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Cost of CLEARING LAND

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INSTITUTE

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Cost of CLEARING LAND

comparative expenses with dozer and shearing blades on crawler-type tractors

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MANY WOODED OR SEMI-WOODED AREAS are of low economic value to owners because of undesirable tree species. To reforest with desirable species or to change the use of such areas, serious problems are encountered. The major one is removal of present cover. In many cases it is not practical to plant desirable trees unless present cover is removed.

Clearing land by hand methods is a laborious and time-consuming process. In most cases on commercial farms, several alternative opportunities exist for the use of labor. The use of large amounts of hand labor in clearing is costly with present farm or nonfarm wage rates and often only a limited amount of labor is available for such work. To be able to change the use of agricultural land (forest, pasture, or cropland) means greater flexibility. This permits land use adjustments by owners or operators to meet changing economic conditions.

A low-cost method of clearing land is needed by farmers and operators. Likewise, such a method is important to land improvement contractors and to others who clear land prior to construction of highways, building sites, airports, and gas and power lines.

Few data are available on costs of clearing land. Clearing costs are quite variable. Too, they cannot be applied from one location to another unless the many variables that affect these costs are considered. Among the more important variables affecting costs of clearing land are: (1) Cover (size, species, and density of trees and brush), (2) type of machinery and equipment used, (3) skill of machine operators, (4) topography (slope, configuration, stoniness), (5) soil type, and (6) soil moisture.

Although many variables affect the physical requirements and costs of clearing, it is desirable to have basic data on inputs and costs. Such information is necessary in making estimates and in reaching

decisions. These may involve size and kind of machines to use, method of clearing, and man labor requirements. In the final analysis, basic input and cost data are needed to help in getting the clearing done at the least cost.

It was the objective of this experiment, results of which are reported herein, to design and carry out a land clearing test to obtain data on inputs and costs of clearing land with three sizes of crawler-type diesel tractors[1] and two types of blades.

DESCRIPTION of LAND CLEARED

The area on which the clearing test was conducted was located on a farm in southwestern Cherokee County in northeastern Alabama (Limestone Valley type-of-farming area). A level area of land with a fairly uniform cover of trees and brush was selected. It was estimated that the area was cut over for saw timber about 1948. Some old pine and a few large hardwood stumps remained on the area.

The area selected was divided into 12 plots of 2 acres each, Figure 1. Alleys, 30 and 66 feet wide, were laid out with a transit and cleared. Each plot was 198 feet wide and 440 feet long.

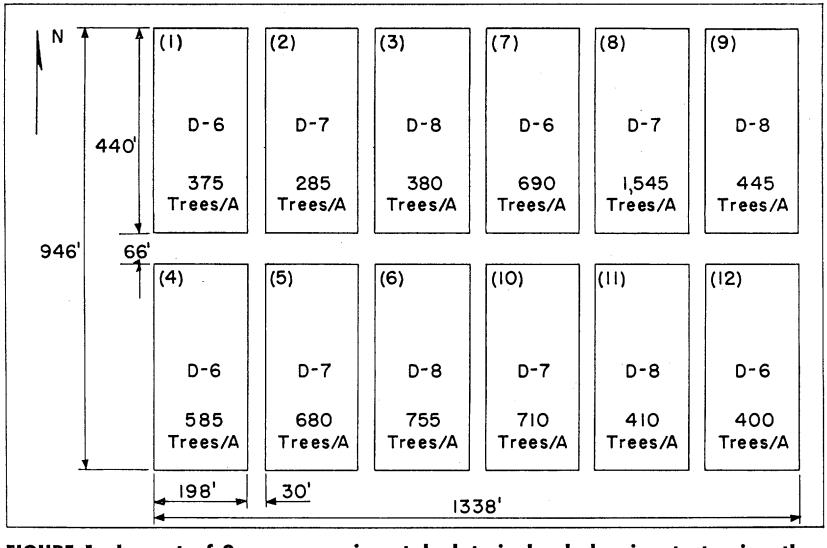

FIGURE 1. Layout of 2-acre experimental plots in land clearing test using three sizes of tractors and two types of blades. Regular bulldozer blade was used in plots 1 through 6, and KG blade in plots 7 through 12. Note the number of trees per acre in each plot.

[1] D-6, D-7, and D-8 Caterpillar tractors were used in this test.

Two sample areas of 0.1 acre each were selected at random within each of the 12, 2-acre blocks for making tree counts. Species of trees, number of trees 2 inches d.b.h. (diameter at breast height) and over, and number of sound stumps were recorded for each area.

In general, the forest cover on the areas cleared was light. Based on tree counts in sample areas of each plot, the number of trees varied from 285 to 1,545 per acre, Figure 1. Plot 8, which occurred in a dense pine thicket, contained the greatest number of trees (based on counts in the sample areas). There was a dense population of small pine trees in the northern part of the plot, and numerous small pines were in plots 4, 5, and 10. (For percentage of pines on each plot, see Table 1.)

