American agriculture rediscovering the windmill s It's interesting to

BY JERRY WEBB University of Delaware

NEWARK, Del. American agriculture is rediscovering the windmill and for very practical reasons. The high cost of fuel is causing farmers and agricultural researchers to look for less expensive sources of energy. And since the wind is free, windmills look like a sure bet to make a strong comeback on the agricultural scene.

Nobody is claiming that wind power will replace diesel power in most agricultural applications. But there are a variety of jobs where present windmill technology applies, and certainly in the long run windmill research is bound to turn up more efficient and more effective wind machines.

Windmill development got shelved with the advent of

20th century. Those windmills you can still see turning on some farms haven't changed much for more than 50 years. Until just recently nobody gave much thought to the problem. They seemed to work pretty well before the arrival of the internal combustion engine and so farmers used them to pump water and to power electricity-producing generators. But they only worked when the wind blew. And any farm boy who ever had to fill a water trough with a hand pump on a windless day knows the drawbacks of windmills. Obviously, today's windmill researchers are well aware of this problem and are coming to grips with all kinds of technology that will once again make the wind

U.S. farm

ANGAR

Ahead in yields

and anthracnose

resistance.

(Continued from Page 129)

sent him a check for \$120. He's tight," joked Marcia. "Doesn't spend a dime. I told him he'll be rich when he goes home.'

Dykstra said, "People around here are interested in Sha and come by to talk to him. On a visit to town to buy some jeans and things, one farmer I introduced him to had helped build the Burma Road to supply China during World War II and remembered the 11- and 12-year-old Chinese boys who carried American construction equipment on their shoulders. He fished a \$20 bill from his wallet and insisted Sha keep it.

"Sha didn't want to take it but I told him to donate it to International Farmers Association for Education," Dynstra said.

"He takes it for granted that he's part of the family. I expect he'll be baby-sitting for us soon. He's much like people anywhere," Tom Aupperlee said. "He's willing to jump right in, too, to learn our ways. After seeing a disco dance program for teenagers on television one night, Sha said he didn't care to learn to dance like that but if we dic it, he'd give it a try. I tolc him to forget it!"

NAPB

practical gas and electric machine an important power in the early part of the source of agricultural energy.

> Already farmers are refurbishing long-abandoned windmills for useful farm work and windmill manufacturers are overrun with orders. Courses of instruction are being offered in windmill care and maintenance and enrollment are high. But the windmill researchers believe these agricultural antiques won't make a strong comeback. Instead, they will be improved upon and a whole new generation of windpowered devices will come on the scene. All sorts of unusual designs are on the drawing boards or are actually being tested.

One type that's gaining attention in Canada's Swift Current Research Station is called a vertical windmill. It has vertical blades mounted on an upright frame and utilities the lift principle that is involved with airplane flight. The researcher says this type may be more cost effective than conventional windmills. Already they're evaluating this system in a number of power generating uses.

Windmill research has been going on for about five vears at Sandia Laboratories in Albuquerque, New Mexico. Researchers there are tinkering with a turbine principle linking it to electricity production. They think such a turbine could produce large amounts of electricity speculate over what might when the wind blows and have happened to windmills could be phased into a farmer's normal electrical system replacing a lot of expensive commercial power.

The U.S. Department of Agriculture is testing a multi-bladed wheel that is not unlike a bicycle wheel with blades instead of spokes. The government researchers say they're close to developing a machine that is economically feasible. At Colorado State University they're testing a vertical wind turbine at that institution's dairy farm. The point of that study is to see if the turbine will generate electrical energy to heat water for the dairy's

sanitation system and to cool water for milk storage. In a year of testing the unit has produced enough electricity to reduce the dairy's electric bill by more than 20 percent. One thing to remember when considering the cost feasibility of windmills is that in the early stages of their development initial costs are high, and yet as such machines reach the market and start to be

widely used the cost per unit

should come down. In the

meantime the cost of con-

ventional energy, such as

electricity, gasoline and diesel fuel appears to be

going steadily upward. So

what was not cost efficient

two or three years ago is

starting to look better, and

projecting perhaps five

years ahead, looks feasible.

had they stayed popular and had research and development continued over the past 50 or more years.

Who's to say that new generations of windmills coupled with new kinds of electrical storage units could not be producing a major portion of the farm's stationary power needs.



90-hp 4040



TOTAL C

Ő

