

Detection of Fungal Infection in Barley using Near Infra-Red Hyperspectral Imaging

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Canada is the fifth largest barley producing country in the world. Canada produces 8 to 9 million tonnes of barley every year. Malting barley accounts for 70% of total production. Canada exports 1.5 million tonnes of malting barley to the world market. Major storage fungi in barley are: *Aspergillus* and *Penicillium spp.* The fungal infection in barley invades the embryo, which will decrease the viability of the kernel, the most important factor in malt production. The fungal infection is the major problem encountered in barley storage. Near Infra-Red (NIR) Hyperspectral imaging technique was used in this study to detect the artificially fungal infected barley samples. The NIR imaging system was utilized to capture single kernel images in the wavelength range of 1000 to 1600 nm at 60 evenly distributed wavelengths. Statistical discriminant (Linear and Quadratic) classifiers were used to classify healthy and fungal infected barley samples. The classifiers gave maximum accuracy of 90 % healthy samples and 88% of fungal infected samples at later stages of infected samples.

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