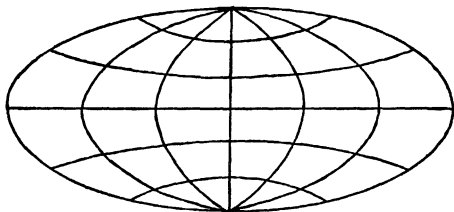


88TH CONGRESS, 2D SESSION, HOUSE DOCUMENT NO. 279

The Yearbook of Agriculture

1964



THE UNITED STATES GOVERNMENT PRINTING OFFICE

Farmer's
World

The Yearbook of Agriculture
1964

THE UNITED STATES DEPARTMENT OF AGRICULTURE

FOR SALE BY THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON, D.C., 20402 - PRICE \$3.00

American and World Agriculture

by ORVILLE L. FREEMAN
Secretary of Agriculture

AT NO TIME in three centuries has American agriculture reached so far and touched the lives of so many people as today.

At no time in thirty centuries has world agriculture faced greater problems, greater challenges, and greater opportunities.

And at no time has American agriculture been so closely connected as now with world agriculture in its gigantic task of feeding and clothing more people; husbanding and developing its various resources; expanding its trade; sharing in and contributing to the upsurge of modern science; undergirding economic growth; and, by doing all this, assuming an ever-larger role in mankind's long struggle for freedom and plenty.

This book reveals the vital stake everybody in the United States has in a healthy export trade for American agriculture, not only because farmers have so much to sell and because the livelihood of so many Americans besides farmers depends on it, but also because the world so greatly needs what we can offer.

Exports of American farm products are now at their highest level. Their total value in 1963 approximated 5 billion dollars, equivalent to one-sixth of cash receipts from all farm marketings. One acre out of every four is harvested for export. The output of about 75 million acres of our cropland is moving abroad.

These exports support at least a million jobs, both on and off the farm. They require financing, storage, and inland and ocean transportation. They would fill more than a million freight cars or more than 5 thousand cargo ships, and they are carried to more than 125 countries and territories.

Most Americans have learned that we cannot separate our agriculture from the rest of our national economy, but many have still to recognize that we cannot disconnect American agriculture from world agriculture and world business. This lesson also is contained herein.

Wheat from Kansas competes in world markets with wheat grown in Canada and Argentina. Hogs from Iowa share markets with those of Denmark and Poland. Oranges from Florida and Spain, cotton from Texas and Brazil, dairy products from Wisconsin and Denmark are increasingly part and parcel of the world market.

Just as national markets have their trading rules, so do the world markets. Trade must be orderly and subject to agreements and conventions worked out through negotiation by the organizations of which we are a part—for example, the General Agreement on Tariffs and Trade.

We hold to the belief that trade is a two-way street, and that a healthy flow of two-way traffic can be promoted by a lowering of tariffs and other trade barriers.

We pride ourselves on being good salesmen with fine products to sell. We know that we have in the Department of Agriculture men and women skilled in the arts and crafts of trade. We know that our farm and food industry is highly qualified for international competition in any liberalized trade situation.

But we know, too, that international relationships are linked closely with commerce, and vice versa. Trade involves much more than loading 5 billion dollars' worth of agricultural goods on ships bound for foreign ports. It is a matter also of supporting or competing with blocs, alignments, or groupings, whose political aims may be no less important than their economic goals.

Readers will sense this challenge in these pages.

But, above all, trade is now what it has ever been: Opportunity.

It is opportunity to share our abundance to fulfill a humanitarian obligation; opportunity to help less privileged regions develop dynamic economies of their own, thus becoming our potential customers; opportunity to raise standards of living all over the world, in the advanced nations as well as those that are emerging; opportunity to stride toward a better day for agriculture, industry, and consumers.

Trade is opportunity to enter more swiftly the age of plenty, progress, freedom, and peace that is the objective of mankind's long pursuit.

PREFACE

Purposes and Ideals

by ALFRED STEFFERUD
Editor of the Yearbook

THE PURPOSE of the Yearbooks of Agriculture (including this one) since their origin many years ago has been to present unbiased, factual information of value and interest to farmers and other Americans.

