A SEEDBED THINNER

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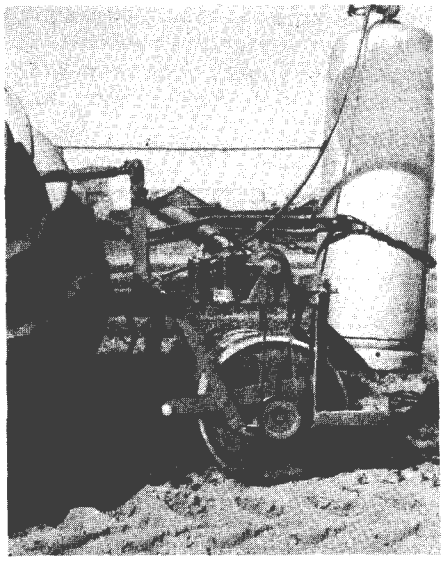
We all know that the quality of tree seedlings decreases when seedbed density is too high. The forest nurseryman attempts to control density by regulating the amount of seed sown. He uses all known information and sows accordingly, but there still remain factors beyond his control. If, as a result, he has too few trees, he can do very little; but if he has too many, something can be done. As in all forest nurseries, the problem of over-density has arisen many times in the nurseries operated by the New York State Conservation Department.

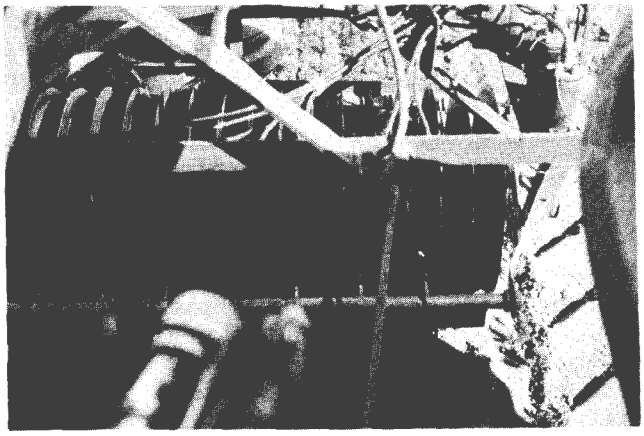
Some years back, E. J. Eliason, Superintendent of Nurseries, suggested to the nursery managers that a mechanical device be made to thin out the beds. It was obvious that such thinnings would need to be made in narrow strips in broadcast seedbeds. The first attempt was made with a machine that chopped out thin lines by means of rapidly moving "J" knives. This method proved difficult to adjust. The next suggestion resulted in the use of a series of small burners which would destroy some of the trees, again in strips. The first successful bed thinner of this type was developed at the Saratoga Nursery. Alterations and improvements were made on the machine at the Lowville Nursery, and it is described herein. Another method under development at the Saratoga Nursery involves using various chemicals in place of the burners; it is expected to accomplish similar results.

The Lowville machine (fig. 1), mounted on a 3-point-hitch tractor, consists mainly of twenty-two 16-inch coulters or straight disks mounted 2 inches apart on a horizontal axle. The disks roll over the seedbeds to be thinned. A Presto Lite propane burner is mounted in every other opening between the disks. Fuel is supplied by bottle gas. This arrangement burns out ten 2-inch bands, leaving nine 2-inch strips of untouched trees plus additional trees on each side of the seedbed. The machine has a working width of 42 inches. The border strips can be wider than 2 inches since trees on the bed edge have more growing space. The machine therefore destroys somewhat less than 50 percent of the trees. It is not adjustable to a lesser amount, unless some of the burners are not fired.

The burners are continuously fired by a dual distributor, coils, and spark plugs using current supplied by the tractor battery. The burners are frequently blown out by the wind, but the continuous spark relights the gas. The direction and height of the burner flame can be adjusted by twisting the pipe on which all the burners are mounted. The gas tank must stand upright to permit proper vaporizing. The whole apparatus, including the frame, disks, and gas tank, can be raised and lowered from the tractor seat by means of the power lift.

[1]The following people of the New York State Conservation Department have contributed ideas for the development of these machines: E. J. Eliason, E. G. Terrell, Richard Abbey. and Charles L. Ransiear.





