CONCLUSION

The **Smart Agriculture Monitoring and Disease Detection system** shows how modern technologies can improve crop management and agricultural productivity. By combining IoT-based monitoring with disease detection methods, the system gives ongoing insights into environmental and crop health conditions. Real-time data on factors like soil moisture, temperature, and humidity helps farmers keep optimal growing conditions and react quickly to changes in the field.

The disease detection part of the system boosts its effectiveness by spotting early signs of crop diseases through image processing and machine learning techniques. Early detection allows for prompt preventive actions, which can reduce crop loss and limit unnecessary pesticide use. This ultimately leads to healthier crops and more sustainable farming.

Overall, the proposed system lowers manual effort, improves resource use, and aids in smart decision-making. It offers a scalable, cost-effective, and efficient solution for precision agriculture. With further improvements, such as better predictive models, mobile applications, and broader sensor integration, the system has great potential to significantly enhance smart farming and support long-term agricultural sustainability.

RESULT

The **Smart Agriculture Monitoring and Disease Detection system** produced reliable and effective results during implementation and testing. The IoT sensors collected real-time data on soil moisture, temperature, and humidity. This provided continuous monitoring of field conditions. Timely analysis allowed for better decision-making compared to traditional manual monitoring methods.

The automated irrigation module worked well by supplying water only when soil moisture levels fell below the defined threshold. This reduced water consumption, improved soil moisture balance, and enhanced energy efficiency. Crops maintained more stable growing conditions, which positively impacted overall plant health.

The disease detection component accurately identified common crop diseases using image-based analysis and machine learning techniques. Early detection enabled preventive actions at the right time, reducing crop damage and limiting unnecessary pesticide use. The system performed well in distinguishing between healthy and infected plants under different conditions.

Overall, the system showed improvements in resource use, crop health monitoring, and operational efficiency. The results confirm that combining real-time monitoring with disease detection can significantly boost agricultural productivity and support sustainable farming practices.