

# Intelligent Electronic Nose System For Basal Stem Rot Disease Detection

## Abstract

The agricultural industry has been, for a long time, dependent upon human expertise in using odour for classification, grading, differentiating and discriminating different types of produce. Odour as a parameter of differentiation can also be used to determine the state of health of crops, although this is not favourable when dealing with detecting plant disease that may pose health threats to human beings. In addition to these, human experts may take years of training and can be inconsistent, as well as prone to fatigue. This paper presents a work conducted on utilising an electronic nose incorporating artificial intelligence to detect plant disease, specifically basal stem rot (BSR) disease that is caused by *Ganoderma boninense* fungus affecting oil palm plantations in South East Asia. This study used a commercially available electronic nose, Cyranose 320, as the front end sensors and artificial neural networks for pattern recognition. The odour samples were captured on site at Besout oil palm plantation, Perak, Malaysia, and the classification performed on a PC. The results showed that the system was able to differentiate healthy and infected oil palm tree using different odour parameters with a high rate of accuracy.

**Keywords:** Commercial electronic nose; ANN; Basal stem rot disease; *Ganoderma boninense*