Management Implications

Grazing management decisions are often calendar based with minimal consideration given to possible ill effects of untimely, intensive defoliation. Since sustained growth of grasses is the objective, managers should understand growth mechanisms of their grass.

-To ensure continued growth in the early spring, locate the apical meristem in the desired grass by splitting the shoot. Control defoliation to maintain the growing points. When basal buds produce sprouts for aftermath tillers, increase grazing pressure to maximize consumption. Removal of developing seed heads will trigger earlier aftermath development which furthers root extension prior to dry conditions.

-Certain grasses produce many non-flowering (sterile) tillers which remain culmless so the apical meristem remains low. This seems to allow for intensive grazing but dry conditions and long rest intervals may cause intercalary meristems to become elevated and vulnerable. Excessive blade removal disrupts photosynthesis an d transpiration which leads to stand thinning and weed invasion.

-Pastures of mixed species are difficult to manage. Consider separate seedings of species, which mature at progressively later dates and graze in succession. In a mixed sward, manage to favor the desired species.

Percentage of sterile tillers

LowHigh Med

Annual ryegrassLittle bluestemBentgrasses
Big bluestemOrchardgrassBluegramma
BromegrassesSideoatsBuffalograss
Reed canarygrass grammaKentucky
Perennial ryegrassTall fescue bluegrass
Switchgrass
Timothy

Culmed regrowthCulmless regrowth
BromegrassesBentgrasses
QuackgrassBluestem grasses
Reed canarygrassKentucky bluegrass
Perennial ryegrass Orchardgrass
Timothy Tall fescue
Wheatgrasses

Grass Growth & Regrowth

Web segment

Consult our comprehensive web segment to learn more about the growth and regrowth mechanisms of grasses. Suggestions, contributions, and feedback are encouraged. Computers are available at libraries and county extension offices.

URL:

http://forages.orst.edu/projects/regrowth/

CD-ROM

A CD-ROM with similar information is available.

ORDER FORM

Name _____

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Please send the following aids to understanding grasses.

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Brochure_____$1.00_____

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The USDA's Sustainable Agriculture Research and Education program is a federal competitive grants program with regional leadership and decision-making structures.

SARE works to increase knowledge about -- and help farmers and ranchers adopt -- sustainable practices that are profitable, environmentally sound and beneficial to local communities and society in general.

SARE provides funding for research, demonstration, education and extension projects carried out by scientists, producers, educators a nd private sector representatives.

Western Region SARE URL:
http://wsare.usu.edu/

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Understanding Grass Growth and Regrowth for Improved Management

OREGON STATE UNIVERSITY

Western Sustainable Agriculture Research and Education

GRASS GROWTH AND REGROWTH…..

Importance

Grasses are often taken for granted because they are all around us, thriving where other plants fail. But as prolific as grasses seem to be, there are definite advantages to understanding and maximizing grass growth.

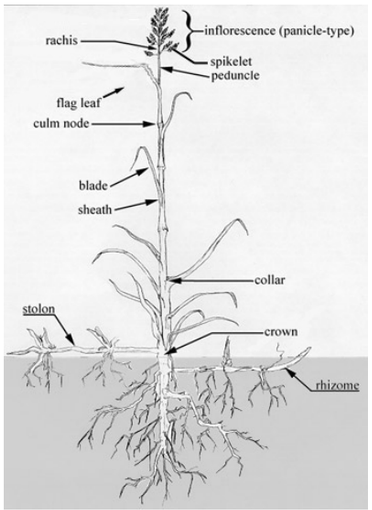
Grass is the healer of the land, covering and repairing the scars left by mankind. Grasses:

purify the air
filter the water
reduce erosion
feed animals
provide habitat for wildlife
beautify the world,
are the core of sustainability,
are the main feed for humans
(wheat, corn, rice, oats, so rghum).

Grasses perform better, have higher yields and better quality when they are properly utilized by grazing or cutting at the optimal time.

Grass Growth

Grasses are different from many common plants because they have a variety of growing points (meristems). These permit multiple harvests within a season if the growing points are not destroyed by defoliation during critical periods. Grasses are resilient to pruning and are actually more productive when cut than when left unmanaged.



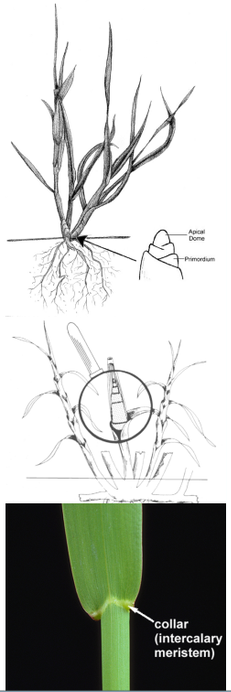
Growing Points (Meristems)

Apical meristems: in the apical dome, allow a grass plant to grow to maturity. During vegetative growth this tissue remains low but is elevated as the plant prepares for reproduction.

Intercalary meristems: initially in the primordium and later at the blade base - allow leaf formation and expansion.

Buds: basal (in the crown) and adventitious buds develop new grass plants but need time to develop.

Rhizomes, stolons: lateral tillers that can produce daughter plants in some grass species.



Grass Regrowth

How grass recovers following grazing varies with growth phase and plant structure. During the vegetative stage, shoots continue normal development under moderate defoliation if the apical meristem remains intact. During transition even moderate grazing may destroy the apical meristem if internode elongation has begun. When the apical meristems are destroyed, regrowth depends on basal buds. If buds have not produced sprouts, recovery will be delayed. This allows invasive species to flourish. Will regrowth develop a culm with an elevated apical meristem? Some grass exhibit this habit. Others, like bunchgrasses, produce culmless, sterile regrowth where the growing point remains near the soil. However, with a long rest period, the intercalary meristems elongate and lift the blades to a vulnerable height. Once removed, leaves die. This is a concern in intensive grazing systems. Grasses vary widely with respect to growth habits. Managers must understand the specific growth and reg rowth mechanisms of their grasses.

Developmental Phases

Grasses grow through phases from seed to maturity. A grass seed germinates when soil conditions are favorable. Grass emerges from the soil with one leaf (monocotyledon).

In the vegetative phase, leaf blades develop and harness energy via photosynthesis. When blades are complete, excess photosynthate is stored in the crown tissue, roots, rhizomes, and stolons.

If climatically induced by temperature and photoperiod, the plant transitions to reproduction. Leaf number becomes fixed. Culm internodes at the base begin to elongate. Seed heads expand within the flag leaf sheath.

The seed head emerges in the reproductive phase. Pollen is soon released (anthesis). Unless interrupted by defoliation, seeds develop. Growth of aftermath shoots is suppressed as long as the seed head remain.