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**National Wildfire  
Coordinating Group**

Sponsored by  
United States  
Department of Agriculture

United States  
Department of the Interior

National Association of  
State Foresters

# Fire Behavior Nomograms



**PMS 436-3**  
**NFES 2220**

**MARCH 1992**

The "Fire Behavior Nomograms" are excerpted from "How to Predict the Spread and Intensity of Forest and Range Fires", Richard C. Rothermel, June 1983, with the exception of the nomogram for fuel model #7 which was updated for this publication.

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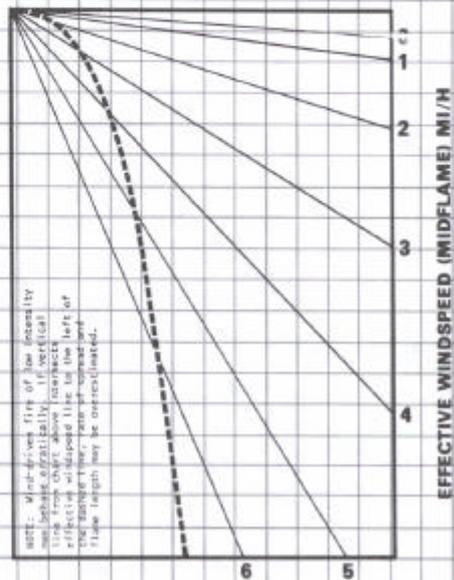
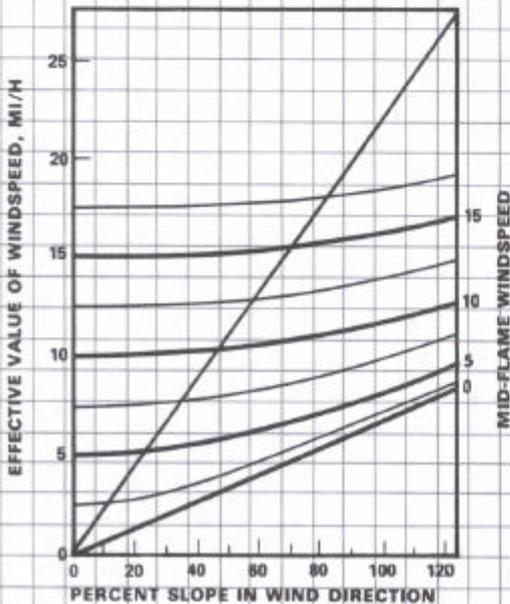
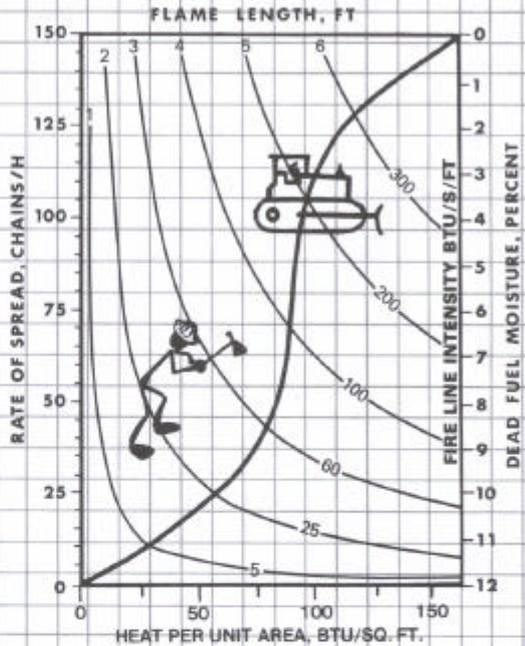
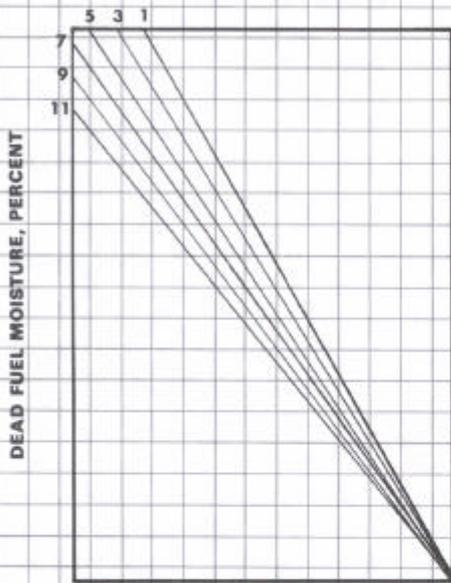
Order NFES # 2220

# APPENDIX A

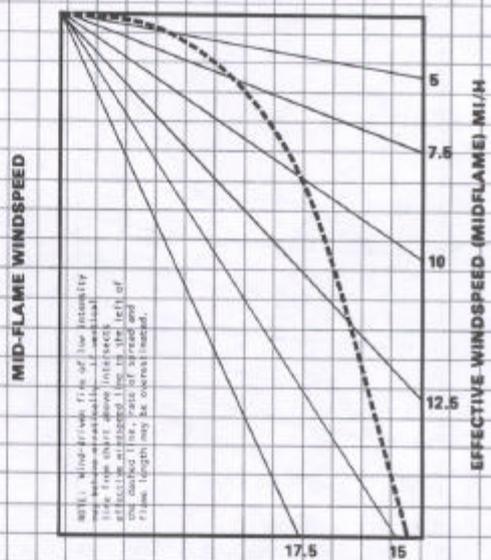
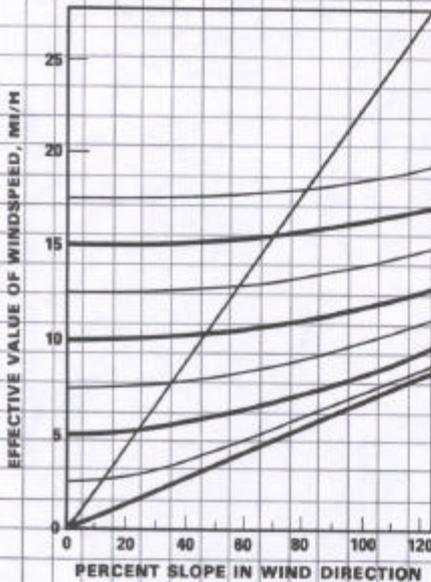
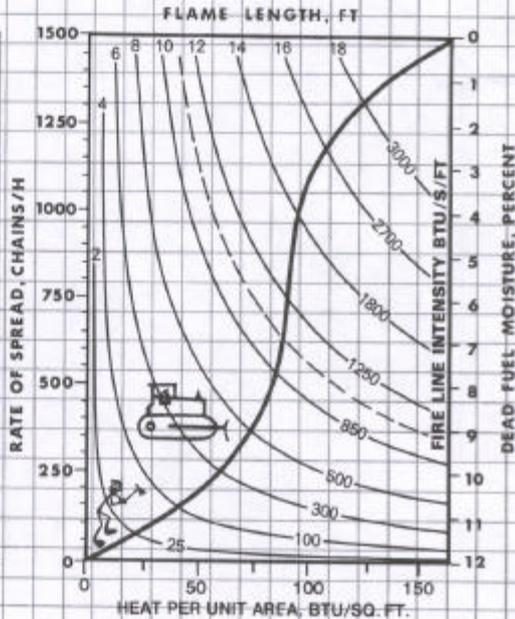
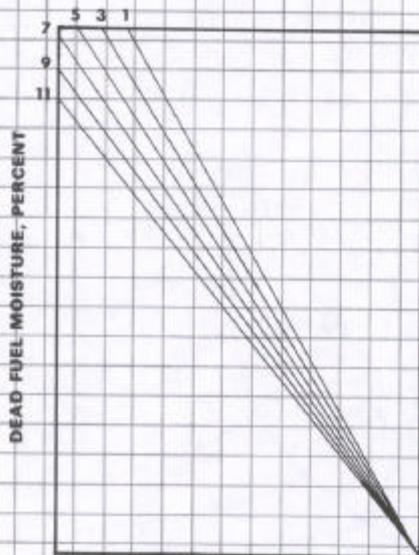
## Nomograms

Fuel model 1 - low windspeeds

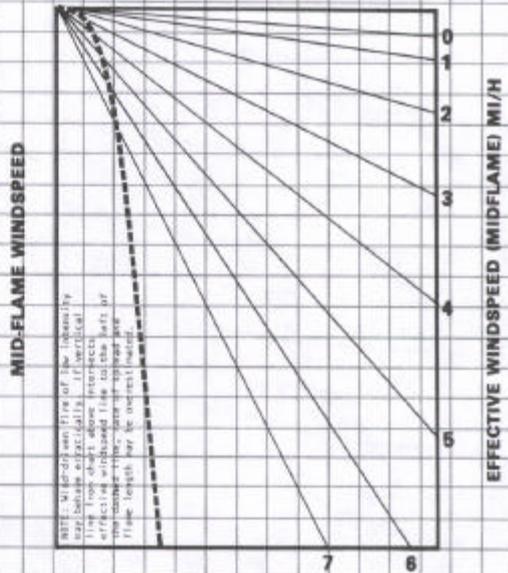
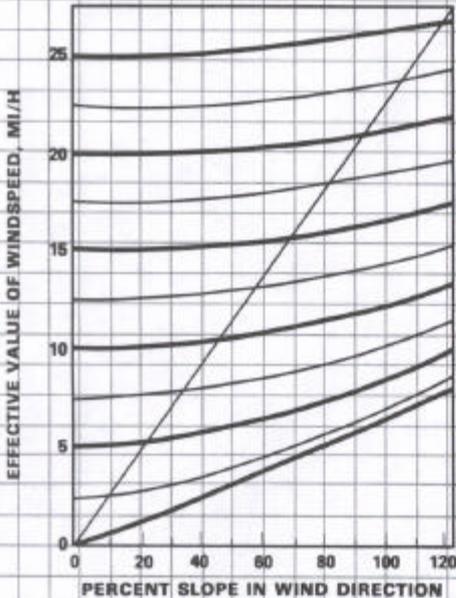
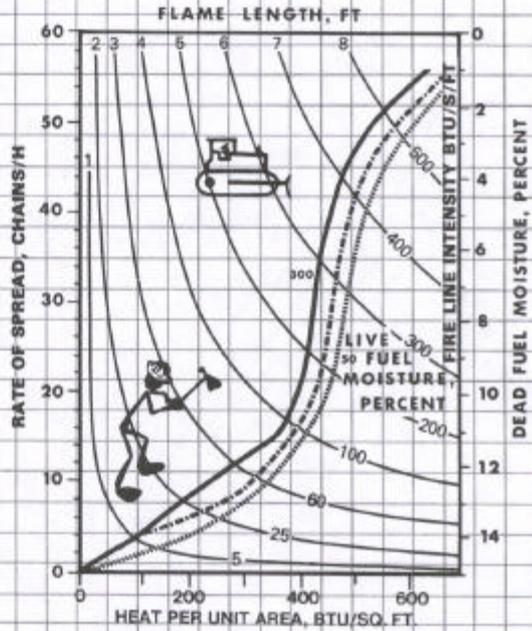
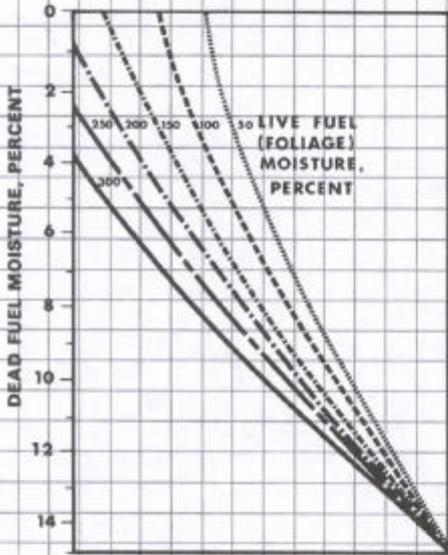
### 1. SHORT GRASS (1 FT) - LOW WINDSPEEDS



