

BLACK ROCK FOREST PAPERS

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A HIGH-DUTY WOODSAW

By

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A HIGH-DUTY WOODSAW

PROFITABLE production of cordwood calls for minimum production costs. Each step—cutting, ranking, hauling out, sawing and delivery must run a high per man per day total. Clear cutting is probably the cheapest form of cutting,—and frequently has the worst possible effect on the growing stock.

In accord with our policy of silvicultural research, our operations have been, in the main, some form of cleaning or thinning. Almost any departure from clear cutting means higher cutting and hauling costs. We tried the various methods of payment for choppers, and our prices still held to a rather high level. We were cutting and splitting with axes and cross-cut saws, ranking in the woods, starting out to a truck road by wagon, woodshod scoot or by chute, and then selling 4-foot wood in the rank by the road, or delivering it ourselves. The various systems of payment used here were:

1. Cutting by the day, 4-foot wood in marked timber
(Both green and experienced men)
2. Cutting by the cord in marked timber
(Both green and experienced men)
3. Cutting by the cord in unmarked timber
(Experienced men only)
4. Cutting by the day, pole wood, in marked timber
(Well experienced men)
- 4a. Cutting by the day, pole wood, in unmarked timber
(Well experienced men)

Plan (4) seems to be best adapted to the general run of preliminary improvement cutting which we are seeking to complete. It costs more than cutting marked timber by the cord, but we simply have to absorb the differential. Market conditions (see below) make sawn wood virtually a necessity; furthermore, this plan makes it possible to get the improvement work done exactly as we wish and at what now appears to be the most reasonable cost consistent with low stumps, proper condition of the overwood, the underwood, the advance growth, and a marketable product.

The difficulty seemed to be in the hauling. With but one team, it was necessary to keep the horses and two men at work until well into the summer. This was time-consuming, not to say a dangerous operation, especially in our rough country where steep grades and much surface rock are very hard on horses and wagons, and where, in warm weather, the risk of snakebite is often present. Furthermore, our market has become gradually more exacting. Today each stick must have both ends sawn, and lengths can not vary as much as frequently occurs in chopped wood. The explanation of this changed demand appears to lie in the metropolitan influence which is gradually spreading over this area. We find it impossible to sell chopped wood in the metropolitan district proper, and almost as difficult in the larger communities within a radius of forty miles of New York City.

It seemed that a pole wood operation combined with an adequate sawing outfit might be the answer. We had a buzz-saw driven by a used Chevrolet engine and equipped with a 4-foot tilting table, which we had used

in cutting 4-foot wood into stove and fireplace lengths. We hauled it up to our 1937-1938 operation. We knew the table was far too short to handle long pole wood efficiently, but we wanted some sort of a try-out before building a new rig.

We chopped for one week, felling and limbing: the two horses, working singly, followed behind the cutters, snaking pole wood out to the main road. At the end of the period we started the saw, using a five-man crew. Several things became immediately plain. Old though the outfit was, and unhandy as the 4-foot table might be, it could buck pole wood at the rate of 25-odd cords per day—which was far more than our small chopping crew could lay down. We tried adding another horse to the skidding crew, but even this combination, snaking over only a short 200-foot haul, could not keep up with the old saw. It was clear that the saw operated much too fast to be kept going by direct hauling. Also, this rapid output made a congestion of sawn wood at the saw. We had to spot a truck at the delivery end, to receive and draw away the wood.

We began to think we were on the right track, for, by putting all the crew to chopping, with the three horses working behind them, we snaked out wood for two weeks. Then the saw was started, and in four days it cut up all we had ready. It was plain that we needed a heavier, longer table, a better engine and saw, and a somewhat different working schedule. These points were clear:

1. The machine must have ample power and rim speed, with a heavy, rolling or sliding table of sufficient length. Seven feet seemed to be about right.
2. The rig must be wheeled so that the crew can shift it by hand along the road. Pneumatic tires would help a great deal here.
3. The saw cannot be kept busy by feeding direct from the woods. Large ranks of pole wood must be spotted in advance.
4. Such ranks should have the butts all laid the same way.
5. Only a few cords can be ranked by the delivery end of the saw; as soon as this space is filled, some provision must be made to draw the cut wood away.

