

North Australian Grassland Fuel Guide

**Sturt Plateau &
Victoria River District, N.T.**

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Northern Territory Government
Department of Business, Industry & Resource Development

Introduction

This guide was prepared to assist land managers and fire authorities in the Sturt Plateau and Victoria River District of northern Australia to estimate fuel characteristics for strategic fire management or wildfire prevention.

It is hoped that other regions of northern Australia will also adopt and create their own fuel guides to improve the overall knowledge of fuel characteristics across the northern grasslands of Australia.

FIELD GUIDE CONTENTS

Section 1 ~ Grassland Curing	3
Section 2 ~ Fuel Loads	20

REFERENCES

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ACKNOWLEDGEMENTS

Thanks goes to the following volunteers for assistance with data collection:

Heather Smith, Jenny Butterworth, Trevor Johnson, Judy Johnson & Andrew Ottens.

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June, 2001.

ISBN: 0 958376 9 X

Published by the Tropical Savannas CRC, May 2002.

Section 1 ~ Curing

Curing is a measure of grass 'greenness' and relates to the percentage of grass material that is dead in the sward.

Grass curing is dependent on seasonal conditions such as rain and temperature. As grass dries off over the dry season (May–October in northern Australia) grass fuel becomes more and more cured.

Curing is also dependent on plant species and land type. Grasses growing on light sandy soils will dry out and cure much more rapidly than grasses growing in heavy clay. Annual grass species will dry out and die off earlier in the dry season than most perennials.

FUEL MOISTURE CONTENT

As grasses cure, moisture content decreases. Fuel moisture is dependent on weather conditions and is largely influenced by humidity and temperature. A fully cured clump of grass will not easily ignite if there has been heavy dew and moisture content is high.

fmc: fuel moisture content (as a percentage of the Wet weight of the plant material.)

$$\text{fmc} = \frac{\text{Wet weight} - \text{dry weight}}{\text{Wet weight}} \times 100$$

GRASS CURING AND FIRE BEHAVIOUR

The greenness and moisture content of grasses affects ignition potential, fire intensity and rate of fire spread. Plant moisture acts as a heat sink and thus influences fire behaviour by increasing the specific heat required for the fuel to combust. As plant moisture decreases, fire intensity and potential ignitability increases.

The following points are largely dependent on weather conditions and fuel cover.

- Fires will spread effectively in grasses cured greater than 50%.
- Fuels cured less than 50% are not likely to carry a continuous flame front, or intense fire.
- Fuels cured less than 20% will be extremely difficult to ignite.

This guide shows curing photographs of Red soil and Black soil communities of the VRD and Sturt Plateau only. Other communities not described in this guide such as Spinifex, may behave differently with fire. Spinifex hummocks may appear very green, but will still burn with ferocity.

BLACK SOIL 0-10% CURED

Grasses actively growing and seed heads beginning to develop
Fuel moisture content >60%



RED SOIL 0-10% CURED

Grasses actively growing and seed heads beginning to develop
Fuel moisture content >60%



BLACK SOIL 10-20% CURED

Grass seed heads maturing, Forbs flowering
Fuel moisture content 45%



RED SOIL 10-20% CURED

Seed heads maturing
Fuel moisture content 40%



BLACK SOIL 20-40% CURED

Seed heads mature
Fuel moisture content 40%



RED SOIL 20-40% CURED

Seed heads mature
Fuel moisture content 35%



BLACK SOIL 40–50% CURED

Seedheads have begun dropping seed, stalks are becoming dry and brittle
Fuel moisture content 30%



RED SOIL 40-50% CURED

Seedheads have begun dropping seed, stalks are becoming dry and brittle
Fuel moisture content 25%



BLACK SOIL 50-60% CURED

Most annual species will be fully cured, perennial grasses beginning to dry off
Fuel moisture content 20%



RED SOIL 50-60% CURED

Most annual species will be fully cured, perennial grasses beginning to dry off
Fuel moisture content 20%



BLACK SOIL 60-70% CURED

Seedheads have dropped most seed
Fuel moisture content 15%



RED SOIL 60-70% CURED

Seedheads have dropped most seed

Fuel moisture content 15%



BLACK SOIL 70–80% CURED

Greenness still evident in the base of perennial clumps

Fuel moisture content 10–15%



RED SOIL 70-80% CURED

Greenness still evident in the base of perennial clumps
Fuel moisture content 10-15%



