Table of Contents

1 Specific Gravity
   Clarification of terminology
   Precision perspective
   Fundamentals of specific gravity variation
   Within-ring specific gravity variation
   Within-tree specific gravity variation
     Cross-sectional variation
     Earlywood-latewood contributions
   Between tree variability
   Heritability
   Effect of growth rate on specific gravity
   Effect of diameter on end product specific gravity
   Effect of site index on specific gravity
   Effect of geographic location on specific gravity
   Summary of major points on specific gravity

2 Fiber Length
   Clarification of terminology
   Factors controlling fiber length
   Within-tree variation in fiber length
   Earlywood vs. latewood tracheid length
   Significance of within-tree variation in fiber length
   Summary of major points on fiber length

3 Fibril Angle
   Primary factors influencing fibril angle
   Within-tree variation in fibril angle
   Relation of fibril angle to strength properties
     Relation of fibril angle to shrinkage
     Significance of fibril angle variation
     Summary of major points on fibril angle

4 Effect of Cultural Practices: Thinning, Fertilization, and Pruning
   Thinning effects on specific gravity
   Thinning effects on other properties: fiber length, compression wood, and straightness
   Fiber length
   Compression wood
   Straightness
   Fertilization effects on specific gravity
   Fertilization effects on fiber length
   Effects of pruning on specific gravity
   Summary of cultural treatment effects
     Thinning
     Fertilization
     Pruning

Bibliography

Subject Index
crown wood; in young trees
density
false rings
fiber
fiber length; affected by growth rate, cambial initial, controlling factors, effect of fertilization, impact on paper properties, increase in, influence of butt swell, influence of growth rate, internode length, relationship to fiber angle, within-tree variation, significance of fiber tracheids
fibril angle; butt logs, influence on, influence of tracheid length, longitudinal shrinkage, measurement of, modulus of elasticity, modulus of rupture, patterns of, relationship to fiber length, relation to shrinkage, theoretical equation for, relation to paper strength, specific gravity relationship, tracheid length, within-tree variation
fibril angle variation; significance of

green volume
heartwood
heritability; broad-sense, narrow-sense
juvenile wood

latewood percentage; variation in libriform fibers
microfibrils; influence of moisture content; determination of
new needle maturity
nitrogen fertilization
overcrowding; effects on specific gravity
periclinal cambial division
phloem
photosynthate; translocation of photosynthesis principle of archimedes
ray cells

root wood; transition to site; variation of site index; by dominant trees, effect on percentage corewood, effect on specific gravity, rising values
specific gravity; base of the tree, between-tree genetic variation, characteristics, diameter, effect on end product, earlywood contributions, effect of fertilization, duration of influence, cell production, frequency of doses, on crown, on tracheid diameter, on wall thickness, effect of geographic location, effect of pruning, on crown, effect of site index, end product, environmental factors, function of biological age, genetic control, green volume, growth rate, effect on density, heritability, narrow-sense, traits, influence, latewood contributions, lower bole, ovendry weight, ring position, values, error control, variation, crown, physiologic, within-ring, within-tree, versus fiber length, versus fibril angle, volume basis, volume-ovendry weight basis, weight basis stocking density

thinning effects on; compression wood, fiber length, specific gravity, straightness
tracheid; cambial initial, length, earlywood, influenced by internode, latewood
vascular cambium
water displacement
water molecules
within-ring specific gravity; evaluation of within-tree; fiber length variation, pattern in wood density; measure of wood;
extractives, produced by, rehydration of, substance of xylem

young trees