

# Bioethanol production from agricultural wastes an overview renewable energy

Agriculture is the second-largest greenhouse gas (GHGs) contributor to the environment (19.9%) after the energy sector (68.1%) (Lamb et al., 2021) and generated a huge amount of solid waste (Kamusoko et al., 2021) discriminate dumping and crop residue (CR) burning cause human and environmental health problems and poses threats to food and ...

Bioenergy refers to the production of renewable energy from biomass along with maintaining sustainability ... Bioethanol: 7.38% [342] Edible oil wastes: NA: NA: NA: NA: Filtered, heated at 1200°C: Transesterification: Biodiesel: ... Method employed for biohydrogen production Agricultural waste feed stock Maximum Biohydrogen yield

This potential of SSF makes it an appropriate process for enzymatic pretreatment and hydrolysis of substrates and subsequent bioethanol production. This review gives an overview of the applications of SSF in every step of bioethanol production; compares its efficiency and feasibility with the submerged fermentation process; and for brevity of ...

Due to rapid growth in population and industrialization, worldwide ethanol demand is increasing continuously. Conventional crops such as corn and sugarcane are unable to meet the global demand of bioethanol production due to their primary value of food and feed. Therefore, lignocellulosic substances such as agricultural wastes are attractive feedstocks for bioethanol ...

Scheme of potential feedstocks for bioethanol production. Data from Renewable Fuels ... (2012) Bioethanol production from agricultural wastes: an overview. *Renew Energy* 37(1):19-27. ... Prince William SPM, Gadhe A, Rath R, Vaidya AN, Wate S (2014) Pretreatment of banana agricultural waste for bio-ethanol production: individual and interactive ...

Unlike other renewable energy sources, ... is collaborating with industry to develop next-generation biofuels made from wastes, cellulosic biomass, and algae-based resources. BETO is focused on the production of hydrocarbon biofuels--also known as "drop-in" fuels--which can serve as petroleum substitutes in existing refineries, tanks ...

The use of agricultural feedstock for bioethanol production is encouraged (Arshad et al. 2018c, d). For the production of bioethanol from renewable energy resources like (cellulosic biomass), pretreatment is required, breakdown of hemicelluloses into simple sugars that can be converted into ethanol.

Sarkar N et al (2012) Bioethanol production from agricultural waste: an overview. In: *Renewal energy*, vol 37. Elsevier, West Bengal, India, pp 17-27. Google Scholar Shah V et al (2010) Influence of iron and copper nanoparticle powder on the production of lignocellulose degrading enzymes in the fungus *Trametes versicolor*.

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1.4.1 Bioethanol. Agricultural residues such as sugarcane bagasse, wheat and rice straw, corn stover, and sugar beet are used in production of bioethanol (Kim and Dale 2004; Sarkar et al. 2012). Bagasse is the most abundant agricultural residues used in synthesis of bioethanol (Canilha et al. 2012). Pretreatment, hydrolysis, and fermentation of sugars are the ...

Waste from the food is a challenge to the environment all over the globe, hence there is need to be recycled. Vegetables and fruits biomass is a resource of renewable energy with significant fuel source potential for the ...

Sarkar N, Ghosh SK, Bannerjee S, Aikat K (2012) Bioethanol production from agricultural wastes: an overview. *Renew Energy* 37:19-27. Article CAS Google Scholar Sewsynker-Sukai Y, Kana EBG (2018) Simultaneous saccharification and bioethanol production from corn cobs: process optimization and kinetic studies.

A waste to energy facility is an important system in the bioethanol manufacturing process from lignocellulosic biomass. Because second-generation lignocellulosic biomass is produced in many source-based places such as ...

Furthermore, the Cumulative Energy Demand analysis highlighted a significant reliance on fossil fuels from agricultural biomass throughout the bioethanol production process. The energy balance analysis shows that the agricultural residues are feasible for bioethanol production with NER of 1.20, 3.10, and 3.28 for rice straw, corn stover, and ...

Bioethanol is the most alternative to petroleum based fossil fuels and being a renewable and environmental friendly cheap energy source. Bioethanol can be produced using a variety of feedstocks, but second ...

