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**THE BLACKLAND SOILS
OF NORTH CAROLINA**
**Their Characteristics
and Management for
Agriculture**

by
J. Paul Lilly
Department of Soil Science
North Carolina State University

North Carolina Agricultural Research Service

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THE BLACKLAND SOILS OF NORTH CAROLINA

Their Characteristics and Management for Agriculture

Introduction

The Blacklands of North Carolina are areas in the lower Coastal Plain which are agriculturally important and require special management due to large amounts of organic matter in the surface soils and poor natural drainage. They are the areas known or once known as swamps, pocosins (81), or bays and were named for the dark soils which are exposed when drained and cleared. The blackland soils range from dark surface mineral to deep organic (Histosols) and occur along the entire North Carolina coast (113). All were formed under conditions where organic matter decomposition was slowed by anaerobic conditions caused by saturation of the soil, or surface ponding of water, for much of the year.

The best known area, and the one of most intense development currently is the peninsula lying between Albemarle Sound to the north and Pamlico Sound to the south. The western limit is the Suffolk Scarp. Other significant areas include the Dismal Swamp of Virginia and North Carolina (55), the pocosins of Beaufort and Pamlico Counties, Open Ground in Carteret County, Croatan National Forest and Hofmann Forest, Holly Shelter Swamp and Angola Bay, Green Swamp in Brunswick County, and many of the Carolina Bays (Figure 1). In addition there is a significant number of smaller tracts.

Estimates of the area of North Carolina peat or muck soils (now called Histosols) range from 1.3 to 1.5 million acres (63, 64); however, there are many more acres of dark surface mineral soils which make up most of the cultivated land in the Blacklands. Wilson (113) estimated there were over three million acres of bogs and wooded swamps in 1962. Figure 1 shows the general distribution of the Histosols and dark surfaced mineral soils in North Carolina.

Much swamp land is owned by government agencies and timber companies, reducing the area currently available for agricultural development. However, significant amounts of former timber company lands have been cleared for agriculture in the past (for example, West Virginia Pulp and Paper Co. lands acquired by First Colony Farms) and

