

Fold-up wings on the new header operate even when folded.

## Fold-Up Combine Header

(Continued from cover page)

up downed crops because of our strong Kansas winds. Consequently, we need lots of header capacity," he told FARM SHOW. "In grain that's not lodged, we've traveled up to 5 mph in wheat with the 40-ft. header, and up to 6 mph in 60 bu. milo, and 4.5 mph in 100 bu. milo."

To build the folding 40-ft. grain head, which cost just \$5,000, Greg cut up three Deere headers that had been junked for one reason or another. "I cut a 24-ft. header down to 20 ft. for

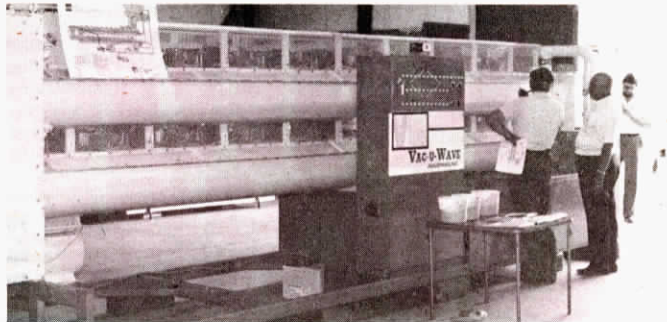
the center section and cut up two others for the 10-ft. wings. On the finished header, the reels are driven by one drive with 90° joints. One of the toughest jobs was overlapping the sickles so there would be no gaps between sections in the field."

The key to the header is in the hinges. With just two 4-in. hydraulic cylinders, they fold the header in such a way that the sections do not kink, even while running. The operator can fold and unfold the header from the cab.

Greg says that in 3,700 acres harvested last fall, the added weight of the 40-ft. header did not put undue stress on the 8820. "They seemed to be built for each other. There are still improvements to be made, however," he told FARM SHOW. "I'll probably put separate drives on the reels. Also, this model doesn't fold to 90° because we didn't need that much fold for our operation. But the basic design will easily adapt to folding the wings to right angles."

Greg says both John Deere and International have expressed an interest in his folding header design, which he would like to sell. Several neighbors, who originally challenged him to build the folding header, are now building their own. Although he hasn't done it, Morris is confident his folding design will work even better on a corn head.

Greg has no literature to send but says he'll be happy to show his header to interested FARM SHOW readers by appointment. Contact:



Stray radiation given off by microwave dryer is less than that given off by a CB radio, says manufacturer.

## First Prototype Microwave Dryer

By Lonnie Stauffer  
Associate Editor

The first farm-size microwave grain dryer, reportedly able to dry grain at five times the rate of conventional dryers at just a fraction of the energy cost, will be tested on farms this summer and fall by the Ken Bratney Co. of Des Moines, Iowa.

"This dryer uses only about as much electrical power as a conventional dryer uses to run its fans and augers," says Neal Alles, vice president, explaining that grain is dried in the new Vac-U-Wave dryer by microwaves in a sealed vacuum chamber. "Since the vacuum lowers the boiling point of the water, less energy is required to vaporize the moisture. Also, as in conventional microwave ovens, the microwaves heat only the liquids in the grain so they require less energy and cause less crop damage."

The new dryer uses industrial-size versions of the same microwave generators, called magnetrons, found in Amana's Radar Range microwave kitchen ovens. There are 36 magnetrons in the 500 bu. per hr. prototype crop dryer.

Grain enters the dryer from a hopper at the top. It passes an airlock into the vacuum chamber where one of two primary augers moves it past the magnetrons in sequence.

Steam boiled out of the grain is car-

ried back to a heat exchanger near the inlet hopper where its heat is passed along to a heat-carrying liquid in the auger tubes. The heated augers pre-heat incoming grain with the recycled energy.

After passing through the primary series of magnetrons, the grain drops down to a secondary set for additional drying. Then, it passes an outlet airlock where it can be hauled or augered away. So far, company tests have shown it takes just three minutes to pull five points of moisture off a bushel of soybeans, says Alles.

"This only is 1/5 to 1/6 the time a conventional heat and air flow dryer requires. A conventional dryer uses about 2,000 btu's to remove a pound of water from soybeans whereas the Vac-U-Wave requires just 50 to 200 btu's. In addition, the microwaves kill spoilage-causing bacteria while leaving the seed germ unharmed," Alles told FARM SHOW.

Models with 500 and 1,000 bu. per hour capacities have been developed so far. The 500 bu. model, with 36 magnetrons, draws a total of 95 kw per hour to operate its microwaves, fans and augers.

Most grains have been tested in the Vac-U-Wave, including corn, soybeans, edible beans, sunflowers, rice and wheat. It also holds promise for drying hay pellets and cubes, and for drying spent alcohol mash for feeding and processing, says Alles.

He claims that the amount of stray microwave radiation output given off by the microwave dryer is less than that given off by a CB radio. After testing this summer and fall, his company intends to start limited production early next year. "Price should be comparable to top-of-the-line conventional dryers," Alles told FARM SHOW.

(The McDonnell Douglas Company, of St. Louis, has also tested an experimental 30 KW vacuum-microwave dryer. McDonnell is currently building a 100 KW model for further testing, but has no plans for commercial production as yet.)

For more information, contact: FARM SHOW Followup, The Ken Bratney Company, 3100 101st St., Des Moines, Iowa 50322 (ph 515 270-2417).

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Morris built a second 40 ft. header, outfitted with twelve Hesston row units, for harvesting milo.