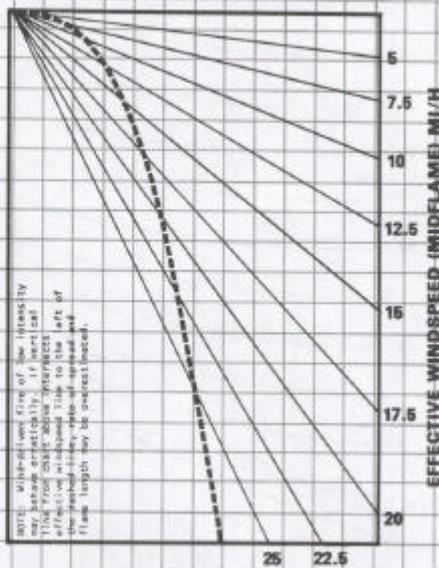
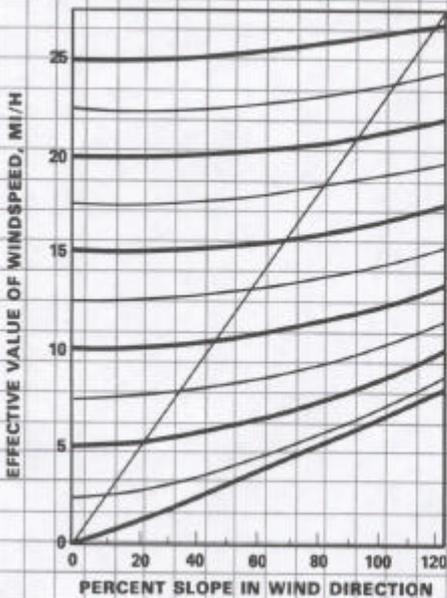
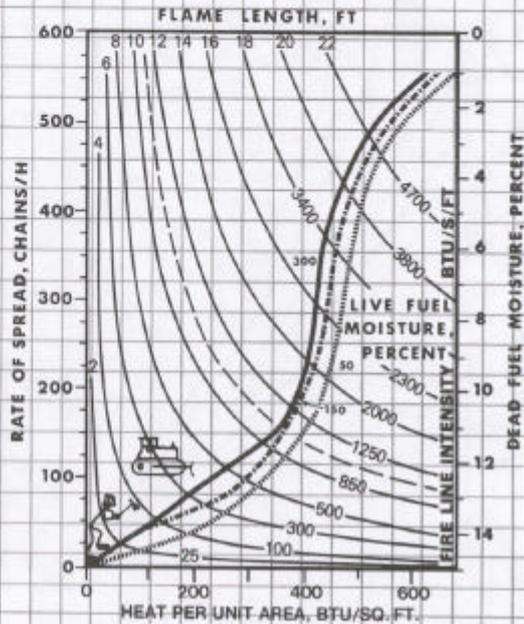
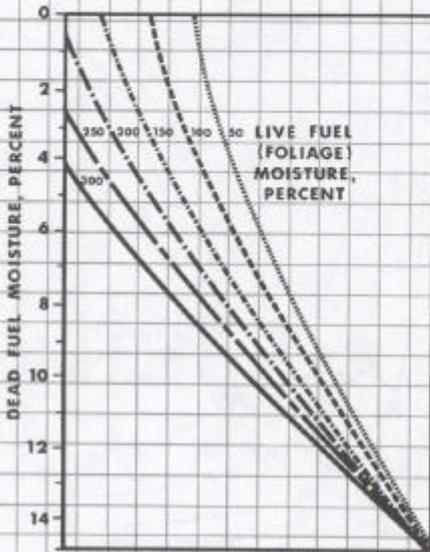
1. SHORT GRASS (1 FT) - HIGH WINDSPEEDS



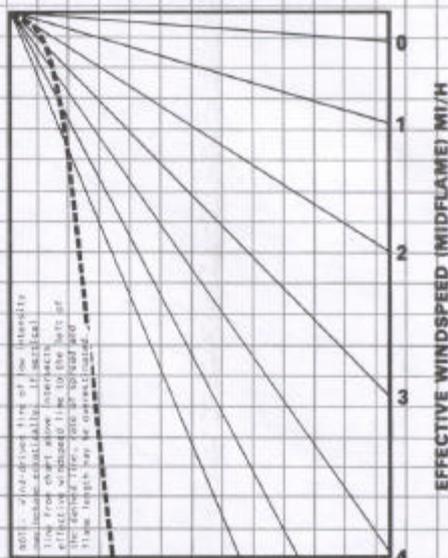
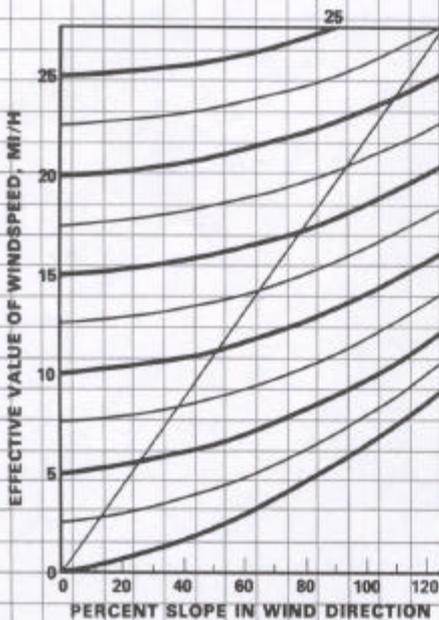
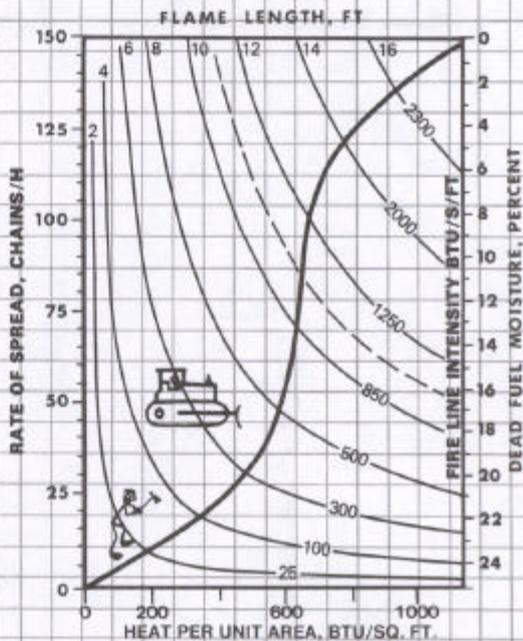
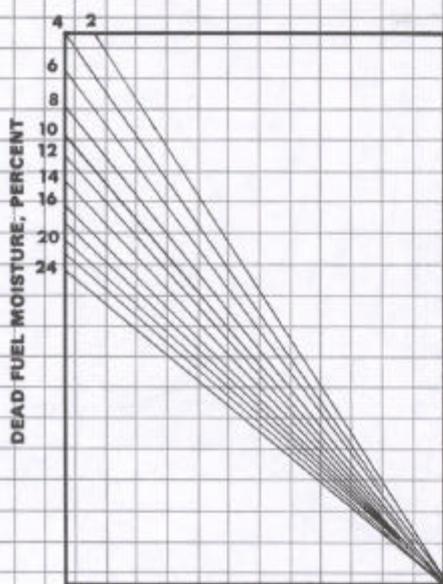
## 2. TIMBER (GRASS & UNDERSTORY) - LOW WINDSPEEDS



2. TIMBER (GRASS & UNDERSTORY)-HIGH WINDSPEEDS

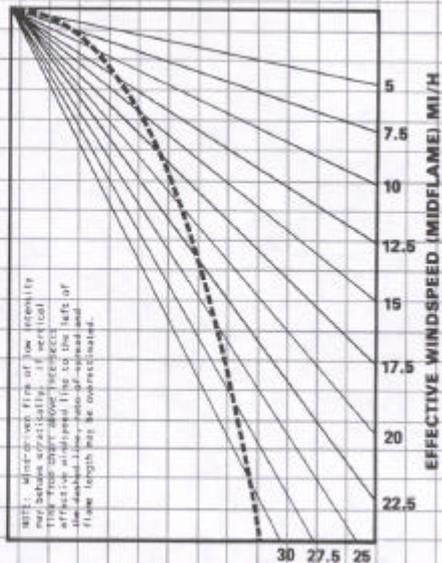
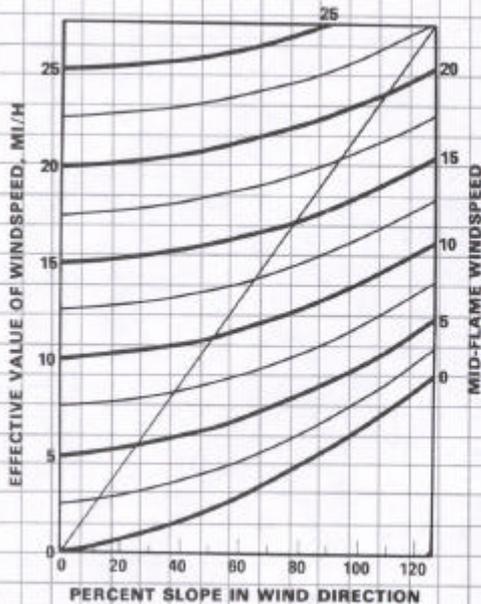
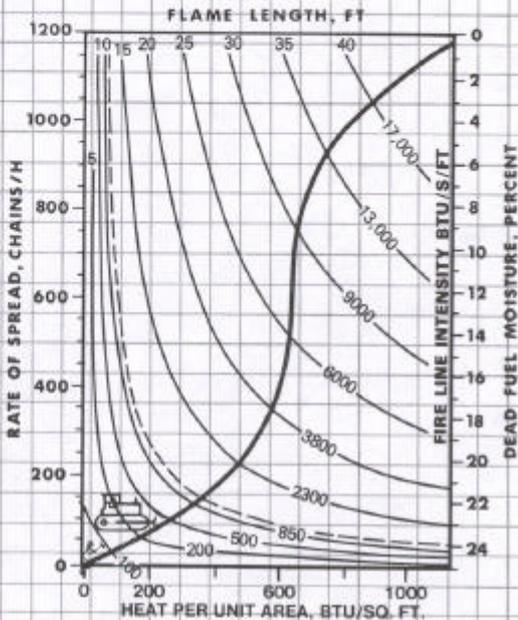
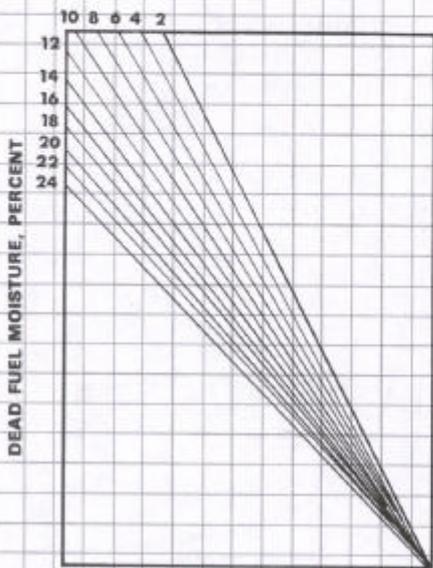


