

## An important point about crimped grain conservation

Papers often mention the addition of strains of bacteria or organic acids to crimped grain in order to improve fermentation or conservation. The use of acids is mandatory in the storage of whole high moisture grain – a material that does not ferment easily in the way that crimped grain does – as stated in this paper from the University of Nebraska–Lincoln Northeast Research and Extension Center:

“High moisture corn also can be stored whole in other types of structures by treating it with organic acids; however, the extra cost of the acid and its application must be considered before using this method of preserving and storing HMC.”





Most research on crimped grain is based on storage in trench and bunker silos. These are rarely perfectly airtight environments, and therefore adding acids may counteract the negative effect of oxygen intrusion to a great degree.

Manufacturers of crimper-baggers often sell organic acids or bacterial mixes as a significant part of their commercial operation. However, in our many years' experience in the field we have verified that adding acids or bacterial mixes is not needed for the good conservation of fermented feed in plastic silo bags.

For maximum conservation time, the basic factor is that grain not be overly excessively moist when bagged. The principal consideration afterwards is maintaining anaerobic conditions by promptly patching up any rips in the plastic.

### Moisture content of corn kernels in relation to milk line position

The best way to determine the maturity of corn for crimping is the location of the milk line. The milk line is where the liquid and solid portions of the kernel meet. The milk line will not appear until the corn is at the dent stage of maturity. After kernels are dented, a milk line appears across the kernel opposite the embryo side. This line advances down toward the cob with maturity and dry down. When the hard starch line approaches the cob, the black layer will form. This is approximately the right time to process and store the grain.

Appearance	Stage	Grain moisture
	Early dent	48%
	50% milk line	40%
	25% milk line	35%
	Black layer	32%

... and consider the fact that all M series machines are actually two pieces of equipment rolled into one!

An important feature of Richiger's M series machines is that, although specifically designed for moist grain processing, these are superlative whole grain baggers as well.

Storing dry, whole grain in bags at harvest is a technique that is rapidly gaining acceptance all over the world, offering the most economical and efficient complement to traditional silo bin storage; even replacing bins altogether.

Dry grain can also be rolled and bagged in one continuous step, saving on time and money by skipping the later stage of grinding it for feed.

## Our 6 ft. M-series baggers



### R6M

Our classic, time proven 6 ft. model can crimp and bag 40 tons (1,575 bushels) of grain in an hour. It will store 125 metric tons (4,900 bushels) of grain in a 250 ft. long, 6 ft. diameter bag.

### R6MX

While possessing the same storage potential of the R6M, our premier 6 ft. crimping bagger packs double the punch with its side-by-side roller mills that can process 80 tons (3,150 bushels) of grain per hour.



### R6MF

An R6 bagger fitted not with a roller mill, but with a hammer mill unit. This makes for a one-of-a-kind machine. Dry corn for example, processed through this unique piece of equipment will yield coarse or finely ground corn meal, an important component in the formulation of dairy feed rations. Bags are ideal for keeping the product and dispensing it to mixers.



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## GRAIN CRIMPING BAGGERS

We have a model to match your requirements

- When moist grain is to be ensiled, it is harvested early. The grain is then crimped and bagged in one continuous step with one of our do-it-all M series baggers.
- Anaerobic fermentation transforms the moist grain into high energy feed, conserving all of the original material's nutrients.
- Ensiled grain is a uniquely palatable and digestible concentrate that remains stable during storage and results in increased feed conversion rates.

### R950MX



With 80 metric tons (3,150 bushels) per hour output, the R950MX is the largest 9 ft. crimper-bagger in the business. A 300 ft. long bag can hold 320 metric tons (12,600 bushels) of produce.



WE MEET YOUR PRODUCTION NEEDS

# R950M

40  
ton/hour  
output

The R-950M model can crimp and bag up to 40 tons/hr of grain (1,575 bushels/hr) and store it inside large 9 ft. bags.



## Roller specifications

All models are fitted with the same roll mill unit (except R6MF provided with a hammer mill). R950M and R6M are fitted with one unit to process 40 tons (1,575 bushels) of grain per hour, while R950MX and R6MX are equipped with two units to process 80 tons (3,150 bushels) per hour.