Several secondary purposes may be served at the same time: To report on work in progress in the Department of Agriculture, since the Yearbooks are related to the annual reports of the Secretary of Agriculture; to summarize developments in the agricultural sciences; to discuss problems in rural affairs and to indicate in an objective fashion the ways in which they may be solved; to point out changes in knowledge, attitudes, and production and consumption; and to present one at a time over the years an integrated, encyclopedic reference series.

A book of science ("A science teaches us to know, and an art to do, and all the more perfect sciences lead to the creation of corresponding useful arts") indulges in no special pleading, however worthy the cause; is dedicated to the pursuit of truth and fact; tries to be clear and to clarify but not to be "popular" in the ways of polls and TV ratings; and takes the long view of programs, policies, and transient pressures.

Those purposes and ideals are apparent, we trust, in the present Yearbook of Agriculture, which encompasses a much broader field than any of its predecessors—a field hitherto untilled and made somewhat precarious by rapid changes in world affairs (including, for example, the names of countries), and the complexity of the subject.

Two special points about this book:

First, its intended readers.

We address ourselves, as always, primarily to American farmers, consumers, and others who have an interest in agriculture, but farmers, agricultural administrators, and policymakers anywhere should find much of value in it.

A paragraph in the notes sent to prospective contributors reads:

“The book will inform Americans about America’s growing stake in world agriculture and explain how our actions, trade, and policies affect and are affected by agricultural, natural, and political developments abroad. It will inform people everywhere of the greatness of American agriculture, the problems we face, the importance of international understanding and joint effort, and the expenditures we consider necessary to achieve agricultural prosperity and security.”

The fact of change also is brought out. Changes in production, consumption, trade, governments, organizations, laws, and programs posed a problem and a challenge as we labored to make a book of lasting value. Life and its components never stand still, but we believe we present a body of information that will remain valid for a number of years—as an introduction to the subject of world trade if nothing else. Periodicals and other publications are available from the Department of Agriculture to producers, dealers, exporters, and others who need current information on specific aspects of production and trade.

Second, its emphasis on the importance of farmers in this changing, striving, industrially developing world.

On farmers rests progress, whether social, political, administrative, or economic. In a world of automation, technology, conferences and international maneuvers, machines, and impersonal relationships, we must keep in mind the men—as men, as human beings—who provide the basic elements of life and whose bond with the earth is an abiding verity.

The members of the 1964 Yearbook Committee are:

Foreign Agricultural Service: W. A. Minor, CHAIRMAN; Kenneth W. Olson, SECRETARY; James O. Howard; Douglas M. Crawford; Afif I. Tannous; Ralph E. Spencer; John H. Dean; Harald C. Larsen.

Economic Research Service: Wilhelm Anderson, Kenneth L. Bachman, Nelson P. Guidry.

Agricultural Marketing Service: Omer W. Herrmann, Howard P. Davis.

Agricultural Stabilization and Conservation Service: Murray Thompson, Ernest W. Grove.

Agricultural Research Service: G. E. Hilbert, Kenneth Haines.

Forest Service: Robert K. Winters.

Soil Conservation Service: Guy D. Smith.

Federal Extension Service: Raymond C. Scott, Dana G. Dalrymple.

CONTENTS

Foreword, AMERICAN AND WORLD AGRICULTURE,
Orville L. Freeman, *Secretary of Agriculture*, page v

Preface, PURPOSES AND IDEALS, Alfred Stefferud,
Editor of the Yearbook, page vii

Perspective

VALLEY TO VALLEY, COUNTRY TO COUNTRY,
Wayne D. Rasmussen, page 1

BOND WITH THE EARTH, *Afif I. Tannous*, page 12

MIGRATIONS AND AGRICULTURE, *Phillips W. Foster*, page 22

QUESTIONS TO BE ANSWERED, *Montell Ogdon*, page 30

NUTRITIONAL STATUS OF THE WORLD, *Esther F. Phipard*
and *Riley H. Kirby*, page 37

WORLD SOURCES OF PROTEIN, *Martin G. Weiss* and
Ruth M. Leverton, page 44

POPULATION, INCOME, AND FOOD, *Robert D. Stevens*, page 53

POTENTIALS FOR FOOD PRODUCTION, *Charles E. Kellogg*,
page 57

SOIL CONSERVATION, A WORLD MOVEMENT,
Roy D. Hockensmith and *Phoebe Harrison*, page 69

