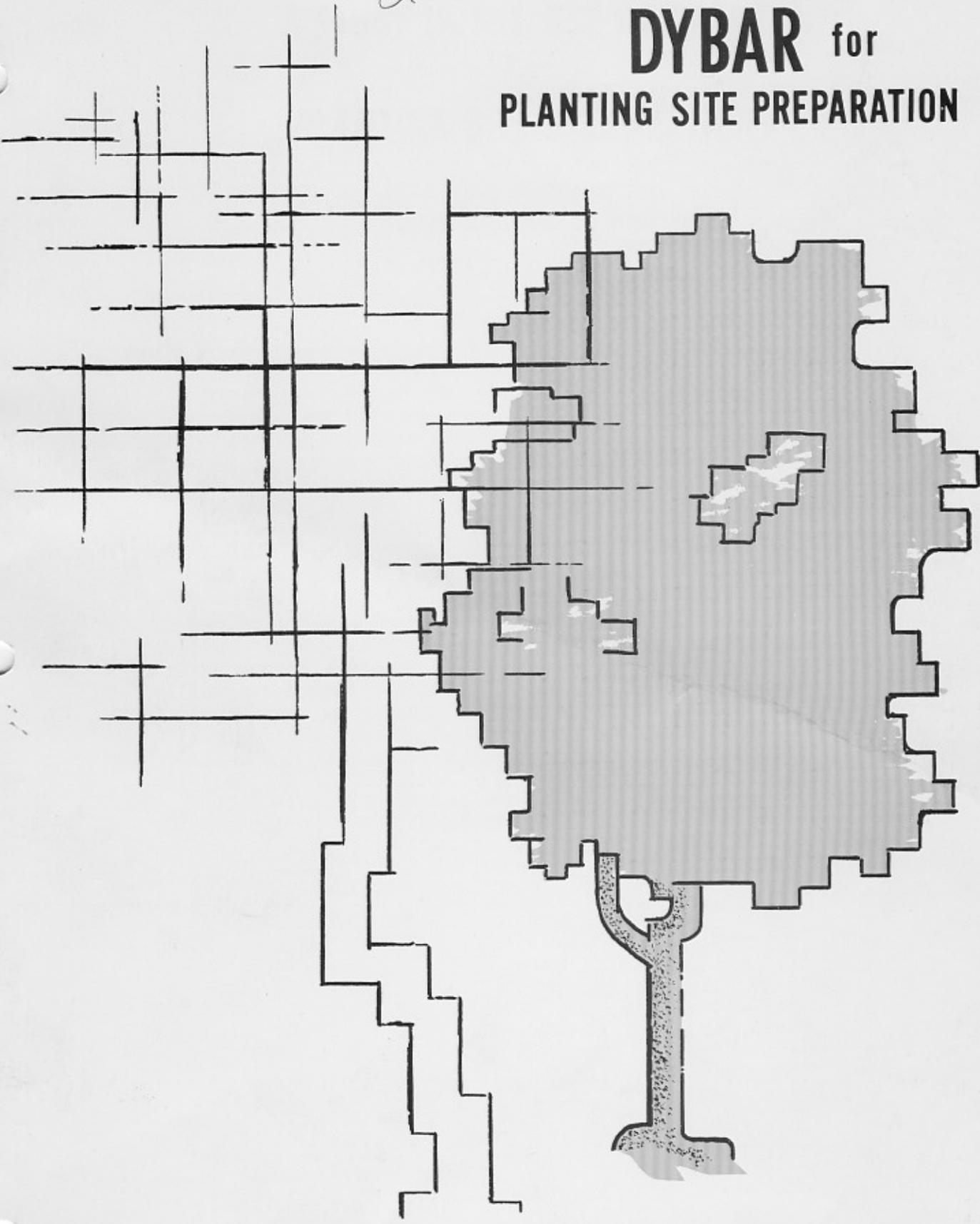


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DYBAR for PLANTING SITE PREPARATION