As an average for all plots, 64 per cent of the trees 2 inches d.b.h. and over were hardwoods and 36 per cent were pines. Species of oak, hickory, and gum were the major hardwoods. Also, based on

TABLE 1. PERCENTAGE OF HARDWOOD AND PINE TREES ON 2-ACRE EXPERIMENTAL PLOTS, CHEROKEE COUNTY, ALABAMA, 1958

Plot	Hardwood	Pine	Total trees per acre
	Per cent	*Per cent*	*Number*
No. 1	79	21	375
No. 2	98	2	285
No. 3	97	3	380
No. 4	56	44	585
No. 5	53	47	680
No. 6	78	22	755
No. 7	80	20	690
No. 8	29	71	1,545
No. 9	72	28	445
No. 10	60	40	710
No. 11	89	11	410
No. 12	75	25	400

TABLE 2. PERCENTAGE OF TREES ON EXPERIMENTAL PLOTS ACCORDING TO DIAMETER AT BREAST HEIGHT, CHEROKEE COUNTY, ALABAMA, 1958

Plot	Type of equipment used	2 in. to less than 6 in. d.b.h.	6 in. d.b.h. and over
		Per cent	*Per cent*
No. 1	Bulldozer blade	87	13
No. 2	Bulldozer blade	74	26
No. 3	Bulldozer blade	76	24
No. 4	Bulldozer blade	87	13
No. 5	Bulldozer blade	93	7
No. 6	Bulldozer blade	87	13
No. 7	K-G blade	86	14
No. 8	K-G blade	98	2
No. 9	K-G blade	82	18
No. 10	K-G blade	98	2
No. 11	K-G blade	72	28
No. 12	K-G blade	76	24

counts in sample areas, 94 per cent of the pines and 84 per cent of the hardwoods were less than 6 inches d.b.h. On all except 4 plots, less than 20 per cent of the trees were 6 inches or over d.b.h., Table 2.

The major soil type of the experimental area was Conasauga silt loam. Considerable organic matter existed in the upper 2 inches of soil. The subsoil was a mottled, yellow and grey, sticky plastic, compact clay. A small tract of gravelly silt loam was located in plots 4 and 5.

PROCEDURE

A bulldozer blade was used to clear the six plots in the western half of the area and the KG blade[2] was used for clearing the eastern half, Figure 2.

Plots to be cleared with each size of tractor, D-6, D-7, and D-8, were assigned at random. Four machine operators were used throughout the clearing test. Operators rotated among machines every 30 minutes. The timekeeper with each machine recorded the time that work started and stopped. Although the operators used were experienced, rotation was practiced so that the time and cost of clearing would not be greatly affected by variation in skills of operators. Since three machines and four operators were used, each operator rested 30 minutes after 1.5 hours of work.

Actual clearing was started November 6, 1958. Final harrowing of plots was completed 8 days later. During this period, less than 0.25 inch of rain fell on the experimental area.

Pushing down or shearing off trees and piling were completed on each plot before the machine was moved to another plot. Actual operating time was recorded by timekeepers on prepared time record forms. Only minor delays caused by breakdowns were encountered. No delay time or time for changing operators was included in the data.

To more fully compare the various sizes of tractors and types of blades used, a cost analysis was made, using the physical data obtained from the experiment. Details of cost calculations and hourly rates of charge for ownership and use of machines and blades are given in Appendix Table 1.

[2] KG blade is the term used to refer to a land-clearing angle blade with a cutting edge parallel to the ground and a protruding point for splitting large trees. The KG blade used in these tests was manufactured by Rome Plow Co., Cedartown, Ga.

FIGURE 2. (Above) Bulldozer blade mounted on crawler-type tractor used in the experiment. Note holes left after removal of stumps with dozer blade. (Below) Mounted KG blade used in land clearing test.

OPERATIONS and COST of CLEARING

The four steps in clearing, each of which is of interest from a time and cost standpoint,[3] were as follows:

1. Felling trees and brush—pushing over or digging out with the dozer blade, or shearing off with the KG blade.

2. Piling or windrowing—moving material to a windrow in the center of the plot.

3. Disposal—burning trees and brush. Some man labor, in addition to that of the machine operator, was required in starting fires. Also, in this test diesel fuel was used to facilitate burning of material in windrows. Tractors were used to push material together to keep it burning. This was included in disposal time and referred to as "punching up" time.

4. Harrowing—preparing land for planting. A disk plowing harrow[4] was used in this operation on each plot. Some land owners, custom operators, or contractors may omit this operation or find it unnecessary. Others may desire some plowing or preparation prior to seeding to pasture or some other crop, or planting trees.

Felling

In all cases the average time and cost of felling trees on the 2-acre plots and on a per-acre basis was less with the KG blade than with the dozer blade on tractors of the same size, Table 3. Average time per acre for the KG blade was 26, 32, and 22 per cent less than that for the dozer blade used on D-6, D-7, and D-8 tractors, respectively.

