



# INTERNATIONAL FOREST FIRE CONFERENCE

INTERNATIONAL FOREST FIRE CONFERENCE IN BLACK SEA REGION

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## ABSTRACTS

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**Determination of Time-Lag Constant for Calabrian Pine Stands (*Pinus brutia* TEN.) According to Crown Closures: A Case Study in Antalya**

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Contemporary fire management organizations require timely, reliable and easily available information to successfully fight forest fires. This calls for the establishment and existence of a fire management system that deals with fire potential and fire behavior. Fire Weather Index System, a major component of Fire Danger Rating System can aid decision makers in fire management activities through predicting fire ignition potential and development from fire weather measurements in a standard fuel type (Calabrian pine). In FWI system, the moisture content of fine fuels (FMC) is an important variable determining fire ignition and behavior.

Modelling FMC is necessary for predicting fire danger and fire behavior. The response characteristics of fine fuels are of critical importance in fuel moisture dynamics. Time-lag constant the term used to describe the response characteristics of fine fuels and defined as the time required for fuels to lose 2/3 of available moisture. In this regard, measurements were carried out in 3 different stands with crown closures %0, %50 and %80. The depth of fine fuels on the surface floor was 1.5 to 2.5 cm and that of duff was 5 to 10 cm. In open parts of stands, 1×1m plots were prepared for measurements. Prior to the measurements, a fully automated weather station was set up at the study site to record weather variables, namely precipitation, temperature, relative humidity, and wind speed and direction. Five sampling plots were set up for fuel moisture measurements located at least 50 m away from the open areas to eliminate edge effect on fuel moisture. To determine fine fuel moisture content grill shaped moisture sticks made up of twelve small sticks measuring each 10×0.5×0.1 cm were weighed every two hours with 0.01 gr precision from 09:00–19:00 for twelve days in April. After weighing, sticks were carefully replaced back to where they had been. At the end of the study period, all sticks were taken to the laboratory to obtain oven-dry weights and thereby fuel moisture contents. The data obtained from field



measurements were used to determine the effect of crown closure on the rate of fuel moisture loss. Based on the analyses, time-lag constant was modeled based on the rate of fuel moisture loss and crown closure. The results obtained from this study constitute a fundamental step towards establishing National Fire Weather Index System, a major component of Fire Danger Rating System in Turkey and will be invaluable contribution in overall fire management planning.

**Keywords:** Forest Fires, Fuel Moisture Content, FWI System.