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CLEARING CUT-OVER LANDS IN BALDWIN COUNTY

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[A progress report on land clearing and wood distillation including a brief summary of results to date.]

To determine the cost of removing stumps from the cut-over lands of the long leaf pine area of Alabama by different methods, and to determine the amount of oil and charcoal in these stumps, nine acres of Baldwin County land were cleared and the wood from each distilled. The work was done by the Alabama Experiment Station in cooperation with the E. I. DuPont Co.; the Hercules Powder Co.; the Adams Motor Co.; Williamson Steel Stump Puller Co., and the Pardon Pine Products Co.

The timber was removed from this area about fifteen years ago, followed by the removal of the fat part of the tops, leaving only the stumps and a few fallen trees suitable for fuel wood. The soil is a dark gray loam overlying a coarse yellow clay subsoil. Its undeveloped value is estimated at $15.00 per acre.

The land clearing methods compared were:

1. Blasting method,
2. Combination of pulling and blasting method.

BLASTING METHOD

Six adjoining acres representative of the cut-over lands of a great part of the South were cleared by the blasting method. A total of 320 stumps and 62 fallen trees were cleared from these six acres. The average diameter at the crown of these stumps was 27.7 inches, and the average height was 32.7 inches. One hundred sixty-nine stumps were sound; 58 were rotten or hollow, and 93 were in various stages of decay. Two hundred and ninety-seven stumps were blasted. Holes were bored in the stumps with a Cowan-Alford boring machine attached to a tractor. To make a study of the effect of the angle of the hole on the necessary amount of dynamite for efficient blasting, holes were bored at various angles on different acres. Two hundred ninety-four holes were bored to an average depth

of 21.5 inches in 12 hours and 20 minutes, at a cost of $4.21 for labor and material. Forty percent ammonia dynamite was placed in the holes, tamped with clay or shavings, and fired by the cap and fuse method.

After blasting, the large hangs were re-shot with small charges of dynamite; then laborers equipped with axes, saws, and levers, cleared the land and prepared the stump wood for the destructive distillation plant.

The fat wood was hauled to a distillation plant and there, by a destructive distillation process, converted into crude pine oil and charcoal.

This work was done under unfavorable weather conditions. Heavy rains prevented complete burning of tap roots left in the ground by blasting.

Combination of Pulling and Blasting Method

Three acres adjoining the blasted area were cleared and the stump wood prepared for the retort by combination of the pulling and blasting method. There were 190 stumps with an average diameter at crown of 25.9 inches and an average height of 28.6 inches on these three acres. Sixty-eight of the stumps were sound, 32 were rotten or hollow, and 90 were in various stages of decay. There were also 60 fallen trees.

One hundred eighty-five of these stumps were pulled with a steel stump puller operated by one driver and two mules with three men at the cable. This work was done in 15 hours and 40 minutes at a total cost of $12.00, or 6.43 cents per stump. The ground was very wet and slippery, making it difficult for the men at the cable to hold their footing. The speed of the work was also reduced by an inexperienced driver and one inexperienced man at the cable.

The pulled stumps were split into retort wood—that is, small pieces not over six inches in width or breadth and of any length. After pulling the stumps on two acres the tap roots were sawed off about 14 inches below the ground line. The small stumps were split with axes, wedges, and sledge hammers, and the large ones (30 inches or more in diameter at crown) were split with small charges of dynamite, and then the large pieces split into smaller ones with axes, etc. On the third acre the large stumps were first split with dynamite, and then the tap roots cut off. The small ones were worked up in the same way as on the other two acres. It required 135.4 man hours of labor and 19.08 pounds of dynamite to prepare the stumps for the retort, at a total cost of $40.50, or $13.50 per acre.

This wood was hauled to a distillation plant and distilled like that from the blasted area.

RESULTS

Summarized data comparing the two methods follow:

	Pulling & Blasting	Blasting
Av. number of stumps per acre	63 1/3	53 1/3
Av. number of sound stumps per acre	22 2/3	28 1/6
Av. diameter of stumps at crown (in inches)	25.9	27.7
Av. height of stumps (inches)	28.6	32.7
Av. number of stumps blasted per acre	18 2/3 (after pulled)	49.5
Av. number of stumps pulled per acre	61 2/3	
Av. number of lbs. of dynamite per acre	6.36	64.42
Av. charge of dynamite per stump (lbs.)	.32	1.31
Av. cost of dynamite, caps and fuse per acre	$2.03	$16.68
Av. cost of dynamite, caps and fuse per stump blasted	10.87c	33.69c
Av. number of hours pulling per acre	4 hrs. 53 min.	
Av. cost of pulling per acre	$4.00	
Av. cost of pulling per stump	6.43c	
Av. cost of wood recovery per acre	$13.50	$21.35
Av. cost of clearing land for cultivation per acre	$15.55	$22.71
Av. cost of clearing land for cultivation per stump	24.5c	42.58c
Cords of fat wood recovered per acre	5.33	4.75
Cords of fuel wood recovered per acre	3.66	.96
Gallons of oil obtained per acre	488	437.5
Tons of charcoal obtained per acre	1.77	1.6
Value of oil and charcoal per acre	$79.97	$71.70
Value of oil and charcoal per stump	$1.26	$1.34
Av. cost of clearing land, hauling wood, and distillation of wood per acre	$42.86	$45.50
Profit per acre	$37.11	$26.20

In addition to this profit the value of land was materially increased.

The advantages and disadvantages of the two methods are listed below as indicative and not as conclusive.

1. *Blasting method*:
   Advantages—
   (1) Requires less initial investment,
   (2) Can be used more economically in removing scattered stumps.
   Disadvantages—
   (1) Operation is expensive,
   (2) Results are less efficient.
2. *Combination method*:
   Advantages—
   (1) Operation is cheaper,
   (2) Results are more efficient.
   Disadvantages—
   (1) Greater initial cost, which becomes a greater disadvantage where only a few stumps are to be removed.

NOTE:—The above costs of labor and material were cash actually expended and the value of products sold represents actual cash received.