

Seeing Red: A Short History of Fire Retardant and the Forest Service

Each year, during the nation's fire season, images of airplanes bleeding bright red retardant onto a raging fire are seen by folks watching television and surfing the Internet. The Forest Service and their Federal and State partners maintain a unique wildland firefighting force across the United States and that force is very familiar with the practice of aerially applying liquid, including retardant, to fight fires. Early attempts to determine which liquids and delivery techniques worked best challenged researchers and practitioners, but fire managers remained diligent through the years to achieve the successes we have today.



As early as 1930, Forest Service fire fighting crews were flying over wildland fire flames delivering water and hoping to either completely obliterate the fire or at least douse it enough to slow its spread. The first recorded water drop in 1930 used a Ford Tri-Motor airplane and a wooden beer keg filled with water. But the successful combination of technology, personnel, and procedure for direct fire control eluded the Forest Service.

World War II initiated a transformation in fixed-wing aircraft capability. At the same time, the country's growing population was spreading out, increasingly living in the wildland-urban interface and raising the urgency of improving wildland fire fighting techniques.

The first free-flowing water airdrop from an airplane onto a fire was made during the Mendenhall Fire, August 13, 1955, on the Mendocino National Forest when the pilot of a Boeing Stearman 75 Kaydet dropped 6 loads of water in support of ground firefighters. The operation successfully knocked-down the blazing fire.

In 1956, interagency water-drop tests consistently showed that weather had to be near perfect for a water airdrop to be effective. During hot or windy days, water barely made it to the ground unless the pilot flew hazardously low. Personnel created a more effective solution, using sodium calcium borate mixed with the water. After the 1956 season, it was discovered the borate mixture sterilized the ground. The Forest Service and other firefighting agencies switched to mixing bentonite with water for a few years and the original Stearman was joined by several N3Ns, which could carry a bigger retardant load. But these biplanes were too small to carry more than 120 gallons of the heavy bentonite retardant and were useless on large fires.

To increase the effectiveness of fire control operations, in the 1960s, Navy TBM Avengers were converted to handle slurry drops, becoming the first aircraft dedicated to aerial firefighting and capable of dropping 600 gallons of retardant on a single sortie. But big fires, especially ones in thick forests or at higher elevations, raged unchecked because of airplanes limitations.

Through the 1960s, the Forest Service explored using a wider variety of military surplus aircraft and discovered that multiengine PBYS, B-24s, A-26s, DC-6s, and even B-17s could carry up to 2,500 gallons of retardant and were more effective on large fires.

Today, retardant is aurally applied and is known to reduce the spread and intensity of fires and slow larger, ore damaging, and thus, more costly fires. In many situations, using retardant to fight fires is the most effective and efficient method of assisting firefighters in protecting people, resources, private property, and facilities; sometimes it is the only tool available.

The Forest Service is nearing completion of an environmental analysis and will prepare an environmental assessment to determine the effects of retardant to people and the environment. A document and decision regarding the continued use of aurally applied fire retardant is expected in the spring of 2007.

