

Is it Time?

Changing Tactics for a Changing Environment

By Shannon De Wit

Long periods of intense heat, insect infestations, and drought have made forested regions of the world ripe for wildfires, altering fire behavior with larger, more destructive, forest fires challenging current wildfire management programs.

The European Union describes the changing trend as a “result of unbalanced policies that can be effective in fire suppression in normal weather conditions but are insufficient to prevent extreme events.”

The European Commission, from 2000 to 2017, reported that 8.5m hectares have burned; 611 people have died, and over EUR 54b in economic losses have amassed. Megafires are shattering records around the world, leaving behind ecological disasters. Overwintering fires,

reaching as far north as the Arctic, smoldering underground, extending over multiple seasons, contributing to climate change.

WILDFIRES HAVE CHANGED HAS THE RESPONSE?

The science is clear. The environment and wildfire behavior have changed. And so must the response. Higher temperatures, lower humidity, and increased winds experienced on today's fires evaporate much of the moisture content of a water drop before it hits the ground. Gel or foam additives improve water's impact to a degree but are no match for a fire burning in extreme conditions. Fire burns deep into organic material on and underground, emerging from the roots after moisture dries out, making wildfires unstoppable without additional support.

The further the fire is from the water source, the harder it is to contain. The fewer the aerial assets, the harder it is to contain. The longer the fire goes uncontained, the greater the cost to fight and the greater the loss and damage.



TWO PARTNERS – ONE GOAL, SUPPRESSANT AND RETARDANT

Water is a suppressant, cooling flames using evaporation. Foam expands water, insulating it, allowing water to penetrate deeper into the fuel layer and remain on the surface longer. Similarly, gel clings to water, making it heavier, falling faster to reach the fuel before evaporating. Water's benefits are immediate but short-lived.

Retardant slows combustion. Mixed with water, it coats the fuel, clinging to the fuel after water has evaporated, altering combustion. Retardant's benefits are immediate and long-lasting.

Retardant lines the perimeter of the fire, slowing its progression, while water drenches the interior of the fire, cooling its heat.

RETARDANT REDUCES BURN FEEDS REGROWTH

Fuels coated with retardant and burned produce only carbon and water vapor. Ingredients of retardant are primarily ammonium phosphate or polyphosphate, found in agricultural fertilizers, plus gum-based thickeners. Retardants are tested and certified as safe for use in the wildfire environment. The red pigment color is added so that drop lines are highly visible for both pilots and ground crews, to target extending lines with precision.

Anticipating future large fires, agencies can adapt their aerial firefighting assets using a balanced approach that strategically takes advantage of the benefits of both water and retardant. Enhancing current fleets of waterbombers with airtankers, capable of dropping both water and retardant, offers a solution to the question of how to fight new wildfire behavior.

Airtankers draw long lines of retardant around the fire perimeter while amphibious aircraft drop water on the fire

to cool flames. In an ideal scenario, this balanced response occurs during a rapid initial attack, catching the fire while it is still small, preventing it from increasing in size so that it is manageable and safely extinguished by ground crews on arrival.

France has successfully managed an integrated fleet of CL415/CL515 waterbombers and Dash 8-400MR airtankers for over 15 years.

WATERBOMBERS AND AIRTANKERS - The Loon Lake Fire

During the Loon Lake Fire, airtankers seamlessly adapted into the waterbombers' predictable and continuous drop pattern, which maximized the effectiveness and efficiency of both aircraft types. The airtankers on this fire observed, planned the drop, and then executed the mission in between amphibious aircraft drops, ensuring waterbomber delivery was not disrupted.

Because the waterbombers skim from a water source, while the airtanker refills from an airbase, the coordinated attack on this fire was able to work without congesting either fill location. A rapid initial attack using both water and retardant on a fire in Kenai National Wildlife Refuge reduced a wildfire from 60 hectares to 30 hectares within hours, lowering the probability of overnight growth. 🛩️

