bushfire CRC

Smoke Particle Emissions from Different Vegetation

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Aim

to determine

➢Vegetation emission factors (EF's)
➢particle chemical composition
➢Particle size distributions
➢Effect of fuel characteristics on emissions

For a variety of different vegetation types, at different fuel moisture (FM), and fuel sizes.

Introduction

Method

Small samples of each fuel were burnt under controlled conditions.

Equipment

Modified high volume field sampler. Enables the measurement of carbon dioxide (CO_2), carbon monoxide (CO), particulate matter (PM), Methane (CH_4) and non-methane hydrocarbons (NMHC). Filters are also collected for chemical analysis.
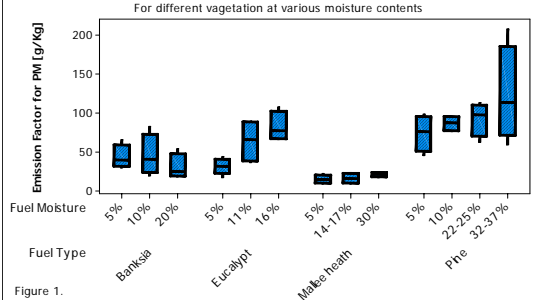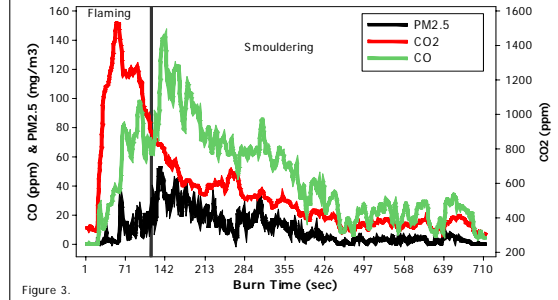

Figure 1.

Eucalyptus emissions were different at varied FM. However, emissions were varied for high FM pine.

Figure 3.

Emissions are increased during flaming (and the transition to smouldering), and drop off steadily thereafter.

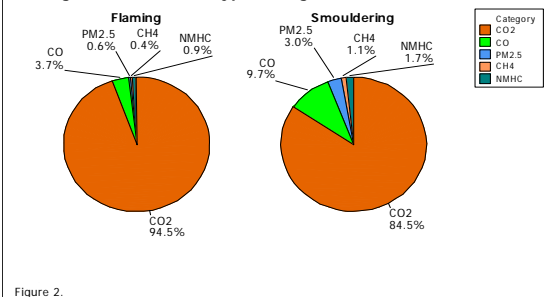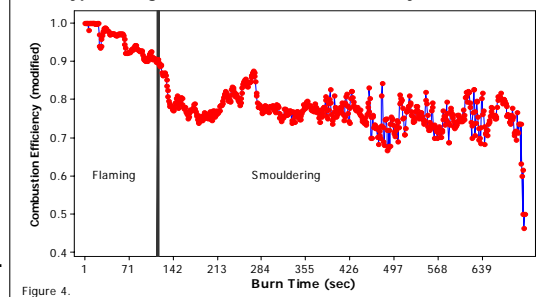## *Preliminary Results –Typical Combustion*

Figure 2.

Emission of CO_2 dominates flaming stage, while CO, $PM_{2.5}$ CH_4 and NMHC are increased during smouldering.

Figure 4.

There is an increase in CE after the flaming - smouldering transition, possibly due to increased availability of O_2.

Discussion – Conclusion

The preliminary results for this experiment indicate that eucalyptus varies emissions with fuel moisture, while the other fuel investigated show no significant difference, (although higher FM pine has increased variability). It was also shown that most of the CO and PM2.5 emissions were in the smouldering stage of combustion, where combustion efficiency was decreased.

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