### 3. TALL GRASS (2.5 FT) - LOW WINDSPEEDS



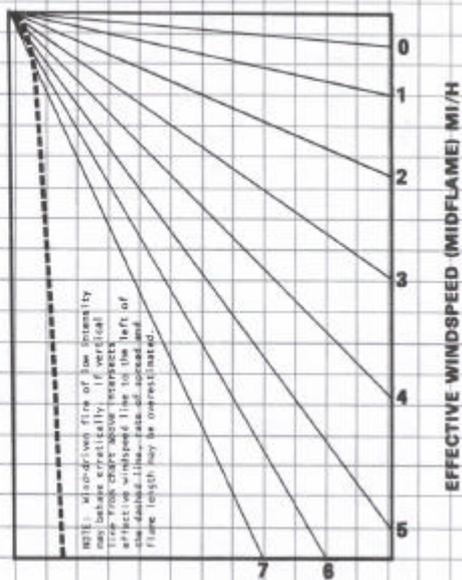
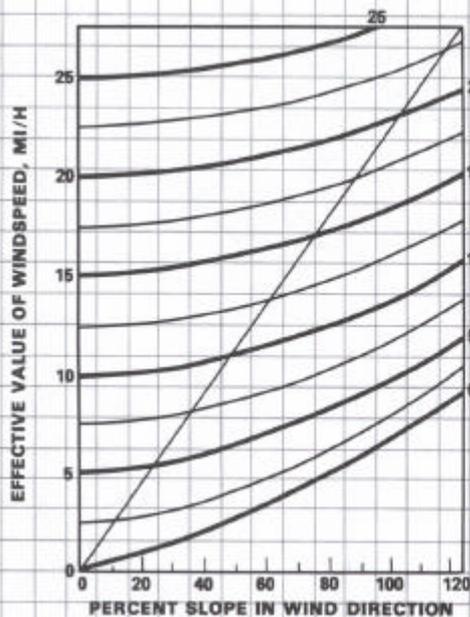
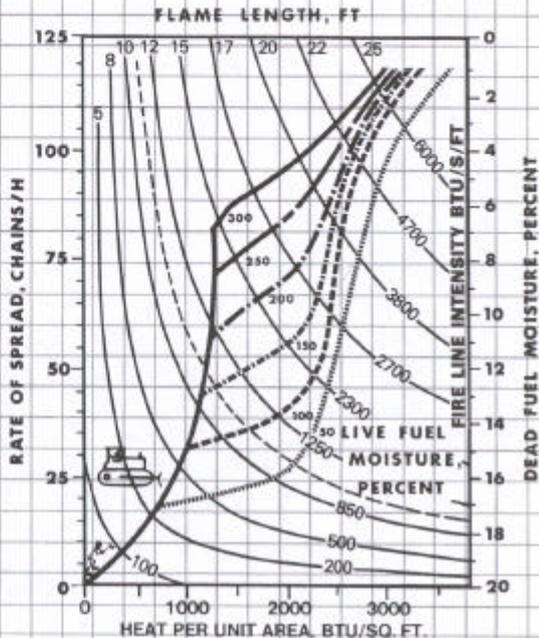
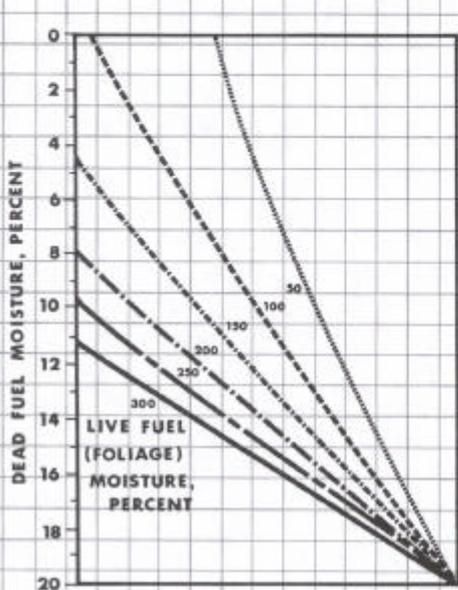
NOTE: The dashed line of the intensity is the fire line intensity. The solid line is the fire line intensity. The dashed line is the fire line intensity. The solid line is the fire line intensity. The dashed line is the fire line intensity. The solid line is the fire line intensity.

### 3. TALL GRASS (2.5 FT) - HIGH WINDSPEEDS

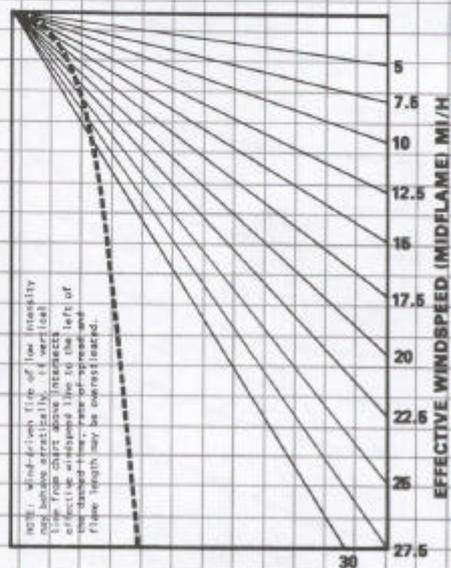
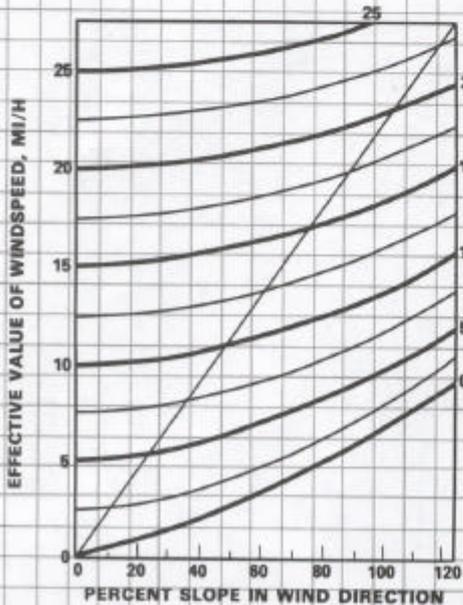
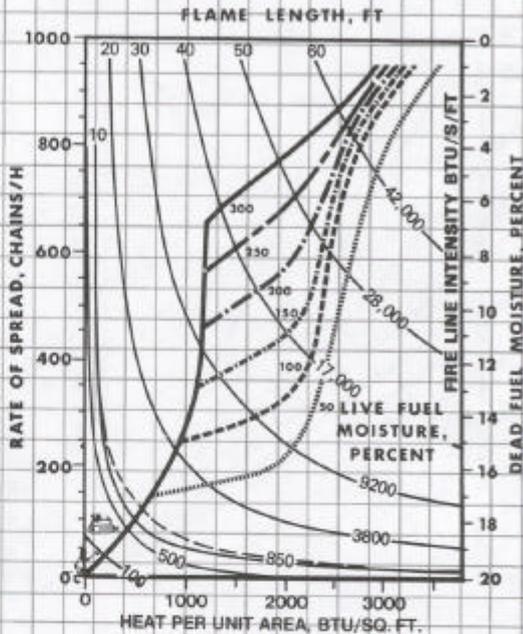
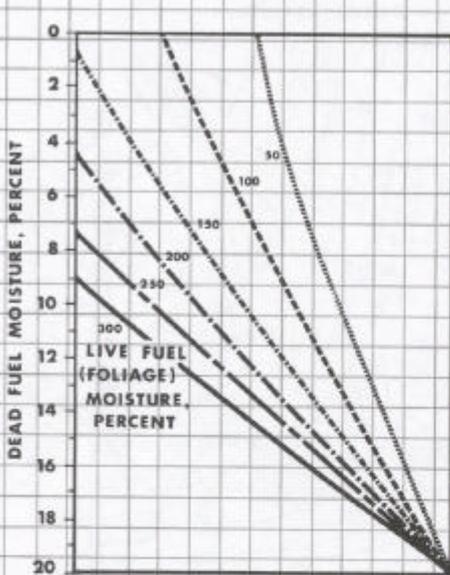


NOTE: Wind direction of fire depends on wind direction. If wind direction is perpendicular to the slope, the effective wind speed is the actual wind speed. If the wind direction is not perpendicular, the effective wind speed must be corrected.

### 4. CHAPARRAL (6 FT) - LOW WINDSPEEDS

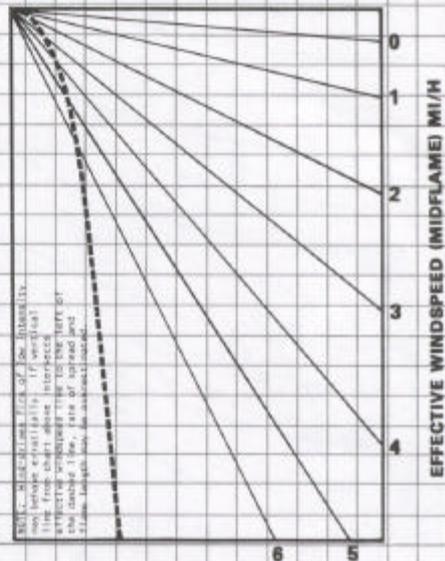
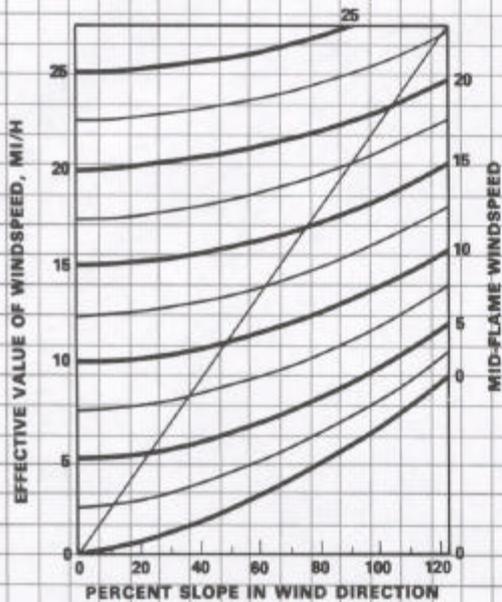
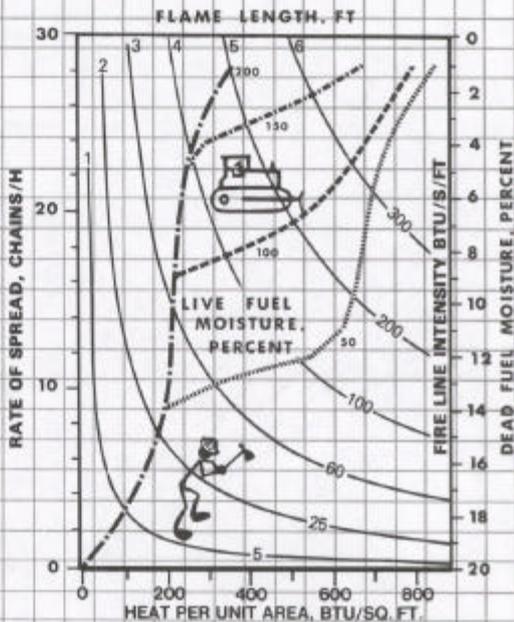
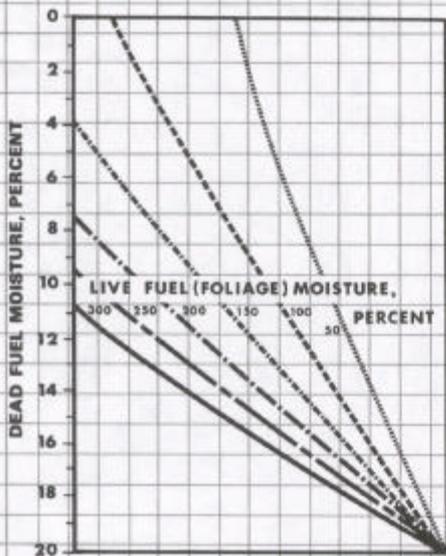


