USDA FOREST SERVICE RESEARCH NOTE NE-111
1970

N
FOREST SERVICE, U. S. DEPT. OF AGRICULTURE, 6816 MARKET STREET, UPPER DARBY, PA.
E

DEER PREFER PINE SEEDLINGS GROWING NEAR BLACK LOCUST

Abstract.—The presence of volunteer black locust seems to make some pine species on a bituminous coal spoil more palatable to white-tailed deer. Seedlings of jack pine, pitch pine, and Austrian pine were browsed more heavily when within 10 feet of a black locust than when farther away. The nitrogen produced by the black locust may have caused more succulent tissue in the pines. Proximity of black locust did not seem to strongly influence browsing of other pine species in the study area.

Deer browsing varied among several species of pine planted on bituminous coal-mine spoils. Some of the trees were browsed more heavily than others; some were not touched. So, we wondered why white-tailed deer (*Odocoileus virginianus*) preferred some pine species over others. This led us to investigate the browsing more closely, and our inspection of the pine planted on the spoils gave us the impression that browsing was more prevalent in pine growing close to black locust trees (*Robinia pseudoacacia* L.) that were invading the site. This made us think that perhaps black locust somehow affected deer browsing habits.

The study was originally established to compare the results of fall planting with spring planting. Trees and shrubs were planted in the fall of 1961 and 1962 and in the spring of 1962 and 1963 on bituminous coal-mine spoils in Clearfield County, Pa. Ten coniferous species were used in this study: red pine (*Pinus resinosa Ait.*), white pine (*P. strobus* L.), Scotch pine (*P. sylvestris* L.), pitch pine (*P. rigida Mill.*), jack pine (*P. banksiana* Lamb.), Austrian pine (*P. nigra* Arnold), European larch (*Larix decidua* Mill.), Japanese larch (*L. leptolepis* Sieb. and Zucc.), white spruce (*Picea glauca* (Moench) Yoss.), and Norway spruce (*P.*

abies L.). Each species was planted on two plots within the experimental area. Shortly after the final plantings were made, volunteer black locust began to invade the study area.

Light browse damage was first noted in December 1967 when the trees were 5 and 6 years old. In April 1968, the incidence of browsing was recorded, and its intensity was coded for all trees in the study area. Distance to the nearest black locust tree was also measured, so we could either substantiate or disprove our impression that the trees near black locusts were more heavily browsed.

Data obtained from the measurements show that 222 of the 2,403 conifers in the study area had been browsed to some degree (table 1). This is only 9 percent of the total; but among trees within 10 feet of a black locust tree, 39 percent had been browsed. The species most heavily browsed were: pitch pine, 24 percent browsed; Austrian pine, 21 percent browsed; and jack pine, 12 percent browsed.

Of the 222 browsed trees, 72 were more than 10 feet from a black locust tree; 57 of these were pitch pine. Thus, pitch pine seems to be the most acceptable pine species to deer. The data suggest that browsing on this species was also influenced by the proximity of black locust; 95 percent of the pitch pines within 10 feet of a locust were browsed.

Our impression that black locust influenced browsing was further substantiated: on one of the Austrian pine plots containing no locust, there was no browsing.

Browse damage to Scotch pine was intermediate but also appeared to be related to the proximity of black locust trees. Light browsing on red and white pine, regardless of the proximity of black locust, suggests that these species are the least acceptable pines in the area. Neither the spruces nor the larches were browsed, even though black locust trees were within the plots.

