

Simple comparison characteristics for 3 biomass crops:

Crop	Moisture at harvest (wt%)	Moisture air dry (wt%)	Combustion ash (wt%)	Volatile matter (%)	Cellulose (%)	Hemicellulose (%)	Lignin (%)	Fixed carbon (%)	Calorific value (MJ/kg)	Optimum annual yield (tDM/ha)
Willow	50 ¹	30 ¹ - 9.08 ²	6.17 ± 3.7 ²	69.2 ± 5.08 ²	38 - 45.6 ⁷	23.8 - 32.4 ⁷	23.1 - 29.6 ⁷	15.55 ± 1.99 ²	18.79 ± 0.40 ²	24.6 ¹⁰
Switchgrass	15 ⁴	12 (baled) ⁵	4.5 - 5.8 ⁴	73 ⁶	28.8 - 43.4 ⁸	30.4 - 35.9 ⁸	18.9 - 23.9 ⁸	14.8 - 16.08 ¹¹	16.7 ¹²	19 ¹³
Paulownia	21.31 ³	10 ³ - 7.74 ²	5.28 ²	68.68 ²	46 - 49 ⁹	22 - 25 ⁹	21 - 23 ⁹	18.29 ²	17.96 ²	45.24 ¹⁴

¹ S. Ledin, 1996. Willow wood properties, production and economy.

² Liao Cuiping, Wu Chuangzhi, Yanyongjie, Huang Haitao, 2004. Chemical elemental characteristics of biomass fuels in China.

³ Zhu Zhao-Hua, 1986. Paulownia in China. Cultivation and Utilization.

⁴ S. B. McLaughlin, R. Samson, D. Bransby, A. Wiseloge, 1996. Evaluating physical, chemical and energetic properties of perennial grasses as biofuels.

⁵ RenewableEnergyWorld.Com article 19 June 2006. Switchgrass Burn Test Proves Hopeful.

⁶ Jerod Smeenk, George Steinfeld, Robert C. Brown, Eric Simpkins and M. Robert Dawson. Evaluation of an Integrated Biomass Gasification/Fuel Cell Power Plant.

⁷ Jozef Kúdela, Stanislav Kurjatko, 2002. Wood Structure and Properties '02. Proceedings of the 4th IUFRO Symposium "Wood Structure and Properties".

⁸ FAIR 5-CT97-3701 Switchgrass as an alternative energy crop in Europe, Final Report for the period from 01-04-1998 to 30-09-2001

⁹ El-Showk, S. and El-Showk, N., 2003. The Paulownia Tree - An alternative for sustainable forestry.

¹⁰ Szczukowski S., Tworowski J., Przyborowski J., Stolarski M., 2001. Productivity of willow coppice in relation to kind of propagation material.

¹¹ David A. Tillman, N. S. Harding, 2004. Fuels of Opportunity: Characteristics and Uses in Combustion Systems.

¹² A. Montia, S. Fazioa, V. Lychnarasb, P. Soldatosb and G. Ventura, 2006. A full economic analysis of switchgrass under different scenarios in Italy estimated by BEE model.

¹³ Roger G. Fuentes and Charles M. Taliaferro, 2002. Biomass Yield Stability of Switchgrass Cultivars.

¹⁴ Based on TGG trialling. 3,000 stem/ha optimum estimated total yield of 348 m³/ha each 2 year regenerated rotation with 260kg/m³ air dry density. Initial yield over 3 years equates annually to 30.16 tDM/ha.