WATER HAS A KEY ROLE, *Elco L. Greenshields*, page 75

ENGINEERING IN AGRICULTURE, *E. G. McKibben* and
W. M. Carleton, page 96

- THE NEED FOR FERTILIZERS, *W. L. Hill*, page 101
- CHEMICALS IN CROP PRODUCTION, *W. B. Ennis, Jr.*,
and *W. D. McClellan*, page 106
- THE PLACE OF INSECTICIDES, *Stanley A. Hall*, page 113

Production

- GRAIN, A BASIC FOOD, *Kenneth L. Murray*, page 118
- FRUIT OF THE EARTH, *Stanley Mehr*, page 126
- GROWING AND USING VEGETABLES, *A. Clinton Cook*, page 138
- MEAT PRODUCTION AND TRADE, *Dwight R. Bishop*, page 146
- MILK AND DAIRY PRODUCTS, *David R. Strobel* and
Samuel L. Crockett, page 155
- FISHERIES OF THE WORLD, *Sidney Shapiro*, page 161
- SUGAR AND OTHER SWEETENERS, *John C. Scholl* and
Leslie C. Hurt, page 177
- WHAT'S BEHIND THE COFFEE BREAK, *Leslie C. Hurt*
and *John C. Scholl*, page 184
- TEA THE WORLD OVER, *William C. Bowser, Jr.* and
Arthur G. Kevorkian, page 190
- PEPPER, VANILLA, AND OTHER SPICES, *Arthur G. Kevorkian*,
page 195
- COCOA AND CHOCOLATE, *Arthur G. Kevorkian* and
Rex E. T. Dull, page 200
- PRODUCTION, TRADE, AND USE OF TOBACCO, *Hugh C. Kiger*,
Franklin S. Everts, and *Edward J. Eisenach*, page 205
- FORESTS AND FOREST PRODUCTS, *Albert A. Downs*, page 211
- FIBERS ARE UNIVERSAL, *Horace G. Porter*, page 218
- COTTON, KING OF FIBERS, *Vernon L. Harness* and
Horace G. Porter, page 220

- BAST, THE TEXTILE FIBERS, *Cecille M. Protzman*, page 227
- STRUCTURAL, OR LEAF, FIBERS, *Cecille M. Protzman*, page 237
- OTHER VEGETABLE FIBERS, *Cecille M. Protzman*, page 246
- WOOL AND OTHER ANIMAL FIBERS, *Horace G. Porter* and
Bernice M. Hornbeck, page 251
- FIBERS MADE BY MAN, *Bernice M. Hornbeck*, page 258

Marketing

- THE EVOLUTION OF COMPETITIVE MARKETS,
Harry C. Trelogan, page 261
- CHANGES IN MARKET STRUCTURE, *Harold F. Breimyer*,
page 269
- SUPERMARKETS AROUND THE WORLD, *R. W. Hoecker*,
page 279
- REGULATING TRADE AMID CHANGES, *Clarence H. Girard*,
page 282
- MAINTAINING QUALITY OF FARM CROPS, *Calvin Golumbic*,
page 291
- THE STORAGE OF FARM CROPS, *A. Lloyd Ryall*, page 303
- PROCESSING AND PRESERVATION, *Robert L. Olson* and
Clyde L. Rasmussen, page 309

World Trade

- BACKGROUND OF TRADE, *Charles A. Gibbons*, page 314
- MONETARY PROBLEMS AND TRADE, *Warrick E. Elrod, Jr.*,
page 321
- ECONOMIC GROWTH AND TRADE, *Arthur B. Mackie* and
Kenneth L. Bachman, page 326

- TRADING BY GOVERNMENTS, *Richard H. Roberts*, page 330
- EAST-WEST AGRICULTURAL TRADE, *Theodora Mills*, page 338
- COOPERATIVES IN WORLD TRADE, *John H. Heckman*,
page 346

