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no.1

JAMES E. HEFNER

FOUR CORNERS 1958

A COOPERATIVE FUEL-BREAK
DEMONSTRATION - - - - -

CLEVELAND NATIONAL FOREST, USFS
CALIFORNIA DIVISION OF FORESTRY,
SAN DIEGO COUNTY

FUEL-BREAK STATE

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INFORMATION DATE

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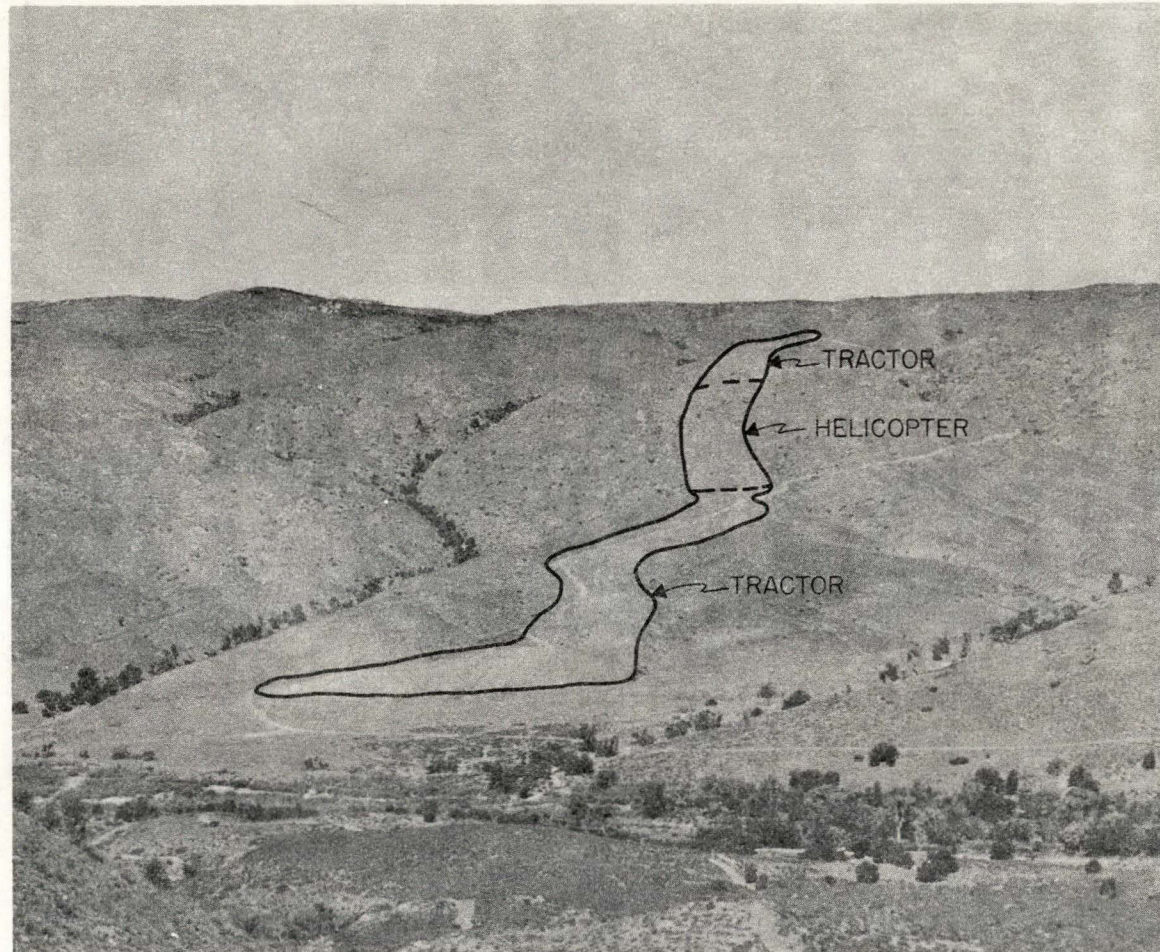
FUEL BREAK

PROJECT 1-1-D

PALOMAR DISTRICT

CLEVELAND NATIONAL FOREST

SAN DIEGO COUNTY



Pacific Southwest Forest and Range Experiment Station

Forest Service, U. S. Department of Agriculture

P.O. Box 245

Berkeley 1, California

December, 1959

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240 W Prospect Rd
Fort Collins CO 80526

