

Fire Resistant Plants

DR. ROBERT L. GONDERMAN AND FREDERICK BOUTIN

In early November, 1966 a fire erupted in the San Gabriel Mountains north of the Sylmar-Pacoima area of Los Angeles County. A portion of this fire encroached into a section of the fire-resistant plant test plot surrounding the chaparral approaches to the Olive View Sanitarium in Sylmar. This test plot was established in 1962 following a fire which destroyed the main hospital at Olive View and resulted in damage in excess of one million dollars.

The test plot of fire-resistant plants at Olive View consists of a planted band, 100 to 300 feet deep and about 400 feet long, separating a portion of the developed hospital grounds from the unmaintained hills. These hills sustain a cover of extremely combustible native brush and scattered eucalyptus trees.

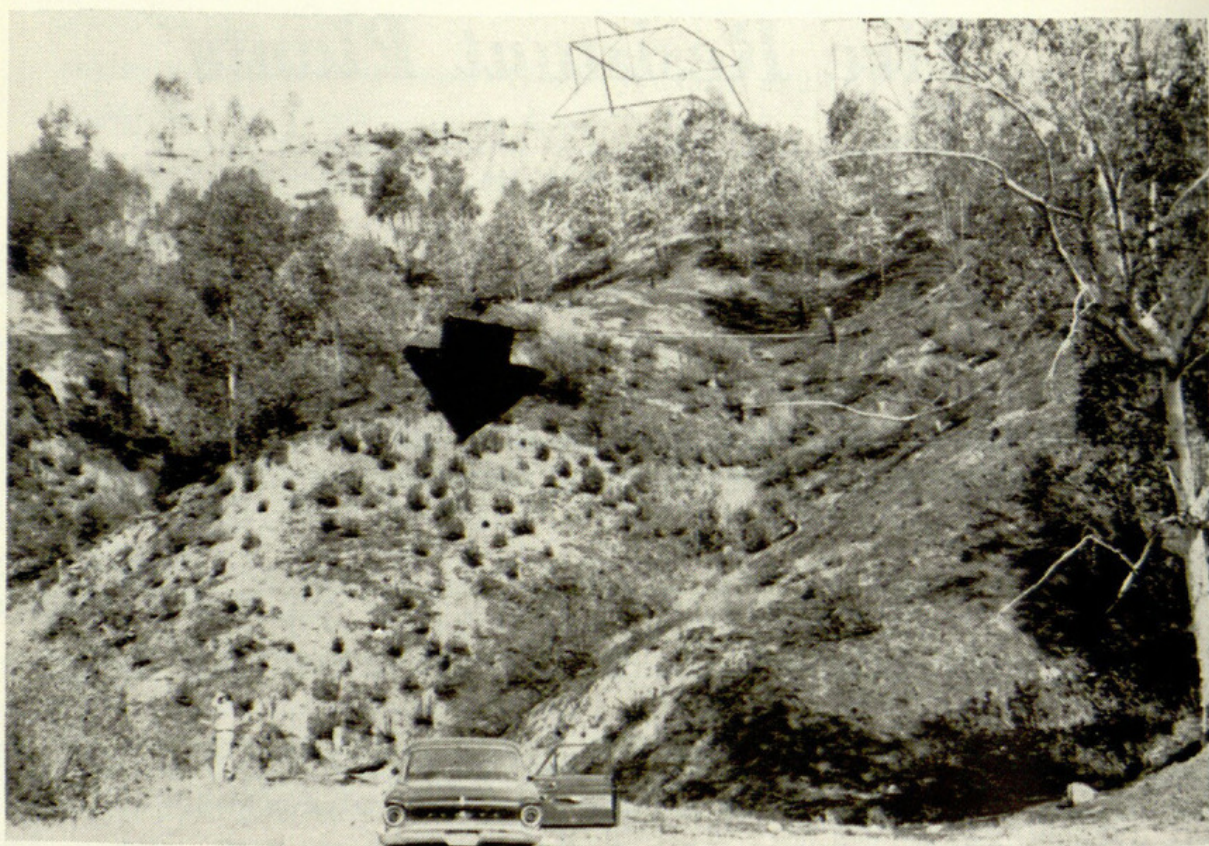
The fire-resistant plants were set out approximately in five-by-five-foot grid patterns, depending upon the terrain. Following completion of the planting, irrigation was performed only when drought conditions became acute, and no further maintenance work was done.

