

# Corn management critical at dryer

By DIETER KRIEG

HERSHEY — No corn storage facility is complete today without aeration, says Joseph McCurdy, Extension agricultural engineer from Penn State University. Calling proper cooling of dried grain the biggest problem in storage management, the scientist says he has heard of corn that isn't wanted simply because the farmer neglected to store it properly.

Corn drying and storage are receiving more and more attention these days as cattle, poultry and dairy producers demand high quality feeds and operating expenses dictate top-level management. On the other side, energy shortages and storage limitations are pinching the grain farmer.

Speaking here Thursday, at Founder's Hall as part of a program designed to bring out the latest in corn and soybean management, McCurdy urged farmers to plan wisely when they're considering drying and storage facilities on their farms. Once the first bin is set, other phases of the operation must be built around it. His advise is to plan something on paper, then figure on doubling it in the near future, and if that's not feasible, then the plan isn't right. His study on the subject shows that existing systems have been expanded tremendously, and the farmer who isn't taking this into consideration in his own operation may only be kidding himself. The farmer should even think of possibly adding a vertical elevator and dumping pit.

Another point McCurdy stressed is safety. Farmers

too often fail to realize the deadly potential of flowing grains. "They're worse than quicksand," he asserted; and to some they even have a fascinating appeal. Children are especially vulnerable to being lost in piles of grain. To exemplify his warning, he illustrated how a 6-inch auger can deliver 20 cubic feet of corn per minute. It takes just seconds to reach a point of no return. Even a fully grown man is helpless once he's caught in the grain above his knees, warned the engineer.

The expenses of drying corn will rise sharply in years to come, McCurdy and other predict. Scientists are therefore hard at work attempting to devise systems which will be more economical to operate. Even solar energy is being tried, but the initial investments thus far outweigh the savings in conventional fuels. In future years, however, it'll be turned around, says McCurdy.

While different methods of drying may be considered by the farmer, some general rules apply to all.

"Anytime the corn temperature in storage is 10 degrees above the temperature of the outside air, aeration is necessary," McCurdy emphasizes, adding that this is a point some farmers fail to recognize. Here is where a good crop of corn go bad if left in storage too long. It's best to store corn at 40 degrees Fahrenheit or less, he recommends.

"Aeration is necessary to prevent mold," the scientist continued to explain. "It takes hundreds of hours to finish the job — until corn is under 40 degrees, we aren't



Joe McCurdy

done," he says. Once it's under 40 degrees, it'll allow the farmer to swing his product into most any marketing situation. A chart accompanying his presentation documented that corn stored at 15 per cent moisture and 35 degrees can be safely stored for 1140 days. Storage length is reduced to 337 days for 15 per cent moisture corn if temperature is increased to 55 degrees. The time limit at 75 degrees is just 116 days. It's vital, however, that moisture be down to around 15 per cent if it is stored. Corn at 20 per cent moisture, for example, will only hold for 118 days at 35 degrees, just 35 days at 55 degrees, and a mere 12 days at 75 degrees.

"Cooling is extra important," McCurdy repeatedly emphasized.

The Penn State also told his audiences that corn will only dry down to certain levels at certain temperature and humidity conditions. A point is eventually reached when the moisture content of the kernel won't be affected by

outside conditions. This strikes down a common "myth" which says dry corn can easily pick up moisture during bad weather. That is not true once the kernels reach what is known as "equilibrium moisture content." Prior to that point being reached, however, the moisture content of the kernel will try to equalize with the moisture content of the surroundings, and vice-versa.

Corn drying is affected by three prime factors, the researcher reminded the audience. Temperature, air volume, and relative humidity, are the basics. Varying them affects the efficiency of the system. Raising air temperature by 20 degrees Fahrenheit, for example, will just about double the water holding ability of the air, says McCurdy.

Studies show that it takes 2000 BTU's of energy to remove a pound of water from a bushel of corn. Harvesting corn at 26 per cent moisture and then drying it to 15½ per cent would mean removing 7.9 pounds of moisture per bushel, McCurdy continued. At that rate it takes a gallon of LP gas for every 5.8 bushels of grain going through the dryer.

The economics of corn drying can be easily recognized once it's known that corn contains twice as much at — say 30 per cent, as opposed to 22 per cent. Drying costs are therefore doubled, McCurdy sees some real possibilities here to cut costs and urges farmers to consider their options.

According to McCurdy, any discussion on corn handling in Pennsylvania must still include ear corn. There's a justified need and demand for such corn, he adds. That leaves conventional corn cribs in the storage picture.