Our Trade

- OUR AGRICULTURAL TRADE POLICIES, *Raymond A. Ioanes*,
page 358
- OUR AGRICULTURAL EXPORTS, *Robert L. Tontz* and
Dewain H. Rahe, page 365
- OUR AGRICULTURAL IMPORTS, *Alex D. Angelidis*, page 370
- CONTROLS OF IMPORTS, *Terrence W. McCabe*, page 374
- THE TRADE EXPANSION ACT, *Irwin R. Hedges*, page 379
- THE REQUIREMENTS OF BUYERS, *James O. Howard*, page 384
- COOPERATIVE PROGRAMS, *David L. Hume*, page 392
- BARTERING FARM PRODUCTS, *Robert O. Link*, page 398
- SALES PROGRAMS FOR DOLLARS, *Charles E. Raeder*, page 400
- THE TRADE FAIRS PROGRAM, *Kenneth K. Krogh*, page 403
- OUR AGRICULTURAL ATTACHÉS, *Douglas M. Crawford*,
page 405
- GETTING AND USING STATISTICS, *Clarence M. Purves*, page 415

Agreements

- INTERNATIONAL ORGANIZATIONS, *Ralph W. Phillips*,
page 423
- FAO OF THE UNITED NATIONS, *Ralph W. Phillips* and
Kenneth A. Haines, page 434

- THE INTER-AMERICAN SYSTEM, *Charles R. Davenport*, page 443
- OECD AND OEEC, *William G. Finn*, page 449
- REGIONAL ECONOMIC GROUPS, *Patrick J. Murphy*, page 453
- THE EUROPEAN ECONOMIC COMMUNITY, *John E. Montel*,
page 458
- GENERAL AGREEMENT ON TARIFFS AND TRADE,
A. Richard DeFelice, page 476
- PREFERENTIAL TRADE AGREEMENTS, *Robert L. Gastineau*,
page 482
- COMMODITY AGREEMENTS, *John C. Scholl*, page 486

Assistance

- FOREIGN ASSISTANCE PROGRAMS, *D. A. FitzGerald*, page 495
- INTERNATIONAL FINANCIAL SERVICES, *Warrick E. Elrod, Jr.*,
page 508
- PUBLIC PROGRAMS TO SHARE FOOD, *Harry W. Henderson*,
page 514
- SHARING OUR KNOWLEDGE, *Cannon C. Hearne*,
William E. Harvey, and *Andrew J. Nichols*, page 518
- PRIVATE FOUNDATIONS AND ORGANIZATIONS, *A. H. Moseman*
and *F. F. Hill*, page 523

Needs

- PROBLEMS OF SOIL AND WATER, *C. A. Bower* and
Jesse Lunin, page 535
- RESEARCH IN FORESTRY, *Robert K. Winters*, page 542
- WORLD PROBLEMS IN ENTOMOLOGY, *Paul Oman*, page 546

COOPERATION IN CROPS,	<i>John H. Martin</i> ,	page 554
PROBLEMS IN HUMAN NUTRITION,	<i>Hazel K. Stiebeling</i> and <i>Ruth M. Leverton</i> ,	page 558
PROBLEMS IN ANIMAL HUSBANDRY,	<i>Ralph E. Hodgson</i> and <i>Ned D. Bayley</i> ,	page 564
RESEARCH PROJECTS IN OTHER LANDS,	<i>Henry W. Marston</i> ,	page 568
EXPANDING THE USES OF FARM PRODUCTS,	<i>George W. Irving, Jr.</i> , and <i>Samuel B. Detwiler, Jr.</i> ,	page 571
PROBLEMS IN ECONOMICS,	<i>Raymond P. Christensen</i> ,	page 576
PROBLEMS IN MARKETING,	<i>Winn F. Finner</i> ,	page 581
Index,		page 586