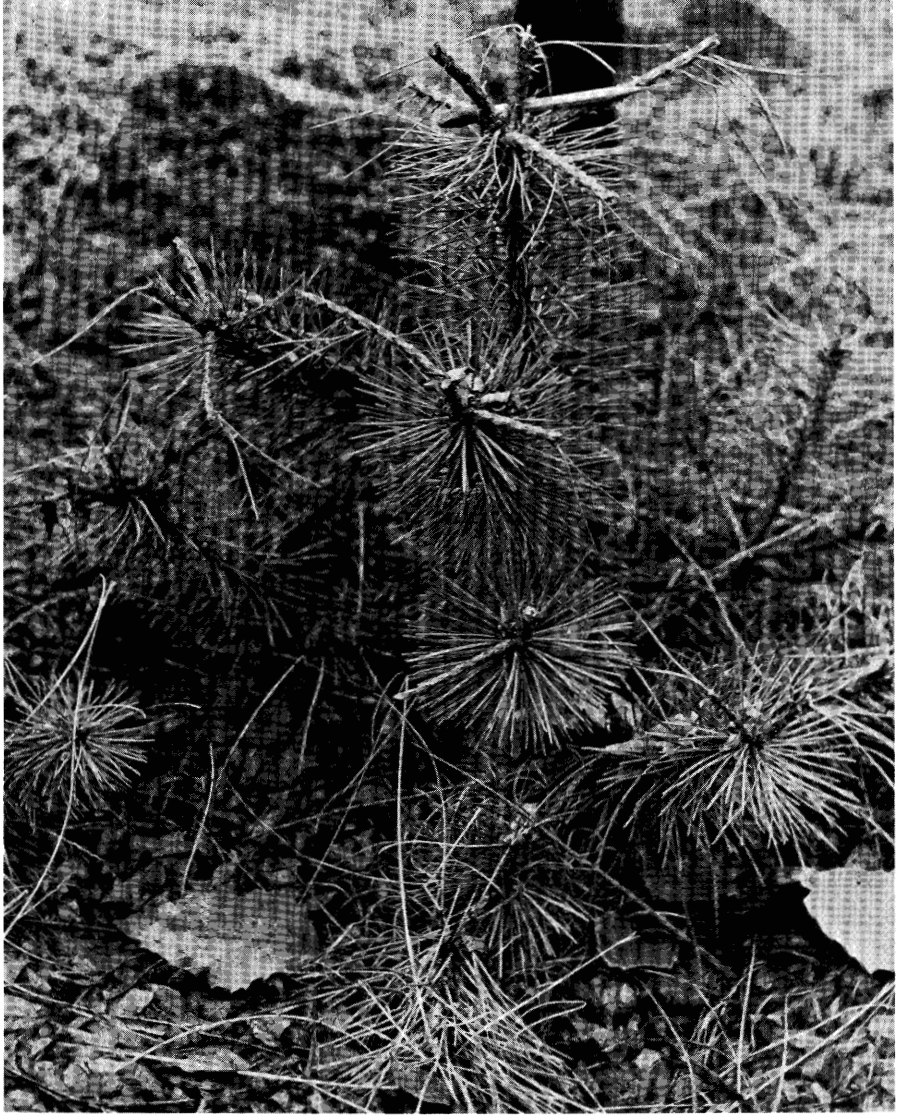
Black locust also influenced the severity of browsing damage on jack pine and especially on Austrian pine; the intensity of deer browsing increased dramatically near the black locusts. Heavy browse damage was recorded for 28 of the 54 browsed Austrian pines within 10 feet of a black locust. Damage was considered heavy when 67 to 100 percent of the branch tips, including the terminal bud of the tree, had been browsed. The increased severity of browsing near black locusts in addition to the higher incidence of browsing indicates that the presence of black locust does influence deer browsing.

Why did deer apparently prefer some pine seedlings growing near black locust in the study area? There are many possible reasons, some

Table 1. — *Deer browsing on trees within 10 feet of a black locust and over 10 feet from a black locust*

Pine species	Trees within 10 feet of locust			Trees over 10 feet from locust			All trees			Black locust on plots
	Total	Browsed		Total	Browsed		Total	Browsed		
	Number	*Number*	*Percent*	*Number*	*Number*	*Percent*	*Number*	*Number*	*Percent*	*Number*
White	67	4	6	329	0	0	396	4	1	7
Red	25	0	0	550	2	0	575	2	0	3
Scotch	40	13	32	274	1	0	314	14	4	15
Jack	99	41	41	362	12	3	461	53	11	15
Pitch	40	38	95	354	57	16	394	95	24	9
Austrian	112	54[1]	48	151	0	0	263	54	21	32
All	383	150	39	2,020	72	4	2,403	222	9	81

[1] Twenty-eight of the browsed Austrian pine within 10 feet of a black locust were heavily browsed; that is, 67 to 100 percent of the branch tips, including the terminal, had been browsed.



A heavily browsed Austrian pine 5 feet away from a black locust (background).

perhaps have not even occurred to us. One possibility is that differences in microsite affected both the establishment of black locust and the palatability of the pine; on strip-mine spoils this seems unlikely. A more likely reason is that the pines growing near locust—a legume that increases soil nitrogen—developed more succulent foliage.

—WALTER H. DAVIDSON
Research Forester
Northeastern Forest Experiment Station
Forest Service, U. S. Dep. of Agriculture
Kingston, Pennsylvania