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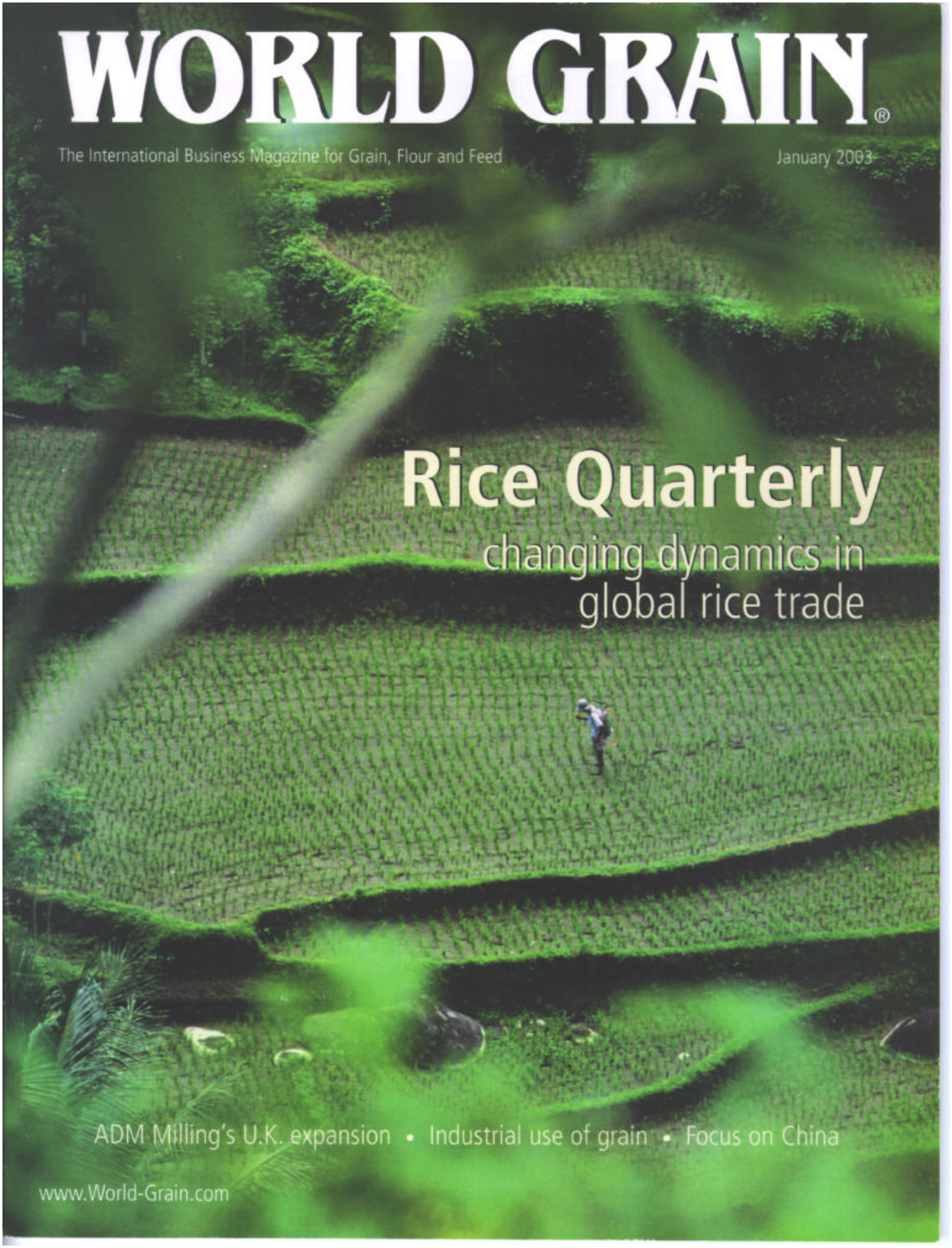

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The conveyor system:

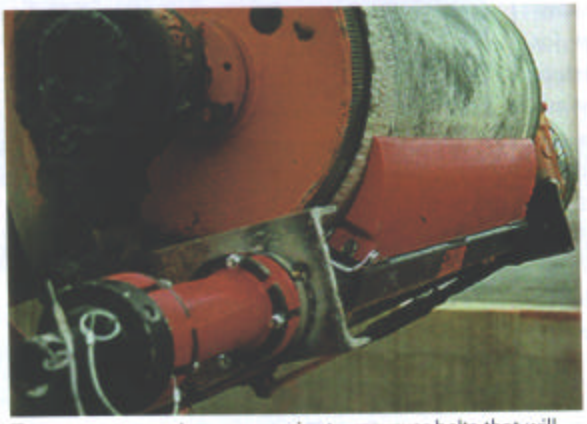
Parts and procedures for a successful conveyor production process

by Neil F. Archer

Most grain stores must have conveyor systems to transport grain to bins and to the stockpile. Sounds simple enough, however, there are many necessary components that must accompany the conveyor itself. To have a complete system, one must take into consideration all of the steps in a successful conveyor process: elimination of carry-back materials, dust control, minimum material loss, accurate measurement and weight of the end product, as well as overall conveyor management.