Also, there was a significant relationship between size of tractor and time required in felling trees when the same type of blade was used. Use of the D-8 with dozer blade required about 41 per cent as much time to fell trees as did the D-6 with dozer blade. For KG blades, the difference in felling time between the large and small tractors was about the same.

It was observed during felling operations that more time was required to fell large trees with a dozer than with a KG blade on the same size tractor. In using the dozer blade, it was necessary to excavate soil from around the base of the tree. As a result of this digging, considerable soil was moved to the windrow and sizeable

[3] Detailed time and cost data for all operations or steps involved in clearing the experimental plots are reported in Appendix Table 2.

[4] The disk harrowing plow used was manufactured by the Rome Plow Co., Cedartown, Ga.

TABLE 3. AVERAGE MACHINE HOURS PER ACRE FOR CLEARING LAND BY OPERATIONS WITH THREE SIZES OF TRACTORS AND TWO TYPES OF BLADES, CHEROKEE COUNTY, ALABAMA, 1958

Operation	Time per acre					
	D-6		D-7		D-8	
	Dozer	KG	Dozer	KG	Dozer	KG
	Hours	*Hours*	*Hours*	*Hours*	*Hours*	*Hours*
Felling[1]	2.19	1.58	1.71	1.14	0.92	0.71
Piling[2]	.52	.55	.56	.60	.48	.46
Disposal [3] [4]	1.75	.84	1.80	.78	1.93	.70
Harrowing[5]	.53	.64	.36	.33	.31	.33
TOTAL	4.99	3.61	4.42	2.86	3.65	2.19

[1] A statistically significant difference exists among average time by size of tractor and between types of blades. Interaction between size of tractor and type of blade is not significant.

[2] Average time according to size of tractor and type of blade is not significantly different.

[3] Differences in average time between types of blades are statistically significant. Effect of size of tractor and interaction are not significant.

[4] All repiling or "punching up" in connection with burning material was done with the D-8 tractor and KG blade.

[5] A significant difference exists in average time used in harrowing according to size of tractor used, but not by type of blade. Interaction is not significant.

holes were left. When felling a tree of any size, particularly hardwood, with the KG blade, the tree was split and then sheared off at ground level. Hence, no digging was necessary.

With the KG blade, a majority of the trees fell in approximately the same direction as they were sheared off level with the ground, Figure 3. This was not true with the dozer blade.

FIGURE 3. Trees sheared off and felled with the KG blade mounted on tractor.

Piling

Distance between windrows affects the time and cost of piling. In this experiment, the windrows were placed in the center of each 2-acre plot in a north-south direction. Since the plots were 198 feet wide, the maximum distance that material had to be pushed in piling was about 100 feet. The optimum distance to push material in the piling operation, according to reports from a number of machine operators, is somewhat less than 100 feet.

The machine time for piling, Table 3, was somewhat less for the dozer than the KG blade with the D-6 and D-7 tractors. This was

