

Bushfire Research Blowing in the Wind Tunnel

CSIRO has opened a 25-metre long wind tunnel that will enable the study of fuel behaviour in bushfire conditions. The Pyrotron allows the placement of grass, forest litter and small logs to simulate real bushfire conditions with varying wind speeds.

The Minister for Science, Senator Kim Carr, claimed that the Pyrotron surpasses the only similar facility of its kind in the world. Its opening meant that "Australian researchers will truly be able to fight fire with fire," Carr said.

Despite increasingly bushfire-friendly conditions, deaths from bushfires have fallen in part as a result of better understanding of how fires spread. Nevertheless, 250 Australians have died in bushfires over the past 40 years, with costs estimated at \$2.5 billion.

CSIRO hopes the Pyrotron will keep firefighters ahead of the anticipated increase in fire intensity under warmer conditions (AS, March 2004, p.8).

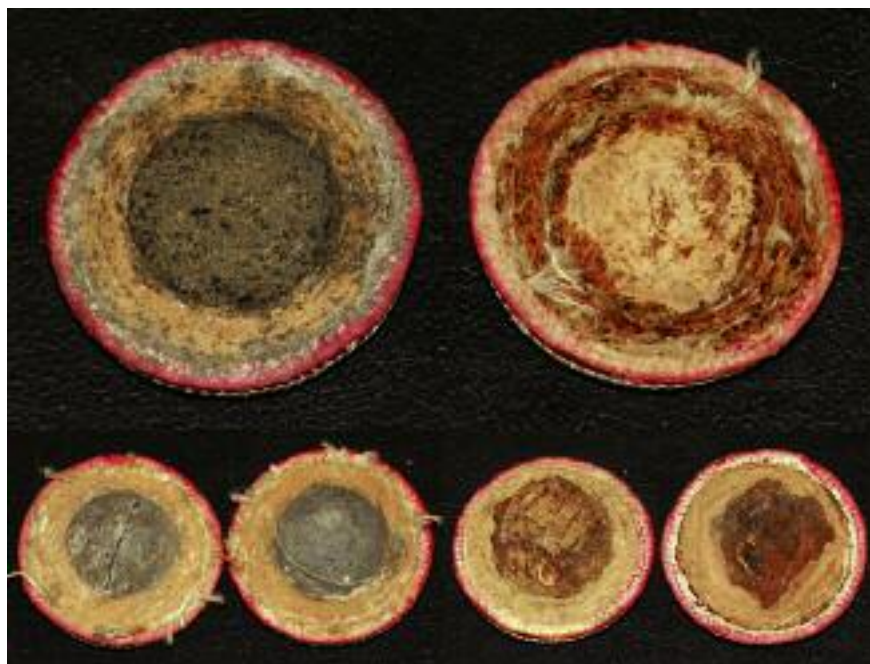
Particles Pose Bushfire Threat

Particulates released by bushfires increase the number of people requiring assistance for breathing difficulties. However, visibility-reducing particles and ozone do not appear to pose a threat.

Dr Rachel Tham of Monash University's School of Rural Health compared hospital admissions and attendance at emergency departments with measurements of air quality in Melbourne and the La Trobe Valley during the 2003 Victorian bushfires.

A strong correlation was found between visits to emergency departments for respiratory conditions and particulates smaller than 10 μm in diameter (PM_{10}). A weak correlation was found between PM_{10} and admissions to hospital for the same conditions. These effects were additional to the rise in illness associated with high temperatures.

The research was published in the journal *Respirology*. Tham and her colleagues argue in the paper: "The population health effects of bushfire smoke, even those remote from the bushfire itself, need to be considered when planning health and emergency services and designing public health messages".



These cricket balls should be identical, but have different cores and behave differently off the bat.

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Cricket Balls Caught Out

As if batsmen did not have enough excuses for getting out in the form of bad umpiring decisions, erratic pitches and poor light – they now have another thanks to A/Prof Franz Konstantin Fuss. It seems cricket balls are not all alike, even within the same manufacturer's model.

Fuss, who is coordinator of the Sports Engineering program at the University of Adelaide, found that the only consistent model among five he tried was Australia's homegrown Kookaburra Special Test. Others varied significantly in hardness as a result of being made from different materials or the tension of their twine.

The hard and soft versions of particular models are visually indistinguishable, but might have rubber or cork cores or other imperceptible differences that change how they respond to an imperfect hit. In some cases the hard and soft versions could be distinguished by weight.

Even Kookaburra may not be entirely pleased with the results – none of their balls were manufactured as they claimed – lacking a layer of twine.

"In contrast to other sport balls, most

cricket balls are still hand-made, which may affect the consistency of manufacturing and thus the properties of a ball," Fuss says. "If the batsman doesn't hit the ball perfectly, a softer ball can still go in the direction aimed at by maintaining its velocity; a hard ball might slide off the bat."

Fuss advocates a consistent manufacturing process to eliminate what he calls the "lottery effect", adding: "A more stringent quality control and testing standard is required for cricket balls in order to avoid unequal chances for both teams".

Some might argue that cricket is always a lottery, with changing pitches and weather conditions often making the toss decisive. "Other factors can't be excluded, so it makes it even more important to control this one," Fuss argues.

Fuss is not sure why the process is so inconsistent, even for very expensive balls. He considered the possibility that some manufacturers have a number of factories that might use different cores, but this does not explain why balls of different hardness are mixed into a single batch.