INDEX

- Abaca, 241
 Abbott, J. C., 270
 Achard, Franz Karl, 6
 Act for International Development, 502, 510
 Act of Bogotá, 444
 Afrasian steppe, 23
 Africa, cacao culture, 202; cattle raising, 147; cigarette output, 211; coffee production, 189; cooperatives, 357; export-import position, 318, 319; farming history, 4; fisheries, 166; food needs, 38; forest areas, 212; fruit production, 130; irrigated land, 76; phosphate deposits, 102; population growth, 53; rivers, 89; state trading, 334; vegetable production, 142, 144; wheat yields, 123
 African and Malagasy Union, 453
 African bowstring, 245
 African migrations, 27
 Agency for International Development, 503, 510, 520
 Agrarian reform, 16
 Agreements, commodity, 361, 426, 486-494; fishing, 172; preferential, 478, 482-486; regional, 453-475; research, 568-571; technical assistance, 503, 519; trade, 33, 322, 361, 379-384, 426, 453-494
 Agricultural Act (1948), 376; (1949), 402; (1950), 376; (1954), 411; (1956), 379, 402
 Agricultural Adjustment Act (1933), 375, 381; (1935), 376
 Agricultural commodities, classification, 317
 Agricultural Development Council, Inc., 531
 Agricultural Marketing Agreement Act, 286, 288
 Agricultural problems, 30-36
 Agricultural productivity, problems, 30, 34, 64, 576-580
 Agricultural Rehabilitation and Development Act, 73
 Agricultural societies, 7
 Agricultural Trade Development and Assistance Act, 365, 392, 400, 499, 508, 515, 568
 Agricultural village, 14
 Agriculture, Department of, 37, 48, 282, 374, 415, 419, 568
 Agriculture, history, 1-11
 Alfalfa, protein yields, 48
 Algae, 49
 Algeria, conservation project, 74; phosphate deposits, 102; wine exports, 136
 Alliance for Progress, 444-448, 512
 Alpaca, 257
 André Mayer Fellowships, 438
 Angelidis, Alex D., 370-374
 Anglo-American Caribbean Commission, 429
 Animal husbandry, history, 1-11; problems, 564-567; *see also* Livestock
 Animal proteins, 44
 Animals, feed conversion ratios, 45
 Antidumping Act, 379
 Antimerger Act, 288
 Appert, Nicolas, 6
 Apple and Pear Export Act, 127
 Apples, exports, 128; imports, 128; production, 127; storage, 300, 306; world output, 128
 Apricots, production, 133; world trade, 134
 Arable land, in use, 60; irrigated, 76, 77; potential, 61-64
 Argentina, apple production, 128; farming history, 9; grain production and trade, 122, 123, 125; irrigated land, 77; meat consumption, 148; meat production and trade, 148, 149, 151; phormium production, 244; sheep numbers, 147; state trading, 335; tea exports, 194; vegetable production, 145
 Asbestos, 219
 Asia, cattle numbers, 147; cigarette output, 211; export-import position, 320; fertilizer production, 102, 104; fisheries, 162, 165; food needs, 38; forest areas, 212; irrigated land, 76, 81; population growth, 53; rivers, 91; wheat yields, 123
 Association of Southeast Asia, 457
 Association of State Universities and Land-Grant Colleges, 520
 Aswan High Dam, 88
 Attachés, 396, 405-414, 419
 Australia, cigarette consumption, 210; conservation practices, 71; cooperatives, 350; farming history, 9; fruit exports, 127, 128; market promotion, 396; meat consumption, 148; meat production and trade, 148, 149, 153; phosphorus production, 104; plant-hire plan, 73; river system, 92; sheep numbers, 147; Sino-Soviet bloc trade, 344; state trading, 334; wheat production and trade, 122, 125
 Austria, irrigation, 79, 90; state trading, 332
 Babcock, Stephen M., 10
 Bachman, Kenneth L., 326-329
 Bacteria, protein-producing, 51
 Bakewell, Robert, 6
 Balance-of-payment problems, 323, 513
 Bamboo, 215
 Bananas, exports, 131; imports, 374; production, 131; world trade volume, 317
 Bantu migration, 24
 Bargaining associations, 276
 Barley, production, 123; uses, 121; world output, 123; world trade volume, 317
 Barter program, 366, 398-399
 Bassine, 249
 Bayley, Ned D., 564-567
 Beans, protein content, 47
 Beef, imports, 150, 364, 371; proportion of meat supply, 147; world output, 148
 Belgium, cigarette consumption, 210; flax production, 231; irrigated land, 79; wheat yields, 122; wool imports, 255; *see also* European Economic Community
 Belgium-Luxembourg Economic Union, 458
 Benelux Customs Union, 458
 Bishop, Dwight R., 146-155
 Black, Eugene R., 96
 BLEU Treaty, 458
 Bolívar, Simón, 429, 443
 Bolivia, irrigated land, 77
 Bower, C. A., 535-542
 Bowser, William C., Jr., 190-194
 Brazil, apple imports, 128; conservation program, 72; corn yields, 123; fiber production, 228, 235, 238, 245, 248; irrigated land, 77; meat output, 148; phosphate deposits, 102; state trading, 335; vegetable production, 145
 Breimyer, Harold F., 269-278
 British Commonwealth, preferential tariff system, 483
 British East India Company, 95
 British Guiana, irrigated land, 77
 Broiler contracts, 268
 Brooks, William Penn, 518
 Broomcorn, 250
 Broomroot, 250
 Brown, A. W. A., 115
 Brussels Pact, 459
 Brussels Tariff Nomenclature, 315
 Buffer stock system, 487
 Bulgur, 572
 Burma, rice exports, 125; state trading, 335; training program, 529
 Butter, production, 157; storage temperatures, 305
 Buyers, requirements, 384-391
 Cacao, culture, 200
 Calories, sources, 39, 559; standards, 37
 Camels, for fiber production, 256
 Canada, apple production, 128; cigarette consumption, 210; conservation program, 73; cooperatives, 275, 350, 356; export-import position, 318; farming history, 9; fruit consumption, 137; fruit trade, 127, 128, 130, 133; grain exports, 125; grain yields, 122, 124; hydroelectric capacity, 78; irrigation projects, 78; oat production, 123; potassium reserves, 103; Sino-Soviet bloc trade, 344; state trading, 333; vegetable production, 141; wheat sales, 334
 Canadian Wheat Board, 34, 277
 Canning, origin, 6
 Capital projects, 502
 Capper-Volstead Act, 288
 Capron, Horace, 9
 Carbon dioxide, value in storage, 301
 Caribbean Organization, 429
 Carleton, W. M., 96-101
 Caroa, 245
 Carotene, 42
 Cashmere, 256
 Cassava, protein content, 47
 Cassia, production, 198
 Cattle, imports, 372; numbers, 147