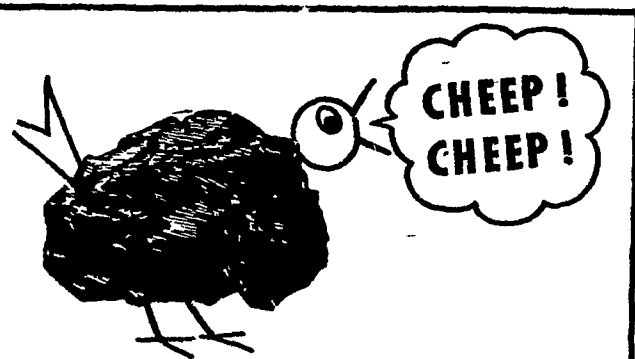
Penn State engineers recommend that the long, narrow corn cribs not exceed five feet in width. Round wire bins should not have a diameter in excess of 12 feet, and some kind of aeration is practically a must if spoilage is to be avoided.

Another alternative is the wide storage bin which depends on forced air for drying and ventilation. One such bin is in use in Blair

County and has a capacity of 6000 bushels. A 7½ horsepower motor powers a 42-inch fan to facilitate drying and cooling. No heat is required in the drying process. The shed, built of wire and lumber, may be used for storage of equipment and supplies such as fertilizer during other times of the year, McCurdy noted. A number of farmers are finding out that they can use a barn for storage of corn, and thus have more than one use for their facilities, the engineer said.

Bin drying is still the cheapest and simplest for shelled corn, McCurdy

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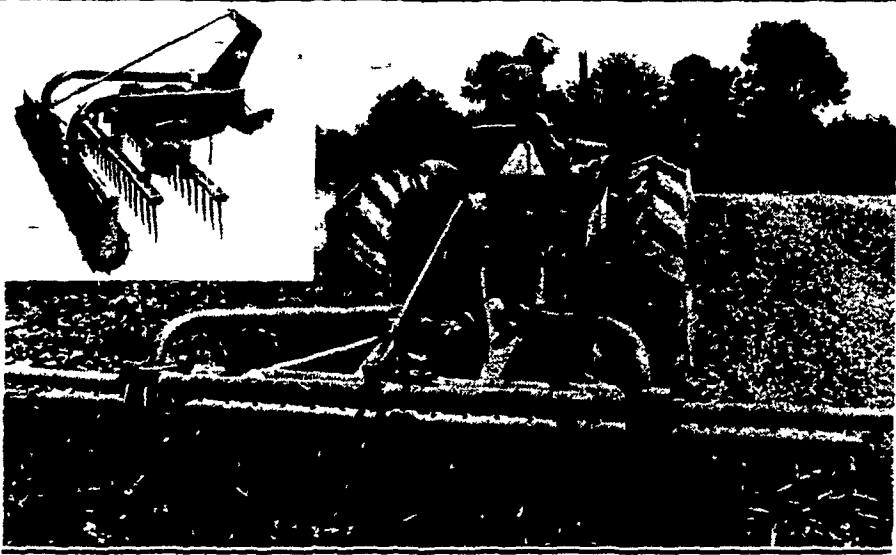
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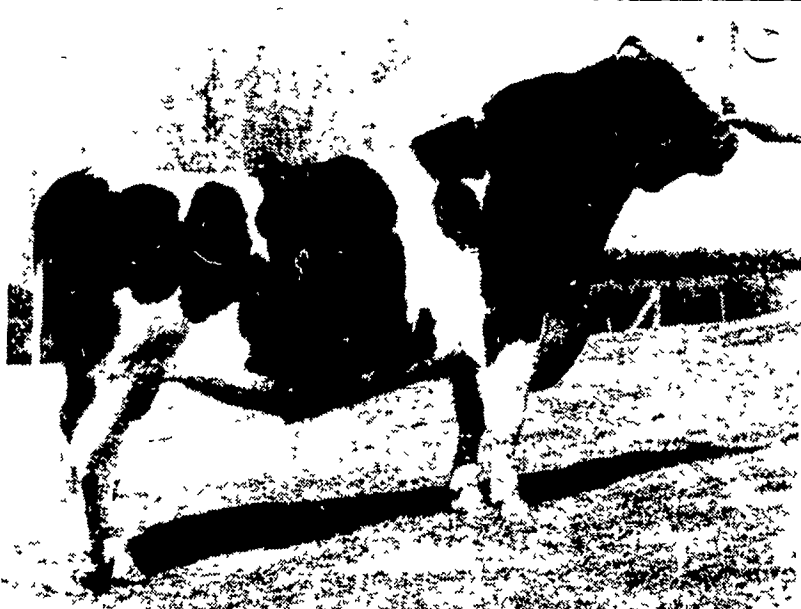
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