

Plant Breeders, Farmers Must Team Up To Improve Grain Quality

DES MOINES, IA — It takes two to tango. And, in the dance of America's corn from hybrid seed development to an export commodity, both plant breeders and farmers need to watch every step for quality.

The plant breeder leads the quality quest with careful genetic selection. The farmer follows with

proper grain handling, combine settings and good storage management.

At issue is foreign buyers' acceptance of the quality of the grain American farmers produce. The prize is the maintenance of acquisition of another share point of the world corn market. Each share point of the international

corn market is worth \$50.2 million to the U.S. economy. Farmers, elevators, terminals, and transportation service suppliers are impacted most directly by the gain or loss of a market share point.

"In the past there hasn't been a lot of work done in the area of grain quality," says Dr. Rick McConnell, director of the Department of Corn Breeding at Pioneer Hi-Bred International, Inc. "Breeders have been more concerned about yield and standability. However, that is changing and we are taking a closer look at what we can do to produce better grain quality."

This focus on breeding for quality works hand in hand with con-

tinued on-farm crop management. Charles Hurburgh, associate professor of agricultural engineering at Iowa State University, has devoted much of his research effort to fine-tuning grain handling procedures.

Quality Deterioration

"Many studies have been conducted on grain quality and they all basically have come to the same conclusion," says Hurburgh. "There is a steady increase in the breakage of corn every time it is handled."

"Each time corn is moved and dropped, you can figure on a 0.4 to 0.5 percent increase in broken kernels. In the course of exporting corn, it can be mechanically handled eight to 10 times from the farm to the end user. Also drying grain artificially further compounds quality problems," he adds.

"We also know that improper harvesting and drying also can create some quality problems.

These come in the form of stress cracks or internal fissures in the kernel, which cause breakage in subsequent handling."

McConnell agrees that better methods of handling and storing can reduce the amount of broken grain, but says breeding for quality and transportability may give farmers longer-lasting benefits.

But developing hybrids that yield a more durable grain for shipment may take time.

"In our corn breeding program, we have to deal with hundreds of genotypes," says McConnell. "Until we find some method of screening a lot of germplasm for grain quality traits, our hands are somewhat tied."

Hurburgh and others at Iowa State are working on instrumentation that will help breeders screen germplasm for quality traits, but it may be five to 10 years before the technology is available.

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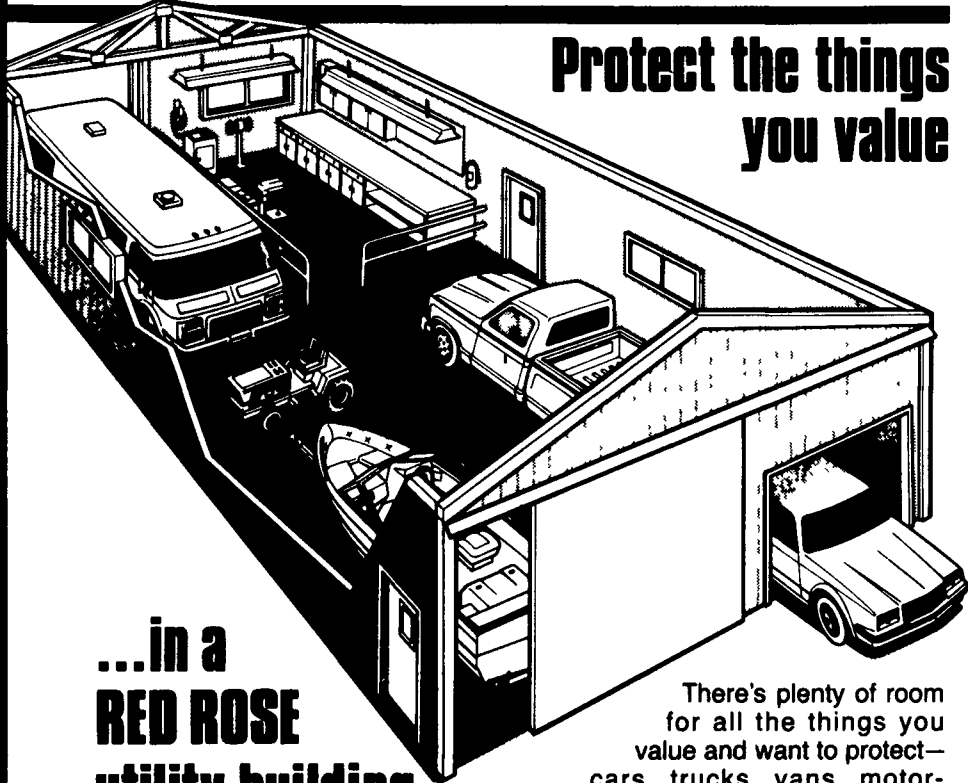


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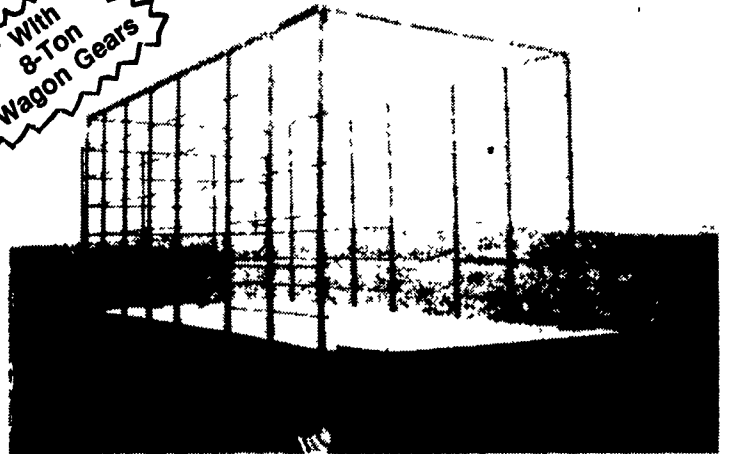


Each time corn is moved and dropped, the number of broken kernels increases by 0.4 percent to 0.5 percent. The Wisconsin Breakage Tester was developed to measure corn hybrids' resistance to breakage.

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