

THE ROLE OF WATER BOMBING AIRCRAFT  
IN THE CONTROL OF FOREST FIRES  
IN AUSTRALIA

by

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SUMMARY AND CONCLUSIONS

- a) Recent analysis of air tanker use by the U. S. Forest Service and Canadian Department of Forestry indicate that:-
- (i) Air tanker use has increased sharply over the last decade and the U. S. Forest Service alone has dropped 45 million gallons in the past ten years.
  - (ii) Around 70% of the drops are rated as being of "definite help" to the suppression crews or have had an appreciable effect in "reducing fire behaviour".
  - (iii) The use of plain water or short term fire retardants is decreasing and the use of long term retardants, especially diammonium phosphate has increased sharply, particularly in Canada.
  - (iv) Air tankers are, in general, most effective in the early stages of a fire.
  - (v) When used at wind speeds greater than 14 miles per hour, effectiveness drops off sharply.
  - (vi) A U. S. Forest Service evaluation finds that air tanker drops have provided substantial assistance to ground forces, but the assessment points up the necessity for using them on a selective planned basis for the utmost efficiency, since they are a relatively expensive fire suppression element.
  - (vii) In all cases the decision to use an air tanker must be based on a careful analysis of the particular situation. Fuels, weather, fire behaviour, topography, follow-up action and the difficulty the air tanker may have in hitting the target are all factors that have to be

considered in deciding whether the retardant drop is actually needed for control and the probability of achieving the desired results.

- b) Despite the massive use of air tankers in the United States, fire damage has only decreased by 20% during the decade of their use. Improvements in fire prevention and increased efficiency in ground attack systems must account for a considerable proportion of this 20% overall reduction. One can only conclude that air tanker use has not significantly reduced forest fire damage in the United States over the last decade. It must follow that air tankers are used in many situations where they have little significant effect on the final size of the fire.
- c) A survey of both Canadian and United States literature indicates that air tanker attack systems have been superimposed on the fire control system without a thorough evaluation of cost/benefit effectiveness.
- d) Single purpose use of air tankers means that fire control must bear heavy capital costs and standby and maintenance charges during the entire fire season.
- e) In Australia, the amount of finance available for fire control is limited, and of necessity, air tanker use will need to be gradually "phased in" over a number of years.
- f) This will allow a careful evaluation of air tanker effectiveness under a wide range of fuel and weather conditions and covering the most suitable, readily available aircraft.
- g) Due to the limited finance available for air tanker operation a system of dual purpose use appears to be a logical development in this country. Suitable agricultural aircraft types are available and research and operational use has already demonstrated that these aircraft can be effectively used in controlling and containing the spread of a fire in eucalypt forest burning under conditions of low to moderate fire danger.
- h) Fortunately the agricultural demand for aircraft is minimal during the hotter and drier months of the year and air tanker operations on forest fires could provide an important alternative use for the industry during the summer months.
- i) Extensive evaluation trials of a number of readily available agricultural aircraft types have commenced and a clear definition of the capabilities of the various aircraft should be available within six months.
- j) With the guide lines established by this evaluation, forest fire authorities

can then "phase in" air tanker use as the situation warrants.

- k) Air tankers can only be used to maximum effectiveness when an efficient ground system of fire control is in operation. The effectiveness of the ground attack system is still not sufficiently developed over many areas of Eastern Australia to warrant their use at the present time.
- l) There are essential differences between the vegetative cover, climate and topography of the United States, Canada and Australia which preclude the adoption of a northern hemisphere air tanker system to Australian conditions. As would be expected, Australian fire control must develop a system best suited to its environment and stage of development.
- m) Air tanker usage is only one aspect of a fire control system and in many circumstances, its use would have little significance in reducing fire damage. Large scale aerial control burning is one aspect which has an important bearing on whether air tanker attack systems are necessary, and in the case of Western Australia, would preclude any consideration of their use.

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