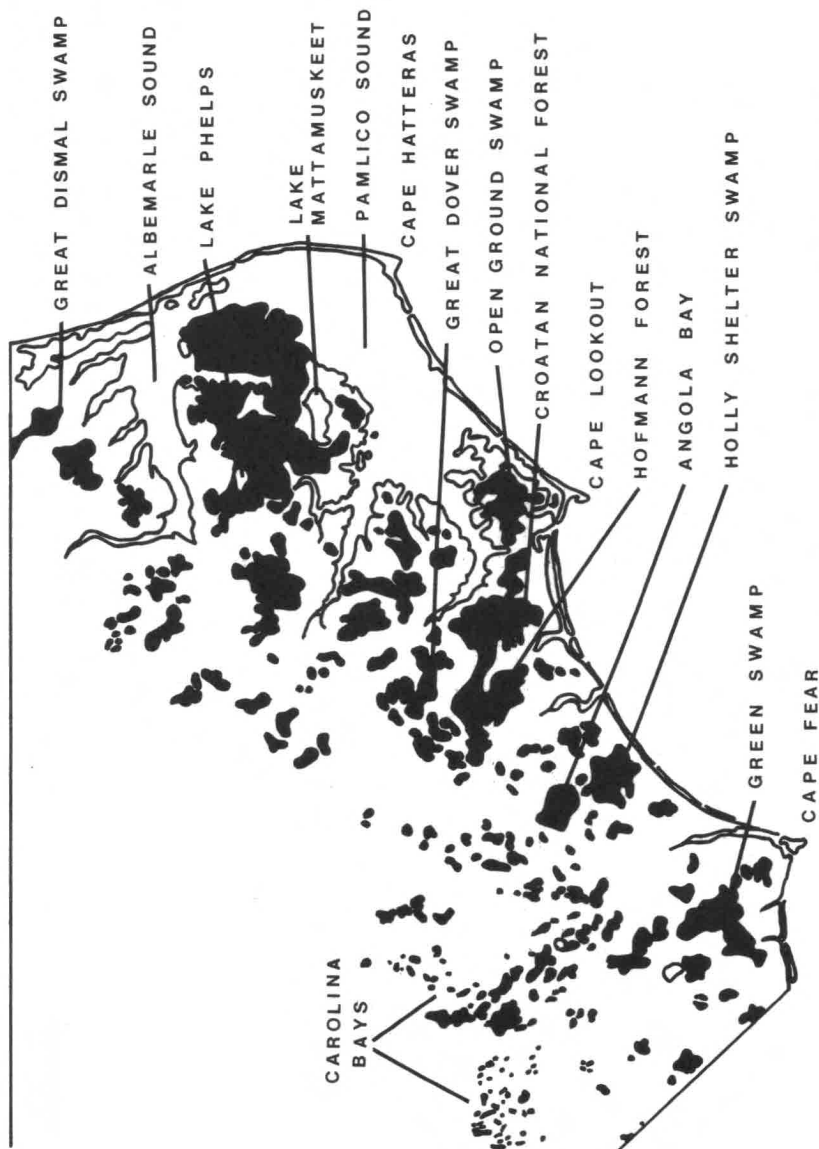


Figure 1. Major areas of Histosols and dark surfaced mineral soils in North Carolina. Adapted from Lee (63) and Wilson (113).

future development will probably depend on economic considerations and land use legislation. Land clearing activity has increased dramatically in the past five to ten years (16, 20) with thousands of acres being cleared each year. Farm land is seen as a desirable investment and it is likely that land clearing will continue at a rapid rate so long as the current economic and regulatory conditions exist.

Climate

The North Carolina coastal zone lies between $33\frac{1}{2}^{\circ}$ and 37° north latitude. The climate varies somewhat from north to south, but is characterized generally by warm temperatures and high rainfall. The average number of freeze-free days (when the temperature does not drop below 32°F) is 235 at Elizabeth City, 215 at Plymouth and 245 at Wilmington (15, 46). One reason for the large differences is the location of the recording stations in relation to large bodies of water; another is that blackland soils tend to warm slowly. Thus in the spring crops grown in the area are more subject to late frost damage than crops grown on land with a higher mineral matter content. Organic soils absorb heat during the day, but they do not conduct heat well and cool rapidly at night by radiation. In addition, they are low lying and flat, and cold air tends to settle in such areas. Corn is normally planted later in the Blacklands than on surrounding, more mineral, land.

Rainfall is fairly high with the annual average ranging from 51.3 inches at Wilmington to 53.0 inches at Plymouth (Figure 2) to 55.4 inches at New Bern (15). Rainfall is lower in the inland areas with Raleigh reporting an annual average of 43.5 inches. Total annual precipitation varies considerably, as does distribution during the year (Table 1). Most rainfall occurs in the summer months as scattered showers and thunderstorms. Consequently, rainfall for a given period can be quite erratic over the region (Table 1). It is not uncommon for some areas to be damaged by drought while other areas only a few miles away have sufficient or even excess water. In addition, the Blacklands are vulnerable to hurricanes and tropical storms in the fall which may cause extremely heavy rainfall at times. This situation can be devastating if crops are in the field at the time of occurrence.

Topography and Geology

The large swamps of North Carolina occur at basically three positions on the landscape and are associated with different geologic formations. The larger ones occur on the Pamlico surface which is the youngest exposed seabed surface of the North Carolina coastal area (23) (Figures 3 and 4). They extend from the Suffolk Scarp (an ancient shoreline) to the eastern salt marshes and include the Great Dismal Swamp (55, 77, 86, 106), the Albemarle-Pamlico peninsula (49),

