Department of **Employment, Economic Development and Innovation**

Mitchell grass pasture phases of growth

A visual aid to restocking after wet season spelling

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PHASE 1 (GREEN PICK) is characterised by:

- short leafy growth, generally at the start of the wet season
- moderate pasture growth rate
- high forage quality but low yield
- high sensitivity to grazing

For Mitchell grass Phase 1 is:

- the crucial time to spell to promote root growth
- when high grazing pressure can do the greatest damage to mature tussocks and seedlings

PHASE 2 (MID GROWTH) is characterised by:

- a well-developed leafy tussock phase
- high pasture growth rate
- good forage quality and a rapidly increasing yield
- moderate sensitivity to grazing

For Mitchell grass Phase 2 is:

- crucial to spell to promote root growth
- when high grazing pressure can damage mature tussocks and seedlings

PHASE 3 (SEEDING) is characterised by:

- the reproductive phase
- low pasture growth rate
- moderate forage quality and maximum yield
- low to moderate sensitivity to grazing pressure

For Mitchell grass Phase 3 is:

- when spelled paddocks can start to be grazed, once seeding has started
- when high grazing pressure starts to do less damage to mature tussocks and seedlings

PHASE 4 (HAYED OFF) is characterised by:

- a dormant phase
- little or no growth
- declining forage quality and maximum yield
- low sensitivity to grazing pressure

For Mitchell grass Phase 4 is:

- when spelled paddocks can be grazed safely
- when high grazing pressure does no damage provided a minimum of 15-20 cm residual stubble is left ready for the next wet season

Grasses and forbs all go through these four phases of growth during an average wet season. Annual plants—such as Flinders grass—die at the end of Phase 3 instead of becoming dormant. In very dry years there may not be enough moisture for plants to go to seed and plants may hay off part way through Phase 3. Different species of plants will be in different Phases during the wet season and re-stocking decisions should be made in relation to the plant being promoted through spelling e.g. Mitchell grass

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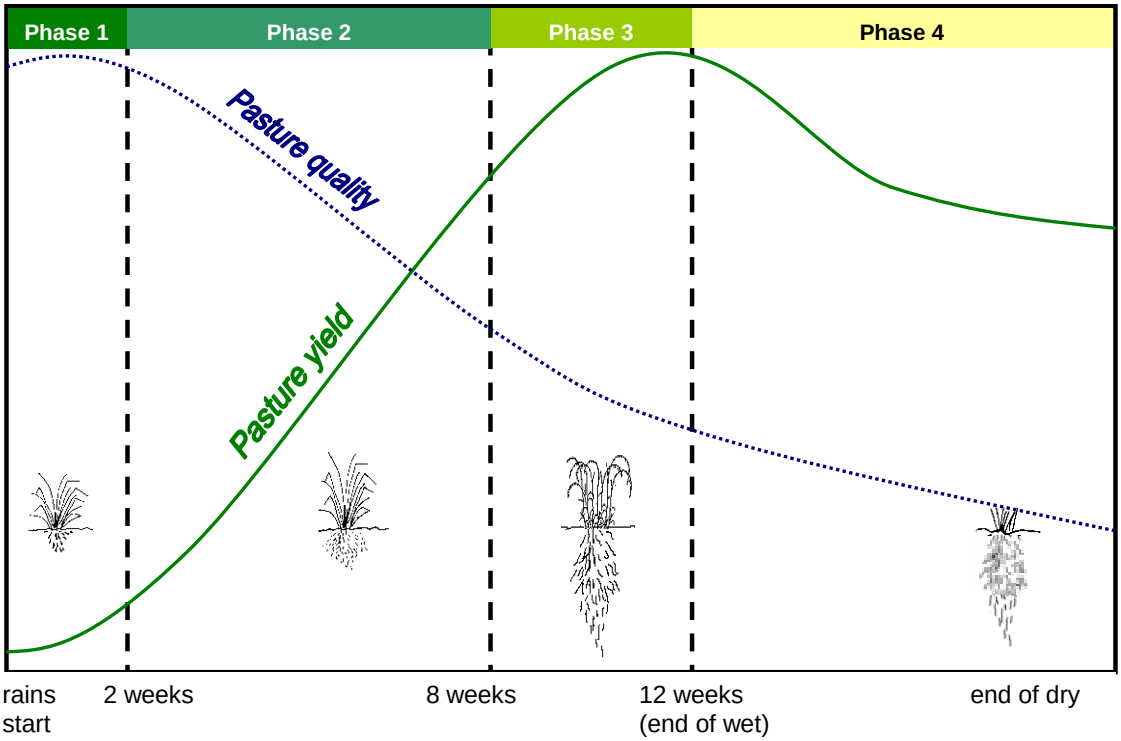

During Phase 1 plants use stored energy reserves to grow their first green leaves and shoots after the dry season. This first growth then captures the sun's energy (through photosynthesis) to promote continued growth of leaves and shoots and start root growth. The greater the area of green leaves and stems exposed to the sun, the greater the capture of energy. Nutrient levels are high in the leaves and stems as the roots start to extract nutrients from the soil and move these into the crown and leaves and stems.

Roots seek moisture and nutrients by extending through the soil and growing numerous fine roots at the tips of the larger roots—these fine roots absorb nutrients mixed in the soil's water. It is the constant growth of these fine roots that provides the moisture and nutrients to help the plant grow more leaves and stems. When fresh leaves and shoots are constantly grazed off the plant becomes less effective at capturing the sun's energy and root growth slows. When root growth slows the plant loses vigour, is less efficient at using soil moisture and less efficient at absorbing the nutrients needed for leaf and shoot growth.

During Phase 2 this growth—both above and below the ground—accelerates and the plant starts to form seed heads within the stems. Leaves are usually numerous and efficiently converting sunlight into energy to promote faster root growth. This faster root growth means more nutrients are being absorbed to promote leaf and shoot growth. Towards the end of Phase 2 stem growth starts to outpace leaf growth as the plant readies for seeding. The removal of stems and leaves has a reduced impact on the plant's growth but overgrazing can still set the plant back.

During Phase 3 growth slows and most energy and nutrients are diverted to seed production. The maximum plant weight is reached in Phase 3 at about the time of flowering. Much of the plant's weight is now in the stems and especially in the fibrous components of stems that are needed to support the weight of seed heads. Seed heads emerge from the stems, flower and mature during Phase 3. The quality of the plant to animal diet is reduced but so is susceptibility to high grazing pressure.
Mitchell grass can generally be grazed safely—even at relatively high grazing pressure—during Phase 3 once the seed heads have emerged from the tillers (stems).

During Phase 4 growth has stopped, seed heads have matured and seed starts to fall. Perennial plants are generally dormant and annual plants have died. Plant weight and quality declines and plants are insensitive to grazing. For Mitchell grass it is important to retain 15-20 cm of stubble ready for Phase 1 in the next wet season.

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