W.P. 19/73 STIRLING RANGE ANALYSIS OF '74 AUTUMN FIRES

5/7/74

A: In all 9 fires were conducted.

Site	No. Fires	Plot Nos
1A	2	2 & 7
1B	3	22, 23, 15
2A	1	2
2B	3	16, 21, 22

The fires on Site 1A were the first successful ones conducted.

Under 10% moisture content and 8.9 km/hr wind the rate of spread was 100 metres/hour. This cannot be compared with any Spring fires.

Site 1B

Ellen track once again supported intense fires.

Three fires were conducted and their statistics are:

SMC %	Wind Vel.	HFROS m/hr
22	8.3	180
22	8.3	280
22	7.3	230

By comparison Spring fires of 1973 under the same wind velocity but with a MC% of approx. 17% recorded head fire rates of spread ranging from 170 m/hr for 7.3 km/hr winds to 210 metres/hour for the 8.3 km/hr winds.

These results agree reasonably with Spring fires and if anything they are slightly higher. Especially when considering the moisture content was 5% higher than for the spring fires. However the results of the Spring '73 fires on Ellen track indicated that moisture content does not drastically effect rate of spread at least in the range 8.0-10 km/hr. In this class four previous fires burnt at moisture contents of 16.5% 12.5% and 9% had a range in rate of spread of 200-250 metres/hour.

In this case a drop of 6% in moisture content lead to an increase of 50 metres/hour in rate of spread. Working on the same basis the Autumn fires might have expected to have been around 150 metres/hour

As they were not, the reason may be something to do with the drop in moisture content of the green material that may be expected following the summer drought.

Site 2A

Only one fire was burnt on this site and it complicated comparisons by burning across the slope in response to an easterly wind. Its rate of spread was 200 m/hr at 11% moisture content and before a 7.4 km/hr wind.

By comparison a spring fire from last season would have burnt at approximately 60 metres an hour allowing for the moisture content.

Ignoring the moisture content under a 7.4 km/hr wind the fire may have been expected to have a maximum rate of spread of approximately 140 m/hr. Both these figures are lower than the observed Autumn fire and the reason may well again have something to do with the droughting of the green vegetation.

Site 2B

Plot No.	MC %	Wind Vel.	HFROS
16	11	8.0	30
21	12	9.9	270
22	12	9.9	230

Previously no successful fires had been conducted on the twins flats so there is nothing to compare them with.

When compared to the Ellen track flat fires they compare very favourably on the already established wind Vs HFROS graph.

Once again no account of moisture content can be taken, and its effect does not seem apparent. The exceptionally slow fire is a result of a fire burning back on itself due to a 180° wind change.

B Comparison of fires and Jarrah Rate of Spread Index

A comparison of the Autumn fires and the relationship obtained between jarrah rate of spread index and HFROS for spring Stirling fires was made.

Fire No.	MT °C	MRH%	Wind Vel. Km/hr	Jarrah ROS I	Expected HFROS m/hr	Actual HFROS m/hr	
1 2A	17	50	7.4	32	125	200	H +1
2 2B	16.5	56	8.0	31	120	30	L -1
3 1B	16.5	60	8.3	39	140	180	H +1
4 1B	16.5	60	8.3	39	140	280	H +1
5 1B	17	60	7.3	31	120	230	H +1
6 1A	16	55	8.9	53	160	100	L -1
7 1A	16	55	8.9	53	160	110	L -1
8 2B	21	48	9.9	104	300	270	L -1
9 2B	21	48	9.9	104	300	230	L -1

The relationship as can be seen is only fair.

5/7/74.