A COMPARISON OF EVAPOTRANSPIRATION FROM MIXED OAK AND WHITE PINE

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ABSTRACT

Soil moisture was monitored weekly to a depth of seven feet under mixed oak and white pine forest stands on the W. Alton Jones Campus, University of Rhode Island Biological Research Area, West Greenwich, Rhode Island. Soil moisture was monitored from May 14 to October 5, 1971 using a neutron probe and portable scaler in an effort to determine evapotranspiration losses. Evapotranspiration was calculated using the soil water budget method where: ET = Precipitation $\pm$ Change in Soil Moisture Storage.

Mean water-holding capacity for the surface seven feet of soil under mixed oak was 16.2 inches and 13.7 inches under white pine. The soil profile beneath the two forest types lost and gained water together. Soil moisture content beneath the two forest types differed less during dry, low-rainfall periods. Soil moisture contents under oaks tended to be higher than soil moisture contents under the pines during wet weather and lower during dry periods. More water tended to be lost from the surface layers of the profile regardless of forest-cover type. In fact, 90% of the total seasonal loss tallied for the 0- to 7-foot profile was extracted from the 0- to 4-foot profile.

Evapotranspiration loss from forest stands on soils of similar water-holding capacity was not significantly

different for the study period. White pine evapotranspired 18.7 inches water, while mixed oak evapotranspired 19.4 inches. Examined on a monthly basis oaks evapotranspired more water than pines in June, even though the pines commenced evapotranspiration about one week earlier. During the September depletion period pine lost slightly more water than oak.

Empirical formulae were employed in determining potential evapotranspiration. Both formulae tend to approximate the actual evapotranspiration loss from white pine. However, for oak these formulae tend to underestimate actual evapotranspiration during the early part of the growing season, and overestimate it during the latter part of the growing season.