

# Chapter 8

## Analyzing Various Grape Diseases and Detection Techniques by Monitoring Environmental Parameters Through IoT and Machine Learning Approaches

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### **ABSTRACT**

*Grape is one of the significant business organic product crop developed on an enormous assortment of soil. Grapes are a vitally important agricultural commodity, cultivated on a great diversity of soil types. In the field of agriculture crop diseases are major factor causing to decrease its product. Grape diseases are also one of its which causes for less production of its fruit. Maharashtra is the predominant contributor to the total area of grape cultivation in India. As grape cultivation expands and becomes more extensive many types of insects enter the vineyard. Out of*

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*these 15-20 insect species were found to cause more damage in different areas. To control diseases pesticides are used. Unnecessary use of pesticides increase cost of production and may lead to residues in the final produce, as well as in the soil and water. To control these diseases at early stage devices are ready to evaluate climate condition for timely diagnosis and precise detection of grape leaf diseases. In this review, we examine and appraise the recent information pertaining to these diseases, and provide guidance concerning the control of the associated grapevine diseases.*

## **1. INTRODUCTION**

Much of the agricultural yield in India consists of cash crops. Agriculture has been one of the oldest professions since antiquity. It is widely acknowledged that the economic well-being of all nations is heavily reliant upon the agricultural sector. The United Nations Food and Agriculture Organization has determined that, in order to adequately sustain the burgeoning population of our world, as per web reference 1 it is necessary to produce a seventy percent more food by the year 2050 than has been produced in recent years. The Agricultural Revolution saw an unprecedented increase in agricultural production, facilitated by the implementation of advanced technologies and automation. Despite the passage of fifty years, there remains a global population of 815 million individuals who are chronically undernourished, a circumstance which is highly concerning. Identifying diseases in the vineyard quickly and accurately is essential for the prevention of pervasive outbreaks and for preserving yields and the quality of the harvest. The likelihood of a pathogen or disease necessitating treatment can vary depending on several factors, including the yearly weather conditions, and the vulnerability of the vines. Consequently, the severity of diseases can differ from one year to the next. The fluctuating severity of a disease from one year to the next necessitates the application of different preventative protocols in order to mitigate potential losses. It is widely accepted that farmers should be equipped with modern, state-of-the-art tools and techniques in order to maximize their productivity. The utilization of Internet of Things (IoT), Big Data, and Expert Systems are essential for successful implementation of Precision Farming and the Internet of Things (IoT) will remain pivotal for the successful operation of agricultural operations. To control these diseases at early stage devices are ready to evaluate climate condition for timely diagnosis and precise detection of grape leaf diseases. Early prediction of diseases will help to grow plant healthy and ensure to increase production.

Downey Mildew, Black Rot, Crown Gall, Powdery Mildew, Bunch Rot are some significant diseases of grapes. These diseases affect both leaves and grapefruits. Diseases can be identified only after the visible symptoms occur. To control and

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