Managing Grasses

By John McGregor, MFGA Extension Support

"Vibrant grasslands and prosperous forage crops on Manitoba's agricultural lands" is MFGA's vision statement. We see grasses as the dominant plant in most forage-based enterprises throughout Manitoba. Whether it's native rangeland, tame pastures or hay field, grasses usually are the basis of the energy and nutrients for animal growth and maintenance.

Effective grazing management not only ensures high forage yield, sustainability, animal health and productivity, it also benefits the pasture ecosystem and gives producers greater control to support the environment (e.g. biodiversity) while allowing them to better use pasture resources for food production.

Manitoba (as well as other parts of Canada) has a lot of excellent forage producers. They understand forage production and grazing strategies so that they are productive and persistent over time as well as multiply grazing/cutting and recovery to prevent overgrazing.

Part of what makes them good at this is they understand how grasses grow.

Plant Growth

A grass plant is a collection of plant parts, like a tree or shrub, made up of growth units called tillers. Each tiller produces roots and leaves. Vegetative tillers consist primarily of leaves (Figure 1), whereas reproductive tillers produce a stem, seedhead, roots and leaves (Figure 2). The basal area of the stem, where roots often arise, is the crown.

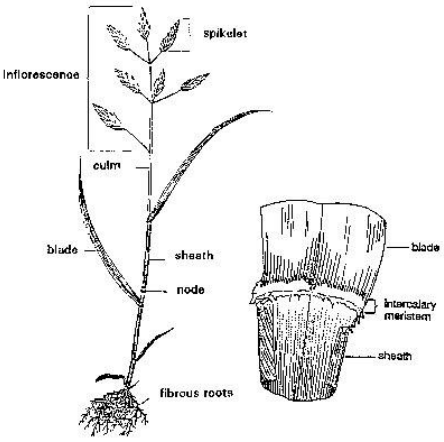


Figure 1

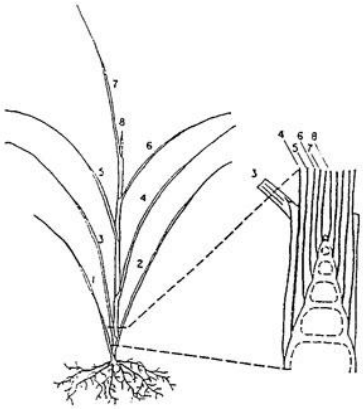
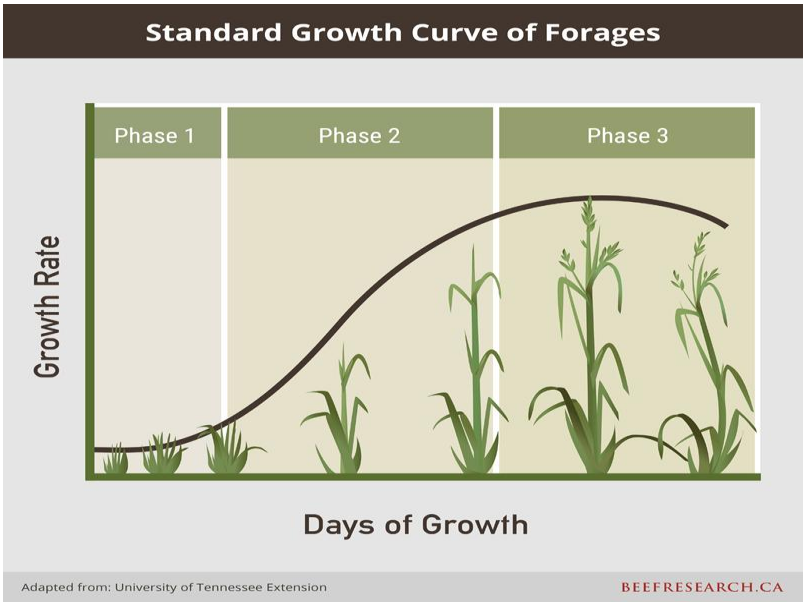


Figure 2

The crown usually has a number of buds (growing points) that produce new tillers and roots. New tillers are anatomically and physiologically connected to older tillers. Therefore, several connected tillers may all live and share water, carbohydrates and

nutrients. If one tiller dies, an adjacent tiller with established roots and leaves usually lives. Some tillers stay vegetative, while others become reproductive and produce seedheads. Whether a tiller becomes reproductive depends on environment and hormones produced in the plant.