BLACK SOIL 80-100% CURED

Most of plant is dead, leaves and stalks are brittle and no longer erect
Fuel moisture content 5-15%



RED SOIL 80–100% CURED

Most of plant is dead, leaves and stalks are brittle and no longer erect
Fuel moisture content 5–15%



Section 2 ~ Fuel Loads

The amount of fuel is important to consider when planning strategic burning or identifying high wildfire risk areas. The more fuel, the greater the risk of a hot intense fire, and the more likely fire is able to spread. Fuel loads in this guide are measured as the dry weight of grass in kilograms per hectare.

Fuel loads required for strategic burning objectives:

Strategic Burning Objective	Fuel Load (kg/ha)
Maintenance of woody veg. structure	2000–3000
Change of woody veg. structure	2500–4000
Hazard/fuel reduction	>1500
Promotion of green pick in native pasture	>2000

This table is a guide only and has been worked for conservatively stocked areas.

For more information contact the Primary Industry and Fisheries agency, NT Department of Business, Industry and Resource Development.

0–1000kg/ha

Fuel bulk low and non-continuous: small patchy fires only, requiring wind to carry and spread flame. **Top photo** 300kg/ha, **bottom photo** 900kg/ha.



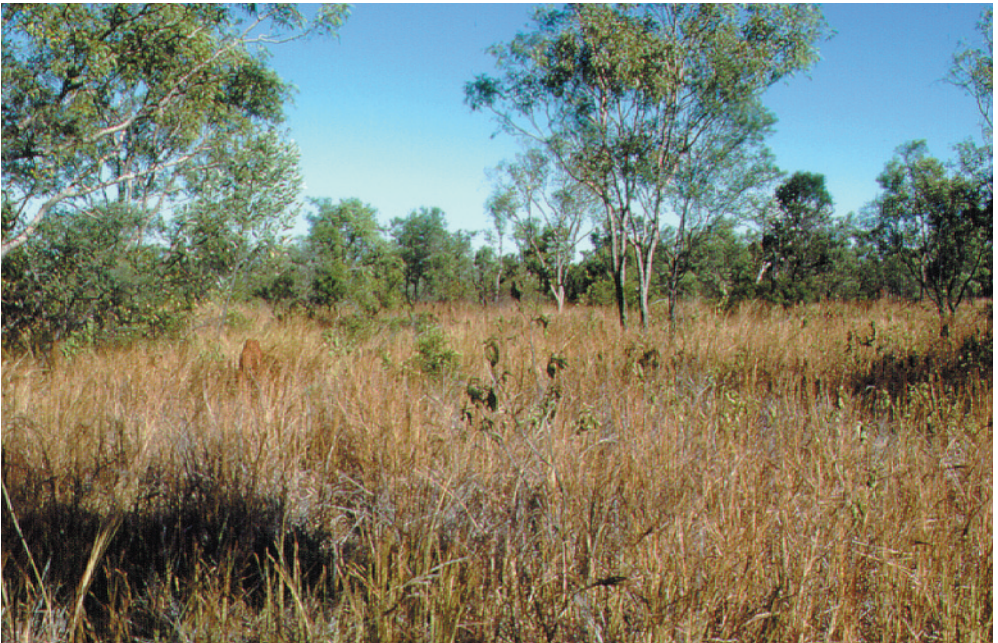
1000–2000kg/ha

Fuel light and patchy. Low to medium intensity fires requiring windy conditions. **Top photo** 1200kg/ha, **bottom photo** 1600kg/ha Spinifex.



2000–3000kg/ha

Fuel is able to carry a medium to hot intensity fire, ideal for burning to maintain pasture condition. **Top photo** 2000kg/ha, **bottom photo** 2400kg/ha.



3000–4000kg/ha

Fuel thick, continuous and able to carry hot and intense fire. Ideal for burning to control woody weeds. **Top photo** 3000kg/ha, **bottom photo** 3500kg/ha.



4000–6000kg/ha

Fuel very thick and deep, able to sustain hot and intense fires. These areas are at great risk to wildfire. **Top photo** 4000kg/ha, **bottom photo** 5500kg/ha.



