INVENTED BY IOWA FARMER

"Fuel Saver" Cuts Drying Costs 50%

A simple method invented and patented by an Iowa corn farmer can save up to 50% on drying fuel costs, he claims.

The method re-uses heat usually wasted when drying grain in a standard two-bin system where one bin, with propane burner and fan, drys grain and the grain is then moved hot to an adjoining bin to cool.

The system pulls heat off the grain that's cooling in the second bin and ducts it back to the original bin — to the burner and fan. The burner then does not have to supply as much heat for the next batch of grain being dryed.

Rights to manufacture and market the invention have been purchased by Nebraska Engineering Co., Omaha, Neb. whose president William Patterson told FARM SHOW that the system will be available for purchase later this year. While still field testing the product, his company is ready to reply to inquiries from interested farmers who want more information.

Dave Primus, who farms near Mt. Auburn in eastern Iowa, invented the fuel-saver. Primus farms 800 acres, of which about 350 are in corn each year, and his grain yields average 125 bu. most years. So he has a lot of corn to dry — about 44,000 bu. a year.

He got the idea for his invention three years ago and has been using it since. His patent, number 4142302, was granted in March, 1979, and is a method patent.

With the fuel-saver in use, Primus says he can dry 2,000 bu. in 24 hrs. taking out 10 points of moisture — not bad for an in-bin system! "Corn is dryed in the first bin, transferred hot to a second bin, then a fan pulls air through the dry, hot grain and a duct carries it to the burner and fan on the first bin," he told FARM SHOW.

In Primus' set-up, the first bin is 4,000-bu. capacity, but he says any size drying bin could be used. A system for sweeping hot grain off the floor and augering it up and out to the second bin is required. Such systems are readily available from several companies.

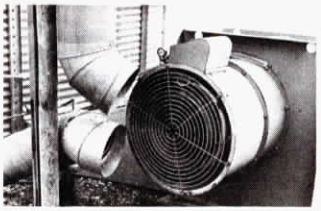
Primus' fan for pulling air through the hot grain is powered by a 1 hp. motor. The sheet metal duct is 12 in. in dia. He says it would help considerably to insulate the duct.

"The system definitely saves fuel," says Primus, "It'll save 25 to 35% on the average, but it has saved as high as 50% and as low as 10%."

Patterson notes that, in his field tests, the system did not save more than 10%, but the tests were done in a year which was unusually good weather-wise for drying.

"You don't save as much when the corn moisture is low," he points out. "Also, outside temperature and humidity have an effect. The humidity of the returning warm air is only 1 to 2 points above outside air.

Dave Primus shown at the point where heat is drawn from a cooling bin. He is holding a sheet of paper over the duct to simulate insulation.



At the other end of the duct, heated air from the cooling bin is fed into the fan and burner on bin No. 1 where drying takes place. There are two ducts coming in because Primus pulls and re-uses heat from two separate bins.

"Last fall, corn could be dryed for a fuel cost of about five cents a bushel," says Primus. "For 10,000 bu., that would be a fuel cost of $500. If you save half of that, it would be a savings of $250."

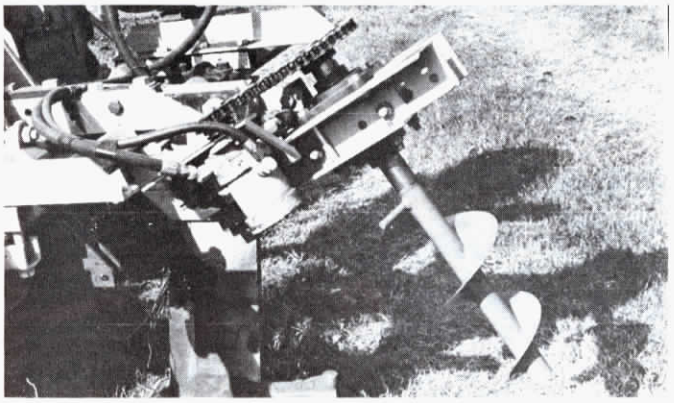
Patterson says the price of the fuel-saver will run somewhere around that figure, not including the motor and fan. The ductwork he markets will not be insulated.

