

The Performance of Wildfire Suppression Systems

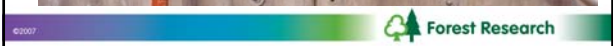
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Content

- PPE (See HSE AFAG 803 Fire Fighting)
- Firebeaters
- Flexible fire fighting knapsacks
- Conventional pumps & fogging units
- Helicopter
- Brush fire suppression
- Firebreaks



Beater type	Fire type suppressed	Head fire intensity (kW/m)	Flank fire intensity (kW/m)	Suppression rate metre/shr per man	Wind speed kph
Short belt	Grass flank	2500 plus	150 -200	100	2
Short belt	Grass backburn	Not recorded	75-120	200	1-4
Long mesh	Heather flank & head	2300	Not recorded	300	24
Long mesh	Heather flank & head	1700	Not recorded	250	20



Flexible Knapsack & Beaters

- Works well at 0.30 litre per metre
- Strong backburn 19 l knapsack for 70 m
- ATC support with 20 litre drums or several knapsacks

Beater suppression

- Longer handles
- Mesh heads for heather not grass
- Belt heads for grass can melt in heather
- Flexible knapsack support
- Welding overalls & face shields



System	Head fire intensity (kW/m)	Litres of water/m	Number in team	Team suppression rate (metres/shr)	Rate of spread (m/hr)
Fogging	2800	0.90	2	600	700
Hathaway Spray	2500	4.10	3	1350	350
Fogging & beater	1700	0.60 *	6	950	500
Fogging	1000	0.60 *	3	1000	300



System	Fire Intensity (kW/m)	Water Usage (Litres/m)	Number in Team	Team Suppression Rate (m/shr)	Rate of Spread (m/hr)
Fogging and 1 beater	2500	0.40	4	1200 (9% reposition)	1400
Fogging and 2 beaters	2400	0.35	5	900 (22% reposition)	1000
Fogging	1500	0.60	3	550 (18% reposition)	600



Helicopter Fire Suppression

Rate of spread m/hr	Intensity	Time elapsed mins	Average load time mins	Suppression rate m/hr	Litres per metre
600	Moderate to high	92	1.53	600-800 (700)	32.5

Helicopter Delivery Rates

- 0.5 km 21 000 to 26000 l/hr UK data
- 0.5 km 23 000 l/hr NZ data
- 1.0 km 18 000 l/hr NZ data
- 2 km 13 000 l/hr NZ data
- 3 km 10 000 l/hr NZ data
- 5 km 6000 l/hr NZ data

NZ data courtesy of New Zealand Forest Research Institute Fire
Technology Transfer Note Number 15 January 1998

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Helicopter Debrief

- Communications
- Personnel transport
- Ground support required on fire front, ie helicopter supports ground crews
- Team work improve efficiency
- Walk perimeter for hot spots

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Planning

- Identify access routes, pedestrian & machine
- Plan firebreaks
- Break large area up into defensive lines
- Water supply points
- Can this effort be sustained through years (10 yrs?) where no fires

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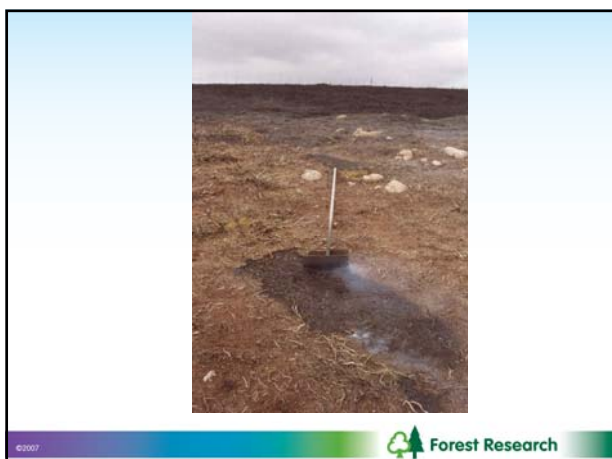
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Brush Fire Suppression

- Plain water 12 litres/metre (7 m/min)
- Low foam 7 litre/metre (8m /min)
- Fogging 4 litres/metre (4m/min)
- 14 litre/min fogging units cannot be widely recommended for intense brush fires



Fire breaks

- 2.5 times flame height & fuel free
- Flame heights 2 to 3 metres
- At least 5 to 7.5 metres, suggest 10 metres
- Purple moor grass will jump





Water usage rates

- **Heather** 0.9 litre per metre fogging
- **Heather** 4 litre per metre conventional
- **Grass** 0.6 litre metre fogging
- Use beaters with fogging less water
- **Heather** 0.6 litre
- **Grass** 0.4