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Tests of an Experimental Slash Ignition Unit

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ABSTRACT: A prototype ignition package containing an incendiary powder and designed for slash and brush burning jobs showed some promise, but the unit tested was not superior to such conventional devices as fusees, diesel backpack type flamethrowers, Very pistols, and drip torches.

Igniting wet brush and slash for disposal in the safe period after fall rains is a problem to many land managers. We are testing various methods of easing this problem. The ideal ignition unit would develop intense heat which would be sustained long enough to establish fire under a wide range of moisture conditions. It should be packaged for protection against wet weather and breakage so it could be placed before the rainy season and yet be ignited at the proper time. A prototype ignition unit has been evaluated, and although it showed some promise, the model tested was not satisfactory.

The unit tested was a waxed, heavy cardboard carton, 12 inches long and 7 inches wide, containing about 20 pounds of an incendiary chemical. A 3-inch black powder primer and an electric ignition squib were inserted through a perforation just before placement. The charge could then be ignited either electrically or with a fusee.

THE TESTS

The ignition unit was tested four times in three different slash types: limbs and tops from ponderosa pine, manzanita and oak brush 4 to 6 feet tall, and heavy logs and limbs with few fines. Charges were placed in all slash types in October 1962 before the first storm, and additional charges were placed in some pine slash at the time of firing. Firing was done in October 1962, after 3.59 inches of precipitation (first storm), in November 1962, after 4.62 inches, in March 1963, after 28.83 inches (including snow), and in April 1963, after a total of 40.63 inches of precipitation. Each test compared the units to other methods of ignition--fusees, backpack-type flamethrowers, drip torches, and Very pistols. Observations

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were: (a) did or did not ignite, (b) fire was or was not established, and (c) times for ignition and establishment.

RESULTS

All methods of ignition failed in April. In other tests, when the ignition unit established fire, other methods did too.

Placing the prototype units was a relatively slow process. It took an average of 35 seconds to perforate the ignition package and insert the primer and ignition squib. An average time of 10 minutes was required at each pile to locate a good fuel bed and place the charge.

The charge burned for an average period of 7 minutes. It produced an intensely hot, white burning molten lava which ran over limbs and the ground. One could not look at the burning charges without eye protection. Placing charges with the perforation down reduced their effectiveness. Fire establishment by the ignition units was not influenced by the slash piles being oriented along or across contours.

Ignition charges placed in the piles at the time of ignition were more successful and burned hotter and longer than those placed before the rainy season began. The preplaced ones became less effective as the winter progressed. The waterproofing qualities of the ignition package and the primer began to break down after the fifth month and about 29 inches of precipitation. One unit exploded, presenting a hazard to personnel.

CONCLUSIONS

The test units were not superior to the conventional diesel flamethrowers, Very pistols, or drip torches in igniting and establishing fire in slash and brush piles. Because other ignition methods allowed workers to walk around fuel piles and obtain many ignition points, they provided greater flexibility and "fire power." A weakness of the test unit is that too many parts could fail when exposed to weather and breakage over a period of time.

When the experimental charges ignited and established fire, 7 minutes of ignition heat was more than enough. Reducing heating time would also reduce size and weight, making the charge easier to handle.

In some cases, the charge burned holes through the center of an otherwise untouched pile. The molten lava should spread over a wide area so that the entire pile will burn.

A simpler, lighter unit which can be easily placed and quickly ignited without accessory items such as batteries, wires, and fusees would be much more satisfactory. Primers and electric ignition squibs, with wires, could always be installed for ignition of large areas.

Even though successful ignition may be possible, adequate slash disposal still may not result unless some practical way of protecting slash from winter moisture is found.

The Authors. . .

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