We built a stout frame of mortised 4" x 4" timbers with the engine, mandrel, saw, and toolbox mounted thereon. This frame can be bolted on any wood wagon. The 7-foot table, with its track, are two separate units which can be demounted for lengthy transport.

The engine is an International Harvester, 5 HP, water-cooled, 1-cylinder affair, turning up 1000 r.p.m. We use a 36-inch solid tooth saw, developing a rim speed of 6500 f.p.m., which is quite satisfactory. It is very important that the saw be properly fitted, with ample gullets, and correct hook and set. Of course the outfit should be set up plumb, so keep a small level in the toolbox. A steel "stop" or gauge is bolted to the delivery end of the table, making it simple to cut wood exactly 4 feet long.

The offbearer will need a leather apron such as black-

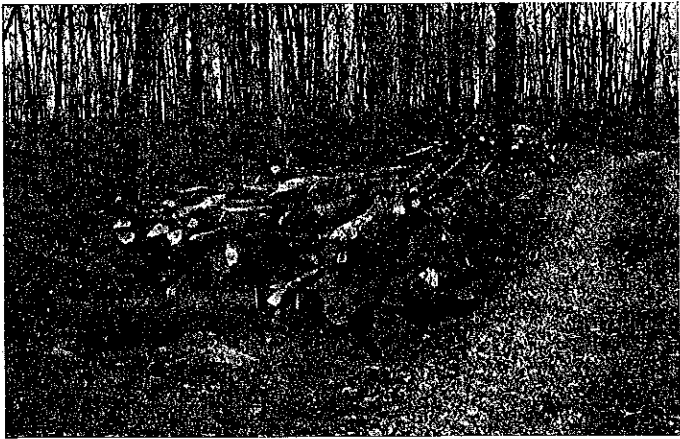


PLATE 1. Polewood, snaked out and ready to saw. All butt-ends face the same way.

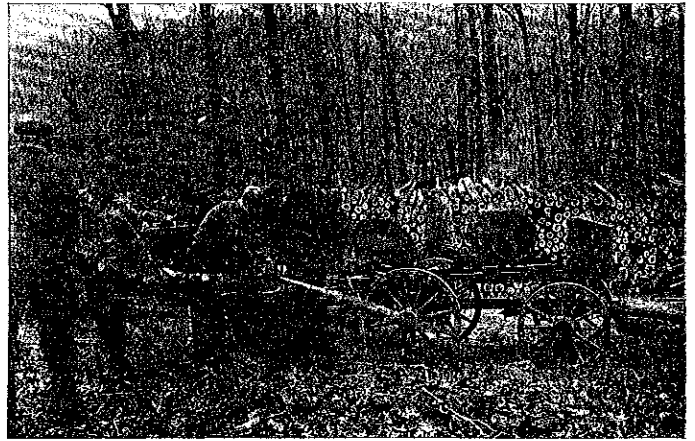


PLATE 2. The saw in operation. Note that two men are starting back for the next stick.

