Natural air drying

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swer "many questions" concerning "grain Chillcuring, which is a patented process of conditioning shelled corn during which its moisture content is reduced."

The three professors conclude that "Harvestall's 'Chillcuring' is basically a natural-air drying system with a very small amount of additional energy added by the infra-red lamps."

"Natural-air drying is not new," say the Minnesota professors. "Farmers use natural-air drying to dry ear corn in cribs. Natural forces (wind and sun) move enough air through the corn to dry it before it spoils provided there is a proper relationship between crib width and corn moisture content, Natural air can and is being used to move enough air through the shelled corn to dry it before it spoils," they say.

Hicks, Cloud and Hardman continue that "Much research has been conducted on the natural-air drying of shelled corn. Since the spoilage rate and the amount of water to be removed both increase with corn moisture content, the quantity of air required for natural air drying of shelled corn increases rapidly with increasing moisture content. Research has shown that an air flow of one cubic foot per minute per bushel is required to dry 21 to 22 per cent moisture content shelled corn with natural air in Minnesota. At 25 to 26 per cent moisture content, the air flow required increases to three cubic feet per bushel.

The professors' primary dispute comes with Harvestall's alleged claim that their patented process will bring about an increase in dry weight. But they also doubt that the system will accomodate enough air movement to dry grain which contains more than 24 per cent moisture. The professors claim that most natural-air drying bins (including Harvestall's) are limited by that factor.

"If corn is being harvested at moisture contents above this (21 to 24 per cent) the bin must be filled at a slower rate over a longer period of time, so the higher moisture corn can be dried before it spoils," Hicks, Cloud, and Hardman reported. "The higher the moisture content of the corn, the slower the bin must be filled to minimize grain spoilage. this is how any low temperature, layer, in-storage drying system must be managed to dry shelled corn successfully," they add.

Hicks, Cloud and Hardman cite a 1975 advertisement by Harvestall Industries which illustrates their disagreement with company claims. The advertisement allegedly was entitled: "Back To Good Grain" and reported a situation where 11,325 bushels of grain went into the bin at a moisture content of 22.5 per cent, and 10,644 bushels at 14.5 per cent moisture were sold from the bin. From these figures, say the professors, one can calculate that 18,130 more pounds of dry matter were removed fom the bin that originally contained the corn.

They base their disagreement on the following calculation: 491,505 pounds of dry matter (11,325 bushels x 56 pounds per bushel x 77.5 per cent dry matter) went into the bin and 509,635 pounds of dry matter (10,644 x 56 x 85.5) were removed.

The three professors then go on to cite a 1978 advertisement titled "Harvestall Grain Chillcuring" which allegedly uses the following example: "13,000 bushels at 27 per cent moisture conditioned to 12,103 bushels at 15.5 per cent by Harvestall 'Chillcuring'." Again, the professors calculate that this would mean more dry matter coming out, than what went into the bin. They disagree that the 'Chillcuring' concept will do that.

The University of Minnesota paper, entitled "Weight Shrink and Dry Matter Change During Drying and Storing Corn Grain" contains five full typewritten pages. Aside from their own work, the paper cites five other sources of information, including C.M. Christensen of the American Association of Cereal Chemists, St. Paul, Minn.

Agricultural colleges have not run any tests on Steffen's system as far as he knows. He stands by tests which he claims took place "on thousands of farms." Aside from pronouncing that his chill-cured system saves energy and preserves quality, the Midwesterner also says that feed requirements are reduced with his method.

Joe McCurdy, a crop storage specialist at Penn State University, says he takes some exception to claims made by Harvestall promoters. He says, simply, that it is a system which works fine, but it has its limitations. A major limiting factor is the humid climate of the Northeast, which takes away from the efficiency of the concept, he says. Point two is that he isn't convinced the idea is efficient with corn placed into the bin at 20 per cent moisture or above. Below that, he says, it is feasible. At any rate, he believes the low-temperature drying concept, as exemplified by Steffen's product, is more adaptable to the Midwest

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