

In-bin natural air drying of corn with IntegrisPro automated fan and heater control

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Abstract

Corn in the U.S. is usually harvested at high moisture content and then dried to safe storage moisture levels. Grain drying in free-standing corrugated galvanized steel bins using natural air is the most cost effective drying method with optimum grain quality. Adverse weather conditions and manual/inappropriate fan control strategies may result in poor drying, high drying cost, and grain spoilage. Using IntegrisPro advanced fan and heater control, corn with 19.0% initial moisture content was dried to 14.5% target moisture for long term safe storage with less than 0.50% spread in moisture throughout the grain mass. The drying operation with automated fan and heater control consumed nearly 475 hours of fan run time and negligible heater operation. The IntegrisPro automated control used low temperature supplemental heat (100F rise in air temperature) to increase drying potential in humid ambient conditions by reducing relative humidity of the incoming air. Grain moisture, grain temperature, and the drying front movement during the drying period were recorded continuously in real-time using OPI-Integris moisture and temperature cables. Automated fan control minimized the over-drying (shrink loss) by rehydrating the bottom layers while simultaneously drying the high moisture grain in the top layers.

Keywords: natural air drying, grain quality, safe storage, fan control, corn