Celler-Kefauver Act, 288
Census, world agricultural, 417
Central America rivers, 91
Central American Bank for Economic Integration, 456
Central American Clearing House, 456
Central American Common Market, 456
Central American Free Trade Association, 446
Cereals, source of protein, 46
Ceylon, coir exports, 247; tea production and trade, 193, 194
Chadbourne Agreement, 490
Chardonnay, Hilaire de, 258
Cheese, import quotas, 378; production, 156; storage temperatures, 305
Chemicals, in crop production, 106-112
Chemosterilants, 116
Cherries, production, 133
Chicle, 216
Chile, agrarian reform law, 72; irrigated land, 77
Chilean nitrate, 104
China, apple exports, 128; conservation plan, 73; farming system, 18; farmland, 81; fish production, 162, 165; hog numbers, 148; irrigated land, 81; kenaf production, 230; meat production, 148; pear production, 130; rice output, 124; rivers, 91; silk production, 253; tea production, 193; vegetable production, 144; *see also* Sino-Soviet bloc
China, Nationalist. *See* Taiwan
Chinese migration, 28
Chlorella, 49, 50
Chlorosis, 537
Chocolate, 202-205
Christensen, Raymond P., 576-580
Church World Service, 534
Cigarettes, blends, 209; consumption, 210; world output, 210
Cigarillos, 210
Cigars, 210
Cinnamon, production, 198
Clark, William Smith, 518
Clay, Henry, 7
Clayton Act, 287
Cloves, production, 197
Cocoa, imports, 374; production, 200-205
Cocoa Agreement, 489
Cocoa Producers Alliance, 205
Cocoa Study Group, 489
Coffee, caffeine content, 189; consumption, 188; East-West trade, 338-345; exports, 187, 494; imports, 188, 373; prices, 188; production, 184-189; soluble, 189; uses, 187; world export value, 317
Coffee agreements, 493
Coir, 247
Coke, Thomas, 6
Collective farm, 17
Colombia, conservation plans, 72; irrigated land, 77
Commerce, Department of, 412
Commercial Fisheries, Bureau of, 164
Commission on International Commodity Trade, 427
Committee on Foreign Affairs Personnel, 414
Commodity agreements, 361, 426, 486-494
Commodity classification systems, 315
Commodity Credit Corporation, 336, 398, 400
Commodity Exchange Act, 284
Commodity Exchange Commission, 285

