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生物炭生产与农用的意义及国内外动态

Implications of production and agricultural utilization of biochar and its international dynamic

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中文摘要:

近年来,生物炭作为土壤改良剂、肥料缓释载体及碳封存剂备受重视。生物炭在土壤中能够保持数百年至数千年,实现碳的封存固定,生物炭还可以改善土壤理化性质及微生物的活性,培肥土壤肥力,延缓肥料养分释放,降低肥料及土壤养分的损失,减轻土壤污染。生物质的热裂解及气化均可产生生物炭,但是慢速热裂解和热水炭化工艺的生物炭产率最大,同时还可获得生物油及混合气,生物油及混合气可升级加工为氢气、生物柴油或化学品,这有助于减轻对化石能源或原料的依赖。生物炭的生产及农用是碳减排的过程,废弃生物质生产生物炭及其农用的效益是多赢的。国外在废弃生物质热裂解生产生物炭及农用方面做了许多研究工作。中国在生物质热裂解获得生物能源方面做了较多工作,但对生物炭的生产及农用重视不够。今后,中国应以废弃生物质生产生物炭,并将生物炭农用作为生物能源、环境及农业可持续发展的战略。

英文摘要:

Much attention recently focus on biochar as a kind of soil amendment, slow-release carrier for fertilizer and carbon sequestrating agent. Biochar can sequester carbon in soil for hundreds to thousands of years, and improve the physical and chemical properties and activity of microbes, soil fertility, and delay nutrient release of fertilizer, as well as reduce nutrient losses from fertilizer and soil, and alleviate soil pollution. Both pyrolysis and gasification of biomass can yield biochar. However, the maximum yield of biochar occurs in slow pyrolysis and hydrothermal carbonization, which can produces bio-oil and syngas, and ulteriorly upgraded them into hydrogen, biodiesel or chemicals. So it can reduce dependence of human on fossil energy or raw materials. Agricultural utilization of biochar produced from waste biomass is carbon-negative process which has multi-win benefits for human being. Much work on the biochar produced by pyrolysis of waste biomass and its agricultural utilization were done abroad. In China, much work was done about bioenergy acquired from pyrolysis of biomass, but less attention was paid on the production and agricultural utilization of biochar. In the future, China should take the strategy for sustainable development of bioenergy, environment and agriculture through biochar production from slow pyrolysis or hydrothermal carbonization of waste biomass and its utilization in agricultural

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