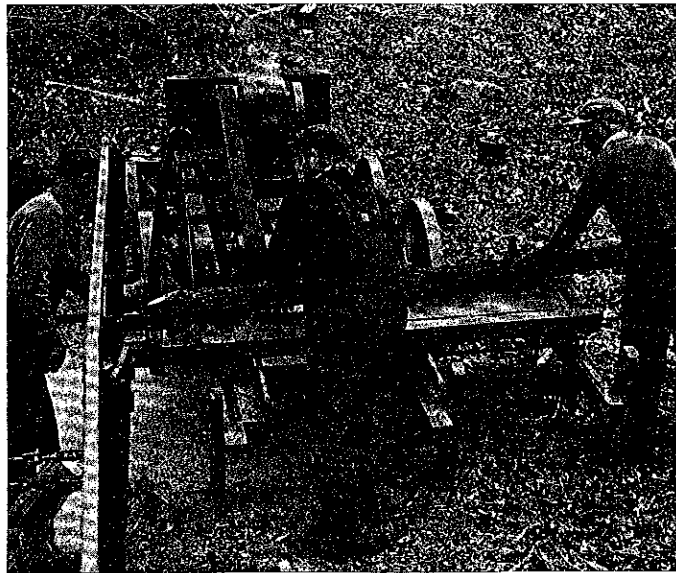


PLATE 3. The saw from above. Butt ends are always squared up first.

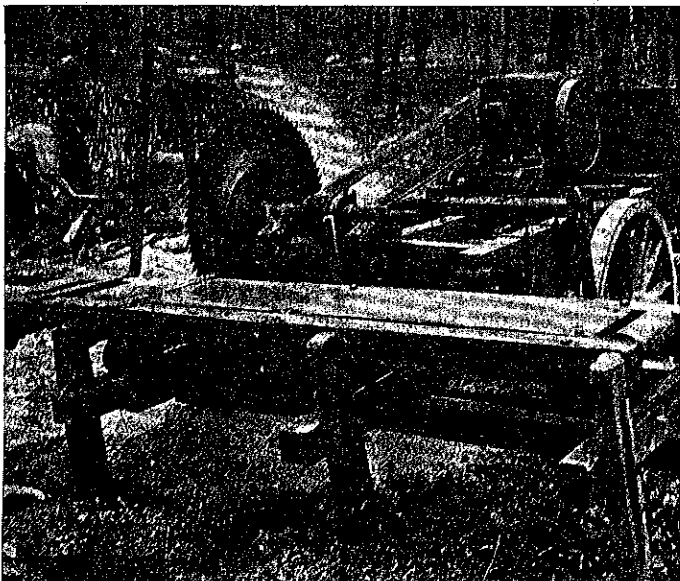


PLATE 4. The saw in detail, showing engine, belting, saw, guard, long, rolling table with steel top, and slotted, adjustable legs.



PLATE 5. The manufactured product. These sticks do not vary over $\pm \frac{1}{2}$ " in length.

smiths use. Such a saw will turn off around five cords of 4-foot wood per hour. On our present wage scale, using a 7-man crew, this works out at from 70¢ to 90¢ per cord of 4-foot wood. This may seem to be an unduly large crew, but things happen so fast around the new rig that we recommend this number.

The rapid output will quickly fill all the available ranking space in and around the saw. We have had to place a truck (or a woodshod scoot, when the roads are snowy) where it can be loaded directly by the offbearer and then drawn by team or tractor to some nearby ranking ground. In this rocky country, woodshod scoots do not do well on bare ground. The shoes wear out very quickly. A wagon or truck is better when there is no snow.

The crew will need two lughooks for handling heavy

sticks. One 4-foot peavy should be included. The machine can be easily moved along the road by the crew if the grade be not too steep. Pole wood should be fed to the saw big end first so that the butt of each stick may be squared on the first cut. Hence, yard all the poles with the butts facing the same way.

Our operations of '37-'38 and '38-'39 were, unfortunately, light cleanings in very thin stands. The yield per acre (only 3-4 cords) was low, making for extremely high chopping costs. The wood from these two operations was delivered to the truck road at a price which means, on its face, a loss, but we believe it just to classify the deficit as the cost of our improvement work. Such operations, while yielding a low cut per acre, can proceed rapidly over a large territory, making the unit improvement costs reasonably low.