Bioethanol as an alternative to renewable energy sources has been gaining support worldwide due to reduced emission of greenhouse gases. Bioethanol is generated from feedstocks containing sugar, which are consumed by humans and that could lead to scarcity of food and hence it is best to utilize agricultural waste to produce bioethanol.

In this study a literature review on the current status and emerging technologies for second generation bioethanol production from waste has been implemented. Specifically, the examined feedstocks included lignocellulosic streams, industrial food processing waste streams and the organic fraction of municipal solid waste.

Waste from the food is a challenge to the environment all over the globe, hence there is need to be recycled. Vegetables and fruits biomass is a resource of renewable energy with significant fuel source potential for the production of electricity and steam, fuel for consumption and laboratory solvents. Bioethanol derived from biomass contributed 10-14% of ...

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Rapidly increasing population and industrialization have led to a tremendous increase in energy consumption. This necessitates the exploration of sustainable and renewable methods of energy production to meet the increasing demand. Lignocellulosic agro-waste...

Ethanol, which is presently the most common renewable fuel, can be produced biologically from a variety of feedstocks and wastes. Hence, the recent focus has been on other waste products and lignocellulosic materials to produce a third- and fourth-generation bioethanol.

Corn, wheat straw, wood, energy crops and other agricultural residues are generally used as raw materials for the production of bioethanol. The use of biomass as raw material in the production of bioethanol helps not only to reduce the CO<sub>2</sub> emissions but also to recycle the CO<sub>2</sub> released during combustion.

Recently, bioethanol production from biomass feedstock or agricultural waste has been successfully carried out in various countries worldwide (Hemansi et al. Citation 2019; Lin and Lu Citation 2021). Bioethanol production and usage result in significantly lower greenhouse gas emissions, which helps mitigate climate change.

bioethanol production. Agricultural wastes from municipal solid waste stream are cost effective, sustainable, addresses environmental pollution and create wealth and energy. Bioethanol production from wastes could be promising, however, the processes has several challenges and limitations such as feedstock sourcing and finance.

Lignocellulosic biomass generated from different sectors (agriculture, forestry, industrial) act as biorefinery precursor for production of second-generation (2G) bioethanol and other biochemicals. The integration of various conversion techniques on a single platform under biorefinery approach for production of biofuel and industrially important chemicals from LCB is ...

Sarkar N, Ghosh SK, Bannerjee S, Aikat K (2012) Bioethanol production from agricultural wastes: an overview. *Renew Energy* 37(1):19-27. Google Scholar Shanavas S, Padmaja G, Moorthy S, Sajeew M, Sheriff J (2011) Process optimization for bioethanol production from cassava starch using novel eco-friendly enzymes.

The world is currently facing critical challenges in energy security and environmental sustainability. The relentless consumption of fossil fuels, the cornerstone of modern industrial civilization, has led to serious energy and climate crises [1] has been estimated that these non-renewable resources, the lifeblood of our energy-hungry world, might be exhausted in mere ...

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Sarkar N, Ghosh SK, Bannerjee S, Aikat K (2012) Bioethanol production from agricultural wastes: an overview. *Renew Energy* 37(1):19-27. Article CAS Google Scholar Seddiqi H, Oliaei E, Honarkar H, Jin J, Geonzon LC, Bacabac RG, Klein-Nulend J (2021) Cellulose and its derivatives: towards biomedical applications.

This escalated agricultural production has given rise to substantial waste generation, presenting both ecological and economic implications. The term "agro-waste," encompasses waste originating from diverse agricultural operations (Thangadurai et al., 2021). These outputs emerge from agricultural processes but are not utilized in the production ...

Waste-based integrated biofuel production and lignocellulosic waste have been described for the production of biohydrogen, bioethanol, biodiesel, and/or biogas production. These fuels are said to be made from a mixture of pure LCB substrates and non-food-based agricultural crops [ 16, 23, 24, 25 ], or a mix of food crops and agricultural ...

The preparation of bioethanol is a possibility for various biomass types. Some of the chosen biomasses can be categorized based on raw materials that comprise sugar, starch, and lignocellulosic because of the chemical makeup of the carbohydrate sources []--materials with sugar, including sugar beet, sugarcane, molasses, cheese processing waste (whey), and ...

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