The Area

The Four-Corners Fuel-Break is within the 1956 Inaja burn, in the San Diego River drainage just above El Capitan Reservoir-- a critical source of local water in San Diego County. When completed the break will connect cleared areas near Four Corners with open land near the river. The break, part of the pre-attack plan, will provide an excellent line location to cut off a fire originating on the north side of the river either below or above the break. Fuel-Breaks of this kind in the original brushfields would have helped greatly in confining the Inaja fire to a smaller acreage.

The area is well suited for a demonstration: The gentle to steep terrain and the short regrowth of brush provide areas for testing both ground and aerial broadcast chemical spraying.

The test was made possible by the cooperation of the administrative agencies who furnished the tractor transport, tractor driver, and work crews. The chemicals and helicopter rental were supplied from program funds furnished by the Forest Service. Fire Control Assistant J. V. Davis directed the work crews. The FUEL-BREAK staff planned and supervised the project.



The 1956 fire cleanly removed the chamise-chaparral cover. By 1958 brush sprouts and seedlings were well established. We set out to kill them on a wide strip that will remain as light "grass" fuel after the brush on the surrounding watershed has regrown into heavy fuel.

Broadcast spraying with 2, 4- D looked like the most promising method. Experience in brush conversion had shown that the chamise and most of its associated species could be killed with this chemical. But, we had found 2-year-old sprouts difficult to kill with the low volume used in broadcast spraying.

Ground and Aerial Spraying Compared

For ground spraying on the ridge-top and on the bench near the river, we used a tractor mounted boom--the most positive method of broadcast spraying. On the steep, rocky ridge point connecting the tractor-sprayed areas we tested application by helicopter.

Photos of the equipment used on this job will be shown in FUEL-BREAK REPORT No. 2--The Chocolate Fuel-Break.

Economical Fuel-break Construction

Hormone-type Chemicals Used

<u>Spray treatment</u>	<u>Area sprayed (acres)</u>	<u>Chemical per acre (pounds a. e.)</u>	<u>Emulsion per acre (gallons)</u>
<u>Tractor,</u> <u>5/3/58</u>			
2,4-D	30	4	13
50/50 mix	10	4	13
<u>Helicopter,</u> <u>5/8/58</u>			
50/50 mix	10	8	20

The 50/50 mix was half 2,4-D and half 2,4,5-T, low volatile esters.

Method of application	Cost per acre					
	Equipment transport	Equipment use	Material	Labor	Other	Total
Tractor (40 acres)	\$ 7.21	\$ 0.94	\$ 6.63	\$ 5.27	\$ 1.91	\$ 21.96
Helicopter (10 acres)	---	8.14	11.14	5.25	1.60	26.15

Although these costs per acre were considerably higher than for most of our broadcast spraying jobs, this was a cheap way to build a fuel-break.

Brush Sprouts Killed



The spraying topkilled almost all brush sprouts and seedlings by the end of 1958. In 1959 the only resprouting species were the occasional sumac and scrub oak plants. Chamise, sage, sagebrush, buckwheat, and wild alfalfa were dead, except for a few plants missed by the spray. All of the living brush plants on the 50-acre area can be sprayed in 1960 by a small crew working one day.

Excellent growing conditions throughout the 1957-58 season probably contributed to the good kill obtained by broadcast spraying. Such perfect results should not be expected every year. Often a higher proportion of plants survive, and an additional broadcast spraying may be needed the next year.

Conclusions

Two-year-old chamise sprouts can be killed by low-volume broadcast spraying of 2, 4-D at moderate to heavy rates.

Adding 2, 4, 5-T to the 2, 4-D was not necessary at the application rates that were used.

Helicopter application at a heavy rate was entirely satisfactory, but more work is needed to learn how consistently effective this method will be at lighter application rates.

Follow-up hand spraying for one or two years will be needed to kill the tough species, such as sumac and scrub oak, and to kill the plants of susceptible species that were missed by the broadcast spraying.

Broadcast spraying of clean burns in chamise-chaparral is a low-cost method of building a wide fuel break.