A STUDY IN THE USE OF DYBAR for PLANTING SITE PREPARATION

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SUMMARY

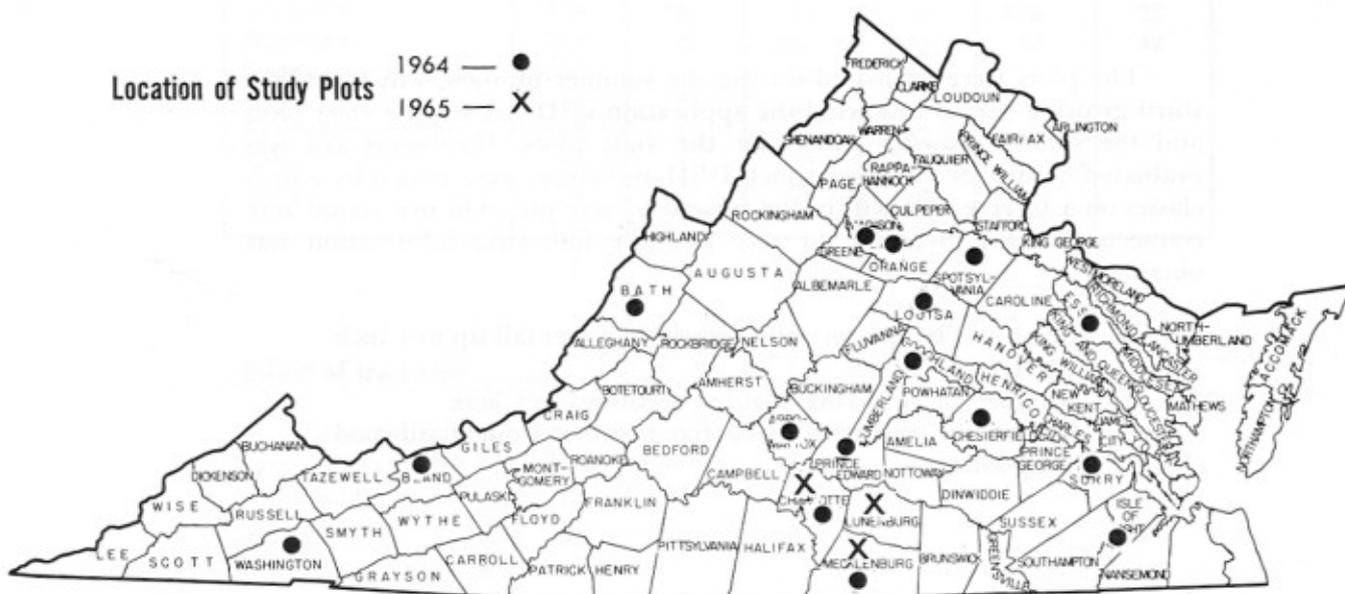
Dybar¹ was tested as a means of killing hardwoods for planting site preparation in 1964 and 1965. The Dybar was applied in April. Pine seedlings were planted just before the Dybar was applied to find out what effect, if any, Dybar might have on them. In 1964 rates of 10 and 20 pounds of Dybar per acre were tested, with single spoonfuls of Dybar dropped on a square-grid spacing. In 1965 a 15 pound per acre rate was used, and two methods of application were tested: dropping single spoonfuls at a square-grid spacing and broadcasting with a cyclone seeder.

Oaks were susceptible to the Dybar, but other hardwood species were more or less resistant. Susceptibility was related to size — large trees were more readily killed than small trees and brush. In 1964, on well-drained soils, acceptable hardwood control was obtained on only 2 of 14 plots for the 10 pound per acre rate and 9 of 14 plots for the 20 pound per acre rate. On two pairs of plots established on poorly-drained soils in 1964 hardwood control was poor for both rates. In 1965, on well-drained soils, the 15 pound per acre rate gave acceptable control on only 1 of 6 plots, and there was no significant difference between the grid and broadcast methods. The Dybar had little or no effect on the planted pine seedlings in either year.

1. Dybar is a product of DuPont and contains 25% Fenuron. It comes in pellet form and the current price is approximately \$1.05 per pound.

Location of Study Plots

1964 — ●
1965 — X



DESCRIPTION OF STUDY

In 1964, 10 and 20 pound per acre rates of Dybar were tested on paired plots at 16 different locations throughout Virginia. Fourteen of these paired plots were established on well-drained, upland soils in the coastal plain, piedmont, and mountain regions; the other two paired plots were established on level, poorly-drained soils in the eastern coastal plain. Single spoonfuls² of Dybar were dropped at a square-grid spacing which was determined by pacing. For the 10 pound per acre rate approximately 500 spoonfuls per acre were dropped at an approximate spacing of 9 by 9 feet, and for the 20 pound per acre rate approximately 1,000 spoonfuls per acre were dropped at an approximate spacing of 6½ by 6½ feet.

In 1965 a rate of 15 pounds per acre of Dybar was used, testing two methods of application: dropping single spoonfuls of Dybar at a square-grid spacing and broadcasting with a cyclone seeder. A spacing of approximately 7½ by 7½ feet was used to give approximately 750 drops per acre. Three pairs of plots were installed on well-drained, upland soils in the southern piedmont of Virginia.

All of the plots supported a considerable amount of hardwood and no cutting had been done on any of the plots in recent years. Square plots of ½ acre were used with at least a 50 foot buffer strip between plots. The Dybar was applied in April shortly after pine seedlings had been planted. Loblolly pine seedlings were planted in all plots except three pairs of plots established in 1964 west of the Blue Ridge mountains where white pine seedlings were planted. When the Dybar was applied with a spoon no attempt was made to prevent it from falling near the seedlings.

