

BIOMASS ALLOCATION AND GROWTH DATA OF SEEDED PLANTS

Summary:

This data set of leaf, stem, and root biomass for various plant taxa was compiled from the primary literature of the 20th century with a significant portion derived from Cannell (1982). Recent allometric additions include measurements made by Niklas, Enquist, and colleagues (Niklas, 2003).

This is a unique data set with which to evaluate allometric patterns of standing biomass within and across the broad spectrum of vascular plant species. Despite its importance to ecology, global climate research, and evolutionary and ecological theory, the general principles underlying how plant metabolic production is allocated to above- and below-ground biomass remain unclear. The resulting uncertainty severely limits the accuracy of models for many ecologically and evolutionarily important phenomena across taxonomically diverse communities. Thus, although quantitative assessments of biomass allocation patterns are central to biology, theoretical or empirical assessments of these patterns remain contentious.

Data tables from Cannell (1982) are provided as companion documents (ftp://daac.ornl.gov/data/global_vegetation/biomass_allocation/comp/).

Data Citation:

Cite this data set as follows:

Niklas, K. J., and B. J. Enquist. 2004. Biomass Allocation and Growth Data of Seeded Plants. Data set. Available on-line [<http://www.daac.ornl.gov>] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A.
[doi:10.3334/ORNLDAAC/703](https://doi.org/10.3334/ORNLDAAC/703).

References:

Cannell M. G. R. 1982. World Forest Biomass and Primary Production Data. Academic Press. London. 391 pp.

Enquist, B. J., and K. J. Niklas. 2002. Global Allocation Rules for Patterns of Biomass Partitioning in Seed Plants. *Science* 295: 1517-1520.

Niklas, K. J. 2003. Reexamination of a canonical model for plant organ biomass partitioning. *Am. J. Bot.* 90: 250-254.

Niklas, K. J. Niklas, unpublished data, Cornell University, Ithaca, New York, 2003.

Niklas, K. J., and B. J. Enquist. 2002. Canonical rules for plant organ biomass partitioning and annual allocation. *Am. J. Bot.* 89: 812-819.

Sack, L., T. Maranon, P. J. Grubb, B. J. Enquist, and K. J. Niklas. 2002. Global Allocation Rules for Patterns of Biomass Partitioning. *Science* 296: 1923a-1923.

Data Format:

For user convenience the data are provided in both .xls (Microsoft Excel 2002) and .csv formats. These files are organized into four general sections: the taxa and literature citation, plant characteristics of age and height (measured and log10 transformed), biomass allocation (measured and log10 transformed), and growth (measured and log10 transformed).

Cells with no data have values of -999. No rounding of measured, derived, or log transformed values has been performed. Some measured values have excess decimal places (e.g., 10.180412371134), but other values in the same column (e.g., 0.0000252) need several decimal places. The data user should round final result values as appropriate or consider scientific notation.

Column Heading	Units
Taxa	Taxa footnotes, "[a]", are found in Column C.
Citation	Literature or other reference. Cannell (1982) source page given***
Footnotes	Footnotes from respective pages of Cannell (1982).
Record Number	Original table order for sorting purposes.
age	years
log age	log10 years
height	m
log height	log10 m
root biomass	kg dry wgt per plant
log root	log10 kg dry wgt per plant
stem biomass	kg dry wgt per plant
log stem	log10 kg dry wgt per plant
leaf biomass	kg dry wgt per plant
log leaf	log10 kg dry wgt per plant
shoot biomass	kg dry wgt per plant
log shoot	log10 kg dry wgt per plant
reproduction biomass	kg dry wgt per plant
log repro	log10 kg dry wgt per plant
total biomass (root+stem+leaf)	kg dry wgt per plant
log total (root+stem+leaf)	log10 kg dry wgt per plant

stem growth (power 10**(V))	kg dry wgt gained per plant per year
log stem growth	log10 kg dry wgt gained per plant per year
leaf growth (power 10**(X))	kg dry wgt gained per plant per year
log leaf growth	log10 kg dry wgt gained per plant per year
root growth (power 10**(Z))	kg dry wgt gained per plant per year
log root growth	log10 kg dry wgt gained per plant per year
total growth (power 10**(AB))	kg dry wgt gained per plant per year
log total growth	log10 kg dry wgt gained per plant per year

*** Cannell (1982) source data tables for the respective rows are provided as companion documents (ftp://daac.ornl.gov/data/global_vegetation/biomass_allocation/comp/) with the data set. These tables are reprinted from Cannell (1982) with the permission of Elsevier [<http://www.elsevier.com>] and may not be used for any other purpose.

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