



# SILVICULTURE AND SOILS

**Kirk McEachern**

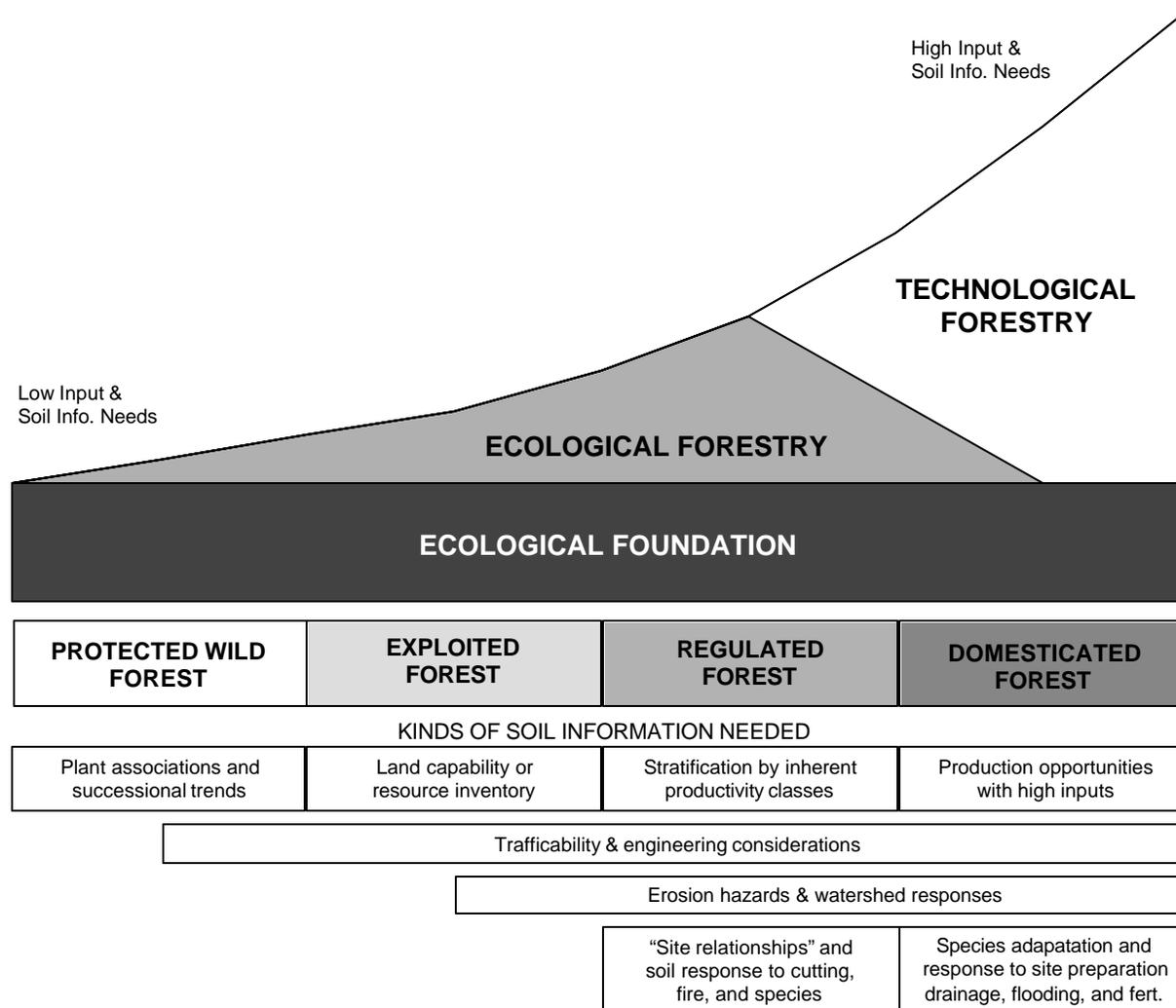
**Donnie Bradshaw**

**Kilsock Bay, Georgetown County, SC**

**Site index of 108 in 25 yr**

# BACKGROUND

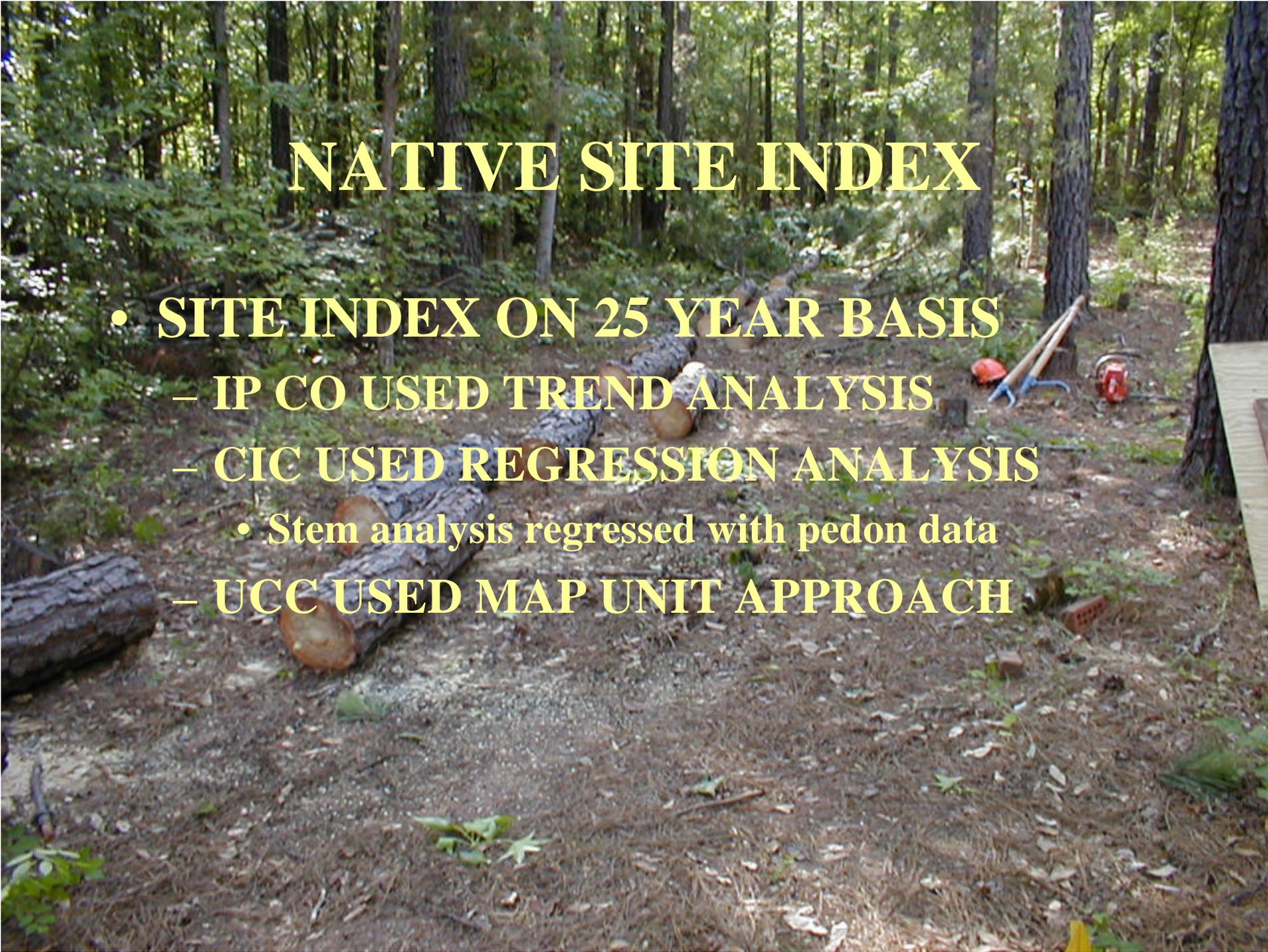
- INTERNATIONAL PAPER IS THE PRODUCT OF MERGERS AND ACQUISITIONS
- FEDERAL PAPER BOARD 1996
- UNION CAMP CORPORATION 1998
- CHAMPION INTERNATIONAL CORPORATION 2000
- 16 MILLION ACRES IN THE SOUTHEAST, NORTHEAST AND LAKE STATES
- EACH COMPANY USED SOILS DATA, ALTHOUGH IN SLIGHTLY DIFFERENT FASHIONS
- EACH COMPANY HAD ACTIVE SILVICULTURE AND TREE IMPROVEMENT RESEARCH PROGRAMS
- OUR CHALLENGE NOW IS TO INTEGRATE AND OPTIMIZE THE USE OF THESE EFFORTS