4. CHAPARRAL (6 FT)- HIGH WINDSPEEDS

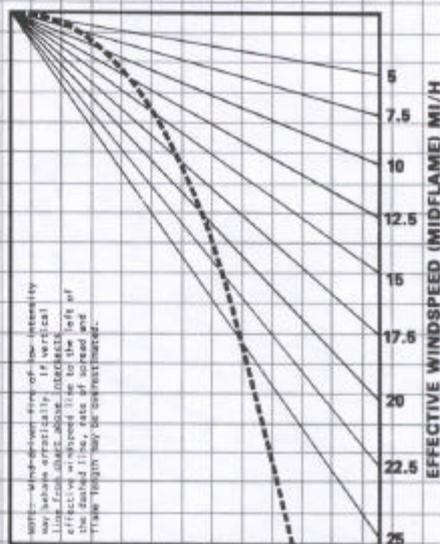
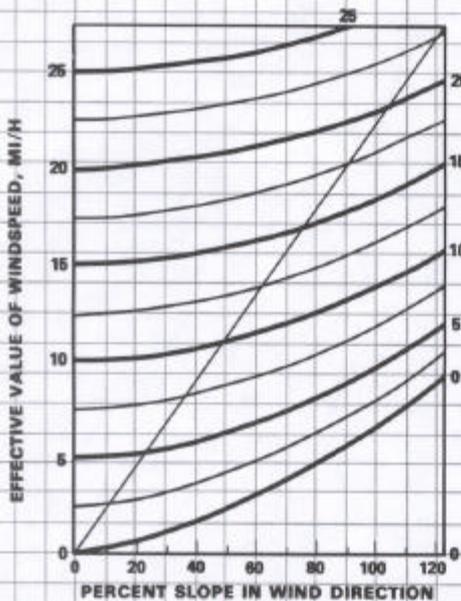
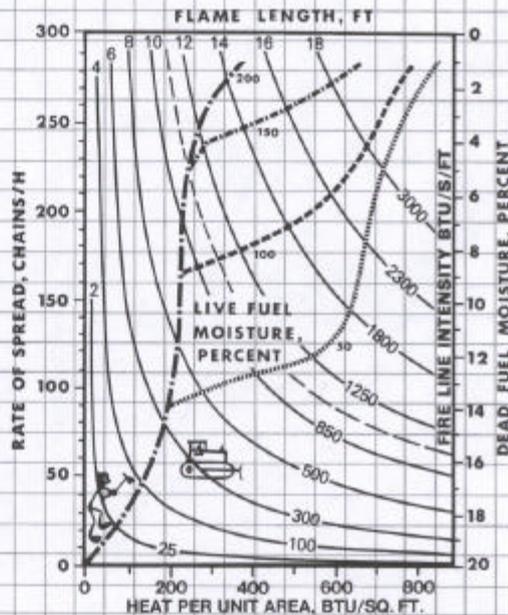
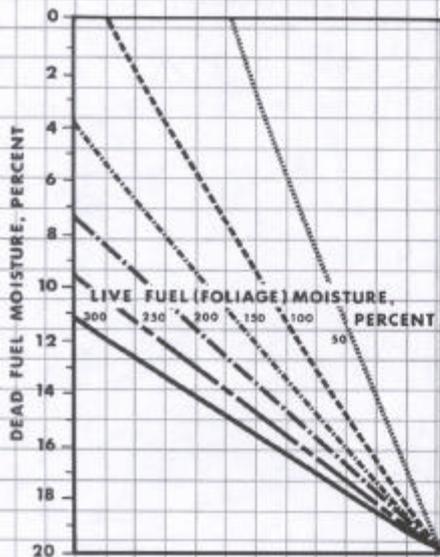


with wind-blown fire of low intensity and smoke obscuring, if vertical line from chart above intersects effective windspeed line to the left of the dashed line, rate-of-spread and flame length may be extrapolated.

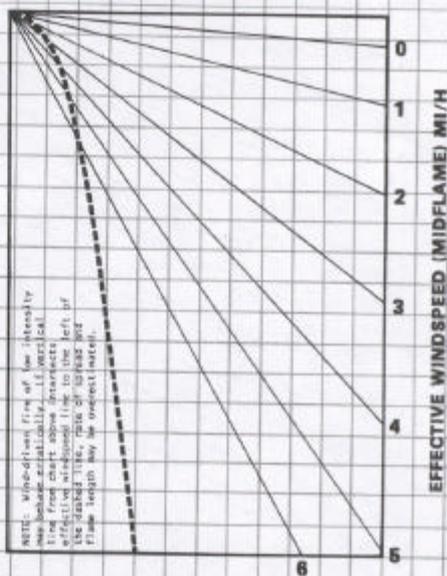
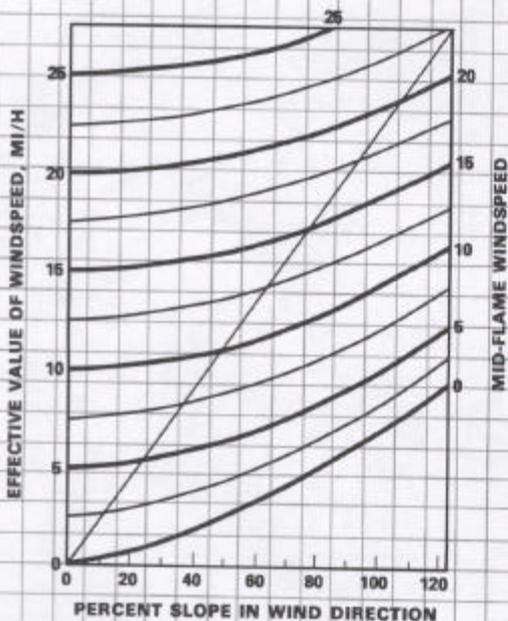
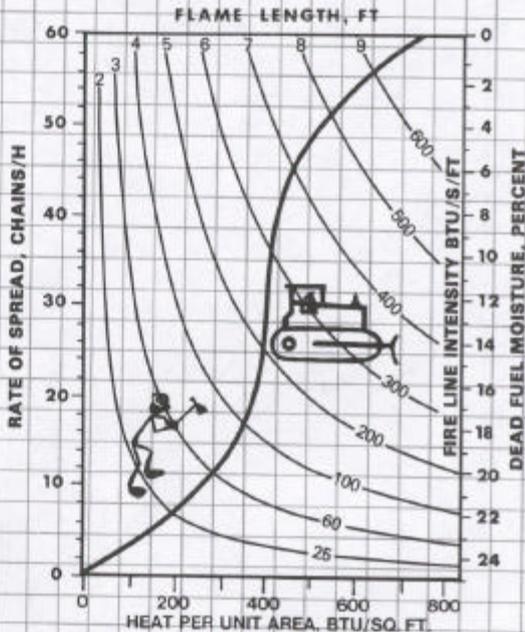
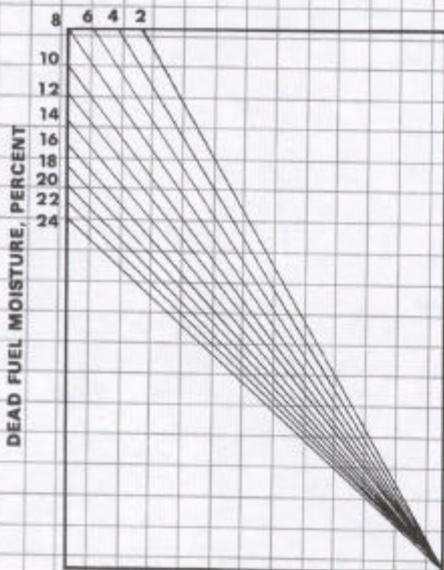
### 5. BRUSH (2 FT) - LOW WINDSPEEDS



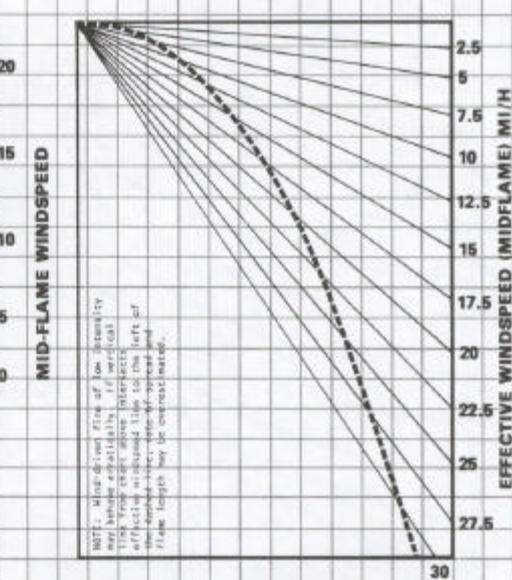
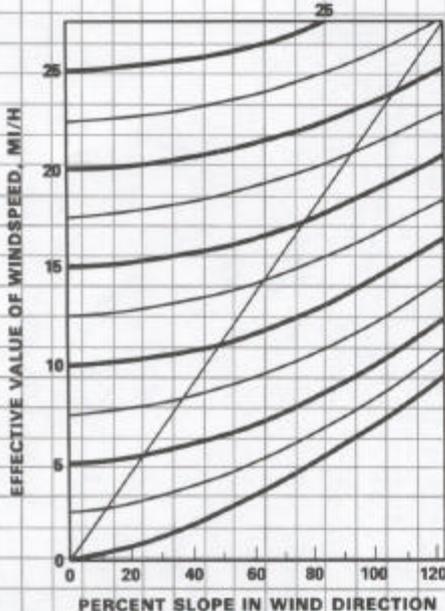
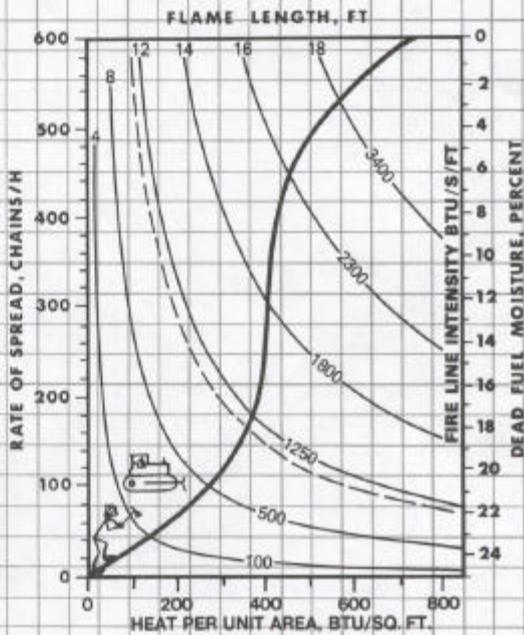
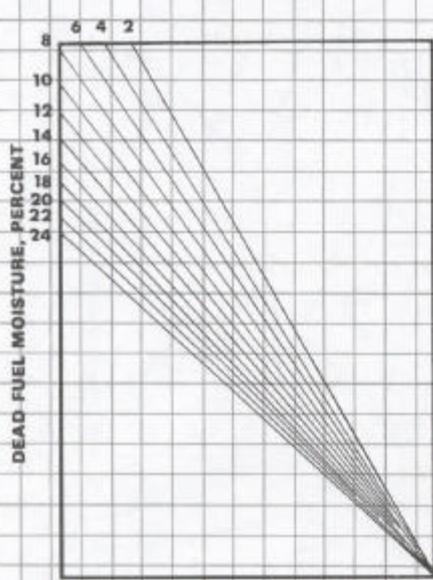
5. BRUSH (2 FT) - HIGH WINDSPEEDS



### 6. DORMANT BRUSH, HARDWOOD SLASH – LOW WINDSPEEDS

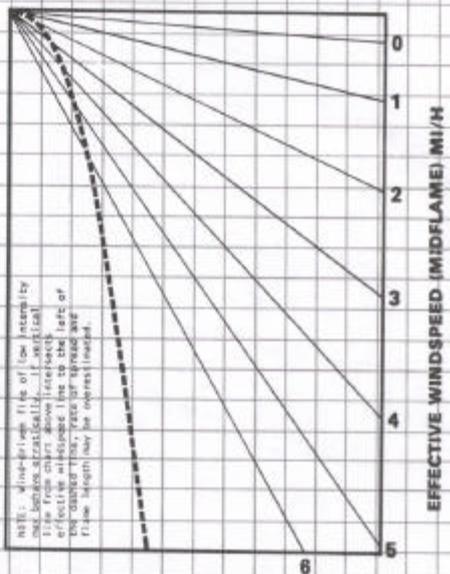
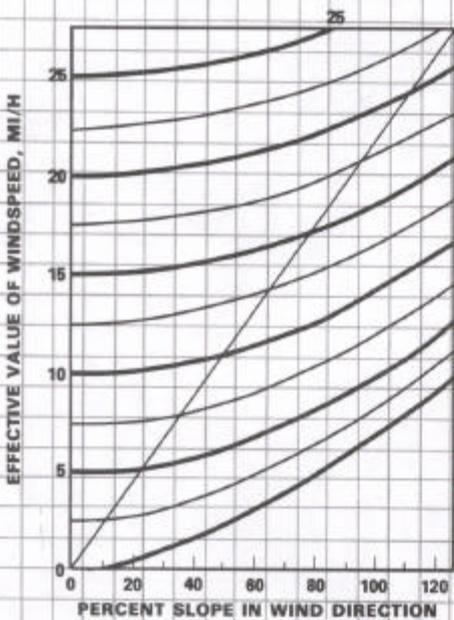
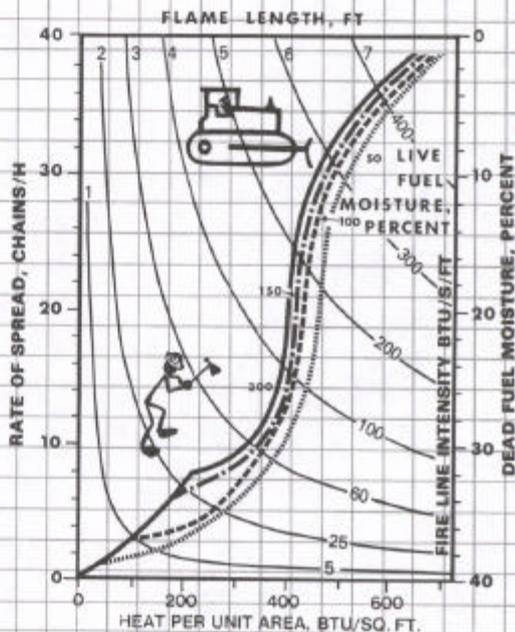
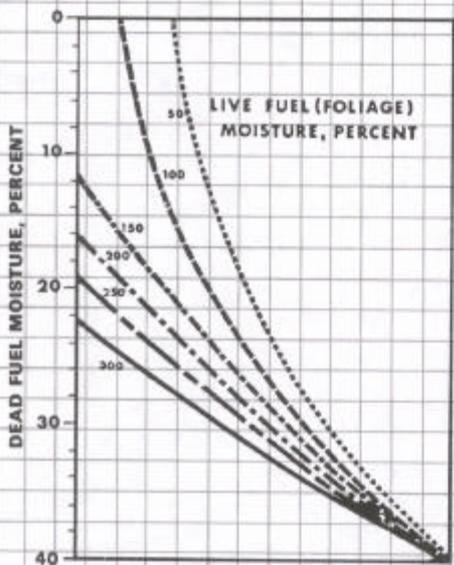


