

# PRESCRIBED BURNING GUIDE

## (Slash Pine Plantation)

(Mk. III)

**FUEL TYPES**

The fire behaviour tables used in this guide apply to Slash Pine plantation fuels which have not been burnt previously, and which may exceed 18 tonnes per hectare in weight.

- Fuel Type 1. Fuel Suspension on 50% of area.
- Fuel Type 2. Fuel Suspension on 50-80% of area.
- Fuel Type 3. Fuel Suspension on 80% of area. Fuel is suspended in dense understorey of Xanthorrhoea, Bracken.
- Fuel Type 4. Dense understorey of Blady Grass.
- Fuel Type 5. Ladder fuels. Fuel is suspended in dense understorey of tea-tree etc.

Fuel types should be mapped on the above basis prior to the development of the burn prescription.

The Fire Behaviour Tables refer to an average fuel condition. Fires in Type 1 will be milder than indicated in the tables; Fires in types 3, 4 & 5 will be hotter.

**DRYING TABLES**

Select an appropriate drying table on page 2 on the basis of average maximum temperature of the drying period. Actual temperature should be used for unseasonal conditions, otherwise the mean monthly temperature indicated at the foot of page 2 may be adopted.

**WARNING:** *Burning must not be attempted unless a minimum of 7 mm of rain has been registered on the burn area.*

**BURN PRESCRIPTION**

Any burn prescription must be based on the following maximum recommended flame heights.

Site Index (m)	AGE (years)					
	10	12	14	16	18	20
18	0.5 m	0.7 m	0.8 m	0.9 m	1.1 m	1.2 m
21	0.6 m	0.8 m	1.0 m	1.1 m	1.2 m	1.4 m
24	0.8 m	1.0 m	1.1 m	1.2 m	1.4 m	1.5 m

**LIGHTING TECHNIQUES**

- (1) **Strip Backfire.** Light on a face or at 20-30 metre intervals along the downwind edge of the block. This is the safest method of burning heavy fuels (types 3, 4) or in poor site index or young stands, or in very exposed sections of a block. Spread rate will be about half, and flame height two-thirds of that indicated in the tables. Use this technique where headfires may be too active, particularly when wind is Force 3-4.
- (2) **Strip Headfire.** Light on a face or at 20-30 metre intervals along the windward edge of the block. Use this method when wind speed is low and fuel moisture content too high for backfires to spread, such as burning plantation edges following rain.
- (3) **Grid Ignition.** Calculate a grid spacing from the predicted Rate of Spread such that the individual fires will link up in about 2 hours. Spots must never be lit to within one grid spacing of the edge of the edge of the plantation on the downwind side, or half a grid spacing on the windward side.

Grid spacing may be varied to suit changing fuel type or weather conditions. Most areas will be grid lit after burning exposed sections by strip head or back fires.

## DRYING TABLES

(Figures indicate weight of fuel (tonnes per ha) available for burning)

Where the effect of one rain period is superimposed on that of another, all rain registered should be taken into account.

30°C

No. Days Since Rain	Rainfall (mm)				
	2.5	7.5	12.5	25	40
1	18	12		TOO	WET
2		18	12	12	
3			18	18	12
4	TOO	DRY			18
5					

28°C

No. Days Since Rain	Rainfall (mm)				
	2.5	7.5	12.5	25	40
1	18	12		TOO	WET
2		18	12		
3			18	12	12
4	TOO	DRY		18	16
5					18

26°C

No. Days Since Rain	Rainfall (mm)				
	2.5	7.5	12.5	25	40
1	12			TOO	WET
2	18	12	12		
3		18	16	12	8
4			18	16	12
5	TOO	DRY		18	16
6					18
7					

24°C

No. Days Since Rain	Rainfall (mm)				
	2.5	7.5	12.5	25	40
1	12				
2	16	12		TOO	WET
3	18	16	12		
4		18	16	12	8
5			18	16	12
6	TOO	DRY		18	16
7					18

22°C

No. Days Since Rain	Rainfall (mm)				
	2.5	7.5	12.5	25	40
1	8				
2	12	8			
3	16	12	8		
4	18	16	12	8	
5		18	16	12	8
6			18	16	12
7				18	16
8					18
9					
10					

20°C

No. Days Since Rain	Rainfall (mm)				
	2.5	7.5	12.5	25	40
1					
2	8				
3	12	8			
4	16	12	8		
5	18	16	12	8	
6		18	14	12	8
7			16	14	12
8			18	16	14
9				18	16
10					18

5 tonnes per ha = 1 cm of dry surface needles  
 10 tonnes per ha = 2 cm of dry surface needles  
 15 tonnes per ha = 3 cm of dry surface needles  
 20 tonnes per ha = 4 cm of dry surface needles

### MEAN DAILY MAXIMUM TEMPERATURE

Locality	March	April	May	June	July	August
South Queensland	28	26	23	21	20	22
Central Queensland	30	28	25	23	23	24
North Queensland	30	29	27	26	25	26

### EXPOSED AREAS

Moisture conditions suitable for effective burning of exposed edges will occur one to two days earlier than indicated in the above drying tables.