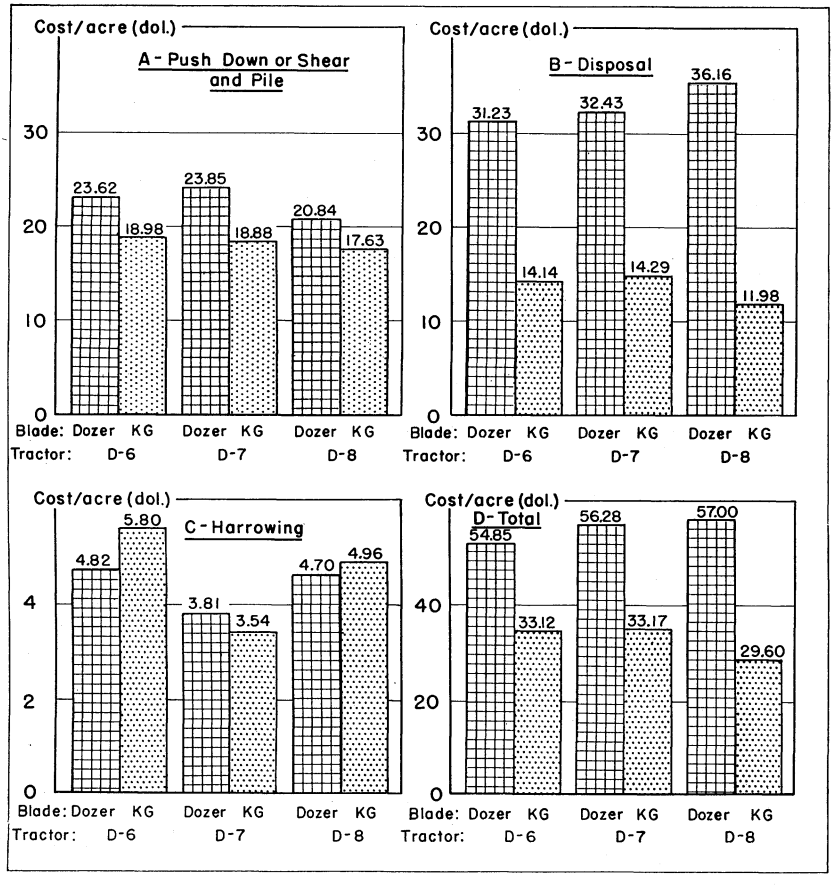

FIGURE 4. Average cost per acre of clearing land using three sizes of tractors and two types of blades in experiment in Cherokee County, Alabama; (A) pushing down or shearing off, and piling trees, brush, and stumps; (B) disposal of piled material; (C) plowing land with heavy harrow; and (D) total per acre cost of clearing experimental plots exclusive of harrowing.

probably the result of a slight difference in how the felling and piling operations were done with each blade. When a large tree was dug with a dozer blade, it was immediately moved to the windrow. Small trees and brush were moved to the windrow after the operator had finished the felling operation. With the KG blade, all trees regardless of size were pushed into a windrow after the felling operation. Thus, some of the time reported as felling for the dozer blade was actually piling time.

The cost per acre of pushing down or shearing off and piling was only slightly less for KG blade and dozer-equipped tractors as the size of tractor increased, Figure 4-A. The difference in cost per

FIGURE 5. (Above) Windrow made with bulldozer blade, and (below) windrow made with KG blade.

acre of these two operations for the dozer as compared to the KG blade on the same size tractor was almost $5.00 for the D-6 and D-7, and $3.21 for the D-8.

Disposal of Material

After trees and brush were pushed into windrows in the center of each plot, Figure 5, disposal consisted of burning the material, Figure 6. Fire was started at each end of the windrow with diesel fuel poured on the green material. Only the D-8 tractor equipped with KG blade was used to push the material together or "punch up" fires to keep them burning. If another size tractor had been used, time and cost would have been different from that reported here. After most of the material was burned, the remaining logs and stumps that could not be reduced economically by burning, were buried on the plots or pushed off the area. Some man labor was required to rekindle fires.

A record was made of man and machine time as well as gallons of diesel fuel used on each plot. In the cost analysis, man labor was charged at $1.50 per hour and diesel fuel at 16 cents per gallon.

Machine time required in disposal was significantly less on plots cleared with the KG blade than with the dozer blade, Table 3. The number of gallons of diesel fuel used in burning the material was two

FIGURE 6. Green material in windrow being burned on an experimental plot.

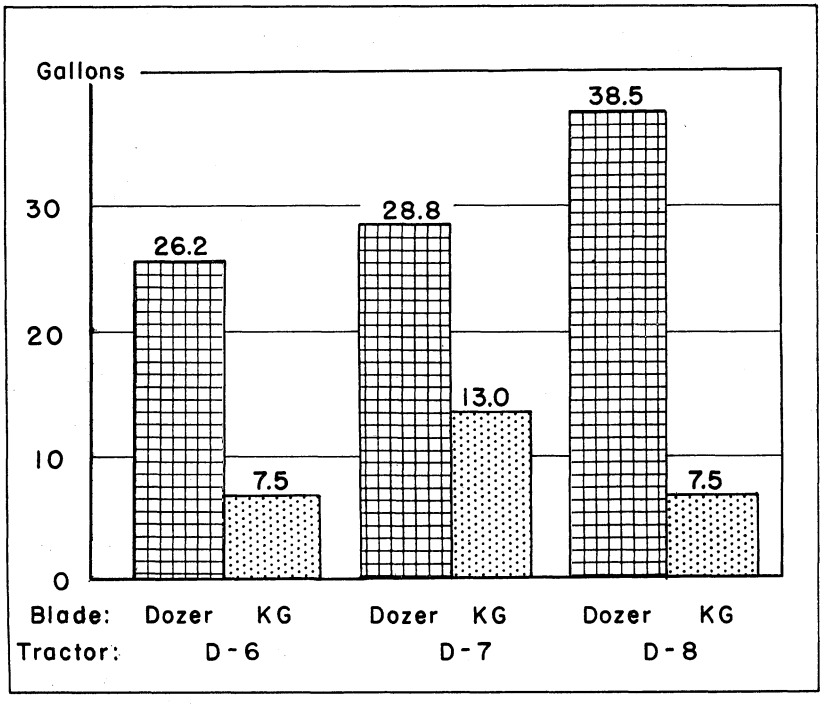

FIGURE 7. Gallons of diesel oil used per acre to burn trees, brush, and stumps according to size of tractor and type of blade used in experiment.

to five times as great on plots cleared with dozer blade as those cleared with the KG blade, Figure 7. Apparently, the reason for the difference in machine disposal time and in gallons of diesel fuel used was the amount of soil on the roots of trees from plots cleared with the dozer blade. In addition, windrows in plots cleared with the KG blade appeared to be more compact.

