Title Controlling deterioration of high-moisture maize with ozone treatment

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Abstract

Two experiments were conducted to determine the effect of ozone treatment on controlling deterioration of high-moisture maize under extreme and moderate environmental conditions experienced during harvest. In the first experiment, 0.77-kg maize samples held at 22% moisture content were treated with ozone at 0.08, 0.16, 0.31, 0.62, 0.94, 1.25 and 1.56 mg kg maize^{-1} min^{-1} (60–1120 ppm ozone in air during application) for periods of 5 or 24 h, with an additional treatment of 1.56 mg min^{-1} repeated every 3 d, and stored at 32 °C for 9 d under continuous aeration. Ozone treatment decreased dry matter loss compared to the control, but not to a level that would likely justify ozone treatment at the rates and treatment times used. In the second experiment, 2.43-kg maize samples held at 26% moisture content were treated with ozonation rates of 0.25, 0.5, 1, and 2 mg kg maize^{-1} min^{-1} (1090–8680 ppm ozone during application) for 24 h, stored at 15.5 °C for 30 d and passively aerated every 3 d. Additional ozone treatments at the 2 mg kg maize^{-1} min^{-1} rate were applied for 1 h on 3-, 6-, and 12-d intervals throughout the experiment. Single ozone treatments of 1 and 2 mg kg maize^{-1} min^{-1} were equally effective, reducing dry matter loss by 1.3 percentage points compared to the control after 30 d of storage. Repeat treatments at 2 mg kg maize^{-1}min^{-1} did not reduce dry matter loss compared to the single treatment.