

Project Note

July 2012

FPIinnovations 
Wildfire Operations Research
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Fire behaviour in mulched fuel beds along linear corridors

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Summer Burning Activities – Fort Providence, NT

On June 22, 2012 researchers conducted two point source ignition tests in mulched lines that had been prepared in 2010. Temperature was 26°C and relative humidity was 19%. There had been little precipitation since June 8 which had created a very dry fuel bed. The first ignition test was a single match dropped at 15:40. Winds were <5 kph and direction was variable. The fire grew in a circular pattern with variations in the fuel bed influencing fire spread. In 15 minutes of free burning, the fire grew to approximately 3.5 metres in diameter with 0.8 m flame lengths. The second ignition test involved dropping a single match in both a mulched line and in a closed forest stand at the same time to observe differences in fire behaviour. Again, with minimal winds both fires grew in a circular pattern. After 12 minutes of free burning, both fires were of the same size and showed similar flame lengths.

On June 23, researchers had the opportunity to observe fire behaviour in a mulched fuel bed that resulted from a nearby unrelated experimental fire (Figure 1). Fire crews reported vigorous and sustained burning in the mulched fuel and containment required water delivery with pump and hose.



Figure 1. Fire suppression in a mulched fuel bed.

On June 25, researchers conducted a test designed to simulate an ignition from a downed hydro line. A branch of approximately 10cm in diameter was placed on the mulched fuel bed and ignited at 13:26 (Figure 2). Temperature was 18°C, relative humidity was 88% and there had been < 1mm precipitation since June 22.



Figure 2. Fire spread 26 minutes after a line ignition.

Because of light precipitation occurring after ignition, the fire was allowed to burn overnight. The fire continued to burn the drier mulch underneath the wet surface layer. After 22 hours and 14mm total precipitation there was no residual heat or smoke (Figure 3).



Figure 3. Fire spread from line ignition after 22 hours and 14mm precipitation.

Data are still being compiled and analyzed. Results will be presented at the spring advisory meeting in 2013.