Cost of disposal averaged $33.27 per acre on plots cleared with a dozer blade and only $13.47 per acre on plots cleared with a KG blade for the three sizes of tractors on which these blades were used, Figure 4-B.

Land Preparation

Heavy duty offset-type plowing harrows, Figure 8, were used on each plot. Size of the harrow was matched with size of the tractor used in the other clearing operations. These harrows had 30-inch disk blades spaced 12½ inches apart.

Harrowing with the D-7 tractor resulted in the least cost per acre,

Figure 4-C. This was probably because the operator of the D-7 found it best to operate the tractor in third gear, whereas the D-6 operator ran the tractor in second gear. It was difficult for the D-6 to pull the harrow in third gear under operating conditions that prevailed.

The D-8 tractor was equipped with torque converter rather than direct drive. This may have provided some advantages in clearing, but it seemed to be a disadvantage in harrowing.

Whether it is desirable to harrow or plow the cleared land depends on topography, use to be made of the land, and a number of other factors. Comparative costs per acre for all operations prior to harrowing are shown in Figure 4-D.

FIGURE 8. (Above) Type of plowing harrow used on experimental plots after disposal of material in windrows was completed; (below) condition of land after plowing plot cleared with KG blade on D-6 tractor.

ACRES PER HOUR

Time used in the various steps for clearing land as presented in the previous sections was reported in terms of hours per acre. Acres cleared per hour as calculated from the hours-per-acre data indicate that if all operations in clearing were done, approximately 0.08, 0.13, and 0.18 more acres per hour could be cleared with the KG blade than with the dozer blade on a D-6, D-7, and D-8 tractor, respectively, Table 4. In an 8-hour day, this would amount to 0.64 to 1.44 additional acres cleared in a day.

TABLE 4. AVERAGE ACRES PER HOUR CLEARED BY OPERATION WITH THREE SIZES OF TRACTORS AND TWO TYPES OF BLADES, CHEROKEE COUNTY, ALABAMA, 1958

Operation in clearing	Machine and blade used					
	D-6		D-7		D-8	
	Dozer	KG	Dozer	KG	Dozer	KG
	Acres/hr.	*Acres/hr.*	*Acres/hr.*	*Acres/hr.*	*Acres/hr.*	*Acres/hr.*
Felling	0.46	0.63	0.58	0.88	1.09	1.41
Piling	1.92	1.82	1.79	1.67	2.08	2.17
Disposal	.57	1.19	.56	1.28	.52	1.43
Harrowing	1.89	1.56	2.78	3.03	3.23	3.03
AVERAGE, ALL OPERATIONS	0.20	0.28	0.23	0.35	0.27	0.46

EFFECT of COVER on TIME and COST

It is doubtful that variation in amount and kind of cover (trees) accounted for the difference in time and cost of clearing as reported. Plots cleared with a dozer blade averaged 510 trees per acre, whereas those cleared with a KG blade averaged 700 per acre, Appendix Tables 3 and 4.

A strength factor was calculated by using the average compression strength perpendicular to grain for the major tree species multiplied by the number of trees.[5] This factor indicated that, on all of the 2-acre plots except one, there was more work to be done with the KG blade than with the dozer blade, Table 5.

The experiment had only one replication and this was not sufficient for isolating the effect of the strength factor on treatments by the covariance analysis technique. Results of this experiment in-

[5] L. J. Markwardt and T. R. C. Wilson, "*Strength and Related Properties of Wood Grown in the United States*," USDA Tech. Bul. 479. 1935.

TABLE 5. STRENGTH FACTOR OF TREES 2 INCHES AND OVER DIAMETER AT BREAST HEIGHT ON 2-ACRE EXPERIMENTAL PLOTS, CHEROKEE COUNTY, ALABAMA, 1958

Size of tractor	Dozer blade		KG blade		Average by size of tractor
	Plot number	Total strength factor	Plot number	Total strength factor	
	No.	*Thousand p.s.i.*	*No.*	*Thousand p.s.i.*	*Thousand p.s.i.*
	1	766	12	1,261	
D-6	4	1,031	7	1,358	
Average		898		1,310	1,104
	5	907	10	758	
D-7	2	851	8	1,769	
Average		879		1,264	1,072
	3	906	9	854	
D-8	6	1,305	11	1,307	
Average		1,106		1,080	1,093
AVERAGE BY TYPE OF BLADE		961		1,218	

dicated that the number of hardwood trees above 8 inches d.b.h. affected time to clear plots more than did the total number of small trees or number of small pine trees on plots.

SUMMARY

Improvements in methods and machines used in clearing land are important to farmers, land owners, land improvement contractors, custom operators, and others. Clearing time, costs, and conditions on a 24-acre, wooded site in northeastern Alabama were studied in this experiment. Two types of blades were used on three sizes of diesel crawler-type tractors.