# USES OF SOILS DATA

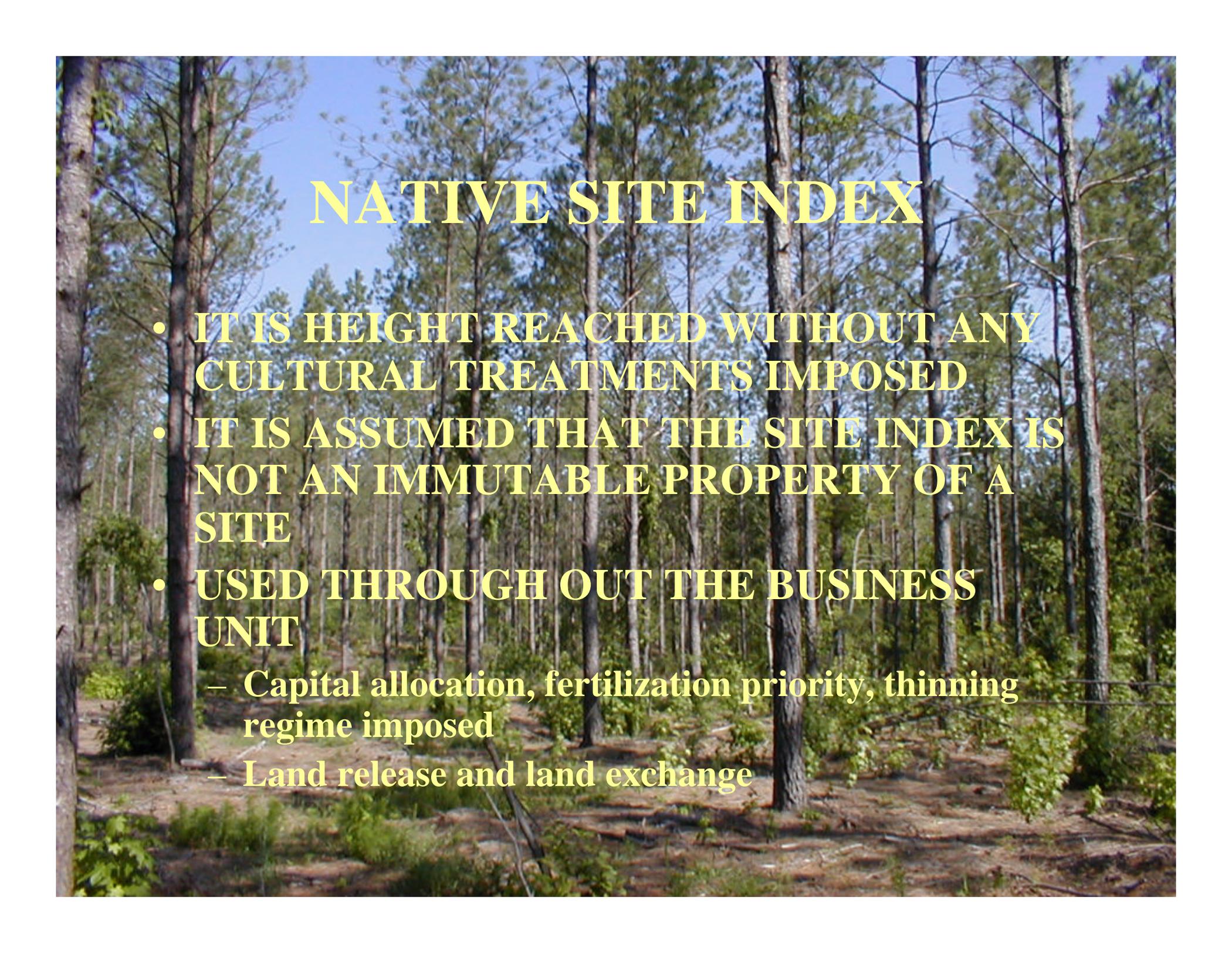


- NATIVE SITE INDEX PREDICTION
- PREDICT RESPONSE TO CULTURAL TREATMENT
- SITE-SPECIFIC REGENERATION PRESCRIPTIONS
- FERTILIZATION NEEDS AND RESPONSE
- GENOTYPE SELECTION
- TIMING OF HARVESTING OPERATIONS
- IDENTIFY NEED FOR BEST MANAGEMENT PRACTICES ON A SITE SPECIFIC BASIS
- EROSION HAZARD PREDICTION
- FOREST CHEMICAL USAGE
- ROAD CONSTRUCTION
- SPECIES SELECTION
- RESEARCH PLOT DESIGN AND LAYOUT

A photograph of a forest floor. In the foreground, there is a large, dark log lying on the ground. To the right, a chainsaw and a red helmet are visible. The background shows a dense forest with many trees and green foliage. The text is overlaid on the image in a yellow, serif font.

# NATIVE SITE INDEX

- **SITE INDEX ON 25 YEAR BASIS**
  - **IP CO USED TREND ANALYSIS**
  - **CIC USED REGRESSION ANALYSIS**
    - **Stem analysis regressed with pedon data**
  - **UCC USED MAP UNIT APPROACH**



# NATIVE SITE INDEX

- IT IS HEIGHT REACHED WITHOUT ANY CULTURAL TREATMENTS IMPOSED
- IT IS ASSUMED THAT THE SITE INDEX IS NOT AN IMMUTABLE PROPERTY OF A SITE
- USED THROUGH OUT THE BUSINESS UNIT
  - Capital allocation, fertilization priority, thinning regime imposed
  - Land release and land exchange

