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研究报告

水曲柳根系生物量、比根长和根长密度的分布格局

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摘要

采用连续钻取土芯法在生长季内对东北林业大学帽儿山实验林场17年生水曲柳人工林根系取样，研究水曲柳不同直径根系现存生物量、比根长和根长密度及垂直分布状况.结果表明，水曲柳人工林根系总生物量为 1 637.6 g·m^{-2}，其中活根生物量占85%，死根占15%.在活根生物量当中，粗根(直径5～30 mm)占的比例最高（69.95%），其次为活细根（直径<1 mm，13.53%），小根(1～2 mm)和中等直径的根(2～5 mm)比例较小（分别为7.21%和9.31%）.直径<1 mm活细根的比根长为32.20 m·g^{-1}，直径5～30 mm粗根的比根长为0.08 m·g^{-1}.单位面积上活根的总长度为 6 602.54 m·m^{-2}，其中直径<1 mm的细根占92.43%，其它直径等级则不到活根总长度的8%.直径<1 mm的细根生物量与根长密度具显著线性关系（R^2=0.923），但与比根长无显著相关关系（R^2=0.134）.

关键词 水曲柳 根系生物量 比根长 根长密度

分类号

Distribution patterns of *Fraxinus mandshurica* root biomass,specific root length and root length density

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Abstract

Employing soil core method,an investigation in Maoershan Experiment Station was made on the root biomass,specific root length (SRL),and root length density (RLD) of *Fraxinus mandshurica* plantation (17 yr) within a growth season in stand level.The results showed that the total root biomass was 1 637 g·m^{-2},in which,living biomass accounted for 85%,and necrotic biomass was 15%.In the living biomass,coarse roots (5～30 mm in diameter) had the highest percentage (69.95%),followed by fine roots (<1 mm in diameter) (13.53%),medium roots (2～5 mm in diameter) (7.21%),and small roots (1～2 mm in diameter) (9.31%).Among the four diameter classes,fine roots had a higher SRL (32.20 m·g^{-1}),while coarse roots had a lower one (0.08 m·g^{-1}).The total RLD in living biomass was 6 602.54 m·m^{-2} in stand level,among which,fine root accounted for 92.43%,and the others was less than 8%.Fine root biomass and RLD had a positive correlation with soil available nitrogen,while no significant correlation was found between SRL and soil available nitrogen.

Key words

Fraxinus mandshurica Root biomass Specific root length Root length density

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