Felling trees and brush and disposal of the material required significantly less time and cost less with a KG blade than with a dozer blade on any one of the three tractors, D-6, D-7, or D-8.

Trees were sheared off even with the ground by the KG blade. Large trees were dug with the bulldozer blade. Tree roots held large amounts of soil. Hence more soil was pushed into the windrow with the dozer blade than with the KG blade. This resulted in greater disposal time and higher costs of plots cleared with the dozer blade. Windrows made with the KG blade also appeared more compact than did those made with the dozer blade.

To reduce disposal costs, the windrowed trees and brush may be left to decay. The areas between windrows can be utilized.

Stumps left in the ground as the result of shearing off the trees with the KG blade may or may not be a problem in using the cleared land. If the land is seeded to pasture or pines, the stumps are a minor problem. If the field is disked or plowed with a heavy harrow, many roots and small stumps are cut into pieces.

Harrowing after disposal of trees and brush is not an essential part of clearing. However, condition and appearance of the land are improved by thoroughly cutting the roots, stems, and sticks that remain on the cleared area.

There was a time advantage associated with the size of tractor in felling trees with both the dozer and the KG blade. There was little difference in time required in piling by the three sizes of tractors.

There was insignificant interaction between type of blade and size of tractor—that is the effect of size of tractor on time required and on costs was the same with both the dozer and the KG blade. Costs of clearing per acre were approximately the same for large, medium, and small-size tractors used in the test with the same type blade. **Although use of the large tractor required less time per acre in clearing, the higher cost per hour of ownership and operation for the large tractor as compared to the small one offset the difference in time; thus about the same cost per acre resulted.**

Variation in number of trees above 8 inches d.b.h. was more closely associated with time required in clearing than was the total number of trees. Plots with the greatest number of trees generally had a high percentage of pine trees. Small pines were sheared off without difficulty or loss of time with both the dozer and the KG blade.

ACKNOWLEDGMENT

The authors acknowledge the assistance of J. I. Davis, technical representative, Rome Plow Co., Cedartown, Ga., for obtaining machines, machine operators and other personnel, and site of the experiment.

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APPENDIX

APPENDIX TABLE 1. ESTIMATED COST[1] OF OWNING AND OPERATING TRACTORS AND BLADES USED, CHEROKEE COUNTY, ALABAMA, 1958

Item	Tractor used		
	D-6[2]	D-7[3]	D-8[4]
Original costs:			
Tractor (December, 1958)	$15,480.00	$19,170.00	$31,094.00
Ownership costs per hour:			
Depreciation (100% in 8,000 hours)	$ 1.94	$ 2.40	$ 3.89
Interest, insurance, and taxes	.46	.57	.93
Total Ownership Costs per Hour	$ 2.40	$ 2.97	$ 4.82
Operating costs per hour:			
Diesel fuel @ 16¢/gallon	$ 0.67	$ 0.99	$ 1.62
Gasoline to start and clean	.03	.03	.03
Engine lub oil @ $1.00/gallon	.06	.06	.10
Transmission oil @ .80/gallon	.02	.03	.03
Filters	.01	.01	.01
Grease @ $.20/pound	.02	.02	.04
Repairs @ 100% of depreciation	1.94	2.40	3.89
Total Operating Costs per Hour	$ 2.75	$ 3.54	$ 5.72
Operators Hourly Wage	$ 2.50	$ 2.50	$ 2.50
TOTAL BASE COST PER HOUR	$ 7.65	$ 9.01	$ 13.04
Controls for blades, cost per hour	.28	.67	.74
Dozer blade costs per hour	.78	.85	1.03
TOTAL WITH DOZER BLADE PER HOUR	$ 8.71	$ 10.53	$ 14.81
KG blade costs per hour[5]	.96	1.14	1.32
TOTAL WITH KG BLADE, AND WITH CONTROLS, PER HOUR	$ 8.89	$ 10.82	$ 15.10
Tractor with plowing harrow-cost per hour	$ 9.10	$ 10.74	$ 15.03

[1] Costs as presented do not include transportation of machines and equipment, travel of operator, nor costs of supervision.

[2] Direct drive, drawbar horsepower 75, engine horsepower at flywheel 93, operating weight without guards, controls or attachments 18,000 pounds.

[3] Direct drive, drawbar horsepower 102, engine horsepower at flywheel 128, operating weight without guards, controls, or attachments 27,030 pounds.

[4] Torque converter, engine horsepower at flywheel 191, operating weight without guards, controls or attachments 42,480 pounds.

[5] Includes sharpening costs.

