

Primary production of plant communities in old clearing areas at Sakaerat Environmental Research Station, Pak Thongchai, Nakhonratchasima.

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ABSTRACT

The aboveground net primary production of plant communities in old-clearing areas, 2, 4, 7 and 10 years of age and dry evergreen forest at Sakaerat Environmental Research Station, Pakthongchai, Nakhon Ratchasima, was investigated during August, 1978 to August, 1979. One sample plot size 12 X 48 m.² was established in each old-clearing area, while the other sample plot size 50X50 m.² was established in DEF stand, for studying DBH growth of trees over 4.5 cm. DBH which were measured at two times. The first measurement was in August, 1978 and September, 1978 for DEF stand and old-clearing areas respectively, while the second measurement was in August, 1979 for all stands. DBH dimension of each tree was used for estimating biomass of individual tree from the already established allometric equations. In each sample plot was subdivided into 36 sub-plots (4 X 4 m.²), 3 sub-plots were monthly random for studying biomass of trees and shrubs under 4.5 cm. DBH. While the biomass of seedlings, herbs, climbers, and grasses were investigated in sub-sub-plot (1 X 1 m.²) randomly located within each 4.4 m.² plot. Biomass of all plant types in this layer were estimated through the direct harvest method. Standing dead and litter fall during the study period were also monthly collected in each 1 X 1 m.² plot. For estimating biomass of undergrowth layers, each plant type was sorted into trees and shrubs under 4.5 cm. DBH, climbers, herbs and grasses. In each type, fresh biomass was weighted separately into stem, branch (or wood), leaf, and standing dead component. Sub-samples of each component in each plant type were oven-dried weight basis. Rate of biomass increment, rate of biomass loss and net primary production were investigated. The results of this study are summarized as follows:

1) Total aboveground biomass including tree layer and undergrowth layer are 582.30, 32.17, 17.00, 16.35 and 9.35 ton/ha in DEF stand; 4, 7, 10 and 2 years old clearing stands respectively.

While the distribution of the aboveground biomass of plant types in each stand are as follows;

2-years old-clearing stand : grasses > herbs > seedlings > climbers > trees;

4-years old-clearing stand : trees > seedlings > climbers > herbs > grasses;

7-years old-clearing stand : trees > herbs > seedlings > grasses > climbers;

10-years old-clearing stand : trees > grasses > seedlings > climbers > herbs;

DEF stand : trees > seedlings > climbers > herbs > and none for grasses.

2) Rate of total aboveground biomass increment including tree and undergrowth layer are 55.19, 50.47, 27.54, 16.90 and 6.55 ton/ha/yr for 4, 7, 10, 2 years old-clearing and DEF stands respectively. While the distribution of the aboveground biomass increment of plant type in each stand are as follows;

2-years old-clearing stand : grasses > herbs > seedlings > climbers > trees;

4-years old-clearing stand : herbs > grasses > seedlings > climbers > trees;

7-years old-clearing stand : herbs > grasses > seedlings > climbers > trees;

10-years old-clearing stand : grasses > herbs > seedlings > trees > climbers;

DEF stand : trees > climbers > seedlings > herbs and none of grasses.

3) Rate of biomass loss by standing dead are 8.94, 6.43, 4.59, 2.15 and 1.61 ton/ha/yr for DEF stand and 2, 10, 7 and 4 years old-clearing stands respectively. While the loss by litterfall are 8.20, 7.60, 6.06, 4.72 and 3.35 ton/ha/yr for 4 years old-clearing, DEF 7, 10 and 2 years old-clearing stands respectively. Rate of total aboveground biomass loss are 16.55, 9.81, 9.78, 9.31 and 8.20 ton/ha/yr for DEF 4, 2, 10 and 7 years old-clearing stands respectively. Net primary production are 64.99, 58.67, 36.84, 26.68 and 23.09 ton/ha/yr for stands of 4, 7, 10, 2 years old-clearing and DEF stand respectively.