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| **A study on pine wood nematode disease monitoring based on UAV-based remote sensing and machine learning in a mixed forest of central China** |
| **Introduction/Aim:** Pine wood nematode(PWD) is a devastating disease of pine trees, seriously threatening the ecological security of China's forests. Timely and reliable monitoring of PWD is extremely important for forest management and disease prevention and control. However, as PWD spreads quickly, traditional manual survey methods are difficult to meet the demand. UAV-based remote sensing can quickly and accurately obtain the spatial distribution and extent of forest pests and diseases, providing reliable information support for forest pest control and management. **Methods:** In this study, a DJI UAV was used to acquire high-resolution red-green-blue (RGB) visible images. Then, vegetation indices (VIs) and texture features (GLCM) were calculated, and a feature selection algorithm was used to select optimal feature combination. After that, Random Forest (RF) and Support Vector Machine (SVM) algorithms were used and compared to monitor the severity degree and spatial distribution of PWD.**Results:** The results showed that (1) using vegetation indices were better than those using texture features; (2) the combination of vegetation indices and texture features can significantly improve the monitoring accuracy; (3) the classification performance of SVM algorithm was better than that of RF. **Conclusion:** UAV-based remote sensing can provide timely and reliable PWD information for forestry pest control and maintaining ecological security. |

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