(Published in Forest Farmer,
Vol. IX, No. 1, p. 7,
October 1949)

GOOD FORESTS ONCE GREW IN THE SANDHILLS

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To many, a mention of the Sandhills brings to mind silvery hills of unique scenic beauty, a wholesome climate, tourists, horses, peaches, pretty girls, attractive cities and towns, and a multitude of other pleasant thoughts. These are realistic things and not mere mirages. Yet, they tend to obscure a real and urgent problem of land management involving millions of acres. These acres once supported good stands of longleaf pine but now are largely covered with a growth of small, gnarled and shrub-like oaks. From the original forest of longleaf came a vast flow of naval stores, including turpentine and rosin, millions of board feet of fine, dense-grained lumber and timbers, and innumerable poles and piling. From the present brushland of scrub oak and poorly populated pine stands come some fuel wood and a mere trickle of other forest products, as a sorry reminder of the past. To men concerned with the economic welfare of South Carolina, these areas of low productivity offer a real challenge. Longleaf pine or its equivalent should again dominate the forested portions of the Sandhills, with scrub oak relegated to its proper position as a minor species.

The Sandhill region occurs in both of the Carolinas and includes the Fall-line hills of Georgia. It is an irregular narrow strip 10 to 40 miles wide and about 420 miles long, extending from Sanford, North Carolina, south through Columbia, South Carolina, Augusta and Macon to Columbus, Georgia. Nearly eight million acres are involved, of which three million are coarse sands suited only for the growing of trees. Half the area is in South Carolina and the remainder about equally divided between the other two states. Similar conditions exist in western Florida, southern Alabama, and eastern Texas. In South Carolina, a total of eleven counties contain some Sandhill area, and in five counties--Aiken, Lexington, Richland, Kershaw, and Chesterfield--it dominates physiographically.

Geologists tell us that the formation of the Sandhills began about 50 million years ago, when the area was the Atlantic Coast. Deep sands were deposited by the ocean on piedmont rocks during several periods of inundation, resulting in soil and topographic conditions which may be grouped into three main subdivisions in the Carolinas: (1) the Aiken plateau; (2) the Richland red hills and high hills of the Santee; and (3) the Congaree sand hills. The Fall-line hills of Georgia are a mixture of these same soil divisions. A large proportion of the Aiken plateau is cultivated and probably will continue to be. The Richland red hills and the high hills of the Santee are even more fertile. The main forestry problem is in the Congaree sand hills. These extend from Aiken County, northeasterly to Sanford in North Carolina.

The Congaree sands are coarse, deep droughty, and unsuited to cultivation. Desert-like plants such as cactus, lichens, and wiregrass indicate how rigorous conditions are. Ecologist B. W. Wells points out the odd fact that with 50 inches of yearly rainfall, these are "deserts in the rain." The deep, coarse sands cannot hold moisture, and within three days after a summer rain, drought conditions prevail. It is a characteristic of the Congaree sand areas that where clay layers are near the surface, moisture conditions are improved and plants grow better. Where the clay layers are 30 to 40 feet below the surface, only the moisture-conserving plants can survive. White sand, reflecting the sun's heat, intensifies the already-rapid evaporation. Turkey oak and longleaf avoid heat injury by turning their leaves or needles edgewise to the ground. Soil organic matter may be only 0.27 percent in the surface 6 inches.

Originally, the pine forest appears to have held its own in this environment. But logging and repeated fires have allowed scrub oaks to capture many former pine sites completely. Also, much of the existing pine type consists of a scattering of longleaf in a sea of scrub oak. When once established, the scrub oak utilizes most, if not all, of the available soil moisture and nutrients, thus effectively preventing the re-establishment of pine. For instance, seven-year-old slash pine in an old field may be 18 feet high, while similar trees are only 6 feet tall in adjacent scrub oak areas even when the oak is cut back every year. If oak isn't cut at all, pine may be only 3 feet. There are now about 500 thousand acres of scrub oak in the South Carolina Sandhills, mostly in the Congaree sand hills province. The longleaf pine type amounts to about 300 thousand acres. Thus, we have almost one million acres of problem area in South Carolina alone. Where scrub oak comprises most of the stand, control of the oak is needed prior to planting with pine. Where longleaf occurs, scrub oak control is needed on much of the area so the pine component can be increased either through planting or natural seeding.

In such an adverse environment as the Congaree sands, one would not expect at first glance that pine plantations could possibly pay for themselves. And yet, they do, and in certain cases grow remarkably well. A 17-year old slash pine plantation near Camden, S. C., contained a total of 28.09 cords per acre before thinning. Growth was at a rate of 1.63 cords per acre per year, and there is nothing wrong with such returns. In the hope of developing profitable stands State and private owners have established many plantations in the Sandhills during the past fifteen or eighteen years. Slash and loblolly have been fairly successful on old fields, but longleaf less so. Any study of the combined plantations shows wide variations in growth rates and survival.

Plantations outside of old fields are almost inevitably confronted by the scrub oak competition problem. Established plants such as scrub oak and wiregrass utilize virtually all the small amounts of moisture and nutrients available, leaving none for seedlings. Thus, control of competition is a key factor in the establishment and growth of pine. It is for this reason that much of the current work in the Sandhills is directed toward scrub oak control.

Under the direction of the South Carolina Forest Service some work is being done on the Sand Hills State Forest in Chesterfield County. In one large area scrub oak has been removed by cutting in order to favor previously planted pine. On another area applications of commercial fertilizer have been made in an effort to boost the survival and development of planted pine. In still another area the chemical, ammonium sulfamate, in crystals and in water solution was applied to test its effectiveness in destroying the oaks. Elsewhere, on an experimental plot, the scrub oak was cut down by hand, piled and burned, the stumps pulled with tractors, and the ground broken with a heavy fire plow. Various sub-plots were treated further by planting peas, mulching with pine straw, commercial fertilizer, or stable manure. However, the most extensive operations on the Sand Hills Forest are with a brush cutter. This is a mechanism similar to, but much larger than a cotton stalk cutter. It consists of two drums in tandem, with blades attached, each drum containing a ton of water. The machine is drawn by a crawler tractor and quite readily beats down and chews up the sapling and smaller-sized oaks. After the area is worked over by the brush cutter, the ground and scrub oak is further broken up by means of a heavy disk fire plow. Areas so treated are readily planted by machine.

In cooperation with the South Carolina State Commission of Forestry, the Southeastern Forest Experiment Station of the U. S. Forest Service has established a number of demonstration plots in scrub oak control on the Sand Hills State Forest. There are eight of these plots and they test the effect of the herbicides, ammonium sulfamate and 2,4-D, singly or in combination with fire, or prior mechanical treatment. The ammonium sulfamate is applied in crystal form in notches cut in the trees. The 2,4-D is sprayed in an aqueous solution of 0.5 percent on foliage.

Some of the new experiments appear promising, but in most cases, several more years must elapse before conclusions can be drawn. As is well known hardwoods are, in a sense, immortal, and destruction of the aerial portions merely slows their capacity for sprouting, which is inherent. Only by killing the roots can we effectively destroy hardwoods.

The trials now in progress are a good beginning. But they only scratch the surface in connection with the total problem of regenerating the Sandhills to pine. For, in addition to the problem of pre-planting treatment, such as scrub oak control, there are those involving proper species to plant, methods of planting, classification of planting sites, proper spacing of trees, the feasibility of direct seeding and the possibilities of natural regeneration.

Here we have a unique area of millions of acres whose most likely use is timber production. The diffucult areas of the Sandhills are thus one of the knottiest and most interesting problems faced by Southeastern foresters.