Chapter 13
Design of an Agribusiness Innovative and Autonomous Robot System for Chemical Weed Control for Staple Food Crops Production in Sub-Saharan Africa

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ABSTRACT

Agriculture and agribusinesses suffer from many challenges, despite their significance to global economic growth. One of the challenges is the lack of appropriate technology to drive the industry to the next level of development. This technological gap contributes to reduced yield and profit without a reduction in manual labour, cost, and stress. Robotics have been explored to boost agricultural production and improve agribusiness productivity. Several weed control robots have been developed for research and field uses, but these systems are not suitable for weed control in large commercial farms or lack control schemes for navigation and weed control. This study presents the design of an autonomous robot system for chemical weed control. The system uses control theory, artificial intelligence, and image processing to navigate a farm environment, identify weeds, and apply herbicide where necessary. Upon implementation and adoption, this system would increase agricultural productivity with minimal human input, thereby leading to an increase in revenue and profit for agribusinesses.

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