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Biological fixation of atmospheric nitrogen by *Robinia pseudoacacia* L. in short-rotation plantations on post-mining sites in Lower Lusatia (Brandenburg, NE Germany)

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As an early successional and nitrogen-fixing tree species black locust (*Robinia pseudoacacia*) grows rapidly even under unfavourable site conditions. Moreover, it is comparatively drought-tolerant and nevertheless produces a dense and high quality wood. Annual production of oven-dried biomass is up to 6 t ha⁻¹. For these reasons, it is highly likely that the importance of black locust for biomass production for bioenergy production with short rotation plantations and agroforestry systems will increase in Brandenburg within the next decades. In this paper we present measurements of biological N fixation (BNF) in leaves obtained by the natural ¹⁵N abundance method and use the results to estimate the annual nitrogen input by black locust. The study was carried out on recultivation sites in the opencast lignite mining area of Welzow-South. As a non-nitrogen fixing reference tree *Quercus rubra* was used. The averaged nitrogen content in the leaves of black locust ranged from 3.1% (C/N 14.8) in 15 years old trees to 3.4% (C/N 14.4) in 2 year-old trees, respectively. A higher content of nitrogen was found in leaves of re-sprouted trees with 4.3% (C/N 11.5). The estimated percentage of nitrogen derived from the atmosphere (% NdfA) in black locust was 63% – 83% compared to 56% in *Hippophaë* and 79% in *Genista*. Their nitrogen fixation ability plays an important role for the improvement of soil fertility of marginal lands and of recultivated ecosystems and landscapes.