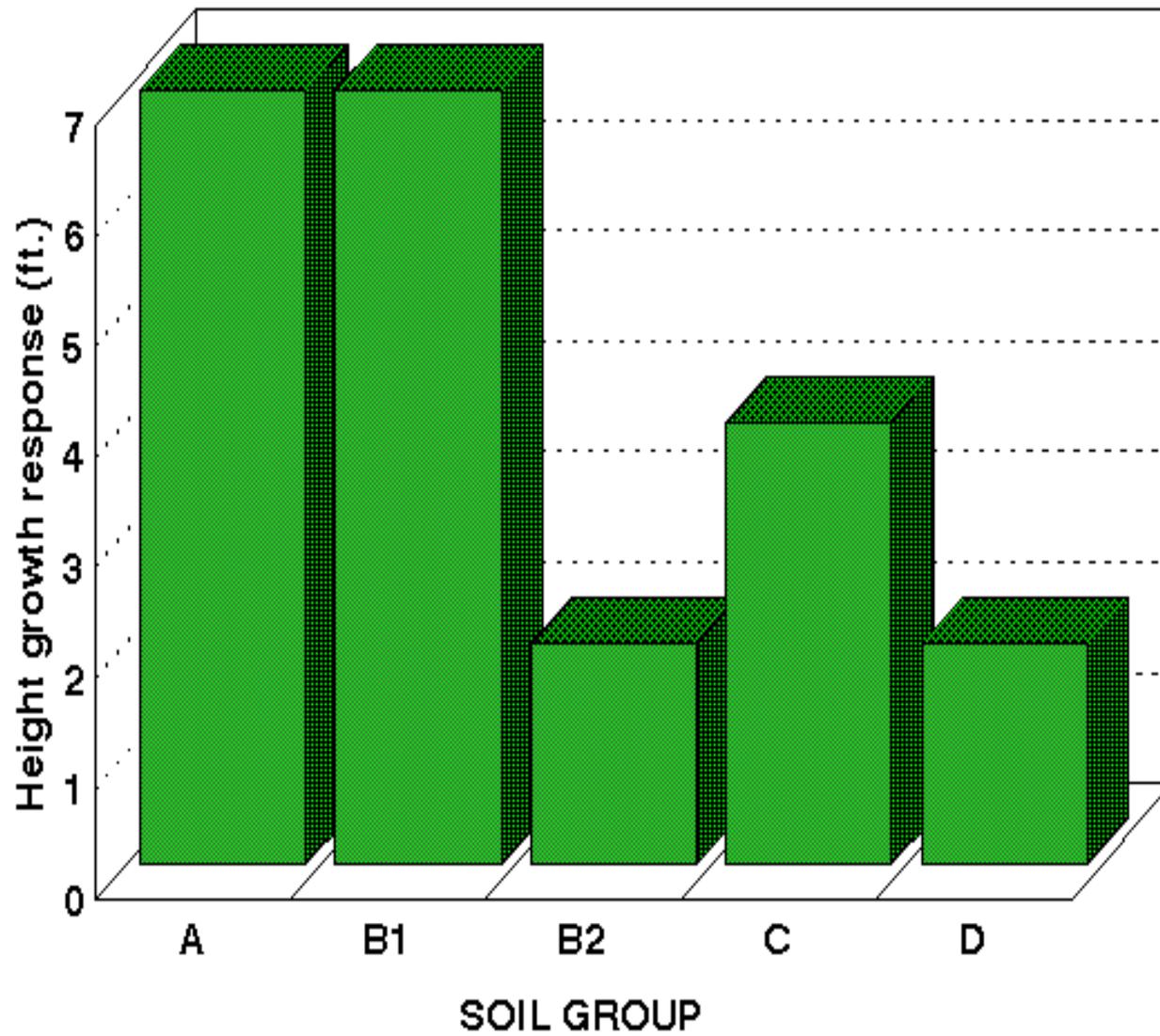
# RESPONSE TO CULTURAL TREATMENT

an Agricultural paradigm



- TILLAGE
  - BED
  - SUBSOIL
  - DISK
- FERTILIZATION
  - ESTABLISHMENT
  - MID-ROTATION
- THINNING
- HERBICIDE APPLICATION
  - Application rates are soil-dependent for some herbicides





