



APPLICATION DATE AND DOSAGE INFLUENCE KILL OF HARDWOODS
BY SOIL APPLICATION OF BROMACIL, FENURON, AND PICLORAM¹

Fred A. Peevy
Principal Plant Ecologist
Southern Forest Experiment Station
USDA Forest Service, Pineville, Louisiana 71360

ABSTRACT. Bromacil was effective when applied as individual-tree treatments to blackjack and post oak. A dose of 2 grams per inch of trunk diameter gave good kills on both species during March, April, May, and June; and a 1-gram dose gave marginal or near-marginal kills in March, April, and May. Fenuron and picloram were not effective in any season, except that the 2-gram rate of fenuron gave marginal kills in March and April.

Banding herbicides on the soil around single trees is potentially a substitute for tree injection. It is especially attractive to small landowners because it is fast and requires little or no outlay for equipment. The method is in use on sandy soils of the Southeast, but has given erratic results on the heavier soils of the West Gulf Coastal Plain. In the study reported here the three most promising herbicides were tested at several dosages in central Louisiana. Applications were made during spring, the season when soil herbicides have proved most effective in other regions.

Procedures

Six treatments, consisting of two dosages of three herbicides, were tested on two species of upland oaks at four dates. The chemicals were: (a) 1, 1-dimethyl-3-phenylurea (fenuron)—25 percent pellets, (b) 5-bromo-3-sec-butyl-6-methyluracil (bromacil)—10 percent pellets, and (c) 4-amino-3,5,6-trichloropicolonic acid (picloram)—10 percent pellets. Dosages were 1 and 2 grams of active chemical for each inch of stem diameter at breast height. Blackjack oak (*Quercus marilandica* Muenchh.) and post oak (*Q. stellata* Wangenh.), common species on sandy loam soils of the uplands, were chosen as test species. All treatments were applied in four consecutive months from March through June.

Herbicides were spread uniformly on the soil in a band 1 foot wide and 12 inches from the base of the tree. Wide spacings between trees prevented herbicides from affecting more than one tree.

A plot consisted of 10 trees of the same species and of approximately the same size. From plot to plot trees ranged from 4 to 10 inches in diameter. Treatments were replicated three times and assigned in a fully randomized design.

¹Cooperators in the research included the
and the Kisatchie National Forest.

Dow Chemical Company, the DuPont Company,



Treatments were evaluated in terms of average topkill two growing seasons after installation. Crown reduction was estimated to the nearest 5 percent for each tree. Mean topkills of 91 percent or higher were regarded as satisfactory, kills of 85 to 90 percent were termed marginal, and kills under 85 percent were considered unsatisfactory. Sprouting was negligible for all treatments. Differences in treatments reported in this paper were statistically significant at the 0.05 level.

Results

Bromacil was clearly superior to fenuron and picloram in all months on both species (table 1). The 2-gram dose of bromacil gave satisfactory kills of both species regardless of time of application. The low rate was satisfactory only on post oak in April, though it effected marginal kills of both species in March.

Table 1.—Crown-kill in August 1969 of two hardwood species treated in four separate months with three herbicides applied at two rates

Seasons	Dosage	Fenuron		Bromacil		Picloram	
		Blackjack Post		Blackjack Post		Blackjack Post	
		oak	oak	oak	oak	oak	oak
	Grams			Percent			
March	1	47	11	88	85	11	4
	2	87	78	100	100	30	10
April	1	73	20	81	99	35	39
	2	89	56	99	92	41	18
May	1	30	15	82	81	48	25
	2	52	33	97	100	77	52
June	1	25	13	55	33	40	21
	2	48	55	95	90	62	37

Fenuron was more effective than picloram when applied to blackjack oak in March and April, though even at the 2-gram dosage the kill was marginal. Picloram was best on blackjack oak in May and June, but the kill was unsatisfactory. Post oak is the more resistant of the two species, and during March it was somewhat easier to kill with fenuron than with picloram, especially at the 2-gram dosage.

Dosage significantly affected the efficiency of picloram and fenuron on blackjack oak and of fenuron on post oak. It did not alter kills of post oak with picloram. Overall, dosage of these two herbicides had a greater effect on kills than month of application.



Discussion

Bromacil was superior to picloram and fenuron when applied to the soil around individual trees at 1- and 2-gram doses per inch of trunk diameter from March to June. The study thus confirmed other research with these chemicals (.2,4.,6) • Since a 1-gram dose of bromacil gave good kills of upland oaks in previous tests, a dose intermediate to 1 and 2 grams may be effective (4). The best kills with fenuron have resulted from applications in late winter and early spring (1,3.,5) , while picloram seems most effective during spring (2) •

Local rainfall records show no indication that kills in the present study were influenced greatly by soil moisture. Moisture was ample during the growing season in which the treatments were installed.

Precautions

Since the registration of herbicides is under constant review by State and Federal authorities, a responsible State agency should be consulted as to the current status of these chemicals.

Soil herbicides should not be applied in the root zone of desirable plants

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