### 6. DORMANT BRUSH, HARDWOOD SLASH-HIGH WINDSPEEDS



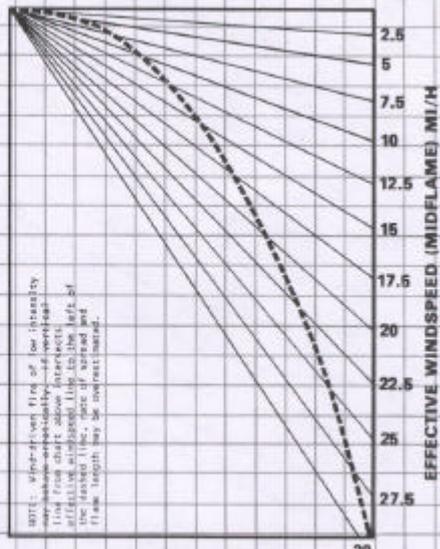
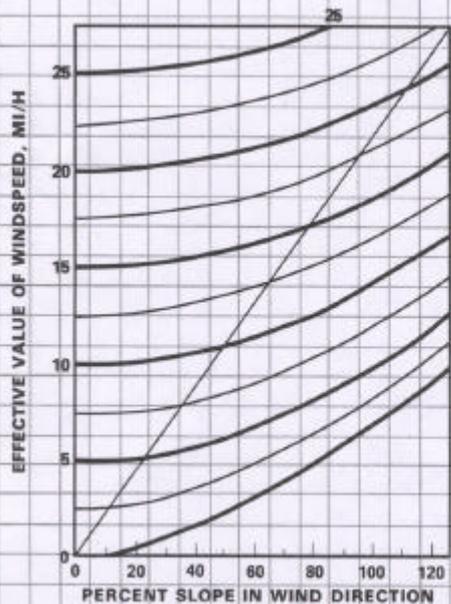
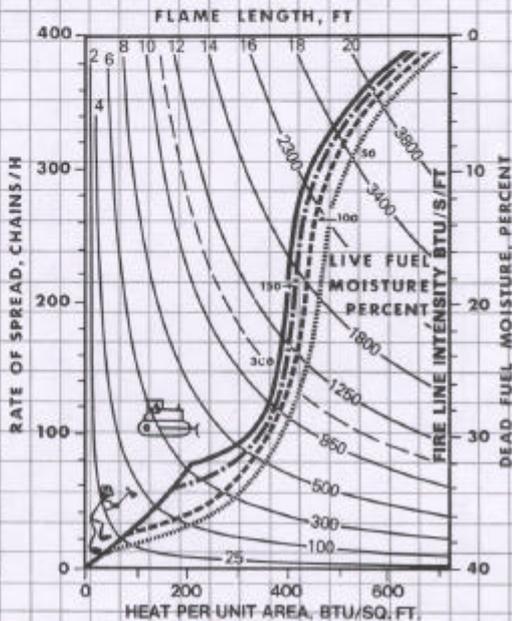
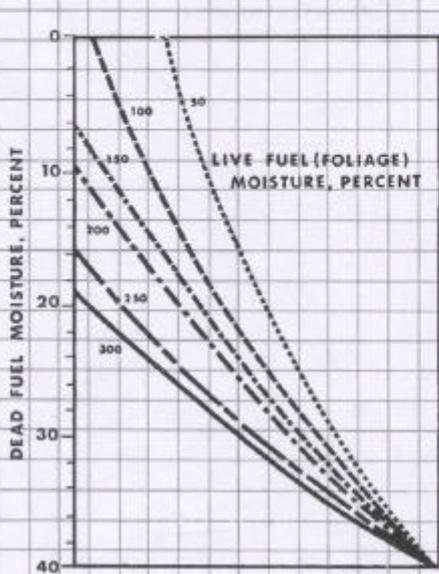
NOTE: Wind-driven fire of low intensity may behave anomalously, if vertical fuel crop and fuel intercepts are not considered. The left of the dashed line is rate of spread and flame length may be overestimated.

### 7. SOUTHERN ROUGH - LOW WINDSPEEDS



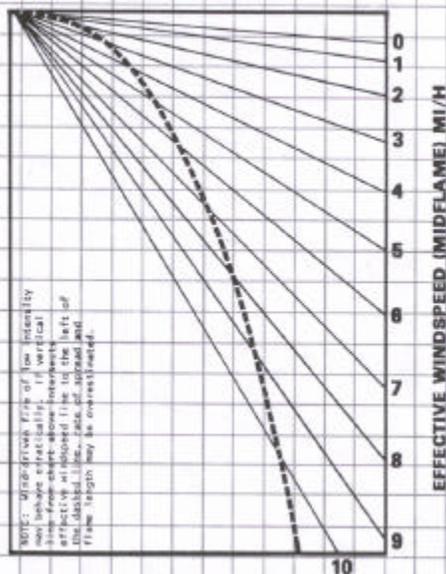
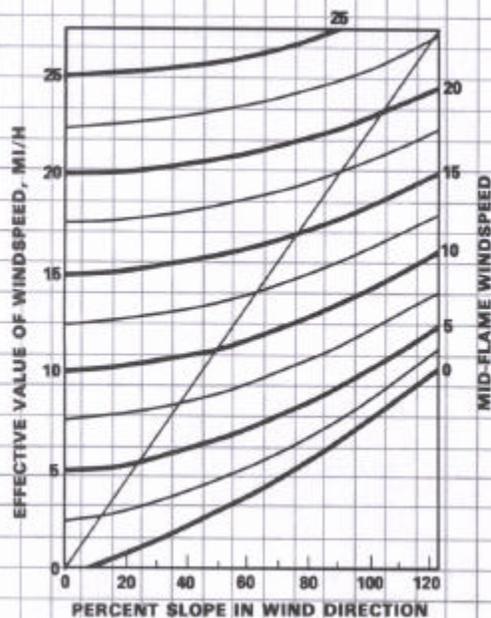
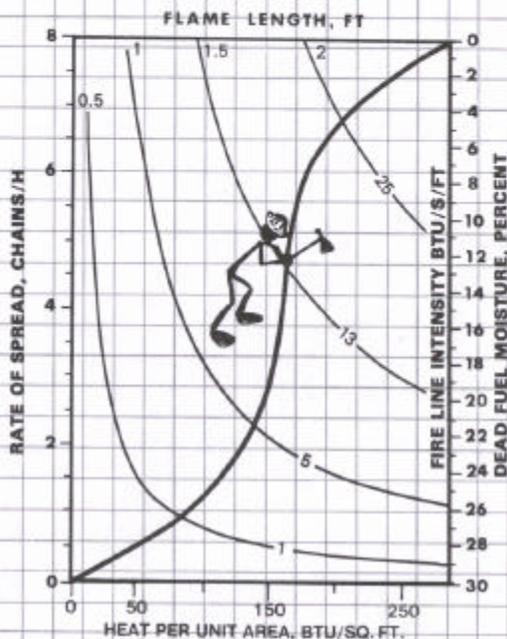
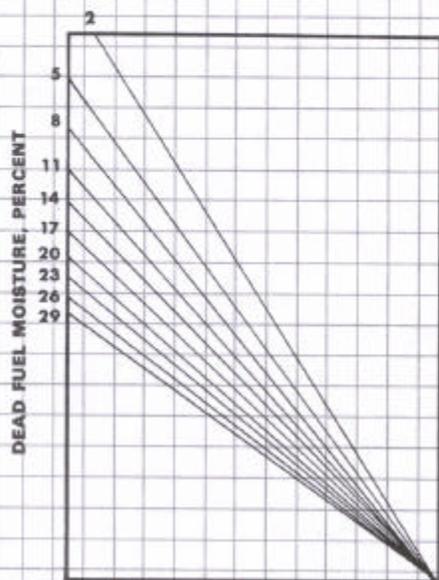
NOTE: Wind-ripples... life of low intensity by one... size... if... fire... above... rate of... spread... length... for... model.

### 7. SOUTHERN ROUGH - HIGH WINDSPEEDS

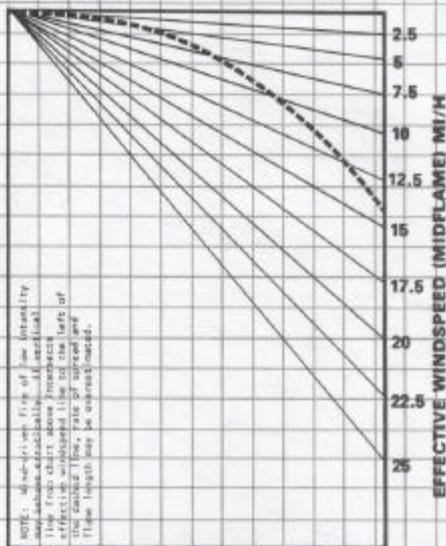
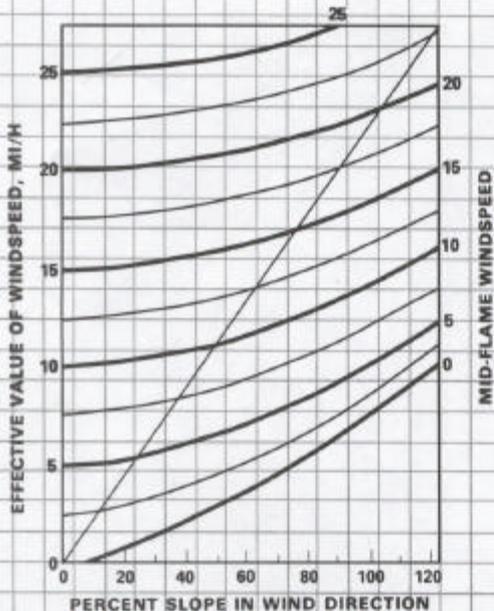
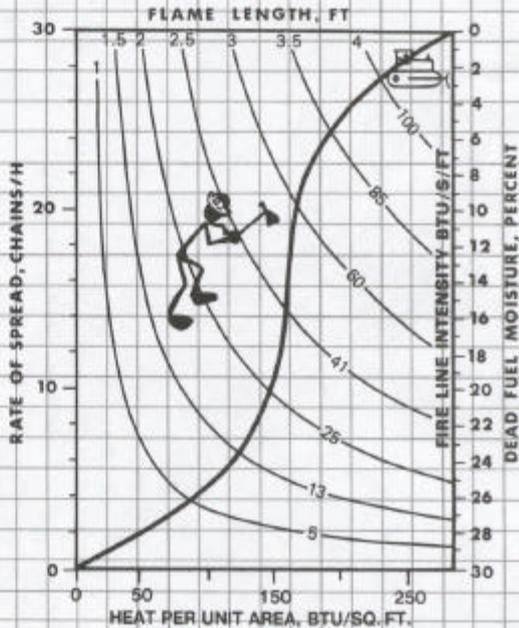
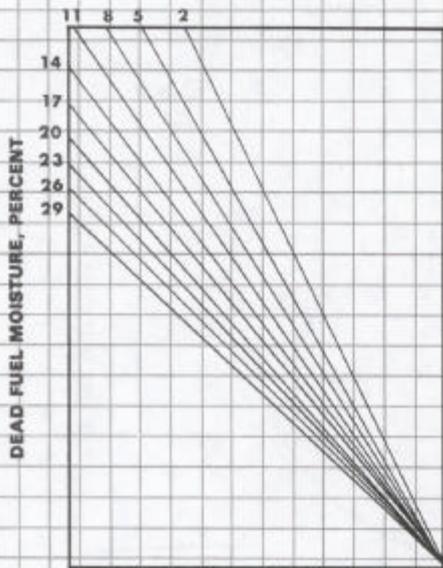


NOTE: Wind direction line of low intensity may show wind velocity of wind direction. Line from chart above intersects effective windspeed line to the left of flame length may be correct answer.

