

Crown Fire Behavior Test Case

Parameter		Unit	Low Fire Behavior		Moderate Fire Behavior		High Fire Behavior	
			IFTDSS	BehavePlus	IFTDSS	BehavePlus	IFTDSS	BehavePlus
Outputs	Critical Surface Intensity	Btu/ft/s	4,185.33	4,185.00	1,787.34	1,787.00	473.01	473.00
	Critical Surface Flame Length	ft	20.85	20.9	14.1	14.1	7.65	7.6
	Transition Ratio		0.2	0.2	0.47	0.47	1.79	1.79
	Transition to Crown Fire		No	No	No	No	Yes	Yes
	Crown Rate of Spread	chains/hour	22.41	22.4	34.32	34.3	50.9	50.9
	Critical Crown Rate of Spread	chains/hour	55.85	55.9	27.93	27.9	13.96	14
	Active Ratio		0.4	0.4	1.23	1.23	3.65	3.65
	Active Crown Fire		No	No	Yes	Yes	Yes	Yes
	Fire Type		Surface	Surface	Conditional Crown	Conditional Crown	Crowning	Crowning
	Crown Spread Distance	chains	67.24	67.2	102.95	103	152.7	152.7
	Crown Fire Area	acres	123.51	123.5	289.53	289.6	636.99	637.1
	Crown Fire Perimeter	chains	142.36	142	217.96	218	323.29	323
	Crown Fire Length-to-Width Ratio	chains/chains	2.88	2.9	2.88	2.9	2.88	2.9
	Crown Fireline Intensity	Btu/ft/s	698.55	699	1,321.17	1,321.00	1,959.66	1,960.00
	Crown Flame Length	ft	15.75	15.7	24.08	24.1	31.32	31.3
	Power of the Fire	ft-lb/second/ft^2	5.42	5	10.24	10	15.19	15
	Power of the Wind	ft-lb/second/ft^2	10.67	11	10.35	10	9.91	10
	Power Ratio		0.51	0.51	0.99	0.99	1.53	1.53
	Wind-Driven Fire		Yes	Yes	Yes	Yes	No	No
	Crown Load	tons/acre	3.27	3.27	4.36	4.36	4.36	4.36
Inputs	Canopy Heat Per Unit Area	Btu/ft^2	1,200.00	1,200.00	1,600.00	1,600.00	1,600.00	1,600.00
	Crown Fire Heat Per Unit Area	Btu/ft^2	1,700.00	1,700.00	2,100.00	2,100.00	2,100.00	2,100.00
	Canopy Height	ft	60		40		20	
	Canopy Base Height	ft	45		30		15	
	Canopy Bulk Density	lb/ft^3	0.01		0.02		0.04	
	1-hr Fuel Moisture	percent	15		7		3	
	10-hr Fuel Moisture	percent	18		10		5	
	100-hr Fuel Moisture	percent	25		12		8	
	Live Woody Fuel Moisture	percent	140		100		75	
	Foliar Moisture	percent	150		125		100	
	20-ft Wind Speed	miles/hour	15		15		15	
	Heat Per Unit Area	Btu/ft^2	500		500		500	
	Flame Length	ft	10		10		10	
	Elapsed Time	hours	3		3		3	