

## Introduction

The world population is projected to reach 9.7 billion by 2050, which will require a 70% increase in food production to meet the demand. This increase in food production must be achieved without expanding the agricultural land area, as this would lead to deforestation and loss of biodiversity. Therefore, the focus must be on increasing the productivity of the existing agricultural land. This can be achieved through the use of advanced crop science and technology, such as precision agriculture, which uses data and technology to optimize crop production. Precision agriculture involves the use of sensors, drones, and other technologies to monitor and manage crops in real-time. This allows farmers to identify and address problems before they become widespread, leading to higher yields and reduced input costs. Another key area of research is the development of new crop varieties that are more resistant to pests and diseases, and that can tolerate harsh environmental conditions. This is being achieved through the use of genetic engineering and other advanced breeding techniques. In addition, the use of artificial intelligence and machine learning is becoming increasingly important in crop science, as it allows researchers to analyze large amounts of data and identify patterns that would be difficult to detect otherwise. Overall, the use of advanced crop science and technology is essential for ensuring food security in the future.

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