The efficiency with which plants convert the sun's energy into green leaves and the ability of animals to harvest and use energy from those leaves depends on the phase of growth of the plants. **Plants go through three phases of growth that form an "S" shaped curve**.



Click to enlarge **The sigmoid (S) growth curve of a typical forage stand indicates how yield, growth rates and rest periods *change over the growing season. (Voisin 1988).***

Phase I occurs in the spring following dormancy or after severe grazing where few leaves remain to intercept sunlight forcing plants to mobilize energy from the roots. The roots become smaller and weaker as energy is used to grow new leaves.

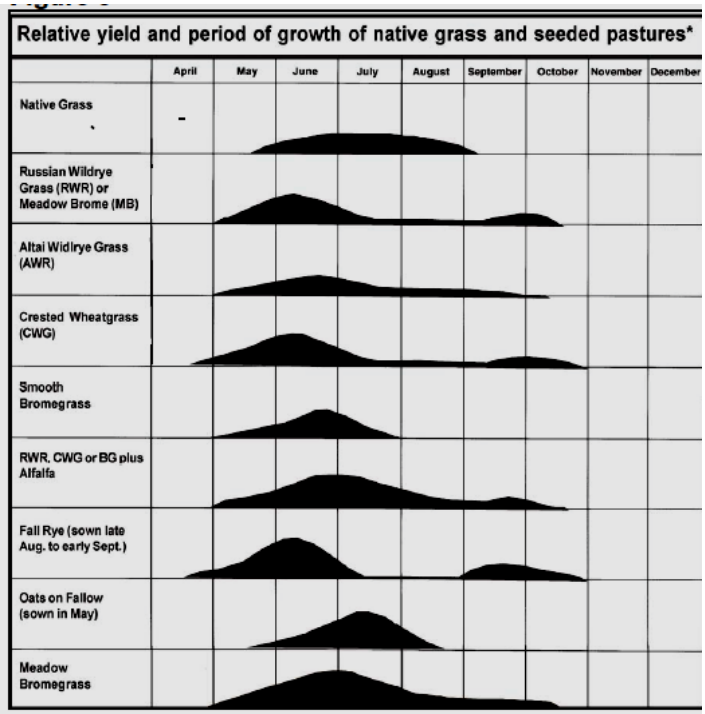
Phase II is the period of most rapid growth. When regrowth reaches one fourth to one third of the plant's mature size, enough energy is captured through photosynthesis to support growth and begin replenishing the roots. A reproductive tiller may remain vegetative if the growing point (terminal meristem) is removed by grazing. Vegetative growth, therefore, is favored by some grazers, it reduces the number of seedheads produced and may stimulate the formation of new tillers. Vegetative tillers usually are less stemmy and more nutritious than reproductive tillers

Phase III material is mature and nutrient content, palatability, and digestibility is relatively poor. Leaves become shaded, die and decompose. During this phase new leaf growth is offset by the death of older leaves.

The key is to adjust grazing and rest periods to keep plants in Phase II. Do not graze plants so short that they enter phase I as regrowth is very slow. Nor should plants be permitted to mature and enter phase III as shading and leaf senescence reduces photosynthesis. The harvest of energy is maximized by keeping plants in phase II. Grazing livestock should harvest only part of the perennial forage crop to maintain the health and vigor of grasses.

The timing of the growth curve for each forage species is unique and these growth characteristics are **an important factor in determining proper season of use for grazing**

For example, crested wheatgrass begins growth relatively early in the growing season while native grass species grow later in the season. Based on these characteristics, crested wheatgrass is best grazed early in the season with native rangelands better suited for use in the summer or fall. It is important to recognize that forage species may be grazed outside their optimal season of use however, the subsequent rest period must be extended to allow plants adequate time to recover.



These curves are averages for Saskatchewan. Growth patterns may differ, according to weather and soil zones.

Once one understands how grasses grow, knowing why we need rest and recovery periods, stand management and grazing plan fall re easily into place.

Some facts to remember:

- Leaves are more palatable than stem, and new growth is more nutritious than older tissue.
- Grasses are most negatively affected when grazed during their reproductive period and least affected during dormancy.
- Spring growth can be grazed if plants are given an opportunity to re-grow without being used again
- Sufficient photosynthetic tissue must remain on plants for production of carbohydrates to meet growth and respiration demands of the plant.

Further information/sources

Grazing Management

Understanding Grass Growth and Regrowth for Improved Management

Grass Growth and Response to Grazing