ELIMINATING CARRYBACK

Material carried back by a conveyor can cause safety hazards and can accelerate the wear on the conveyor components. Cleanup of unnecessary carryback is also very expensive. To alleviate these problems, a proper belt cleaner must be in place. The most efficient belt cleaner will maintain its cleaning efficiency throughout its wear life without damaging mechanical splices. The belt cleaner must maintain consistent pressure and contact between the blade and the belt. Also, a proper belt cleaner is virtually maintenance free, and does not need to be checked or readjusted on a daily basis.



There are many various accessories to conveyor belts that will improve it's performance, including the belt cleaner pictured here.

Benito Castiglione of CHS Cooperative's Myrtle Grove terminal in Bell Chasse, Louisiana, U.S. had belt cleaners installed six years ago at his facility. Since then, he has had to replace only one of the belt cleaners and has noticed a significant difference in carryback materials. Castiligion also states it is indispensable to have the belt cleaners to save time and money on unnecessary cleanup.

SAFETY AND PROTECTION

Protecting the impact point on a chute or screen is imperative as well. Look for a urethane, multi-coned chute liner to maximize the liner's ability to reduce wear on all chutes and screens, as well as to work as a noise barrier. Flat urethane or hardened steel liners are not sufficient for they must be replaced as often as every 30 to 60 days. They also do not protect workers' hearing as a multi-coned, urethane chute liner does.

Set by the U.S. Occupational Safety & Health Administration (OSHA), U.S. employers must comply with the "Hearing Conservation Amendment," limiting employee noise exposure. With a proper chute liner, companies can prevent unnecessary fines and ultimately employee's hearing loss by making their conveyor the safest and most effective as possible.

A proper chute liner will also aid in dust control by controlling material build-up and preventing airborne dust from escaping.

ACCURATE MEASURING

All plants must be able to measure the material they are conveying for inventory and loading purposes. The best scales provide in-motion accuracy by using dual-ended load cells. These patented load cells provide long-term repeatability without recalibration.

The dual-ended load cell method allows the scales to take advantage of the natural tendency for the idler frame to twist in the direction of belt travel. By doing so, the frame equally forces one end of the load cell down and the other up, zeroing out the effects of the idler's movement. In turn, this allows an accurate measurement of the material on the belt. (*For more on*

bulk weighing, see Dec. WG, *page 30; E-archive #58796.)*

PREVENTING MISALIGNMENT

A proficient idler is very important in preventing misalignment. There are idlers that exist with a "training" mechanism that works to keep the belt from misaligning and consequently causing spillage. Some idler designs incorporate up to three idler rolls to support the belt by six bearings, rather than the standard two as found in a standard single idler roll. This design with extra rolls also allows a training idler to automatically correct misalignment when it occurs. Rubber-coated trainer rolls help to avoid unnecessary build-up and to prevent premature wear on the rolls.

A self-adjusting, three-roll idler adds extra support to the belt and helps prevent misalignment.

Bart Bauer of Zen Noh Grain, Convent, Louisiana, U.S., installed training idlers at his facility on two conveyors that are about one-quarter mile (.4 kilometers) long each. These conveyors carry grain out to the docks to be loaded onto ships. According to Bauer, misalignment on the tail section was a major problem, prior to the installation of the training idlers. Since the installation, Zen Noh Grain has not had any misalignment problems, Bauer said.

PREVENTING MATERIAL LOSS

Spillage along the belt can be a problem in many grain facilities. With a suitable sealing system along the conveyor, these

A good conveyor belt sealing system will prevent spillage problems.

troubles can be prevented. It is imperative to find a seal constructed of rubber. With a rubber seal, grooves in the sealing surface work to introduce any escaping dust back into the bulk material flow. The rubber should not be mounted straight down to the belt, but needs to be rolled under the chute forming a bend in the rubber. This bend will improve the seal by using the rubber's natural flexibility. A proper seal can end spillage problems.

CONVEYOR MONITORING

In most grain elevators, production begins with the product in a bulk form that is generally moved by a conveyor. A proper computerized conveyor management system protects not only the employees who work on or near the conveyor but also the single most expensive item on the conveyor — the belt. The ultimate goal of the monitor is to provide the safest, most productive conveyor possible.

It is important to look for a system that can instantly detect abnormality on a conveyor to prevent major damage from being caused. These systems monitor the belts throughout the entire process with a series of trip switches along the conveyor. These switches are both physically and electrically connected together through a pull cable that delivers the signal through six internal conductors. When a fault is indicated, production is stopped immediately, thus eliminating unnecessary downtime that would result in a greater problem if not detected.

Also, look for a system that contains a pre-start warning at each trip switch to alert personnel when the conveyor is about to start. This allows the alarm to be heard along every part of the conveyor to provide ample warning to employees. This warning alarm can be made both audible and visual. Safety should be at the forefront of a company's concerns, and a management system aids in the prevention of injury. WG

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