

Chapter 10

Image Processing: A Smart Technology for Early Detection of Crop Pests and Diseases



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Introduction

Agriculture is the backbone of any developing country's economy and a major contributor to its GDP. There is an 80% probability that the world population will hit 9.6 billion in the year 2030, and will constantly demand to increase the current food production by 2% every year [26]. The arable land for crop cultivation is limited; therefore, the only way to overcome hunger is to increase the productivity per unit land area using high-yielding varieties. Invasion, evolution, and from time to time the emergence of catastrophic pest and disease outbreaks are constantly posing threat to the agriculture sector. According to FAO statistics, 20–40% of the global crop yield is being lost due to the damage caused by the pests and diseases. In India alone, 18% of the total crop production is being lost every year, and an estimated monetary value of Rs. 60,000 Crores. If all forms of crop loss are avoided, it would be enough to feed additional 100 million people annually.

These undesirable huge crop losses can be avoided if crop pests and diseases are detected in advance. Farmer's knowledge on accurate detection of the pest and diseases is minimal especially those living in developing and least developing countries, and without proper diagnosis and plant protection expert's guidance, farmers indiscriminately apply dangerous pesticides which can cause deleterious impact on human health and biodiversity if applied frequently [11].

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