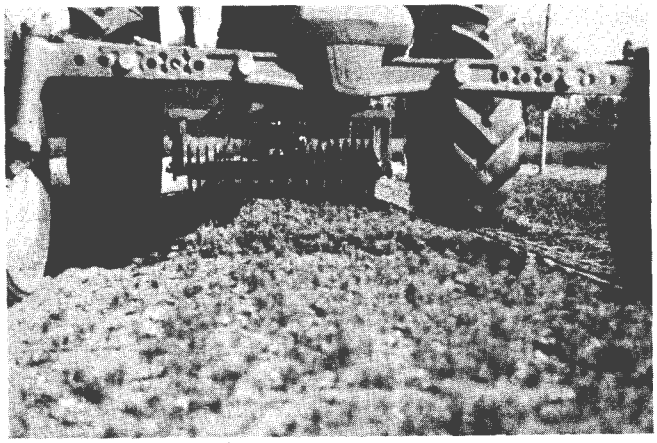
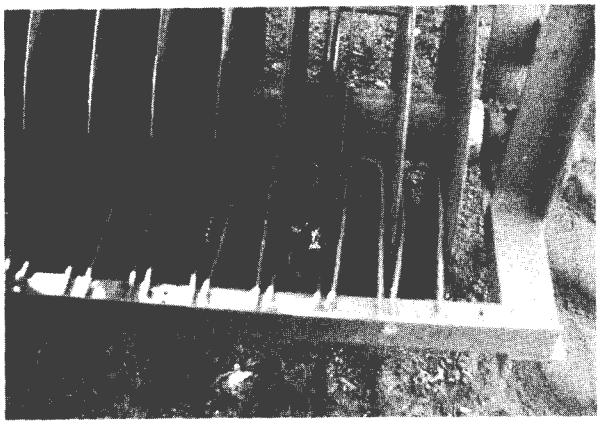
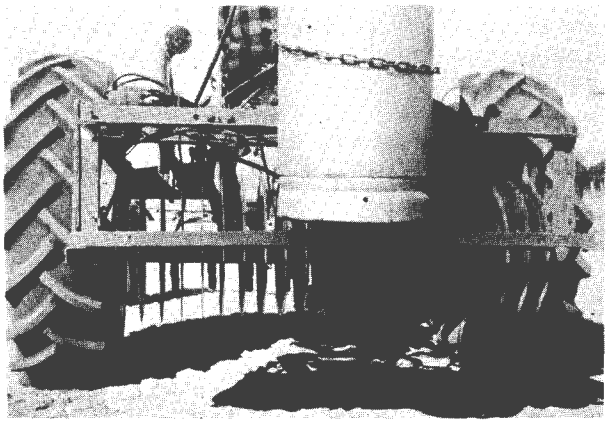


Figure 1.--Seedbed thinner: Top left, side view showing gas tank, distributor, coils, coulter, and tractor lift. Top right, operator's view showing disk and burners. Center, thinner working over a broadcast bed. Bottom left, heavy wire scrapers for cleaning disks. Bottom right, thinner in lift position.





Parts for the tree thinner are as follows:

	Quantity
Main shaft: 55.5-inch by 1-inch diameter (welded inside of 2-inch pipe threaded on each end so coulters can be tight)	
Coulters: 16-inch diameter (center holes bored 2 3/8 inches to fit over 2-inch pipe)	22
Spacers: 2 inches long, cut from 2.5-inch pipe	
Frame: 2 by 3/16-inch angle iron	
Scrapers: Heavy galvanized wire, 1/8-inch diameter	
Burners: Presto Lite #3 w/propane head #11 x 12	9
Bearings: Self aligning	2
Spark plugs: Champion P-4, installed in threaded hole in burner	9

Seedbeds in New York State are best thinned when the trees are 1 year old. At the end of the first winter a seedling inventory is taken that indicates number of seedlings that can be expected to survive and what beds should be thinned. It is best to thin before spring growth starts, however they can be effectively thinned after they have made some growth. Older aged trees are impractical to destroy because of their bulk. This machine affects only the tops of the trees which come in contact with the flame. The remaining trees are not disturbed in the least. Flammable winter mulch may be troublesome. Watering the trees before thinning will prevent the mulch from burning.