Response to bedding on poorly drained soils. J.A. Gent, 1992



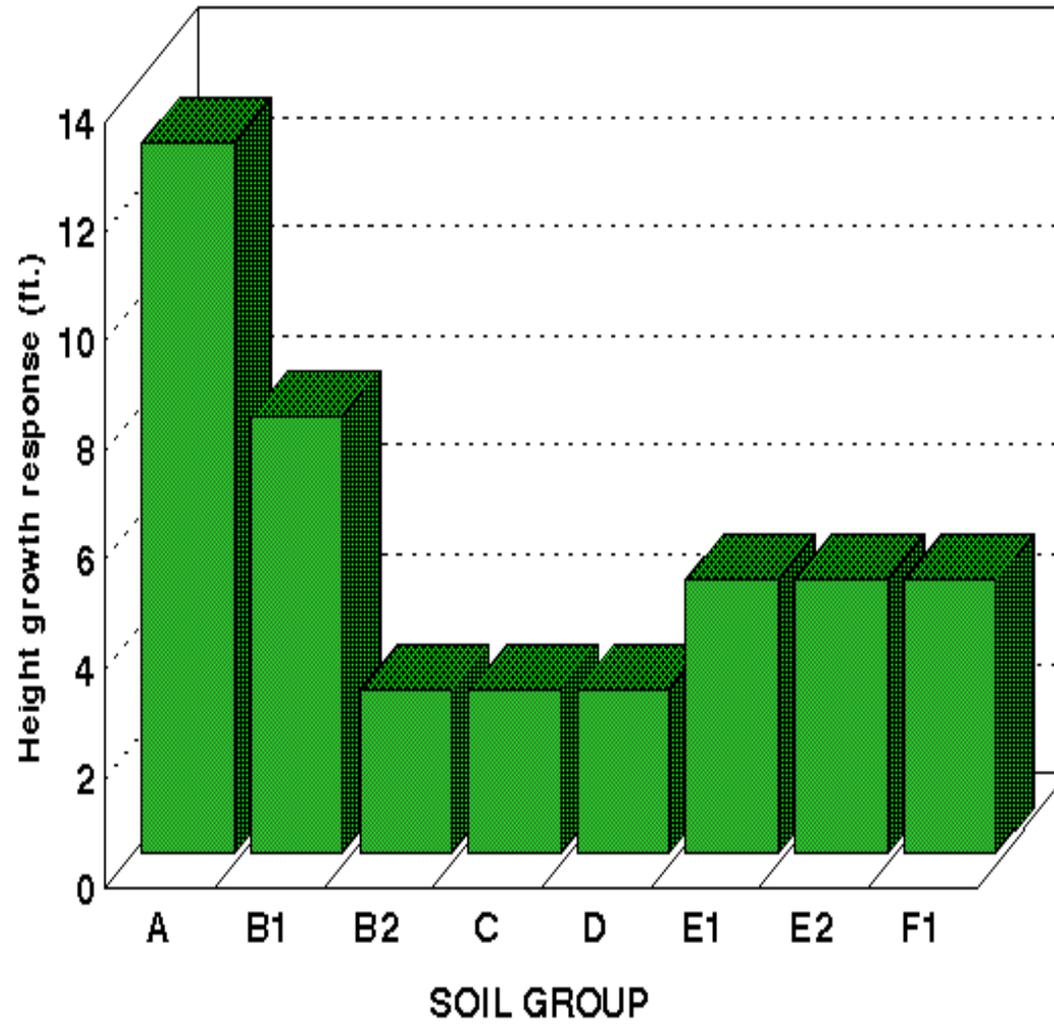


# REGENERATION PRESCRIPTION

- BASED ON SOIL AND SITE
- GUIDELINES ARE GIVEN FOR:
  - SPECIES SELECTION
  - TILLAGE
    - WETNESS
    - NATURALLY LIMITING LAYERS
    - COMPACTION FROM PAST USE
  - FERTILIZATION AT ESTABLISHMENT NEEDS
  - HERBACEOUS WEED CONTROL