Rollers: hollow core type. The inner cylinder is enclosed by the outer, hardened steel sleeve. The central shaft runs through caps mounted on the cylinder ends.

Length: 780 mm.

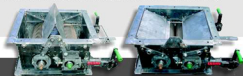
Diameter: 219 mm.

Shaft ends: 45 mm dia.

Grooves: 4, 6 or 9 teeth per inch for different size grains.

Transmission: designed for a 540 rpm PTO. The rollers are driven at differential speeds of 950 rpm and 700 rpm to shear grain for added efficiency.

Flaps positioned between hopper and rollers determine whether grain will be rolled and crimped, or will be conveyed unbroken into the bag. At left the flaps are shown closed, covering the rollers to allow free passage of grain down the sides. At right the flaps are shown open, funneling grain to the rollers for crimping.



## Some features of the 9 ft. crimper-baggers

The 340 mm diameter compression auger pushes in the grain, either crimped or whole. When bagging unprocessed whole grain, it is introduced in the bag at the rate of 290 tons/hr (11,400 bu/hr).



The R950MX has a double set of rollers mounted side to side beneath the reception hopper.



Grain dividers in the hopper of R950MX ensure that both roller mills are fed equal amounts of grain.



Large, high-load industrial type tires provide good clearance and high flotation. Tires prevent the wheels from blocking and sliding by providing a good grip in muddy or powdery soil conditions.



The degree of compression of the bagged material is achieved by increasing or decreasing wheel brake action, and disc brakes provide superior restraining power in combination with the lugged tires.



The command station allows precise monitoring of brake pressure, essential for obtaining a well packed bag.



## The advantages of bagging moist grain

"There may be as much as 10 percent improvement in the feed value of the grain for cattle," (from the Dept. of Animal Sciences of the University of Missouri, in reference to corn and milo harvested early for use as high grain feed for beef-cattle)

Crimping is done prior to ensiling early harvested moist cereals or pulse grains. These are rolled to break the seed coat and allow fermentation to take place. The end result is a highly digestible moist feed.

Crimping followed by bagging preserves farm grown cereals or pulse grains with high moisture content (e.g. wheat, barley, oats, corn, soybeans, peas, beans). All grains harvested with a combine can be crimped. Cereals in general are bagged at 30% - 40% moisture, pulses at 30% - 35% and corn generally at 25% - 33%. Lower permissible moisture level is 25% for proper ensiling action to take place.

Grain attains its highest nutrient level, dry matter yield, palatability and ease of assimilation after fermentation progresses to its last stage at these high moisture levels in an acidic environment, in about a month's time. The product remains virtually unaltered as long as the grain feed is not exposed to air.

Crimped grain has been traditionally processed in pits lined with plastic, but bagging has the enormous advantage of automatically providing the compression and the anaerobic atmosphere required, as well as a steady processing pace. Once crimped and ensiled, grain undergoes lactic fermentation in the absence of oxygen. No further processing is required afterward, saving on time and handling.

Energy use and costs diminish as grain does not have to be dried. Crimped grain is dust free, healthier for workers and stock.

Crops are harvested on average 3 weeks before conventional dates, at the time of their peak nutritional value, and at an earlier stage than when fungal diseases emerge.

Earlier harvest allows easier programming of combine use and timelier establishment of following crops for improved land management. Field grain losses diminish when combining ahead of time.

"Field losses at harvest may be reduced by 5 to 10 percent. Losses average about 13 percent for 15 percent moisture grain vs. 2 percent for 26 percent moisture grain." (from the Dept. of Animal Sciences of the University of Missouri, in reference to corn and milo harvested early as high moisture grain feed for beef-cattle)

Crimped grains are ideal concentrate feed for ruminant livestock ranging from calves and lambs to dairy cows, beef cattle and adult sheep. The inclusion of crimped feed in livestock rations results in better rumen stability and conversion efficiency. Non-ruminants can also benefit from this high concentrate grain feed.