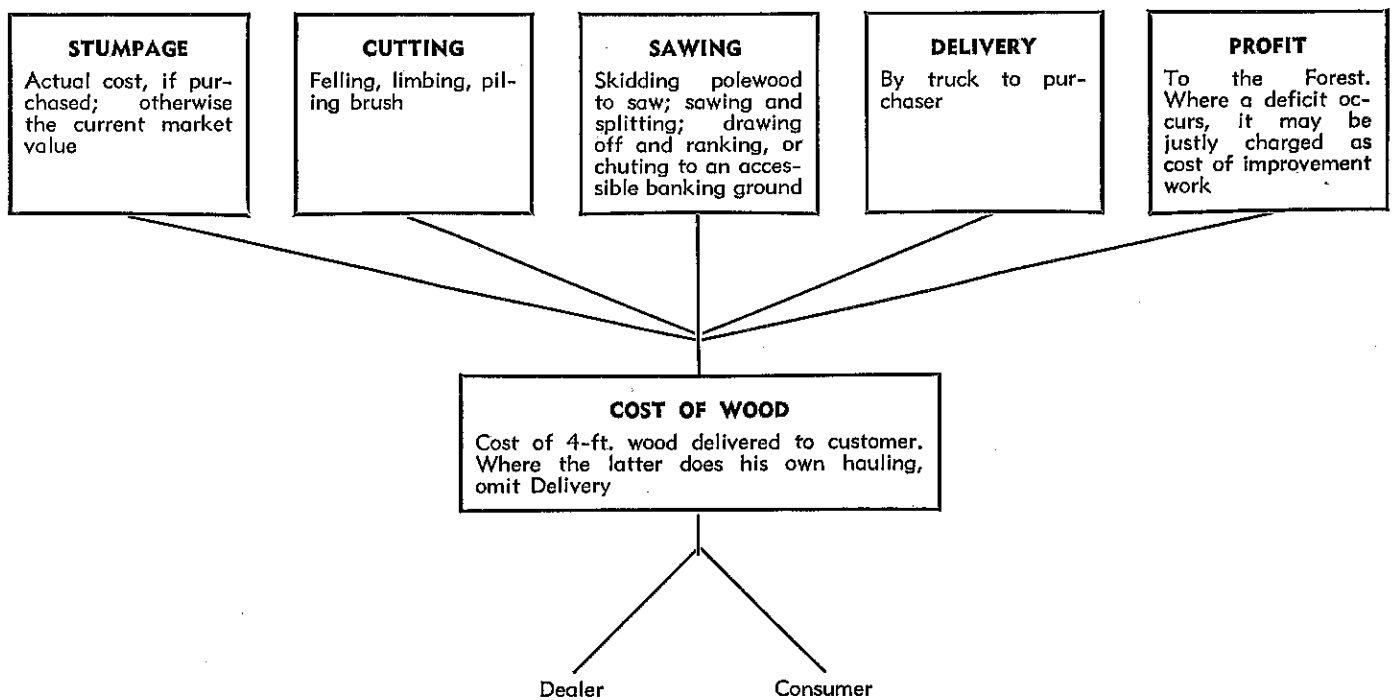


Fig. 1. Breaking down the various cost elements of a typical polewood fuel operation exclusive of overhead.

Our next operation will probably be in steep, hilly country, where hauling will be difficult. Our general plan of campaign will be to brush out a rough road about half-way up the slope to be cut. The pole wood coming from the upper half of the area will be spotted on this road, and as the sawing proceeds the offbearer will drop each piece directly into the receiving end of our portable wood chute. This will make for very cheap delivery to the truck road at the foot of the cutting. The question will immediately occur: "How can you scale such heaps of jackstraws"? We solve this by measuring the body of a purchaser's truck. This has usually worked out satisfactorily with all hands. The pole wood coming

from the lower half of the area will be yarded for sawing to the main road skirting the foot of the slope.

This system seems to have several good points. We have not used it enough, as yet, to be able to quote sound cost figures, but it has all the appearance of a low-cost method. From our point of view, one favorable feature is that it can be carried on by a small, stable crew, and, when the last pole is sawn, the job is completed. The long session of summer hauling out, with the consequent reduction of our force for summer work, confronts us no longer. For best results, all the men should be skilled fallers, two or three must be teamsters, and one must understand the care and operation of circular saws and internal combustion engines.