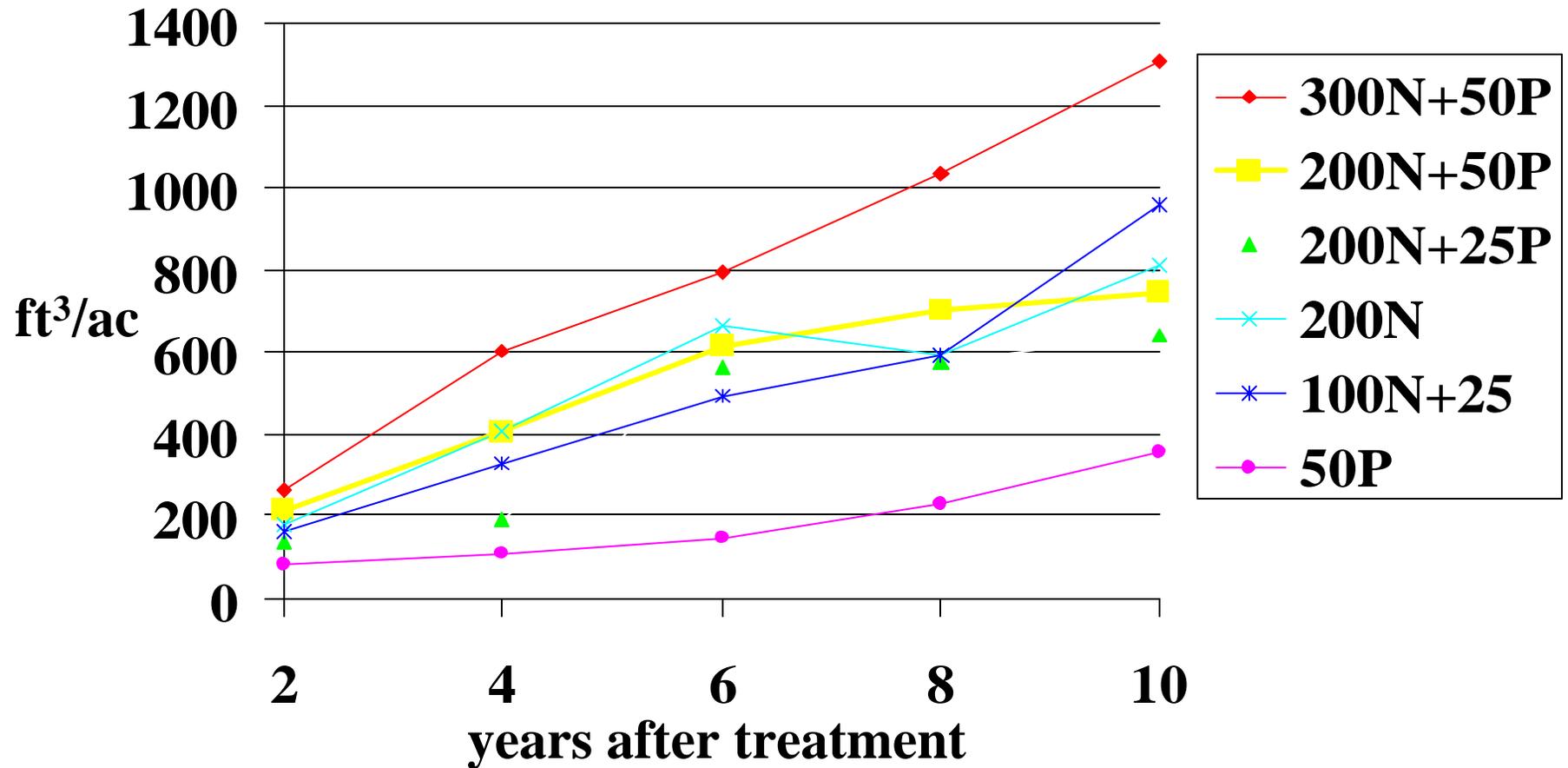
# FERTILIZATION

- GROWTH RESPONSE CLASSES ASSIGNED TO MAP UNITS
- BASED ON GEOLOGY AS WELL AS MAP UNIT
- MICRONUTRIENT NEEDS ARE ASSIGNED WHERE NEEDED
- MIDROTATION RATES ARE ASSIGNED SEPARATELY FROM ESTABLISHMENT RATES
  - Primarily a function of the stand being treated



Response to phosphorus fertilization at establishment by soil group J.A. Gent, 1992

## Regionwide 13 volume response to mid-rotation fertilization. Cecil series, Greenwood County, SC



## OTHER DATA USES



- EROSION HAZARD IDENTIFICATION
- WETLAND ISSUES
- WET WEATHER HARVESTING POTENTIAL
  - Rank sites based on harvesting potential during winter months and after rainfall
- WOOD PROCUREMENT
- TRAFFICABILITY







# FOREST ROADS



- CONSTRUCTION, DESIGN AND LAYOUT
- ROAD SUBGRADE MATERIAL
- ENGINEERING CLASSIFICATION FOR BINDING AGENT APPLICATION

# SPECIES



- LOBLOLLY IS THE DOMINANT SPECIES
  - GENOTYPE SELECTION IS BASED ON SOIL TYPE
- SLASH PINE IN SOME INSTANCES
- SAND PINE IN EVEN FEWER INSTANCES
- HYBRID POPLAR IN MINNESOTTA

