

## EVALUATION OF PASSIVE FLAME HEIGHT SENSORS FOR THE CENTRAL HARDWOODS REGION

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We conducted a pilot study to determine the best material for measuring flame height in the oak-hickory forest litter fuels present in the Central Hardwood Region. Fire-retardant-soaked cotton string and four different compositions of lead/tin solder (63/37, 60/40, 50/50/, and 40/60) were compared. We evaluated three replicates containing four strands of each material suspended vertically between two guy wires. At the end of each linear replicate two height poles were positioned within view of a video camera. Backing and head fires were set so that the flaming front advanced perpendicular to each replicate. The string was measured to the highest point where it was uniformly blackened and the solder sensors were measured where they melted off. Averages for each sensor type were computed for each replicate and regressed on actual average flame height determined from a video taken during each test. Analysis indicated that string soaked in fire retardant performed the best having the highest R<sup>2</sup>, 0.99 [Flame Height = (.61)\*(Uniformly Blackened String Height)]. All compositions of solder had R<sup>2</sup> > 0.96, with 50/50 solder having a R<sup>2</sup> of 0.98.

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