2. A plastic tablespoon was ground down so that 50 heaping spoonfuls of Dybar would make a pound.

EVALUATION OF PLOTS

The plots were evaluated during the summer of 1966, which was the third growing season following the application of Dybar for the 1964 plots and the second growing season for the 1965 plots. Hardwood kill was evaluated by species. All trees 1 inch DBH and larger were tallied by 2 inch classes on a ¼ acre plot within the treated ½ acre plot. On five 10-mil acre transects scattered over the ¼ acre plot the following information was obtained:

1. Brush kill by species (all stems from 2 feet tall up to 1 inch DBH)
2. Number of surviving planted seedlings per acre
3. Percent of mil-acre plots free-to-grow from hardwood competition.

RESULTS FOR PLOTS ON WELL-DRAINED SOILS

Fourteen of the 16 pairs of plots in 1964 and all three pairs of plots in 1965 were on well-drained, upland soils. In 1964 the 20 pound per acre rate was much more effective than the 10 pound per acre rate and the results for the two rates are reported separately below. In 1965 the two methods of applying Dybar gave similar results (small differences in favor of the grid method were not statistically significant) and the results for the two methods are combined below.

Species susceptibility.....

Hardwood species varied considerably in their susceptibility to Dybar as shown in Table 1. In general, the oaks were susceptible and other species were more or less resistant. Scattered larger pine trees were present on some of the plots, and most of these were killed by the Dybar.

Table 1 — Species Susceptibility—Total number of trees over 1 inch DBH and percent killed (all plots combined).

Species	1964 Study				1965 Study	
	10 Pounds Per Acre		20 Pounds Per Acre		15 Pounds Per Acre	
	No. Trees	Percent Killed	No. Trees	Percent Killed	No. Trees	Percent Killed
Post Oak	17	76	21	95	—	—
Scarlet Oak	214	63	129	92	136	94
Black & So. Red Oaks	147	62	130	92	51	90
White Oak	792	43	639	84	330	81
Chestnut Oak	143	22	69	70	—	—
Sassafras	20	20	14	36	—	—
Hickory	172	15	191	59	143	36
Red Maple	216	12	163	44	243	29
Yellow Poplar	17	12	25	0	19	0
Black Gum	173	10	184	34	130	21
Sourwood	134	10	95	40	178	25
Dogwood	214	8	356	23	43	42
Sweetgum	27	7	24	38	—	—
Cedar	15	7	37	0	—	—
Persimmon	22	5	6	33	—	—
Ash	85	1	72	1	—	—
Holly	11	0	25	4	—	—

Effect of tree size.....

Susceptibility to Dybar was related to size. The kill was best on large trees, intermediate on small trees, and poorest on brush, as shown for oaks in Table 2.

Table 2 — Effect of Tree Size—Percent kill by size class for oaks, all plots combined

Tree size	1964 Study		1965 Study
	10 Pounds Per Acre	20 Pounds Per Acre	15 Pounds Per Acre
	Percent Kill		
Brush(stems under 1" DBH)	25	66	46
Trees 1" to 3" DBH	38	82	80
Trees over 3" DBH	54	88	90

Overall Effectiveness.....

Overall hardwood control varied considerably from one pair of plots to another. Excellent hardwood control was obtained on some plots, and on others it was very poor. Species composition was the most important factor affecting overall hardwood control — the higher the proportion of oak the better. Size of trees was less important — better overall hardwood control was obtained on plots with little brush and most of the trees over 3 inches DBH. Hardwood control was judged to be "acceptable" for plots on which 80 percent or more of the sample mil-acre plots were free-to-grow from hardwood competition. The number of plots judged acceptable by this criteria are shown in Table 3.

Table 3 — Number of Plots with Acceptable Hardwood Control

	1964 Study		1965 Study
	10 Pounds Per Acre	20 Pounds Per Acre	15 Pounds Per Acre
	No. Plots		
Acceptable	2	9	1
Not Acceptable	12	5	5

Effect on planted pines.....

The Dybar had little or no effect on planted pine seedlings.

Pales Weevil.....

On several plots where scattered larger pine trees were killed by the Dybar, Pales weevils killed planted seedlings. The possibility of Pales weevil attack should be kept in mind when using Dybar on stands containing scattered pine.

RESULTS FOR PLOTS ON POORLY-DRAINED SOILS

Overall hardwood control was very poor on the two pairs of plots installed on poorly-drained soils in 1964. On one pair of plots the oak kill was high and on the other pair it was low. However, even on the pair of plots with the good oak kill the overall kill was very poor because only a small percentage of the trees on the plots were oaks.

CONCLUSION

Dybar as used in this study appears to have limited use for planting site preparation. Only the 20 pound per acre rate can be recommended, and then only on well-drained soils for nearly-pure oak stands of trees primarily 3 inches DBH or larger.