

Title Study on the sterilization of grain surface using UV radiation: Development and evaluation of UV irradiation equipment

Author Hidaka Y. and Kubota K.

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Abstract

The aim of this study was to control microorganisms that cause grain degradation using ultraviolet (UV) sterilization, as a method that is eco-friendly and safe for storage without the need for postharvest application. In order to obtain practical ultraviolet sterilization, we manufactured recirculating grain sterilization equipment that uses UV irradiation. We investigated applying UV sterilization directly to microorganisms that adhere to the surface of the wheat, and then checked the quality. Sterilization tests indicated that the required sterilization time to obtain a 90% sterilization rate was 6.3 h for bacteria and 5.6 h for mold using 254 nm wavelength and 97 W/square m UV irradiance. The germination and amylograph tests suggested that quality was minimally affected by UV irradiation in this range.