

Introduction

Slash pine is widely planted in the southeastern U.S. On some soils increased wood production can be realized by fertilization, but the long time (5 to 30 years) between fertilization and harvest makes fertilization a long-term investment which requires careful consideration.

The size and longevity of tree growth response to fertilization can range from over 14 m³/ha/yr (200 ft³ acre/yr)* for 20 years to less than 1.4 m³/ha/yr (20 ft³/acre/yr) for only a few years. Forest fertilization initially became an accepted forest management tool because on selected soils one small application of phosphorus (P) changed unproductive forests to very productive ones. While not all growth responses to fertilization are this dramatic, soils of the southeastern U.S. are generally infertile and pine plantations will show good fertilizer response on many sites.

The purpose of this publication is to summarize

current interpretations of research findings and to present pine fertilization recommendations that have a good probability of increasing wood production. The recommendations are based on research conducted by the Cooperative Research in Forest Fertilization (CRIFF) program. CRIFF is a cooperative venture between the University of Florida Soil Science Department, the University of Florida Department of Forestry, and thirteen private corporations. Throughout this report, an experimental "fertilizer response" is one where the pine growth response is at least 1.2 m³/ha/yr (18 ft³/acre/yr). To provide economical benefit, a fertilizer response may need to be higher depending on the conditions of each situation.

Slash pine response to fertilization is soil-specific. For this reason, soils of the Florida-Georgia Coastal Plain have been organized by the CRIFF program into eight major soil groups (Table 1). The groups are useful in that they contain soils of similar physical properties and provide a common

Table 1. CRIFF soil-group definitions.

Soil Group	Major Land Area	Drainage	Important Features
A	Savannas	Very poorly to somewhat poorly drained	Sand to loamy sand surface layer less than 20 inches thick, with a finer-textured soil horizon below.
B	Savannas	Very poorly to somewhat poorly drained	Sand to loamy sand surface layer greater than 20 inches thick, with a finer-textured soil horizon below.
C	Flatwoods	Poorly to somewhat poorly drained	Spodic horizon below the surface layer; sandy loam or finer-textured soil horizon below the spodic.
D	Flatwoods	Poorly to somewhat poorly drained	Spodic horizon below the surface layer; sand to loamy sand soil horizon below the spodic.
E	Uplands	Moderately-well to well drained	Sand to loamy sand surface layer less than 20 inches thick with a finer-textured soil horizon below.
F	Uplands	Moderately-well to well drained	Sand to loamy sand surface layer greater than 20 inches thick, with a finer-textured soil horizon below.
G	Sandhills	Excessively drained	Sand to loamy sand surface layer at least 100 inches thick.
H	Depressions	Very poorly drained	High in decomposing plant residues. An organic soil.

(Adapted from Munson, 1984)

* Which units should we use? This question is not easily answered when we consider the many audiences for this publication. English units are familiar to U.S. users but involve unwieldy factors. Metric units are easier to work with, but some audiences lack familiarity with the system. Expression of phosphorus and potassium fertilizer rates can also be confusing because fertilizer laws, written in the days of gravimetric analyses, require phosphorus content of fertilizers to be expressed as P₂O₅ and potassium content as K₂O. In this publication when we write P or K, we mean the elemental equivalents, and when we write P₂O₅ or K₂O we mean the oxide equivalents of the elements. Throughout this publication phosphorus and potassium rates will be expressed as elemental in conjunction with metric units and as P₂O₅ and K₂O in conjunction with U.S. English units. The existence of multiple systems of measurement is inconvenient but at present is a fact of life.