the United States and Canada results in the cultivation of a large number of plant species for forage and rangeland production systems. There are more than 32 million hectares of land in hay and silage production in North America (Fig. 1) The largest area of production of hay and silage is in the midwestern region of the United States. The largest area of production of hay and silage in Canada is in Alberta. Species grown in the United States and Canada vary greatly between regions. Cool-season grasses predominate the midwestern, northern, and northeastern portions of the United States and Canada, and forages such as elephantgrass and perennial peanut are grown primarily in the coastal plains in the southern United States. Alfalfa is widely adapted and is grown in every state in the United States and in all provinces in Canada. However, the most concentrated areas of production of alfalfa are found in the Midwest and Northeast United States and Ontario. This chapter focuses primarily on the major grasses and legumes (Tables 1 and 2). Management practices of the more important species used for forage and rangeland production are discussed.

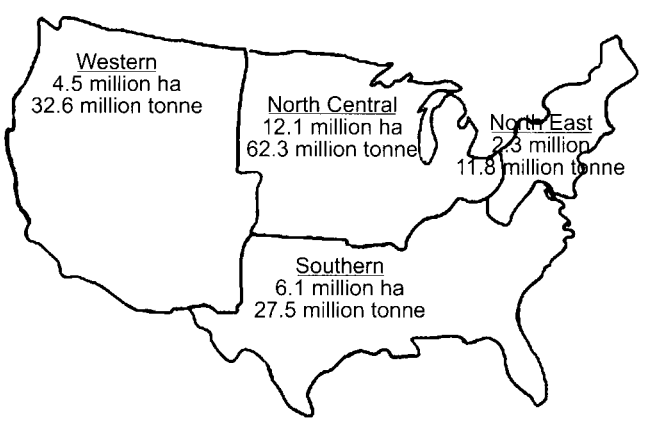

Fig. 1. Hay and silage production in North America by region.

History of Forage Production

Forage production has long been important to human civilization. The dawn of civilization found humans grazing sheep and goats in the Fertile Crescent of the Middle East. Following the seasonal rainfall patterns with their herds, herders probably helped establish the trade routes that connected cities and formed the basis for the ancient Assyrian and Babylonian empires. As civilization developed, so did forage and rangeland production systems. Farmers discovered how to grow crops to sustain their herds of cattle or sheep instead of moving their herds to locate forage. Over the ages, forage production has developed into a fine science in which almost every factor that affects production, from fertility, to species selection, and even water availability, has been brought under human management.

Native rangeland utilization also has been refined. Native Americans living on the plains were known to burn the prairies to improve the grazing. Now rangeland managers can use satellite photos and weather maps to predict where and when to graze their huge tracts of land.

Several significant advances in plant breeding for improvement of forage crops have been made. Forage species are improved for varied soil moisture conditions, fertility, quality, growing seasons, and pest tolerances. Forage producers within regions of the United States and Canada can select the forage crops best suited to their particular conditions. Species, and varieties within species, can be chosen for drought tolerance, greater winter hardiness, or greater pest resistance.

Legumes are characterized by a type of fruit pod that is called monocarpellary (one-chamber) fruit containing a single seed or a single row of seed that dehisces along both sutures or ribs. Legumes can be annual, biennial, or perennial, depending on the lifespan of the plant. Morphology of legumes differs greatly from that of grasses. There are different morphological characteristics between legume species that help in identification. The leaves of legumes are arranged alternately on the stem and are usually connected to the stem by a petiole. When a single leaf is attached directly to the petiole, it is termed unifoliolate. In compound leaves, (trifoliolate) three or more leaf blades are individually connected to the petiole by a short stalk called a petiolule. The inflorescense of legumes varies between species and is useful in identifying legume species. Morphological characteristics can