# FIRE BEHAVIOUR TABLES

(These figures refer to fires lit at a single point and allowed to spread.

Fires lit on a face or in strips will be approx. 1.5 times as hot.

R = forward rate of spread in metres/h    H = flame height in metres.

Figures in brackets apply to exposed areas.)

## (1) First Suitable Burning Day After Rain.

(Available Fuel = 8 t/ha, Fuel Moisture Content 30–35%)

Relative Humidity	Wind Strength			
	Force 1 1 – 5 km/h	Force 2 6 – 11 km/h	Force 3 12 – 18 km/h	Force 4 19 – 29 km/h
15%	R = 32 (41) H = 0.8 (0.9)	R = 36 (46) H = 0.9 (1.0)	R = 43 (59) H = 1.0 (1.2)	R = 63 (92) H = 1.3 (1.7)
25%	R = 27 (34) H = 0.7 (0.8)	R = 31 (41) H = 0.8 (0.9)	R = 38 (52) H = 0.9 (1.1)	R = 54 (83) H = 1.1 (1.6)
35%	R = 22 (29) H = 0.7 (0.7)	R = 27 (36) H = 0.7 (0.9)	R = 34 (45) H = 0.8 (1.0)	R = 45 (74) H = 1.0 (1.4)
45%	R = 18 (23) H = 0.6 (0.6)	R = 23 (31) H = 0.6 (0.8)	R = 31 (40) H = 0.8 (0.9)	R = 40 (65) H = 0.9 (1.3)
55%	R = 14 (18) H = 0.5 (0.6)	R = 18 (25) H = 0.6 (0.7)	R = 25 (34) H = 0.7 (0.8)	R = 32 (56) H = 0.8 (1.2)
65%	R = 11 (14) H = 0.5 (0.5)	R = 14 (20) H = 0.5 (0.6)	R = 18 (29) H = 0.6 (0.7)	R = 25 (49) H = 0.7 (1.1)
75%	R = 7 (11) H = 0.4 (0.5)	R = 11 (14) H = 0.5 (0.5)	R = 14 (23) H = 0.5 (0.6)	R = 16 (41) H = 0.5 (0.9)
85%	R = 5 (7) H = 0.4 (0.4)	R = 7 (11) H = 0.4 (0.5)	R = 11 (18) H = 0.5 (0.6)	R = 11 (34) H = 0.5 (0.8)

## (2) Second Suitable Burning Day After Rain

(Available Fuel = 12 t/ha, Fuel Moisture Content 25 – 30%)

Relative Humidity	Wind Strength			
	Force 1 1 – 5 km/h	Force 2 6 – 11 km/h	Force 3 12 – 18 km/h	Force 4 19 – 29 km/h
15%	R = 38 (49) H = 0.9 (1.1)	R = 43 (54) H = 1.0 (1.1)	R = 52 (70) H = 1.1 (1.4)	R = 76 (112) H = 1.5 (2.0)
25%	R = 32 (41) H = 0.8 (0.9)	R = 36 (47) H = 0.9 (1.0)	R = 45 (61) H = 1.0 (1.3)	R = 63 (101) H = 1.3 (1.9)
35%	R = 27 (34) H = 0.7 (0.8)	R = 32 (41) H = 0.8 (0.9)	R = 40 (54) H = 0.9 (1.1)	R = 54 (90) H = 1.1 (1.7)
45%	R = 23 (29) H = 0.6 (0.7)	R = 29 (36) H = 0.7 (0.9)	R = 36 (47) H = 0.9 (1.0)	R = 47 (81) H = 1.0 (1.6)
55%	R = 18 (23) H = 0.6 (0.6)	R = 22 (31) H = 0.6 (0.8)	R = 31 (41) H = 0.8 (0.9)	R = 40 (72) H = 0.9 (1.4)
65%	R = 14 (18) H = 0.5 (0.6)	R = 18 (25) H = 0.6 (0.7)	R = 25 (36) H = 0.7 (0.9)	R = 32 (65) H = 0.9 (1.3)
75%	R = 11 (14) H = 0.4 (0.5)	R = 14 (20) H = 0.5 (0.6)	R = 18 (31) H = 0.6 (0.8)	R = 25 (58) H = 0.7 (1.2)
85%	R = 7 (11) H = 0.4 (0.4)	R = 11 (14) H = 0.4 (0.5)	R = 14 (25) H = 0.5 (0.7)	R = 18 (50) H = 0.6 (1.1)