Fire-resistant plants employed for this area consisted chiefly of *Atriplex halimus* and *Cistus ladaniferus*. These were among the first plants recommended through applied research at the Los Angeles State and County Arboretum through the efforts of Dr. L. B. Martin, Mr. F. C. Ching, and the Arboretum's Director, Dr. W. S. Stewart.

The recent fire burned into the eastern end of the test plot. The fire also burned into bank control plantings along the road atop the Los Pinetos Ridge above Loop Canyon. Reports of post-fire results at both of these sites are based largely upon visual observations and accounts obtained from individuals who witnessed the conflagration.

One observation was that the fire-resistant plants had reached neither the size nor the density to stand as a major barrier to the progress of the fire. Fire-resistant plants were still relatively small in stature and had not attained adequate coverage within the planting areas. Estimated coverage for *Cistus ladaniferus* was about 25 percent, while ground coverage for the *Atriplex halimus* was closer to 50 percent.

Natural brush and grasses were found in varying densities, being sparse on ridges and tall and heavy in canyon bottoms and more protected sites. In some places the brush was extremely thick, providing a fuel volume approximately four times that of the *Cistus*. In sites where the *Cistus* plantings were closer together, a relatively small amount of native vegetation had grown, so that little fuel was present. Here the fire had burned into the edge of the planting, then traveled around it through the heavy brush along the canyon bottoms. The fire also burned between the *Cistus* in places where the plantings were widely spaced.



Arrow points to stand of *Cistus ladaniferus* which remained unburned during the fire. Dark areas were completely burned over.

Atriplex halimus was generally planted in drifts on ridges. Here little native vegetation had grown, and the fire had been stopped. Again it was noticed that fires had burned laterally into bushy areas and traveled around the *Atriplex* plantings, indicating the effectiveness of the *Atriplex* as a barrier.

Roger Welch, Superintendent of Grounds at Olive View has requested more fire-resistant plants to fill in between the existing plants in order to provide a greater degree of protection.

A review of post-fire results at sites along the Los Pinetos road above Olive View Sanitarium and the Veteran's Administration Hospital revealed a fire of a very different character. Here the fire, generated in part by strong winds, had "funnelled" up canyons leading to the ridge. Observers reported that winds of 50 to 70 knots were registered at the nearby U. S. Army Nike site, and that flames had leaped to 50 to 70 feet into the air.

Plants had been placed here in two adjacent rows, primarily in order to control bank slippage on new road fills. This was done approximately eight to ten years ago.

In this intervening period of time, because of harsh mediterranean climatic conditions with precipitation largely limited to the winter months (and then only averaging 14.7 inches), several plantings had died, and seedlings had generally not maintained the density of the stand.

Observers reported that the flames had engulfed and had jumped *over* the bands of *Cistus ladaniferus* before the plants themselves burned. Most of these plants were incinerated. In a few instances, however, the upper side — away from the fire — had remained green.

Melted bottles attested to a ground temperature in the area of 1800 to 1900°F, which is considered to be very hot even for a fire of this magnitude.

The Sylmar-Pacoima disaster indicated that narrow bands of fire-resistant plants cannot contain fires of this size and intensity. More extensive plantings, together with control of flammable vegetation would bring greater effectiveness.

The portion of the fire near the Olive View facility was reportedly started from a fire ball coming from the direction of the Veteran's Hospital. These fire balls can be carried over comparatively wide expanses and start new fires ahead of the main fire front. Fire balls can be propelled over even wide bands of fire-resistant plants, just as they can travel over fire-breaks.

The results of the post fire survey indicate the need for more dense and continuous covering of fire-resistant plants to provide an effective barrier against the spread of fire. Close initial planting appears to be the means to establish a rapid cover. A pre-emergent herbicide, applied at the time of transplanting, might be effective in reducing competition from combustible regrowth. And broad bands, which flames are not likely to jump over, can act as physical barriers to encroaching or spreading fires — a benefit which erodable bare soil cannot provide.



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