APPENDIX TABLE 2. COST OF CLEARING 2-ACRE PLOTS WITH THREE SIZES OF TRACTORS AND TWO TYPES OF BLADES, CHEROKEE COUNTY, ALABAMA, 1958

Plot number	Machine used	Push down or shear off			Piling		Total cost
		Time	Cost rate per hour	Cost	Time	Cost	
		Hours	*Dollars*	*Dollars*	*Hours*	*Dollars*	*Dollars*
1	D-6 Dozer Blade	4.92	8.71	42.85	1.20	10.45	53.30
4	D-6 Dozer Blade	3.85	8.71	33.53	.88	7.66	41.19
	Total	8.77		76.38	2.08	18.11	94.49
	Average per acre	2.19		19.10	.52	4.53	23.62
12	D-6 K-G Blade	2.77	8.89	24.63	.97	8.62	33.25
7	D-6 K-G Blade	3.57	8.89	31.74	1.23	10.93	42.67
	Total	6.34		56.37	2.20	19.55	75.92
	Average per acre	1.58		14.09	.55	4.89	18.98
5	D-7 Dozer Blade	3.42	10.53	36.01	.95	10.00	46.01
2	D-7 Dozer Blade	3.42	10.53	36.01	1.27	13.37	49.38
	Total	6.84		72.02	2.22	23.37	95.39
	Average per acre	1.71		18.00	.56	5.84	23.85
10	D-7 K-G Blade	2.25	10.82	24.34	1.07	11.58	35.92
8	D-7 K-G Blade	2.33	10.82	25.21	1.33	14.39	39.60
	Total	4.58		49.55	2.40	25.97	75.52
	Average per acre	1.14		12.39	.60	6.49	18.88
3	D-8 Dozer Blade	2.02	14.81	29.92	1.07	15.85	45.77
6	D-8 Dozer Blade	1.67	14.81	24.73	.87	12.88	37.61
	Total	3.69		54.65	1.94	28.73	83.38
	Average per acre	.92		13.66	.48	7.18	20.84
9	D-8 K-G Blade	1.57	15.10	23.71	.95	14.34	38.05
11	D-8 K-G Blade	1.27	15.10	19.18	.88	13.29	32.47
	Total	2.84		42.89	1.83	27.63	70.52
	Average per acre	.71		10.74	.46	6.91	17.63

(Continued)

APPENDIX TABLE 2 (Cont'd). COST OF CLEARING 2-ACRE PLOTS WITH THREE SIZES OF TRACTORS AND TWO TYPES OF BLADES. CHEROKEE COUNTY, ALABAMA, 1958

Plot number	Machine used	Time to repile for burning	Cost rate per hour	Repiling cost	Man hours for burning	Man labor cost for burning[1]	Gallons of fuel oil used in burning	Cost of fuel oil[2]	Cost of disposal
		Hours	*Dollars*	*Dollars*	*Hours*	*Dollars*	*Gallons*	*Dollars*	*Dollars*
1	D-6 Dozer Blade	3.17	15.10	47.87	.78	1.17	58	9.28	58.32
4	D-6 Dozer Blade	3.83	15.10	57.83	.83	1.24	47	7.52	66.59
	Total	7.00		105.70	1.61	2.41	105	16.80	124.91
	Average per acre	1.75		26.42	.40	.60	26.2	4.20	31.23
12	D-6 K-G Blade	1.63	15.10	24.61	.45	.68	19	3.04	28.33
7	D-6 K-G Blade	1.73	15.10	26.12	.22	.33	11	1.76	28.21
	Total	3.36		50.73	.67	1.01	30	4.80	56.54
	Average per acre	.84		12.68	.17	.25	7.5	1.20	14.14
5	D-7 Dozer Blade	3.58	15.10	54.06	1.02	1.53	54	8.64	64.23
2	D-7 Dozer Blade	3.62	15.10	54.66	.72	1.08	61	9.76	65.50
	Total	7.20		108.72	1.74	2.61	115	18.40	129.73
	Average per acre	1.80		27.18	.44	.65	28.8	4.60	32.43
10	D-7 K-G Blade	1.55	15.10	23.40	.62	.93	38	6.08	30.41
8	D-7 K-G Blade	1.58	15.10	23.86	.43	.64	14	2.24	26.74
	Total	3.13		47.26	1.05	1.57	52	8.32	57.15
	Average per acre	.78		11.82	.26	.39	13	2.08	14.29
3	D-8 Dozer Blade	3.28	15.10	49.53	1.28	1.92	86	13.76	65.21
6	D-8 Dozer Blade	4.45	15.10	67.20	.90	1.35	68	10.88	79.43
	Total	7.73		116.73	2.18	3.27	154	24.64	144.64
	Average per acre	1.93		29.18	.54	.82	38.5	6.16	36.16
9	D-8 K-G Blade	1.23	15.10	18.57	.38	.57	11	1.76	20.90
11	D-8 K-G Blade	1.55	15.10	23.40	.37	.56	19	3.04	27.00
	Total	2.78		41.97	.75	1.13	30	4.80	47.90
	Average per acre	.70		10.49	.19	.28	7.5	1.20	11.98

[1] Man labor used in connection with burning trees, brush, and stumps charged at $1.50 per hour. *(Continued)*
[2] Diesel fuel used in burning material charged at 16¢ per gallon.

