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Moisture Sorption in Commercial Hybrid Maize *(Zea 1nays* L.) Seeds During Storage at Ambient Tropical Conditions

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ABSTRACT

Seed moisture sorption isotherms were determined for 2 tropical hybrid maize varieties stored at simulated humid tropical conditions using the static method. Sealed containers with saturated salts solutions were used to generate 8 relative humidity conditions inside an incubator set at 31±4°C for 12 months. Changes in seed moisture content were evaluated at intervals. Seed moisture sorption isotherms were constructed for the 2 varieties and fitted to five different sorption models (Henderson, Henderson-Thompson, Chung-Pfost, modified Halsey and GAB). Seed moisture sorption isotherms for the 2 seed lots were the expected sigmoidal curve. The point of inflexion of the curve was at 55% relative humidity, indicating when seed drying was initiated and maximum relative humidity for drying and/or dry-storage at the ambient temperature. The sorption isotherms for the 2 seed lots however differed in magnitude, thus equilibrium seed moisture at this point was ~8% for Suwan-1-SRY and 5% for Oba-Super-1. Fits of the sorption isotherms to mathematical models differed also differed among seed genotypes. The Henderson-Thompson and Chung-Pfost models exhibited best fits (%D = 13.413 and 6.038) to the moisture sorption data of Oba Super-1 and Suwan·1·SRY seed lots, respectively. The results suggested the need to determine sorption isotherms for tropical hybrid maize genotypes in relationship with seed morphology. Meanwhile, generalized prediction of seed moisture during drying or dry-storage of these varieties in tropical seed stores can be done using the Henderson-Thompson and Chung-Pfost models.

Key words: Maize, tropical hybrids, dry seed storage, seed moisture content, moisture sorption isotherms