### 8. CLOSED TIMBER LITTER - LOW WINDSPEEDS

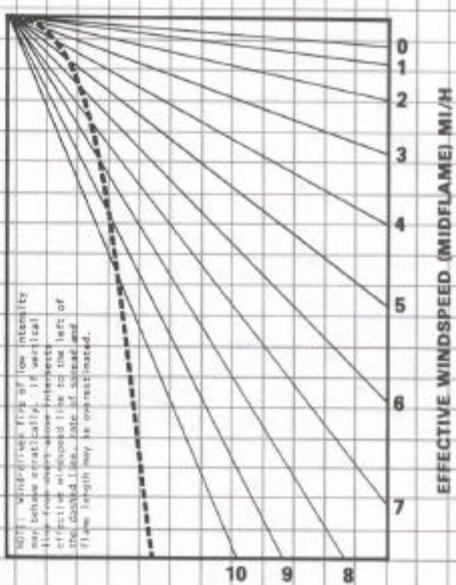
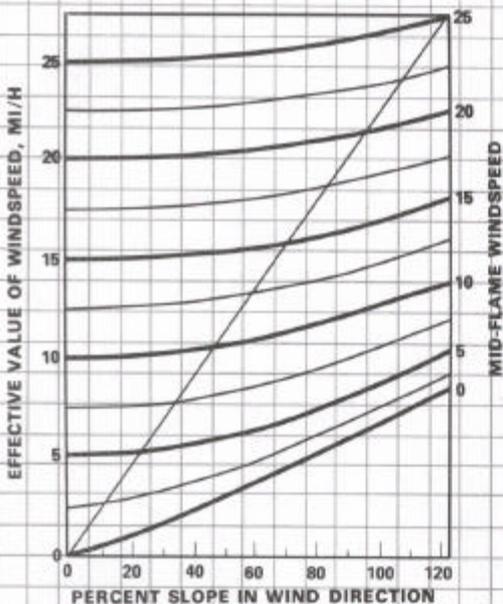
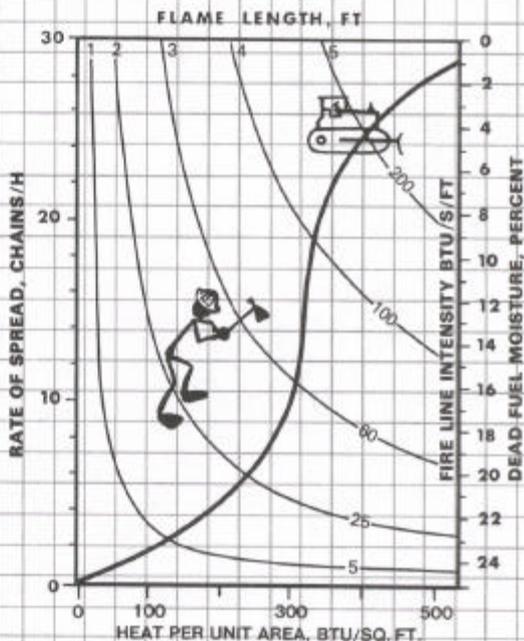
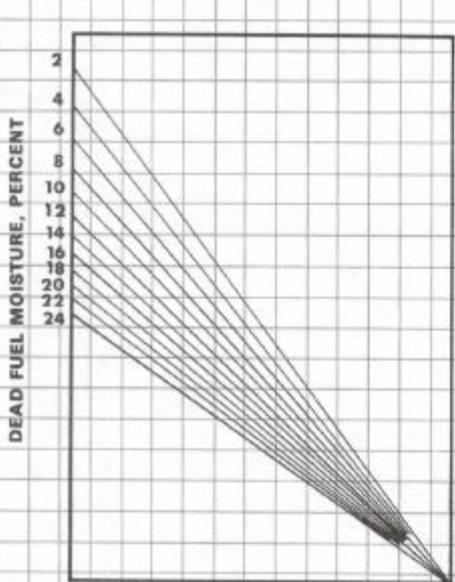


### 8. CLOSED TIMBER LITTER - HIGH WINDSPEEDS

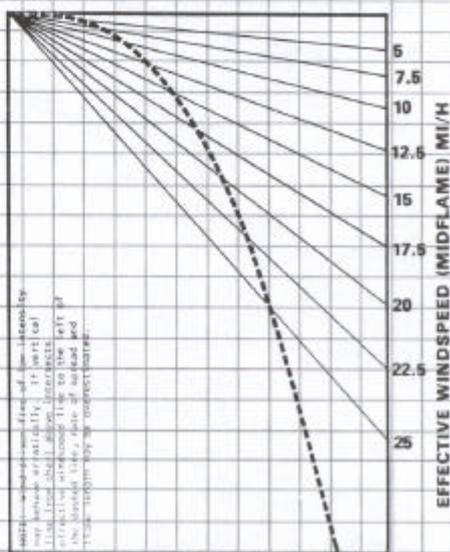
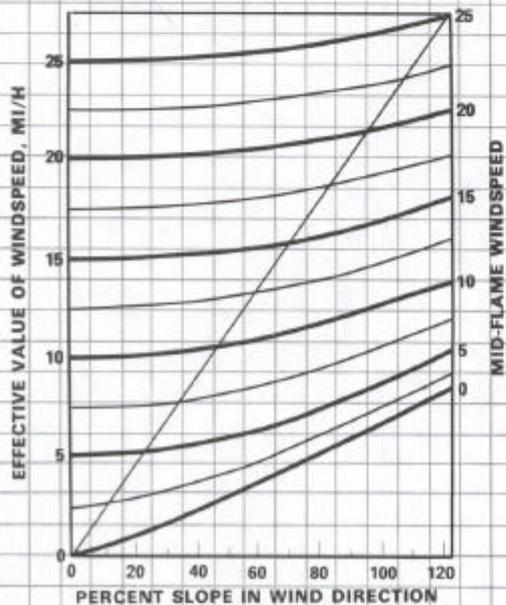
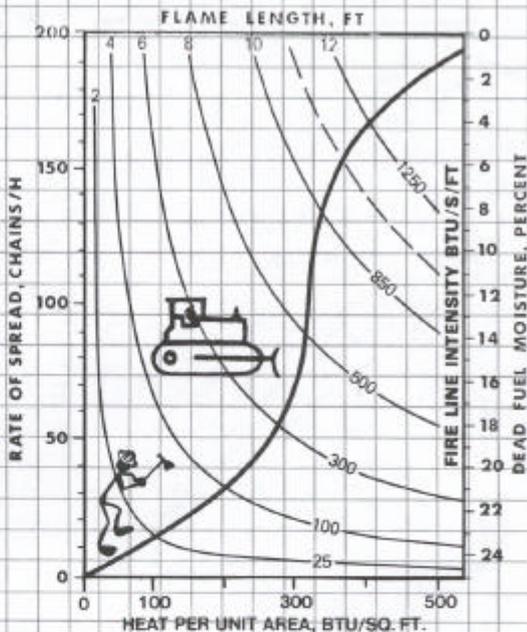
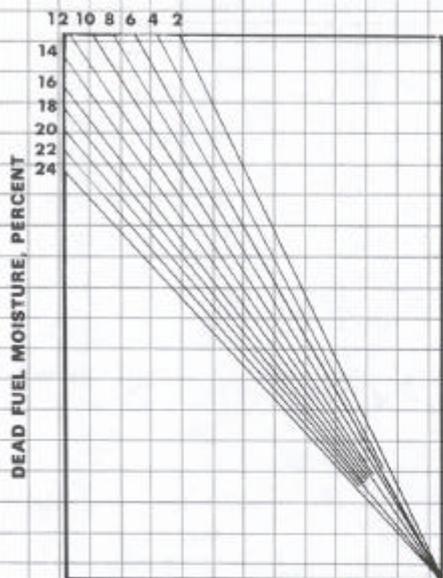


NOTE: Mid-flame wind speed is the intensity of the wind speed at the mid-flame. It is not the same as the effective windspeed in the fire front. Flame length may be substituted.

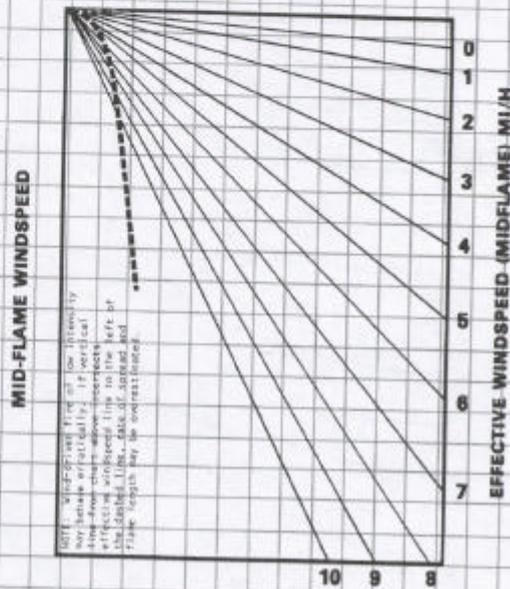
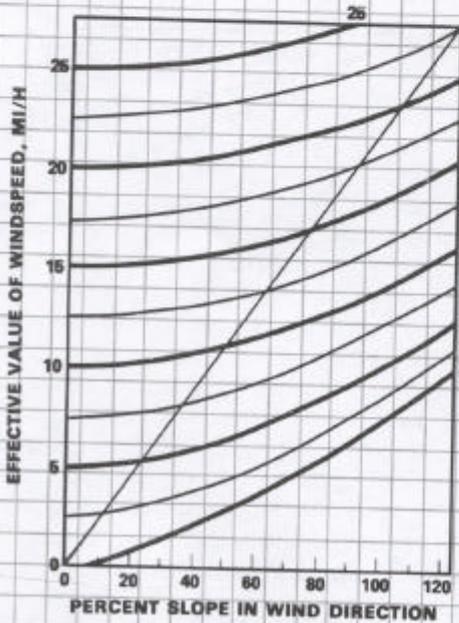
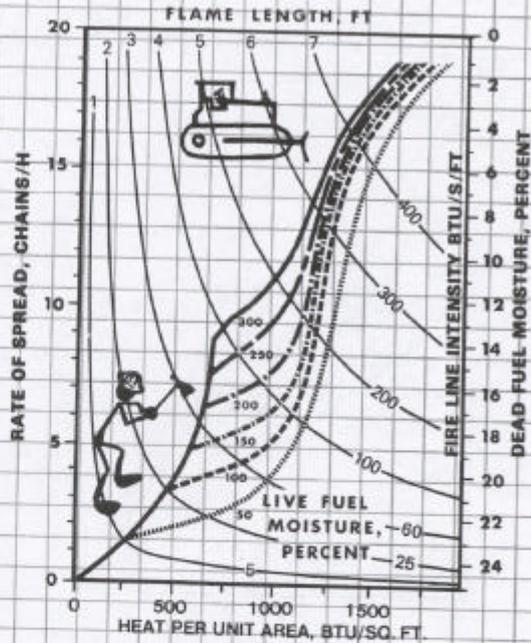
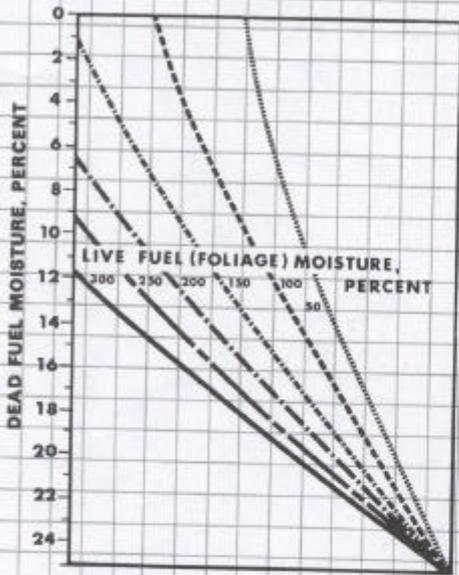
### 9. HARDWOOD LITTER - LOW WINDSPEEDS



