

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Science serves its readers as a forum for the presentation and discussion of important issues related to the advancement of science, including the presentation of minority or conflicting points of view, rather than by publishing only material on which a consensus has been reached. Accordingly, all articles published in *Science*—including editorials, news and comment, and book reviews—are signed and reflect the individual views of the authors and not official points of view adopted by the AAAS or the institutions with which the authors are affiliated.

Editorial Board

1973

H. S. GUTOWSKY	GARDNER LINDZEY
ARTHUR D. HASLER	RAYMOND H. THOMPSON
RUDOLF KOMPFFNER	EDWARD O. WILSON
DANIEL E. KOSHLAND, JR.	

1974

ALFRED BROWN	FRANK W. PUTNAM
JAMES F. CROW	MAXINE SINGER
SEYMOUR S. KETY	GORDON WOLMAN
FRANK PRESS	

Editorial Staff

Editor

PHILIP H. ABELSON

<i>Publisher</i>	<i>Business Manager</i>
WILLIAM BEVAN	HANS NUSSBAUM

Managing Editor: ROBERT V. ORMES

Assistant Editors: ELLEN E. MURPHY, JOHN E. RINGLE

Assistant to the Editor: NANCY TEIMOURIAN

News and Comment: JOHN WALSH, LUTHER J. CARTER, DEBORAH SHAPLEY, ROBERT GILLETTE, NICHOLAS WADE, CONSTANCE HOLDEN, BARBARA J. CULLITON, SCHERRAINE MACK

Research News: ALLEN L. HAMMOND, WILLIAM D. METZ, THOMAS H. MAUGH II, JEAN L. MARX, ARTHUR L. ROBINSON

Book Reviews: SYLVIA EBERHART, KATHERINE LIVINGSTON, ANN SELTZ-PETRASH

Cover Editor: GRAYCE FINGER

Editorial Assistants: MARGARET ALLEN, ISABELLA BOULDIN, BLAIR BURNS, ELEANORE BUTZ, MARY DORFMAN, JUDITH GIVELBER, CORRINE HARRIS, NANCY HARTNAGEL, OLIVER HEATWOLE, CHRISTINE KARLIK, GINA BARI KOLATA, MARGARET LLOYD, JEAN ROCKWOOD, PATRICIA ROWE, LEAH RYAN, JOHN SCHAUER, LOIS SCHMITT, MICHAEL SCHWARTZ, RICHARD SEMIKLOSE, KENNETH SMITH, YA LI SWIGART

Guide to Scientific Instruments: RICHARD SOMMER

Membership Recruitment: GWENDOLYN HUDDLE;
Subscription Records and Member Records: ANN RAGLAND

Advertising Staff

<i>Director</i>	<i>Production Manager</i>
EARL J. SCHERAGO	PATTY WELLS

Advertising Sales Manager: RICHARD L. CHARLES

Sales: NEW YORK, N.Y. 10036: Herbert L. Burklund, 11 W. 42 St. (212-PE-6-1858); SCOTCH PLAINS, N.J. 07076: C. Richard Callis, 12 Unami Lane (201-889-4873); CHICAGO, ILL. 60611: John P. Cahill, Room 2107, 919 N. Michigan Ave. (312-DE-7-4973); BEVERLY HILLS, CALIF. 90211: Winn Nance, 111 N. La Cienega Blvd. (213-657-2772)

EDITORIAL CORRESPONDENCE: 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Phones: (Area code 202) Central Office: 467-4350; Book Reviews: 467-4367; Business Office: 467-4411; Circulation: 467-4417; Guide to Scientific Instruments: 467-4480; News and Comment: 467-4430; Reprints and Permissions: 467-4483; Research News: 467-4321; Reviewing: 467-4440. Cable: Advancesci, Washington. Copies of "Instructions for Contributors" can be obtained from the editorial office. See also page xv, *Science*, 28 September 1973. ADVERTISING CORRESPONDENCE: Room 1740, 11 W. 42 St., New York, N.Y. 10036. Phone: 212-PE-6-1858.

A Sino-American Soybean Research Institute

Over the past quarter-century, soybeans have emerged as one of the world's leading sources of protein. In recent years, world demand for soybeans has been expanding by nearly 7 percent annually. If sustained, this rate of growth doubles consumption every 11 years. For a billion people in East Asia, soybeans are consumed directly, constituting an important dietary staple. For the affluent industrial countries of North America and Europe, they have become the dominant source of high-quality protein for livestock and poultry feed. As growth in the world fish catch slows, the pressure on soybean supplies intensifies further.

Perhaps the best single barometer of the increasing world demand for protein is U.S. soybean exports. The growth in exports has been phenomenal, climbing from a few hundred million dollars in the early 1960's to more than \$2 billion in 1972. The value of U.S. soybean exports now exceeds that of any other product, including high-technology items such as computers and jet aircraft.

Future demand prospects for soybeans are very bright. Both growing populations and rising affluence are generating additional demand. The supply problem is somewhat less promising. The world protein market is being converted from a buyer's to a seller's market. Soybean prices in 1973 have been more than double the average price during the 1960's.

Agricultural scientists have not been able to achieve a breakthrough in soybean yield per acre of the sort achieved for most other important crops. Since 1950, yields of soybeans in the United States, where two-thirds of the world's soybean crop is produced, have increased just over 1 percent per year. This contrasts with nearly 4 percent per year for corn. As a result, most of the fourfold increase in U.S. soybean production since 1950 has come from expanding the acreage of soybeans. We get more soybeans by planting more soybeans. As of 1973, nearly 1 in every 6 acres of cropland in the United States is planted to soybeans.

Together the United States and mainland China produce 90 percent of the world soybean crop. With the cropland idled under government programs in the United States rapidly disappearing, and with the world dependent on the United States for 85 percent of exportable soybean supplies, this inability to achieve a yield breakthrough suddenly begins to loom as a rather formidable cloud hanging over the world food economy. The Department of Agriculture now projects a decline in the U.S. soybean crop in 1974 as other crops, especially cotton, compete for available cropland. Such a decline combined with continuing growth in the world demand for soybeans can bring only higher prices for soybeans and for livestock products produced with soybeans.

Within China, the remarkable achievements on the nutritional front are based in large measure on the extensive direct consumption of soybeans. If the production of soybeans in China continues to decline, as soybeans are displaced by the higher-yielding cereals, the nutritional gains of the past decade may be reversed.

These difficulties in raising soybean yields in a land-scarce world suggest the need for a much greater research effort and in particular for the creation of a Sino-American Soybean Research Institute. Since the soybean originated in China, it probably has the most diverse available collection of germ plasm, a vital asset in an expanded soybean research effort. On the other hand, scientists in the United States have expended a great deal of effort to devise better cultural practices and to make the soybean plant more productive. The critical importance of the soybean to both economies, not to mention mankind as a whole, and the pressing need to achieve a breakthrough in yields of soybeans, argues for a pooling of germ plasm, the coordination of research efforts, and the sharing of research results.—LESTER R. BROWN, *Overseas Development Council, 1717 Massachusetts Avenue, NW, Washington, D.C. 20036*