Sustainable farming in areas with stubble burning: a systematic review of management techniques and policy measures

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Stubble burning, a prevalent agricultural practice in Punjab and Haryana, poses significant environmental, health and socioeconomic challenges, particularly concerning air pollution and soil degradation. This systematic literature review (SLR) examines research findings, policy interventions and technological innovations aimed at addressing the adverse effects of stubble burning and promoting sustainable crop residue management. This review encompasses studies investigating the extent of stubble burning, its impact on air quality, soil fertility and human health, as well as alternative management strategies like the adoption of Happy Seeder technology and bioenergy utilization. The present article identifies key trends, challenges and opportunities in stubble-burning research and policymaking.

Keywords: Air pollution, environmental impact, Happy Seeder technology, policy interventions, stubble-burning.

decomposers like the bio-decomposer, aim to incentivize sustainable practices and mitigate environmental pollution[3]. However, challenges persist in the widespread adoption of these alternatives, including financial constraints, limited access to machinery and the need for extensive farmer education[4]. Moreover, the urgency of addressing stubble burning-induced air pollution necessitates a comprehensive approach involving government policies, technological innovations and community participation. In light of these complexities, this review provides a comprehensive understanding of the issue. By examining the various dimensions of stubble burning, including its causes, impacts and potential mitigation strategies, this review aims to inform policymakers, researchers and agricultural stakeholders about the urgency of addressing this environmental challenge. Through a multidisciplinary lens, encompassing insights from various studies and empirical data, it endeavours to pave the way for sustainable agricultural