Both Patterson and Primus explain that their system offers a distinct advantage over the several heat-saver systems now available for use on large, portable batch grain dryers.

"They haven't solved the bees' wings problem," explains Primus. "The wetter the corn, the more bees' wings there are, and they can collect in the burner and fan or under the bin floor and catch fire. They come off the tip of the corn kernel where it joins the cob, and can be a real fire hazard. Our system leaves the bees' wings with the corn in the second bin."

Primus concedes that a farmer could build his own heat-saver, but probably would be just as well off buying one because he wouldn't save any money, and would have to do his own engineering.

For more information, contact: FARM SHOW Followup, Nebraska Engineering Co., Box 12171, Omaha, Neb. 68112 (ph 402 453-6912).



"Soil Twisters" operate at a depth of 14 in., directly behind subsoil shanks.

TILLAGE WITH A NEW TWIST

"Twister" Makes Seedbed Behind Row Subsoiler

Latest new twist in tillage is the "Soil Twister" which mounts directly behind row subsoilers to prepare a seedbed suitable for planting. The idea: To break up hardpan and prepare a row-crop seedbed in a once-over operation.

"We think it has real possibilities," reports Cecil Hammond, who, along with co-workers Travis Reid and W. E. Seigler, developed the new tillage tool. All three are University of Georgia agricultural engineers.

The original plan was to mount an inclined, rotating, tapered auger — similar to a giant woodscrew — behind a subsoil shank. Four other hydraulically powered soil pulverizing devices (see photo) were subsequently developed and tested in a heavy Davison clay loam soil at the experiment station, located in Griffin, Ga. The subsoil shank (one row unit) was operated at a depth of 18 in., and the pulverizer attachments at a depth of 14 in.

All of the pulverizing devices were powered by a hydraulic motor supplied by the tractor hydraulic's system. They were mounted at 60° from horizontal (top leaning forward) and rotated at 325 rpm.

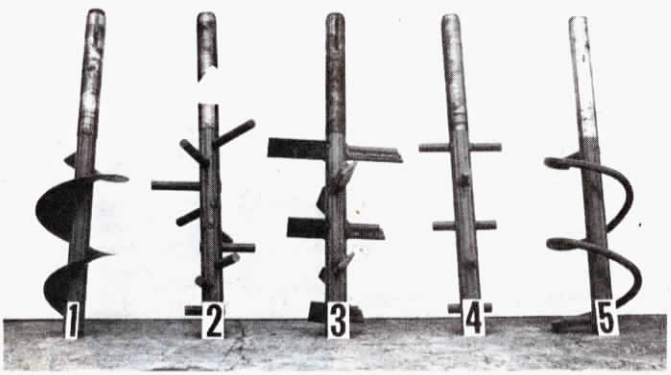
All of the devices tested did a reasonably acceptable job of pulverizing the soil. Weeds and crop litter (green pea vines) created some wrapping problems on devices 2, 3 and 4, but not on devices 1 and 5.

"It would be desirable to have a helix (device 5) with an open center (without the lower center shaft) to make it self-cleaning since a few vines were caught between the helix and the bottom stablizing bar which attaches the helix to the center shaft. This may have caused a slight increase in power to rotate the drive shaft but otherwise was of no consequence," explains Hammon.

The shape of the spiral or flighting on the pulverizer can be modified to suit the particular needs for various soils and planting operations.

"A manufacturer has agreed to license and market the device. Consequently, you should be seeing a soil twister on the market in the not too distant future which, hopefully, will allow once-over farming under almost any conditions," Hammond told FARM SHOW.

For more details, contact: FARM SHOW Followup, Cecil Hammond, Extension Engineer, University of Georgia, Athens, Ga.



In addition to the tapered auger design, four other soil pulverizing devices have been developed.