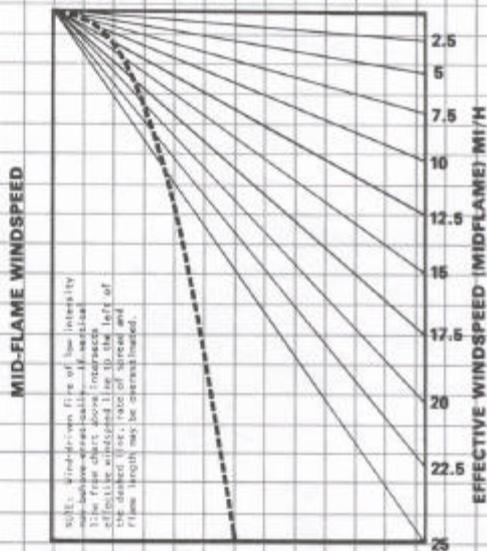
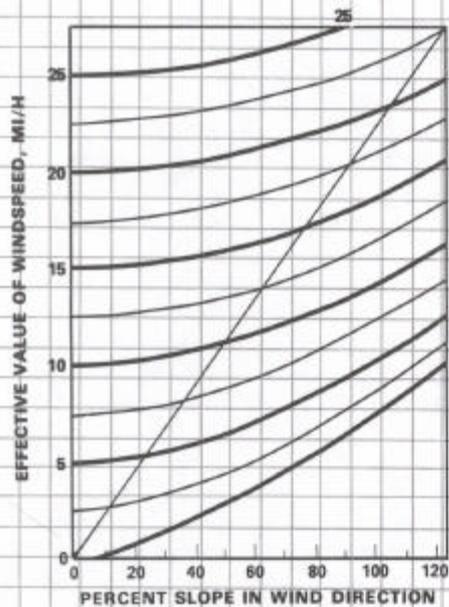
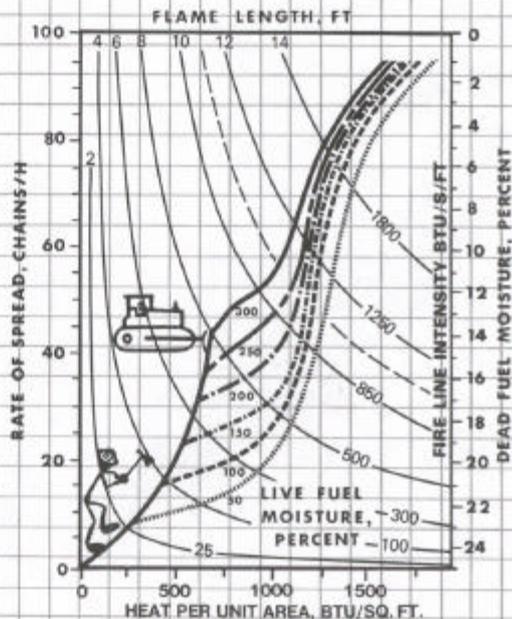
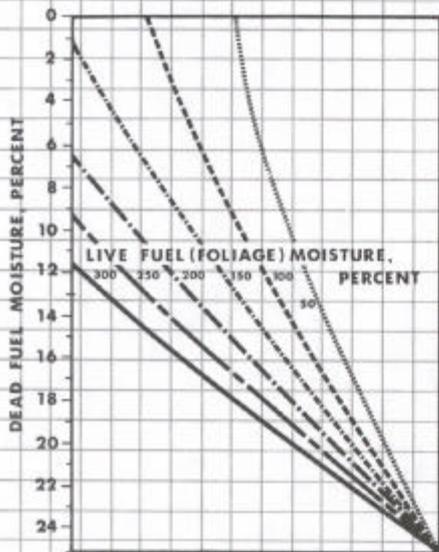
### 9. HARDWOOD LITTER - HIGH WINDSPEEDS



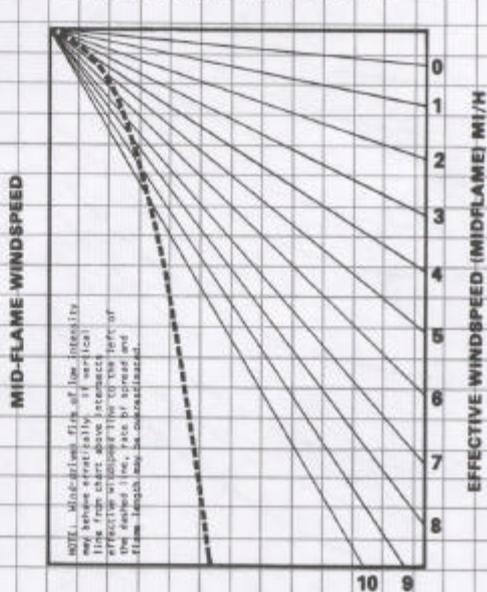
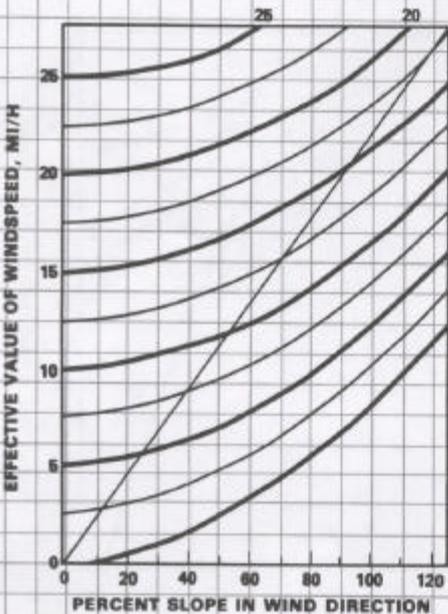
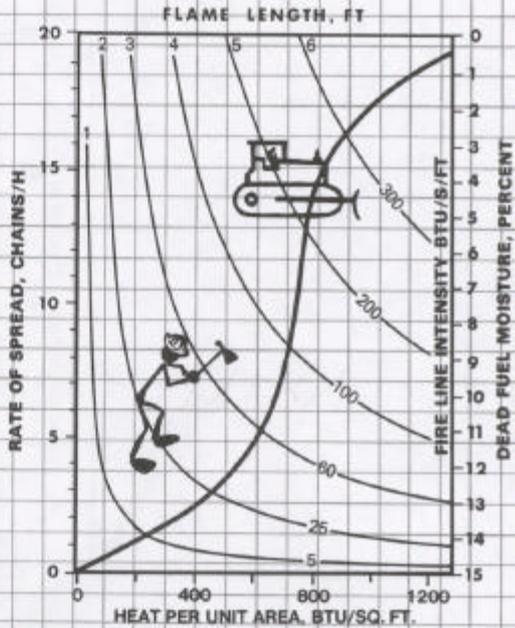
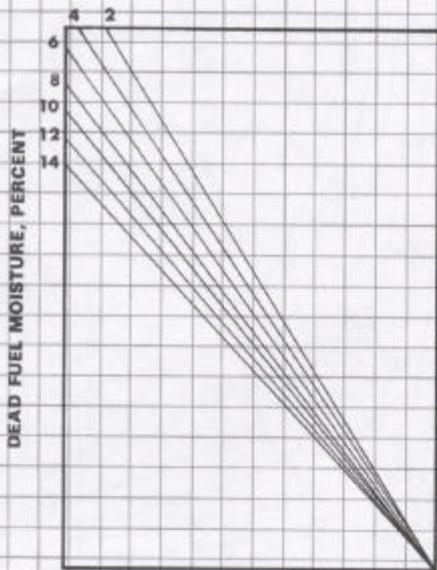
### 10. TIMBER (LITTER & UNDERSTORY) - LOW WINDSPEEDS



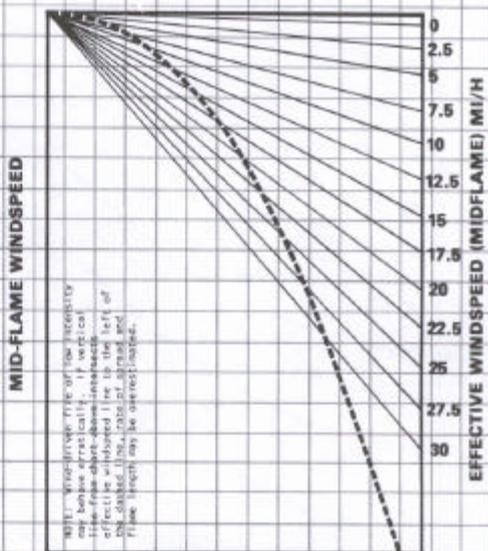
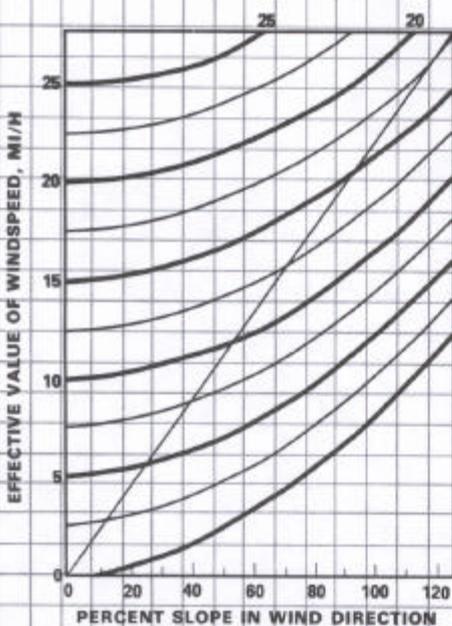
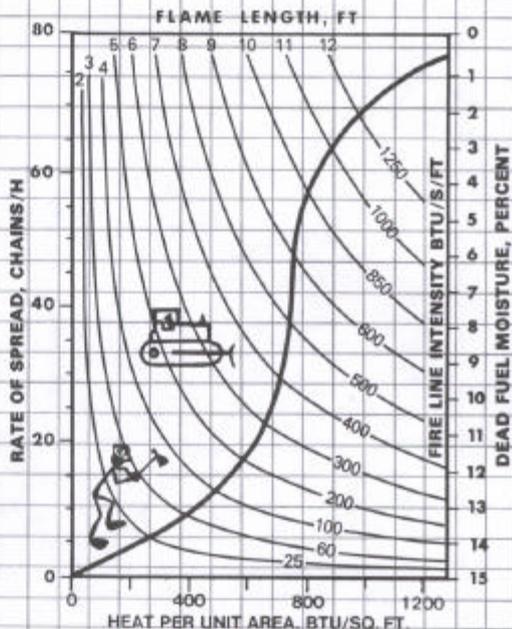
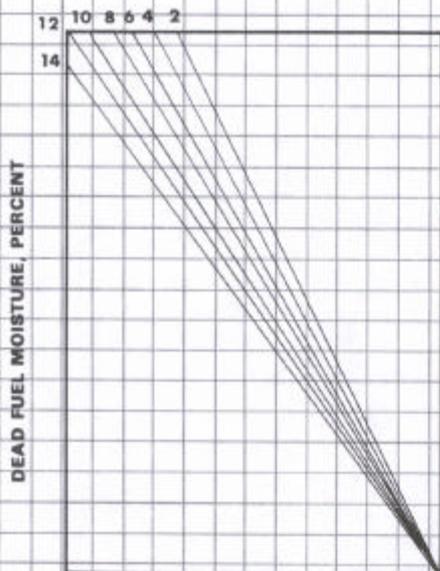
### 10. TIMBER (LITTER & UNDERSTORY)-HIGH WINDSPEEDS



