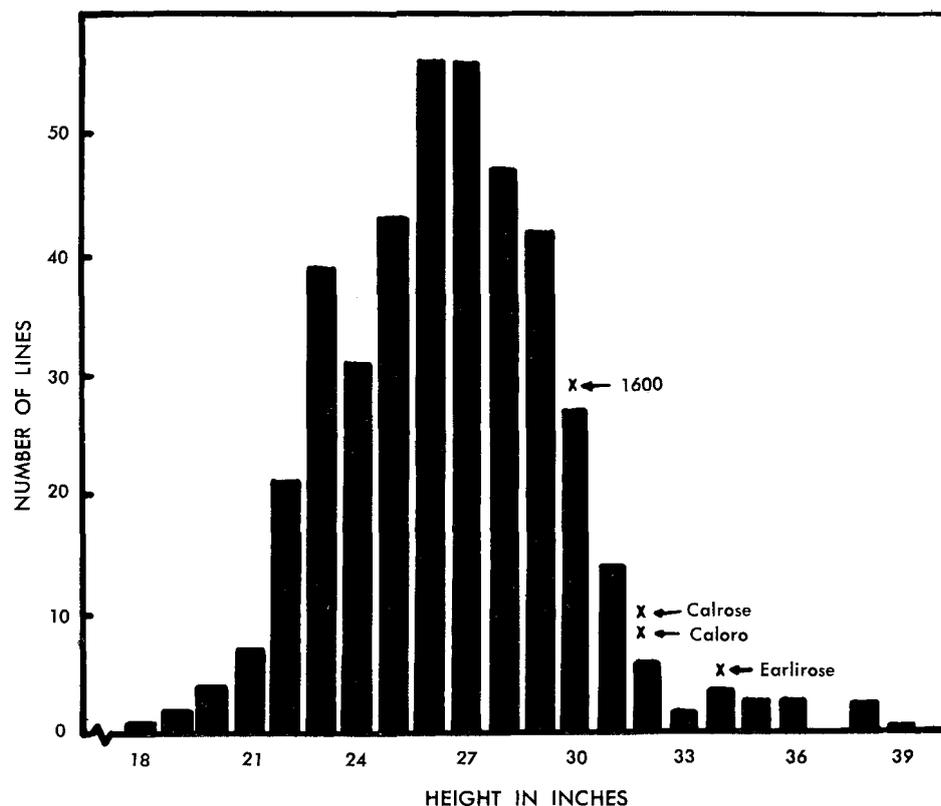


GRAPH 2. FREQUENCY DISTRIBUTION OF PLANT HEIGHT FOR RICE LINES OBTAINED FROM IRRI, LOS BANOS, PHILIPPINES, AND GROWN NEAR EL CENTRO DURING SUMMER 1969



from vertical (22 per cent) may have lodging resistance but judging from subsequent behavior, many others also resisted lodging. A few appeared to have weak straw. More work is needed on the importance of this character under the conditions of the test.

Most introduced lines had longer panicles than the California varieties. However, the effect of environment on this character is unknown.

Seventy-four lines which were relatively homozygous and appeared to warrant testing on a replicated basis were selected and then all remaining plants within each line were harvested in bulk. Individual plant selections were also made within other lines resulting in 636 plant selections. Lines that were late or that had undesirable seed or plant characteristics, such as very small seeds or definite lodging potential, were discarded. Some lines (see table) appeared to have more potential than others.

Characteristics stressed in making plant selections were maturity, short stature, upright plant type, generally vigorous appearance, and grain size. Short stature, lodging resistance, and perhaps long-grain type appeared to be the most important characters obtained from this material. It seems unlikely that vari-

eties acceptable to California growers could be selected from this group of introduced material. However, the greatest value will come from use as parents in crosses to short, weak-strawed but high-quality Japanese varieties or early, tall, weak-strawed but high-yielding California varieties having commercially acceptable grain quality. One cross may be sufficient. However, backcrossing to the present high-yielding California varieties may prove to be a rapid means of introducing this germplasm into an acceptable variety adapted to California.

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DEBRIS ACCUM in Pond Pine

JAMES K. AGEE
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These results indicate that thinning, with subsequent slash removal, will diminish the rate of debris accumulation for at least 20 years—facilitating maintenance of low fire hazards, and easing the problems of multiple-use forest management.

Prescribed burning has been a valuable technique to help maintain low wildfire hazard in California. In this technique, fire is used under specified conditions to obtain an initial burn of the desired intensity. After the first hazard reduction is completed, periodic prescribed fires maintain the fire hazard at a low level. The time interval necessary between these maintenance fires involves the rate of fuel increase, including growth of understory trees and shrubs, as well as debris. This report shows the rate of increase of forest debris in a ponderosa pine forest over an 18 year period.

ULATION a erosa Forest



This plot was thinned in 1952. Since that time there has been no debris accumulation on the plot.

Study area

The study area is located at Hoberg's in the Coast Range of Lake County, at 3000 ft elevation. The second-growth, 85 year-old ponderosa pine forest is growing on a site II, Salminas loam soil derived from basic igneous rocks. Secondary tree species are black oak, Douglas-fir and sugar pine.

Nine plots were established in 1952, three of which were thinned to medium stocking, two of which were heavily thinned, and four of which were left unthinned. The trees on the thinned plots were pruned up to 22 ft and the pruned materials were burned on the plots.

Plots since 1952

Litter and debris accumulations on the plots have been studied at various times since 1952. This report concentrates on the debris component of the fuel complex—dead woody material more than 1 inch in diameter. At intermittent intervals all current standing and fallen debris on the plots was removed and weighed. Samples were analyzed for moisture, and results were recorded (see table) on an oven-dry-weight basis.

Debris buildup

Two of the thinned plots accumulated no debris since 1952, and none of the thinned plots accumulated any debris in the last 10 years. Most of the debris shown in the table for plots 1 and 4 (1952–1960) was from three trees that died from over-exposure after heavy thinning. The unthinned plots showed a continuous buildup of debris, however, since 1952.

Debris increase on the thinned plots on the basis of average annual increment was 98 lbs per year contrasted to 668 lbs per year on the unthinned plots. This large difference resulted from: (1) the basal area of the thinned plots averaging only 138 sq ft per acre compared with an average of 234 sq ft on the unthinned plots suggesting a larger biomass on the unthinned plots where a higher return of debris could be expected; (2) the natural thinning process on the unthinned plots with smaller, suppressed trees dying and adding to the debris (while on the thinned plots the suppressed trees were cut and removed in 1952); (3) trees on the thinned plots were pruned up to 22 ft, which removed the dead limbs and reduced the amount of natural branch mor-

tality that would have occurred in the future.

Debris vs litter

The proportion of debris component as compared with litter was also estimated. Needlefall for the 1969 growing season averaged 2333 lbs per acre on the thinned plots and 3370 lbs per acre on the unthinned plots. In comparison, the average annual debris increment of 98 lbs per acre on the thinned plots was a relatively minor part of the annual total while on the unthinned plots, the average debris increment of 668 lbs per acre was 17 per cent of the yearly fuel addition to the forest floor.

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DEBRIS ACCUMULATION IN A PONDEROSA PINE FOREST AT HOBERG'S, LAKE COUNTY, 1952–1970

Years	Pounds per acre, oven-dry weight								
	Thinned plots				Unthinned plots				
	1	2	3	4	5	1	2	3	4
1952–60	1925	24	0	5091	0	3417	4097	8504	8882
1960–70	0	0	0	0	0	1800	5122	11473	4820
Total	1925	24	0	5091	0	5217	9219	19977	13702