

## Observations of a chemical retardant drop from the Convair CV-580 multi engine air tanker. - October 2011.

### Introduction

Just how durable is chemical retardant? Numerous images and anecdotal evidence is available, which indicates chemical retardant will remain and be effective on treated fuels and other surfaces until precipitation occurs.

During the recent State Aircraft Unit (SAU) Aerial Intelligence Gathering trials held at Mangalore Airport and the forested areas at Mt Hickey Victoria, a ground support crew came across an area which had been treated with D75R chemical retardant during a formal evaluation activity of the Multi Engine Air Tanker Project 2011.

The area of the drop footprint still showed significant evidence of treatment by the D75R (colour staining).



Image: Barry James, Ovens Rappel Crew.

Plate 1 Bomber 390 commences drop evacuation.

### Background

On the 15 February 2011 at approximately 14:09 hours Bomber 390 (Convair CV-580) delivered a partial load of D75R. The approximate volume was 7142 at coverage level 8.

At approximately 10:16 hours on Wednesday, 21 September 2011 the site was revisited by two SAU representatives.

### Aim

The aim of the exercise was to totally combust the samples that had been selected and test to see if the chemical retardant product was still effective.

### Evaluation method

The fire was prepared which consisted of a range of small and large diameter fuels.

A fire was lit and a number of small diameter and finer fuels samples were selected photographed and prepared for combustion.

Treated fuel samples that were selected consisted of elevated or standing samples to ensure the moisture content was lower than the surrounding ground litter fuels.

The items selected were desiccated vertical fuel samples consisting of standing bracken fern cane branch lets less than 8 millimetres in diameter and smooth bark samples from eucalypt trees, refer to Plate 1.



Image: Eain McRae, SAU.

Plate 2 Selected desiccated bracken frond sample.

The moisture content of the ground fuels and selected D75R treated samples was not measured.

Each of the selected fuel samples was paced adjacent to the larger fire perimeter along side untreated fuels to simulate an advancing fire edge.

At the conclusion of the controlled testing process a bias (more heating) was introduced to accelerate the impact on the D75R treated fuels to encourage rapid or total combustion.

### Testing process

Close inspection of the fuel samples collected showed a distribution of a red coloured stain on the upper and lower surfaces on the vertical and horizontal arrangements.

The samples were partially placed in an elevated position over a point where sustained fire activity and heating could be achieved.

None of the test fuel samples were directly inserted into the fire.

Plate 3 shows the sustained fire activity in the untreated fuels and the D75R treated fuel on the left side in the elevated and exposed position.



Image: Eain McRae, SAU.

Plate 3 Placement of the treated fuel sample and fire activity.

Plate 3 also shows the attempted ignition process occurring where only charring of the treated sample is occurring.

A vigorous hand rub and crumble test of the finer ground fuels and the selected D75R fuel samples indicated clearly that the treated samples were much drier.

The attempted combustion process for one of the selected fuels shown in Plate 4 commenced at 10:16:12 hours and was concluded when a loss of pre heating occurred at 10:17:56 hours.

Subsequent test regimes indicated a very similar result.

During the testing process a number of untreated fuels were collected. When the untreated fuel samples were exposed to the heating process combustion was easily achieved.

The activities associated with the exercise continued for through out the day on several occasions with similar results.

Recorded weather conditions (hand held Kestrel meter).

Location	Temp. C	RH %	Wind dir.	Wind sp km.
Mt Hickey	18.5	42	West	10 - 15



Image: Eain McRae, SAU.

Plate 4 Increased flame height and activity.

Plate 4 shows the attempted combustion process with a selected fuel sample. The image shows limited evidence of the charring process but a significant amount constriction to the structure and form of the fuel sample.

Also evident is the staining residue of the D75R.

Plate 5 shows the loss of the sustained combustion process and the subsequent loss of pre heating of the selected fuel.

The selected fuel sample remained relatively intact apart from the limited charring process observed and the structure and form change.

The fuel did not ignite where as the untreated fuels did.



Image: Eain McRae, SAU.

Plate 5 Fuel sample has resisted combustion.

### Comment

Information obtained about the general weather conditions for the Mt Hickey area indicated a significant amount of precipitation has occurred since the initial activity associated with the drops from the Convair CV-580.

### Further Information

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