



SOLUCIONES TECNOLÓGICAS AVANZADAS PARA LA MEJORA DE LA PREVENCIÓN, LA EFICACIA Y LA SEGURIDAD EN MATERIA DE EXTINCIÓN DE INCENDIOS FORESTALES

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Effects of flame interaction on the rate of spread of heading and suppression fires in shrubland experimental fires



Effects of flame interaction on the rate of spread of heading and suppression fires in shrubland experimental fires. J. A. Vega ^{A D}, E. Jiménez ^A, J.-L. Dupuy ^B and R. R. Linn ^C

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Abstract

Suppression fires are frequently used in wildland firefighting operations. However, little is known about how suppression fires behave and how the main front and the suppression fire interact. Lack of information limits the operational use and effectiveness of suppression fires and compromises the safety of firefighters. A series of experimental fires were conducted in a shrubland fuel complex in Galicia to quantify the effect of the interaction between a heading fire burning upslope with the prevailing wind and a suppression fire burning downslope from a control line against the wind. An empirical model was developed to estimate the possible effect of interaction between fronts on the rate of spread of both fronts. For heading fires, the explanatory variables were: wind speed on the windward side of the fire, distance between fronts and slope angle. In contrast, for suppression fires, the only significant explanatory variable was the distance between fronts. The models reflected the observed low to moderate acceleration in the rate of spread of both fronts and the short distance over which interaction occurred (<20 m). The study revealed that the safe and effective use of suppression firing is more limited than previously expected. In fact, with moderately high wind velocities on flat and moderately steep terrain, the use of line firing appeared unsafe.

Additional keywords: fire fighting, in-draft, mixed heathland wildfire behaviour.

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