## RESEARCH:



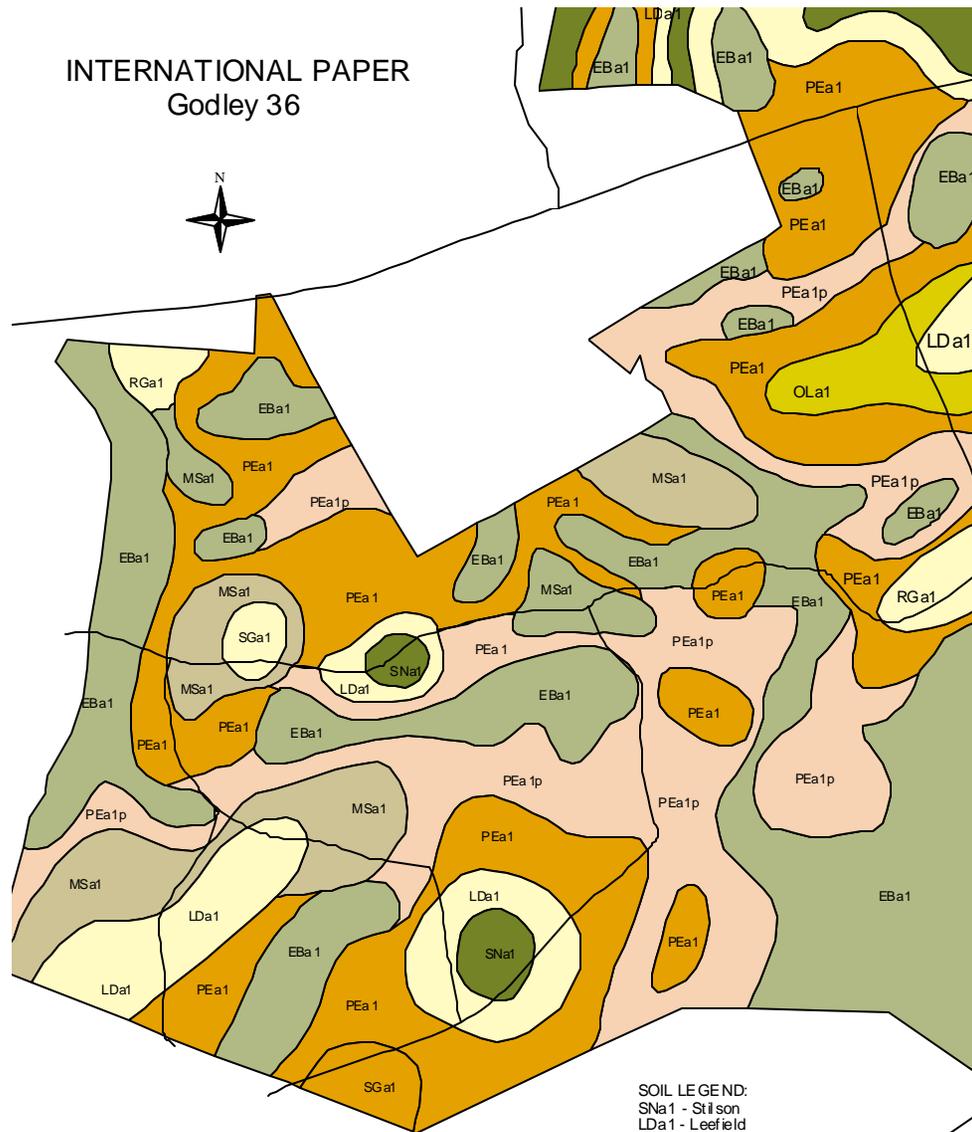
- TREE IMPROVEMENT/BREEDING TRIALS
- SPACING
- FERTILIZATION
- HERBICIDE
- GROUNDWATER CONTAMINATION  
HAZARD POTENTIAL FROM HERBICIDE  
APPLICATION
- PLOT DESIGN AND REPLICATION
- MAXIMUM CULTURE TRIALS

# DELIVERY OF SOILS DATA



- BOUND BOOKS IN MOST AREAS
- ARC INFO & ARCVIEW GIS TOOLS OF CHOICE
- MOVING TO A WEB BASED APPLICATION
- DYNAMIC SOIL DATA RECORDS
  - Updates are frequent based on current research findings
- MOVING TO AN ENTIRELY DIGITAL PRODUCT
- LIVE LINK FROM DIGITAL SOIL MAP TO SOIL SERIES DESCRIPTION, MAP UNIT DESCRIPTION, PHOTOGRAPHS AND INTERPRETATION TABLES

INTERNATIONAL PAPER  
Godley 36



SOIL LEGEND:  
SNa1 - Stilson  
LDa1 - Leefield  
RGA1 - Rigdon  
SGa1 - Seagate  
MSa1 - Mascotte  
OLa1 - Olustee  
PEa1 - Pelham  
PEa1p - Pelham - ponded  
EBa1 - Ellabelle





**NOT ASHAMED  
BAPTIST CHURCH**



*Pastor - Curtis L. Mitchell*