

# Energy, Food Related

By Ferdie J. Deering

The energy crisis cannot be separated from the food crisis. When the price of one escalates, the other will go up, and brighter uses of sunlight can make both more plentiful.

This idea is receiving attention from farm experts and politicians, and it was



a main topic at the recent meeting of the American Society of Agricultural Engineers at Oklahoma State University. Sen. Henry Bellmon reports that Washington politicians are climbing on the food-energy crisis bandwagon, too. The big question in Washington, the senator says, is how far the United States can go in sharing our food resources with nations whose survival is at stake, recognizing that it is literally beyond our ability to save them all. There is much concern that American delegates to the World Food Conference in Rome next November may give away more than this country can afford.

Diverse views on whether we are making good use of energy in food production were presented at the Stillwater convention, but there was agreement that solar energy offers opportunities for improvement.

"Our nation's agriculture is the most efficient in the history of mankind in terms of production per man, but it may be among

the least efficient in terms of output per unit of energy input," said Dr. Warren L. Roller of the Ohio Agricultural Research and Development Center at Wooster.

He stated that in terms of energy return per unit of energy input, we are actually less productive than primitive civilizations, but said that we can't return to primitive agriculture because of the increasing need for food.

Pointing to products of agriculture, forestry, fisheries, wildlife and range as renewable resources, Dr. S. H. Wittwer, director of Michigan State University Agricultural Experiment Station, said that some factors have been ignored in charging agriculture with less efficient energy utilization.

He said that release of land through higher yields and release of 95 per cent of the working force of this nation from food production are efficient uses of energy. He said that 46 million acres have been released from wheat and corn production in the last 40 years, while output has doubled.

In addition, Wittwer noted that capital has been substituted for both skilled and unskilled labor by use of labor saving equipment.

"Food, fiber and timber are reproducible because solar energy fixation through photosynthesis and biologically fixed nitrogen are free and essentially inexhaustible," Wittwer said.

"We can go back to the land, the water and the air year after year and renew them, or reproduce the process," he added. "Some nonrenewable resources such as fertilizers, chemi-

cals, machinery and fuel are needed, but the energy return is still better than two to one for the major food and feed crops."

"The sun holds the secret" to the solution to our energy crisis, Dr. Roller said. He stated that 96 per cent of the world's non-food energy now comes from hydrocarbons — coal, oil and natural gas, and that demand is doubling every 15 years.

The entire western hemisphere has only 9 per cent of the world's known oil reserves, we are using more oil than we are discovering, and our refinery capacity is insufficient, Roller said.

"The photosynthetic process annually fixes into organic matter five times the world's total energy use," the scientist said. "And this represents only one-fortieth of one per cent of the total solar energy that falls on earth. The potential is there if we can develop a way to use it."

He said that tubers and root crops collect about 2 per cent of the solar radiation that falls on them, while cereal grains utilize only about 1 per cent.

Food is a source of energy, and whether we consume it ourselves or export it as grain, it must be considered in relation to other sources of energy.

There are differences of opinion about the wisdom of using energy in the form of grain to feed livestock for human consumption and there are different attitudes about a world food reserve, but agreement is developing that the sun offers the most promising solution to our need for more food and more energy.