RESEARCH NOTES
SOUTHEASTERN FOREST EXPERIMENT STATION
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CALCIUM CONTENT OF HARDWOOD LITTER FOUR TIMES THAT FROM PINE; NITROGEN DOUBLE

Most Piedmont forests, growing on land worn out by row cropping and abandoned, are low in site quality. They contribute appreciable flood runoff and sediment. Soil structure is poor and nutrient content low. Such improvement as takes place comes generally from litter fall, particularly hardwood leaves.

Studies at the Calhoun Experimental Forest, near Union, S. C., reported in Proceedings of the Soil Science Society of America, January 1952, show that shortleaf and loblolly pine contribute less nitrogen, calcium, and magnesium than any of the other common species. Where it is necessary to increase these elements in the surface soil under pure pine stands, the improvement can be accomplished by favoring a hardwood understory, as the following comparison indicates.

Nitrogen, calcium, and magnesium content of various Piedmont tree species growing in Union County, South Carolina

(In percent of element on oven-dry basis)

Species	Nitrogen	Calcium	Magnesium
Eastern redbud	**1.16**	**2.96**	0.22
Eastern red oak	1.00	1.42	**0.36**
White oak	**0.92**	**1.69**	**0.30**
Blackjack oak	0.85	**0.96**	0.28
Post oak	0.80	0.97	0.22
Black oak	0.70	1.04	**0.23**
Southern red oak	0.60	1.06	**0.23**
Flowering dogwood	0.68	3.38	0.53
Hickory	**0.62**	2.78	0.62
Yellow-poplar	0.53	**2.61**	0.72
Red maple	0.51	1.32	0.33
American sweetgum	**0.49**	1.30	**0.47**
Shortleaf pine	**0.45**	0.59	0.19
Loblolly pine	0.31	0.43	0.15

To find the per-acre quantity and quality of litter fall under various Piedmont forest types, measurements were made in nine stands in Union County, s. c., from September 1950 to September 1951. As shown in the following table, although the weight of litter per acre from pure shortleaf stands nearly equals that from hardwoods, the amount of nitrogen returned is less than half, and the amount of calcium less than one-fifth that from hardwood stands. Owners troubled by littleleaf disease in shortleaf stands may find that such differences in nutrient content are important.

Litter fall from forest stands in Union County, S. C.
(In pounds per acre, oven-dry basis)

Stand	Total litter, including leaves, twigs, bark, and fruit	Leaf fall	Quantity of element returned in leaf fall	
			Nitrogen 1/	Calcium 2/
11-yr-old loblolly plantation	5619	4476	15	21
30- to 40-yr.-old loblolly and shortleaf	4103	2938	13	17
30- to 40-yr.-old shortleaf	4059	3771	12	16
Shortleaf-hardwoods (average of 3 stands)	4762	3472	24	44
Hardwoods (average of 3 stands)	4502	3818	26	88

1/ To get an estimate in pounds of equivalent applied sodium nitrate, multiply by 6.
2/ To get an estimate in pounds of equivalent applied limestone, multiply by 2-1/2.

Louis J. Metz
Divisions of Watershed Management
and Forest Management