### 11. LIGHT LOGGING SLASH - LOW WINDSPEEDS

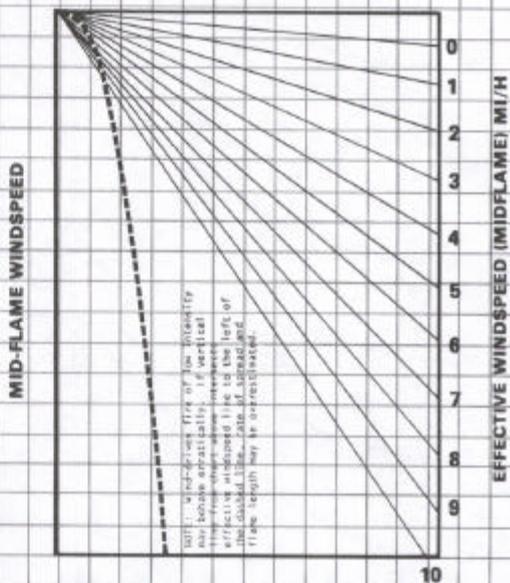
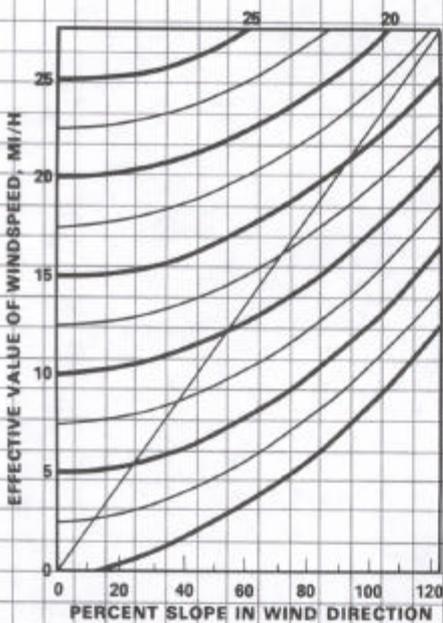
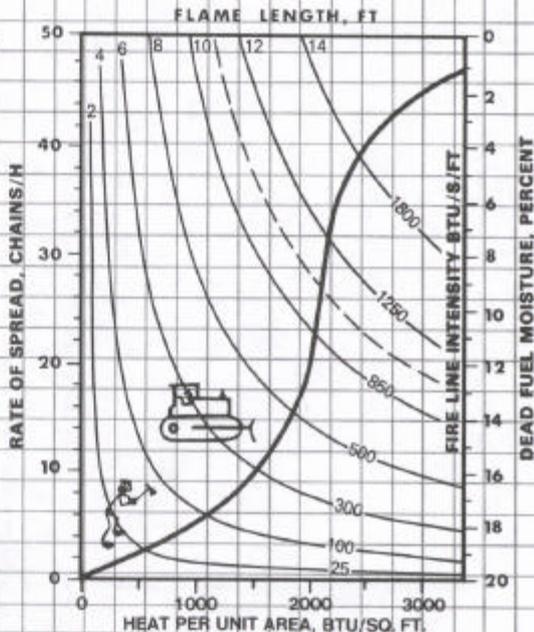
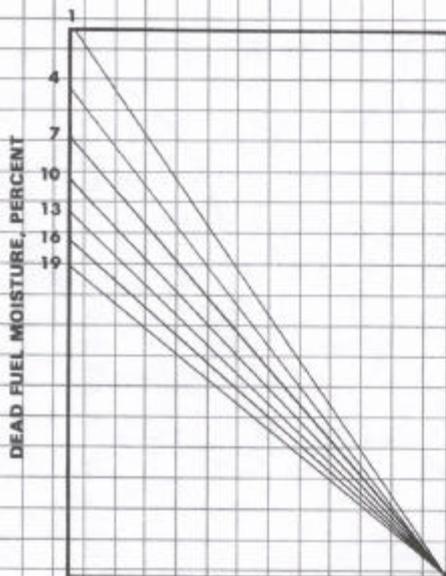


### 11. LIGHT LOGGING SLASH - HIGH WINDSPEEDS

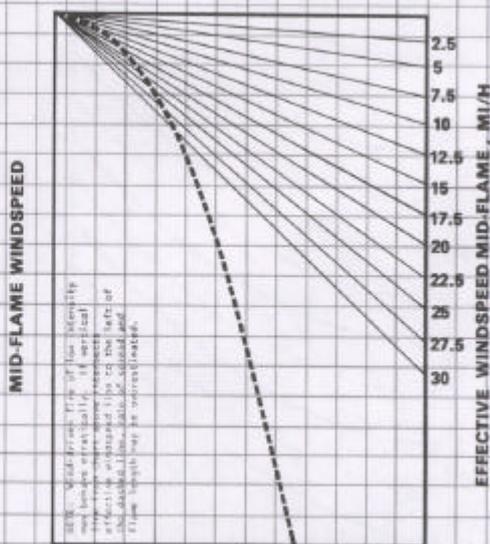
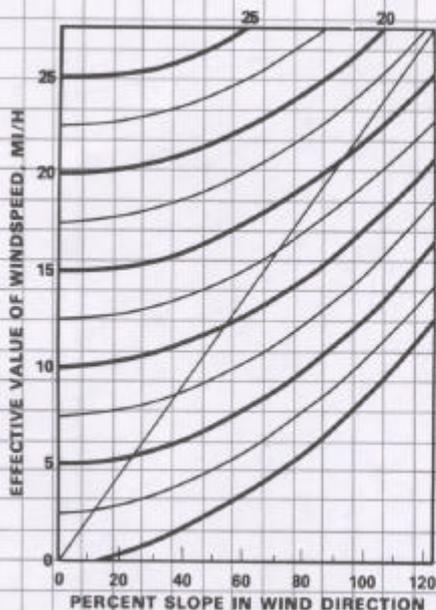
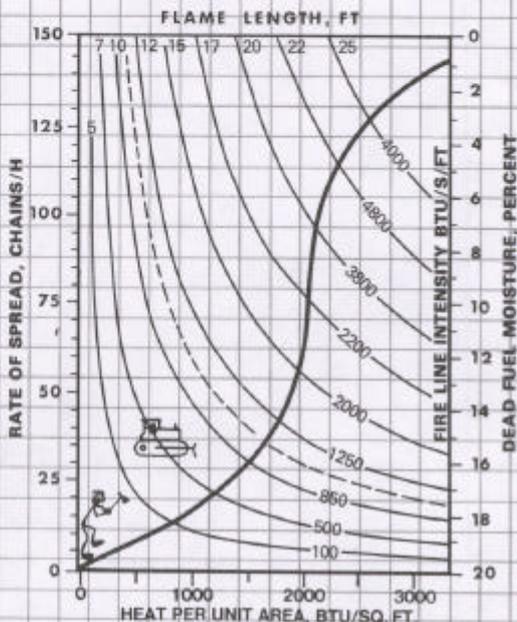
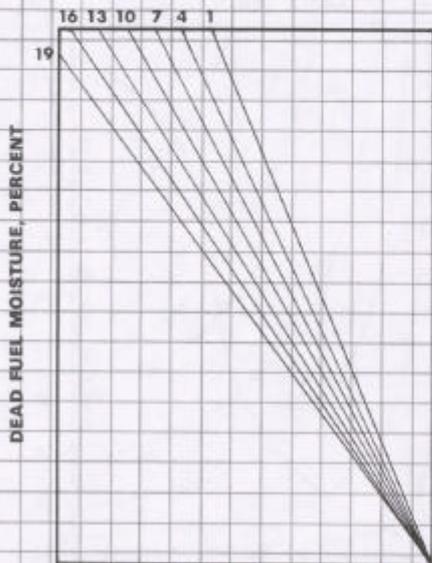


NOTE: Windspeeds are given for the frequency and length of the fire. If actual fire-line observed line is the left of the dashed line, the observed and flame length may be overestimated.

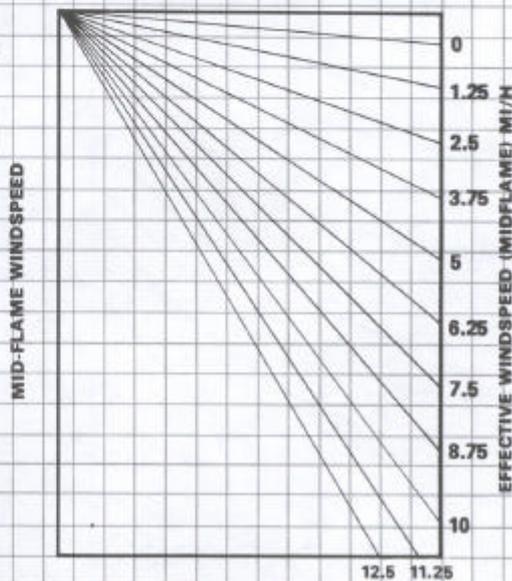
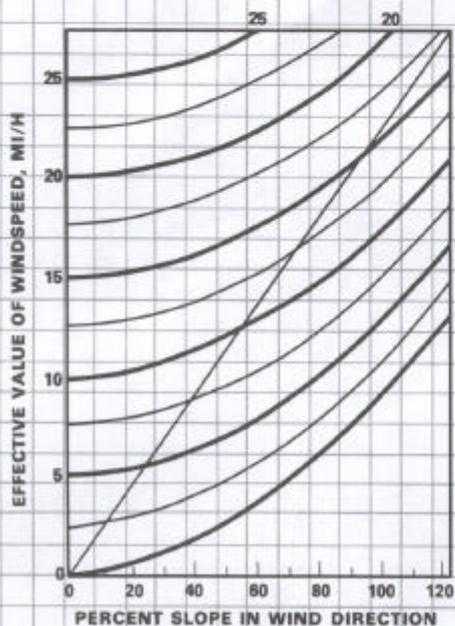
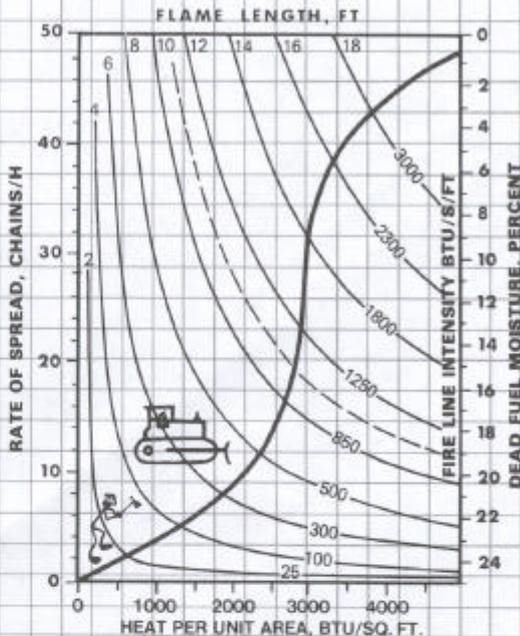
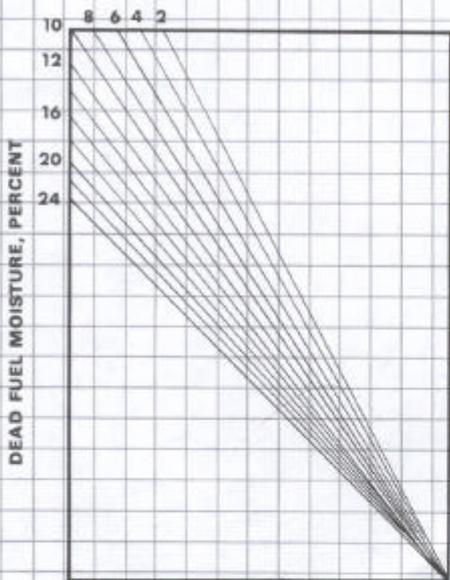
## 12. MEDIUM LOGGING SLASH - LOW WINDSPEEDS



## 12. MEDIUM LOGGING SLASH-HIGH WINDSPEEDS



### 13. HEAVY LOGGING SLASH-LOW WINDSPEEDS



### 13. HEAVY LOGGING SLASH - HIGH WINDSPEEDS

