

**Table 1. Time it takes to grow a ream of office paper and a #10 envelope**

Tree Species	Wood Density	Wood Volume		Growth Rate				Time to Grow				Time to Grow			
		of 16.7 lbs	of 0.004 lbs	Annual		Daily <sup>^</sup>		on 1 acre				on 100 acres			
				Average	Optimal	Average	Optimal	Ream		Envelope		Ream		Envelope	
		lb/ft <sup>3</sup>	ft <sup>3</sup>	ft <sup>3</sup> /acre/y		ft <sup>3</sup> /acre/day		days		minutes		hours		seconds	
<b>Native Aspen<sup>1</sup></b> <i>(Populus tremuloides)</i>	25	0.67	0.0002	32.0	64.0	0.09	0.18	7.6	3.8	2.6	1.3	1.8	0.9	1.6	NA
<b>Hybrid Aspen<sup>1</sup></b> <i>(Populus tremuloides)</i>	25	0.67	0.0002	128.0	320.0	0.35	0.88	1.9	0.8	0.7	0.3	0.5	0.2	0.4	NA
<b>Balsam Fir<sup>2</sup></b> <i>(Abies balsamea)</i>	25	0.67	0.0002	50.0	NA	0.14	NA	4.9	NA	1.7	NA	1.2	NA	1.0	NA
<b>Loblolly Pine<sup>3</sup></b> <i>(Pinus taeda)</i>	37	0.45	0.0001	114.7	172.5	0.31	0.47	1.4	1.0	0.5	0.3	0.3	0.2	0.3	NA
<b>Lodgepole Pine<sup>4</sup></b> <i>(Pinus contorta)</i>	27	0.62	0.0001	45.9	126.7	0.13	0.35	4.9	1.8	1.7	0.6	1.2	0.4	1.0	NA
<b>Slash Pine<sup>3</sup></b> <i>(Pinus elliotii)</i>	39	0.43	0.0001	97.9	131.7	0.27	0.36	1.6	1.2	0.6	0.4	0.4	0.3	0.3	NA
<b>White Pine<sup>5</sup></b> <i>(Pinus strobus)</i>	23	0.73	0.0002	41.2	74.0	0.11	0.20	6.4	3.6	2.2	1.2	1.5	0.9	1.3	NA
<b>Black Spruce<sup>5</sup></b> <i>(Picea mariana)</i>	28	0.60	0.0001	24.1	59.5	0.07	0.16	9.0	3.7	3.1	1.3	2.2	0.9	1.9	NA
<b>White Spruce<sup>6</sup></b> <i>(Picea glauca)</i>	28	0.60	0.0001	61.8	95.7	0.17	0.26	3.5	2.3	1.2	0.8	0.8	0.5	0.7	NA

**Assumptions:**

A typical ream of 500-p office paper (8.5"x11") weighs 5 lbs and that it takes 16.7 lbs of wood to produce the ream.  
A standard #10 envelope (4 1/8"x 9 1/2") weighs 0.0013 lbs and that it takes 0.004 lbs of wood to produce the envelope.  
Wood is about 50% moisture so 1 lb of debarked tree gives about 0.5 lb oven dried wood which in turn produces about 0.25 lb pulp.  
Office paper is typically made of 20% filler, 10% long fiber (such as pine) and 70% hardwood (such as aspen).  
When we add 20% filler we get 0.3 lb paper from our 1 lb of wood. Thus, to get our 5 lbs of paper, we need about 16.7 lbs of wood.  
The envelope is made from the same quality of paper as the ream so the ratio of wood to paper is assumed to be the same.  
<sup>^</sup> Daily growth rate calculated assuming tree grows 365 days per year.

1. National Council for Air and Stream Improvement, Inc. (NCASI). 2008. Aspen in the Lake States: A research review. Technical Bulletin No. 955. Research Triangle Park, N.C.
2. T.VanBuskirk, New Brunswick, personal communication
3. Coble, D.W. and Pendergast, K. 2014. Project Report #69. Observed growth and yield of loblolly and slash pine plantations in East Texas. Informal Projects Report Paper.
4. Johnstone, W.D. 1976. Variable-density yield tables for natural stands of Lodgepole Pine in Alberta. Canadian Forestry Service. Forestry Technical Report 20, Ottawa, Canada.
5. Plonski's Normal Yield Tables at <http://flash.lakeheadu.ca/~fluckai/nytweb.html> - Accessed November 2014
6. Pollack, J.C., W.D. Johnstone, K.D.Coates, and P.LePage. 1992. The influence of initial espacement on the growth of a 32-year-old white spruce plantation. B.C. Min. For., Res. Br., Victoria, B.C., Res. Note 111. p.16.