APPENDIX TABLE 2 (Cont'd). COST OF CLEARING 2-ACRE PLOTS WITH THREE SIZES OF TRACTORS AND TWO TYPES OF BLADES, CHEROKEE COUNTY, ALABAMA, 1958

Plot number	Machine used	Total machine hours	Total man hours	Total cost	Time to harrow	Cost rate per hour	Harrowing cost	Grand total machine hours	Grand total cost
		Hours	*Hours*	*Dollars*	*Hours*	*Dollars*	*Dollars*	*Hours*	*Dollars*
1	D-6 Dozer Blade	9.29	10.07	111.62	1.12	9.10	10.19	10.41	121.81
4	D-6 Dozer Blade	8.56	9.39	107.78	1.00	9.10	9.10	9.56	116.88
	Total	17.85	19.46	219.40	2.12		19.29	19.97	238.69
	Average per acre	4.46	4.86	54.85	.53		4.82	4.99	59.67
12	D-6 K-G Blade	5.37	5.82	61.58	1.13	9.10	10.28	6.50	71.86
7	D-6 K-G Blade	6.53	6.75	70.88	1.42	9.10	12.92	7.95	83.80
	Total	11.90	12.57	132.46	2.55		23.20	14.45	155.66
	Average per acre	2.98	3.14	33.12	.64		5.80	3.61	38.92
5	D-7 Dozer Blade	7.95	8.97	110.24	.70	10.74	7.52	8.65	117.76
2	D-7 Dozer Blade	8.31	9.03	114.88	.72	10.74	7.73	9.03	122.61
	Total	16.26	18.00	225.12	1.42		15.25	17.68	240.37
	Average per acre	4.06	4.50	56.28	.36		3.81	4.42	60.09
10	D-7 K-G Blade	4.87	5.49	66.33	.67	10.74	7.20	5.54	73.53
8	D-7 K-G Blade	5.24	5.67	66.34	.65	10.74	6.98	5.89	73.32
	Total	10.11	11.16	132.67	1.32		14.18	11.43	146.85
	Average per acre	2.53	2.79	33.17	.33		3.54	2.86	36.71
3	D-8 Dozer Blade	6.37	7.65	110.98	.60	15.03	9.02	6.97	120.00
6	D-8 Dozer Blade	6.99	7.89	117.04	.65	15.03	9.77	7.64	126.81
	Total	13.36	15.54	228.02	1.25		18.79	14.61	246.81
	Average per acre	3.34	3.88	57.00	.31		4.70	3.65	61.70
9	D-8 K-G Blade	3.75	4.13	58.95	.67	15.03	10.07	4.42	69.02
11	D-8 K-G Blade	3.70	4.07	59.47	.65	15.03	9.77	4.35	69.24
	Total	7.45	8.20	118.42	1.32		19.84	8.77	138.26
	Average per acre	1.86	2.05	29.60	.33		4.96	2.19	34.56

APPENDIX TABLE 3. AVERAGE NUMBER OF TREES[1] PER ACRE ON PLOTS CLEARED WITH DOZER AND KG BLADES, CHEROKEE COUNTY, ALABAMA, 1958

Class of trees and equipment used in clearing plots	Size of trees (diameter at breast height)					
	2"-4"	4"-6"	6"-8"	8"-12"	Over 12"	All sizes
	No.	*No.*	*No.*	*No.*	*No.*	*No.*
Pine:						
Dozer blade	106	22	6	4	2	140
KG blade	222	72	2	2	1	299
Average	164	47	4	3	1	219
Hardwood:						
Dozer blade	260	49	37	15	9	370
KG blade	288	48	32	19	15	402
Average	274	48	34	17	12	386
All trees:						
Dozer blade	366	72	42	19	11	510
KG blade	510	119	34	21	16	700
Average	438	95	38	20	13	605

[1] Includes sound stumps.

APPENDIX TABLE 4. AVERAGE NUMBER OF TREES[1] PER ACRE FOR PLOTS CLEARED WITH THREE SIZES OF TRACTORS, CHEROKEE COUNTY, ALABAMA, 1958

Class of trees and size of tractor used in clearing plots	Size of trees (diameter at breast height)					
	2"-4"	4"-6"	6"-8"	8"-12"	Over 12"	All sizes
	No.	*No.*	*No.*	*No.*	*No.*	*No.*
Pine:						
D-6	111	24	4	2	1	142
D-7	311	106	3	5	3	428
D-8	69	11	6	1	0	87
Average	164	47	4	3	1	219
Hardwood:						
D-6	259	40	35	18	18	370
D-7	304	44	14	11	5	378
D-8	260	61	54	23	12	410
Average	274	48	34	17	12	386
All trees:						
D-6	370	64	39	20	20	513
D-7	615	150	16	16	8	805
D-8	329	72	60	24	13	498
Average	438	95	38	20	13	605

[1] Includes sound stumps.