

rebels—a force largely made up of indigenous peasants—staged an armed uprising in January 1994 to protest the government's decision to abandon a historic commitment to land reform. This led in turn to violent clashes with the Mexican army, and political instability that continues today."

Thus does Worldwatch "prove" that strife comes from the soil, resources are exhausted, and population should be cut.

### Lester Brown's biography

Lester Russell Brown's entire career as a food and resources "expert" has been associated with the Worldwatch Institute, which he has headed since its creation in 1974. Brown was born in New Jersey in 1934, and was elevated into his role as an "agriculture authority" as a young man in Washington, D.C. in the 1960s.

**Funding:** The 1974 start-up grant for Worldwatch Institute was \$500,000 provided by the Rockefeller Brothers Fund. The chief funders of Worldwatch over the succeeding years include the following foundations: Ford, Rockefeller, John D. and Catherine T. MacArthur, Andrew W. Mellon, (Ted) Turner, William and Flora Hewlett, Charles Stewart Mott, Geraldine R. Dodge, Edward John Noble, W. Alton Jones, Curtis and Edith Munson, Frank Weeden, Energy, George Gund, Surdna, Public Welfare, and Edna McCon-

nell Clark.

Other Worldwatch funding agencies include the UN Environment Program, the UN Population Fund, the Rockefeller Brothers Fund, the Winthrop Rockefeller Trust, the Lynn R. and Karl E. Pickett Fund, the Robert R. McCormick Charitable Trust, and the Pew Charitable Trusts.

**Associations:** Brown is a member of the following groups: New York Council on Foreign Relations, Zero Population Growth, Common Cause, and World Future Society. He is a board member of the Institute of 21st Century Studies, the Population Reference Bureau; and an advisory council member of the Commission of National Institutions for the Environment. He is on the advisory committee of the Institute of International Economics, a consulting group run by C. Fred Bergsten of the Trilateral Commission, which acts in close association with the International Monetary Fund.

**Education:** BS from Rutgers University; masters degree in agriculture economics from the University of Maryland, 1959; masters degree in public administration from Harvard University, 1962.

**Background:** Brown worked at the U.S. Department of Agriculture in Washington, D.C. in 1959-69, starting out as an analyst for international agriculture in 1959-63, and otherwise working in the USDA Foreign Agriculture Service. During

## New 'super rice' means 25% yield increase

On Oct. 15, two veteran scientists from the first Green Revolution, Dr. Gurdev Singh Khush and Dr. Henry Beachell, jointly received the 25th annual World Food Prize, in honor of their work on the 1960s "miracle rice," and on the more recent "super rice."

Dr. Beachell, an American, now 90 years old, began work at the International Rice Research Institute (IRRI) in the Philippines in 1963; in 1966, he developed "IR8," the stiff-strawed, semi-dwarf rice variety, that revolutionized world rice growing. In 1967, Gurdev Singh Khush, an Indian, now 61 years old, came to the IRRI, collaborated on disseminating IRRI "miracle rice," and on developing "super rice."

In their remarks at the awards ceremony in Des Moines, Iowa, the researchers reported on the 25% increase possible in per-hectare rice yields by the year 2000.

Dr. Singh Khush said that the new rice is the basis for providing increased food for millions more people. He reported, "In 1988, IRRI scientists conceptualized a 'new plant type' which will produce 20-25% higher yield. The breeding program to develop such plants was initiated in

1989 and, within five years, the new plant type became a reality."

He then provided the per-hectare specifics on biomass potential, and also gave a short review of the pre-Green Revolution biomass per hectare, up through the most recent advances in increasing edible biomass per hectare.

"The pre-Green Revolution rice varieties produce a biomass (grains, stems, and leaves) of 12 tons/hectare, and 30% of that are grains, and the rest straw. Thus, their maximum yield is about 4 tons/hectare. Modern high-yielding varieties, when properly fertilized, can produce 18-20 tons of biomass, and 50% of that is grain. So they can produce 9-10 tons/hectare. We reasoned that the rice varieties of the future must produce a biomass of 21 tons, of which 60% should be grain. They would then produce 12.0 to 12.5 tons of rice per hectare. Modern high-yielding varieties have 25-27 tillers [grain stalks], of which only 15-16 produce panicles or ears, each with about 100 grains. Remaining tillers remain unproductive. On the other hand, the new plant type, dubbed 'super rice' by some, has only 8-10 tillers, all of which produce panicles, each with more than 200 grains. It has sturdy, lodging-resistant stems. We are now incorporating genes for disease and insect resistance into the new plant type lines. When finally ready, by the turn of the century, they should outyield existing high-yielding varieties by 20-25%."—*Marcia Merry Baker*