**(3) Third Suitable Burning Day After Rain**

(Available Fuel = 16 t/ha, Fuel Moisture Content 20-25%)

Relative Humidity	Wind Strength			
	Force 1 1 – 5 km/h	Force 2 6 – 11 km/h	Force 3 12 – 18 km/h	Force 4 19 – 29 km/h
15%	R = 43 (54) H = 1.0 (1.1)	R = 50 (74) H = 1.1 (1.5)	R = 68 (85) H = 1.4 (1.6)	R = 91 (135) H = 1.7 (2.4)
25%	R = 40 (51) H = 0.9 (1.1)	R = 46 (66) H = 1.0 (1.3)	R = 63 (78) H = 1.2 (1.5)	R = 80 (129) H = 1.5 (2.2)
35%	R = 34 (44) H = 0.8 (0.9)	R = 40 (54) H = 0.9 (1.1)	R = 52 (65) H = 1.1 (1.3)	R = 65 (112) H = 1.3 (2.0)
45%	R = 27 (34) H = 0.7 (0.8)	R = 34 (45) H = 0.8 (1.0)	R = 45 (58) H = 1.0 (1.2)	R = 58 (101) H = 1.2 (1.9)
55%	R = 23 (29) H = 0.6 (0.7)	R = 29 (40) H = 0.7 (0.9)	R = 38 (50) H = 0.9 (1.1)	R = 50 (90) H = 1.1 (1.7)
65%	R = 18 (23) H = 0.6 (0.6)	R = 22 (34) H = 0.6 (0.8)	R = 31 (43) H = 0.8 (1.0)	R = 43 (81) H = 1.0 (1.6)
75%	R = 14 (18) H = 0.5 (0.6)	R = 18 (29) H = 0.6 (0.7)	R = 25 (38) H = 0.7 (0.9)	R = 36 (72) H = 0.9 (1.4)
85%	R = 11 (14) H = 0.4 (0.5)	R = 14 (23) H = 0.5 (0.6)	R = 18 (32) H = 0.6 (0.8)	R = 29 (65) H = 0.7 (1.3)

**(4) Fourth Suitable Burning Day After Rain**

(Available Fuel = 18 t/ha, Fuel Moisture Content 15-20%)

Relative Humidity	Wind Strength			
	Force 1 1 – 5 km/h	Force 2 6 – 11 km/h	Force 3 12 – 18 km/h	Force 4 19 – 29 km/h
15%	R = 50 (61) H = 1.1 (1.2)	R = 59 (83) H = 1.2 (1.6)	R = 76 (99) H = 1.4 (1.8)	R = 99 (153) H = 1.8 (2.6)
25%	R = 43 (54) H = 0.9 (1.0)	R = 52 (72) H = 1.0 (1.2)	R = 67 (85) H = 1.2 (1.4)	R = 85 (137) H = 1.4 (2.2)
35%	R = 38 (47) H = 0.8 (0.9)	R = 47 (61) H = 0.9 (1.1)	R = 59 (74) H = 1.1 (1.3)	R = 74 (124) H = 1.3 (2.0)
45%	R = 32 (40) H = 0.8 (0.9)	R = 41 (52) H = 0.9 (1.1)	R = 52 (65) H = 1.1 (1.3)	R = 67 (110) H = 1.3 (2.0)
55%	R = 27 (32) H = 0.7 (0.8)	R = 36 (46) H = 0.8 (1.0)	R = 45 (58) H = 1.0 (1.2)	R = 59 (99) H = 1.2 (1.8)
65%	R = 22 (27) H = 0.6 (0.7)	R = 31 (36) H = 0.8 (0.8)	R = 38 (50) H = 0.9 (1.1)	R = 52 (88) H = 1.1 (1.7)
75%	R = 16 (22) H = 0.5 (0.6)	R = 25 (31) H = 0.7 (0.8)	R = 32 (43) H = 0.8 (1.0)	R = 45 (79) H = 1.0 (1.5)
85%	R = 13 (16) H = 0.5 (0.5)	R = 22 (25) H = 0.6 (0.6)	R = 25 (38) H = 0.7 (0.9)	R = 38 (72) H = 0.9 (1.4)