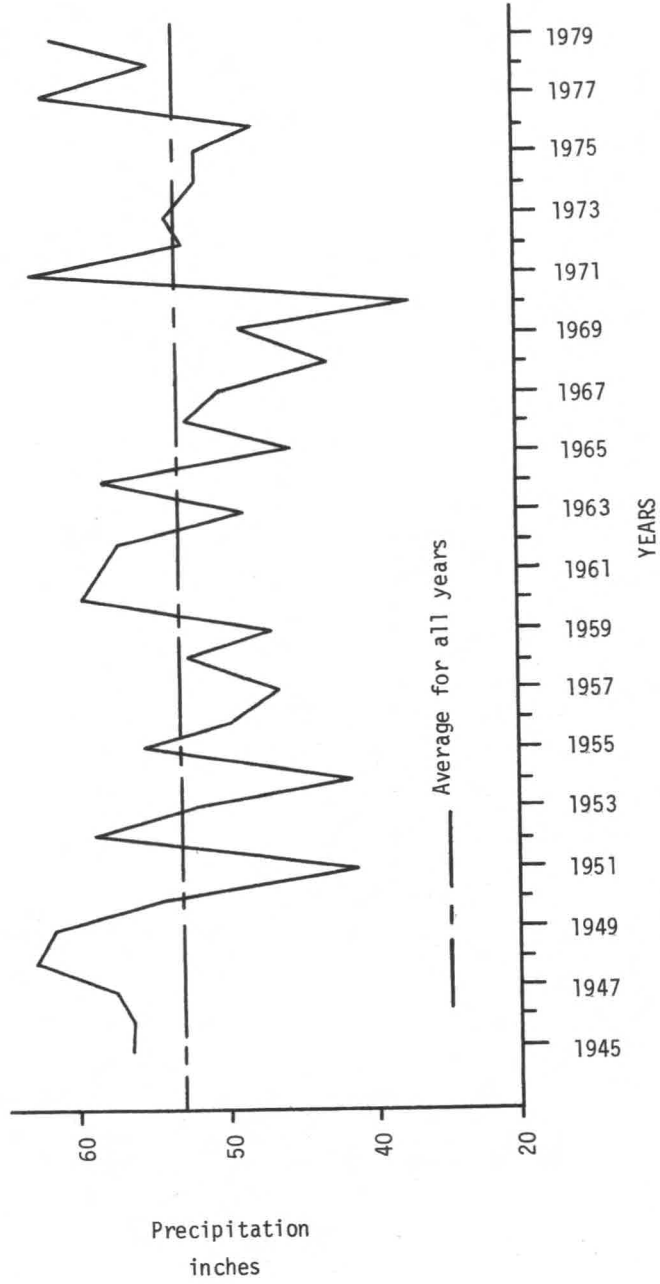


Figure 2. Average annual precipitation at the Tidewater Research Station, Plymouth, from 1945 through 1979.

Table 1. Precipitation distribution during the 35 year period 1945-1979, at the Tidewater Research Station, Plymouth.

Month	Ave Monthly Precipitation in.	Precipitation, Inches												Highest Month in.	Lowest Month in.	
		0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10+	Percent of months in range			
Jan	4.0	0	11	23	20	14	14	11	0	3	3	0	0	0	9.0	1.1
Feb	4.0	3	14	9	14	31	17	11	0	0	0	0	0	0	6.8	0.7
Mar	3.9	6	3	11	29	29	20	3	0	0	0	0	0	0	6.0	0.7
Apr	3.0	0	20	29	23	20	9	0	0	0	0	0	0	0	5.6	1.1
May	4.7	3	9	20	3	17	11	20	9	3	3	3	3	3	11.1	0.9
Jun	5.1	3	9	11	20	17	9	11	6	6	0	9	9	9	13.1	0.9
Jul	6.8	3	3	0	6	17	20	11	9	9	3	20	20	20	15.0	0.8
Aug	6.0	3	9	9	11	11	6	14	17	3	0	17	17	17	13.4	0.3
Sept	5.1	3	6	14	11	17	17	11	9	3	3	6	6	6	12.0	1.4
Oct	3.2	6	34	20	11	11	6	3	3	0	0	6	6	6	11.5	0.6
Nov	3.5	6	26	20	9	17	6	11	0	0	0	6	6	6	10.5	0.6
Dec	3.4	3	11	20	37	11	11	0	6	0	0	0	0	0	7.8	0.6
Yearly	53.0															

