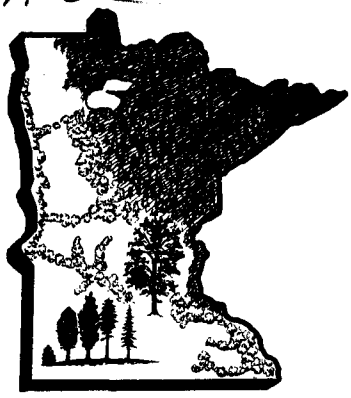

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KILLING CULL BLACK OAKS WITH AMMATE, 2,4,5-T AND MECHANICAL GIRDLING

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In many Minnesota woodlots, cull trees take up space, produce no usable wood, and seriously handicap stand improvement. In order to increase productivity, a method must be developed which will remove them at low cost.

This study was established in a black oak (Quercus velutina Lamarck) stand on the Whitewater Refuge of the Minnesota Conservation Department in Winona County, Minnesota, during the summer of 1956. The objective was to compare the effectiveness of chemical and mechanical methods of removing cull trees under Minnesota conditions. The treatments selected for testing were as follows:

(1) Ammate in notches (Fig. 1) A tablespoonful of ammonium sulfamate crystals placed in axe-cut notches spaced about 4 to 6 inches apart at 18 inches above the ground.

(2) 2,4,5-T in oil (Fig. 2) A solution of the propylene glycol butyl ether ester of 2,4,5-T in number two fuel oil, at a concentration of 16 pounds of acid equivalent per hundred gallons, applied with a garden-type back-pack sprayer, at a rate of one gallon for 80 diameter inches, to the lower three feet of the stem. (Applied to undisturbed bark until solution began to run off.)

(3) Mechanical girdle (Fig. 3) A gasoline powered, portable, flexible shaft cutting girdles one inch in width and about one and a half inches deep.

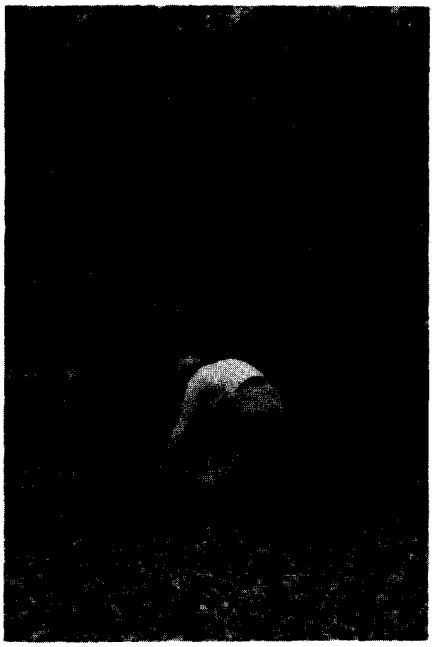

Fig. 1. Ammate in notches

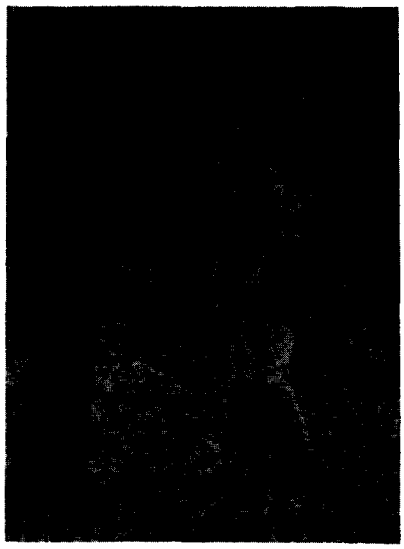

Fig. 2. Basal spray

Fig. 3. Mechanical girdle

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Treatments were applied during the growing season (July 11-12, 1956) and during the dormant season (October 27, 1956). Three methods in two seasons plus a control or untreated set gave a total of seven treatments. In order to have 40 trees in each treatment, 280 black oaks were selected from a stand growing on an abandoned pasture on sandy soil with a 10-15% north-west-facing slope. Trees were selected so that there were 70 in each of four size-vigor classes,[2/] and treatments were assigned to trees at random, with the restriction that each treatment be applied to 10 trees in each size-vigor class. Top kill and sprouting were observed at intervals after treatment. The table below presents the top kill results observed during the middle of the second growing season after treatment.

TOP KILL IN PER CENT
(July 17, 1958)

Treatment	Date	Small Trees (under 8 inches d.b.h.)		Large Trees (over 8 inches d.b.h.)	
		Good Vigor	Poor Vigor	Good Vigor	Poor Vigor
Ammate	July, 1956	100	80	50	30
2,4,5-T	July, 1956	100	100	80	90
Girdle	July, 1956	100	100	100	100
Ammate	October, 1956	90	100	50	40
2,4,5-T	October, 1956	60	30	20	60
Girdle	October, 1956	100	90	100	100
Control	———	0	0	0	0

Almost 80% of the small and 40% of the large girdled trees had basal or stem sprouts in July, 1958. This seemed to be the same for both dormant and growing season girdles. No sprouts were observed on trees treated with ammate or 2,4,5-T. The summer ammate treatment cannot be considered a fair test of this method since a heavy rain flushed some of the chemical out of the notches shortly after it was applied. Some further mortality may have occurred after the July, 1958 check, since some of the chemically treated trees had deformed and discolored leaves at that time.

These data indicate that girdling should be used only where sprouts are desired or are not objectionable. The 2,4,5-T in oil applied as a basal spray will give satisfactory results if applied during the early summer, even on black oaks up to 20 inches in d.b.h. The ammate in notches was effective on small trees, in spite of rain after treatment.

Where a considerable number of trees of all sizes are involved, the summer basal spray with 2,4,5-T is probably the most practical method. Where only a few trees are involved, ammate crystals in notches are easier to apply, since no solution must be prepared. Where sprouts are desired for restocking, a mechanical girdle is recommended.

2/ Small trees ranged from 2.0 to 7.9 inches; large, from 8.0 inches to 29.7 inches. Vigor was judged on the basis of crown size, density and position, and evidence of disease or injury.

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