Common Agricultural Policy, 34, 368, 382, 383, 462-470, 472-475
Common external tariff, 381, 466
Common market, defined, 453
Common Market, Central American, 456
Common Market, European. *See* European Economic Community
Commonwealth Economic Committee, 137
Commonwealth Sugar Agreement, 181
Commune system, 18
Conference on Food and Agriculture, 435
Congo, farming system, 21; urea production, 235
Congress of Panama, 429, 443
Conservation practices, 69-75
Consultative Subcommittee on Surplus Disposal, 337, 363
Consumer preferences, 385
Cook, A. Clinton, 138-145
Cooley loans, 509
Cooperative for American Relief Everywhere, 532
Cooperative village, 21
Cooperatives, 275, 346-357; cotton, 350; dairy, 353; fruit, 351; grain, 353; oilseed, 353; poultry, 355
Cork, 215
Corn, acre yields, 123; hybrid, 60, 556; production, 123; protein content, 46; types, 121; utilization research, 573; world output, 123; world trade volume, 317
Costa Rica, irrigated land, 77
Cotton, acreage, 221; East-West trade, 338-345; exports, 225; ginning, 224; import quotas, 377, 378; imports, 226, 373; market promotion, 397; production, 220-226; textile manufacturing, 224; utilization research, 573; weed control, 223; world output, 221; world export value, 317; world trade volume, 317
Cotton gin, 8
Cotton Futures Act, 282
Cotton Standards Act, 282
Cottonseed, protein content, 47
Council of Europe, 449, 462
Council on Economic and Cultural Affairs, 531
Court of Justice, 462
Crawford, Douglas M., 405-414
Crim vegetal, 248
Crockett, Samuel L., 155-160
Cropland, acreage reductions, 363; potential, 61; surplus, 60
Crops, history, 1-11; hybrid, 556; insect-resistant, 117, 550; maintaining quality, 291-302; maturity standards, 292; research, 524, 554-558, 570; yields, 577
Cuba, henequen production, 240; irrigated land, 77; sugar output, 180
Cuprammonium, 258
Curare, 216
Currencies, converting, 322; exchange rates, 322; foreign, uses, 392, 509
Customs, Bureau of, 375
Customs union, 453
Cyprus, irrigated land, 79
Dairy products, exports, 158; import quotas, 378; imports, 158, 373; production, 155-160
Davenport, Charles R., 443-448
Deere, John, 8
DeFelice, A. Richard, 476-481
Defoliants, 112

Delgado, Francisco, 250
Denmark, barley yields, 123; co-operatives, 350, 356; irrigated land, 79; market promotion, 396
Deserts, 76
Desiccants, 112
Detwiler, Samuel B., Jr., 571-575
Diets, deficiency diseases, 40, 559; problems, 558-564; world status, 37-43
Distributive system, history, 261-269
Dominican Republic, irrigated land, 77
Downs, Albert A., 211-217
Drainage problems, 540
Dull, Rex E. T., 200-205
Duneland, stabilization, 75
Dyer, E. H., 178
East African Common Services Organization, 454
East-West trade, 338-345
Economic and Social Affairs, Department of, 56
Economic commissions, regional, 298, 427, 439
Economic communities, 453-475
Economic growth, and trade, 326-329, 578
Economic Research Service, 419
Economics, problems, 30, 576-580
Ecuador, banana production, 131; fruit exports, 127; irrigated land, 77
Eggs, preparing for market, 294; sorting system, 297; storage, 299, 301, 305
Egypt, agricultural history, 7; water project, 88; *see also* United Arab Republic
Eisenach, Edward J., 205-211
Electrification, farm, 97
Elrod, Warrick E., Jr., 321-325; 508-514
El Salvador, irrigated land, 77
Emergency Tariff Act, 375
Endemic goiter, 41
Engel's law, 54
Engineering, in agriculture, 96-101
England, farming history, 3, 6; *see also* United Kingdom
Ennis, W. B., Jr., 106-112
Entomology research, 546-554, 570
Equatorial Customs Union, 454
Ethoxyquin, 574
Eugenol, 198
Europe, cigarette output, 211; export-import position, 318; fertilizer production, 104; fisheries, 166; forest areas, 212; import controls, 33; irrigated land, 76, 78; population growth, 53; rivers of, 90; rye output, 124; supermarkets, 279; vegetable production, 142; wheat yields, 122
European Atomic Energy Community, 460
European Coal and Steel Community, 459
European Defense Community, 460
European Development Fund, 474
European Economic Community, 427, 458-475; agricultural productivity, 470-472; coffee imports, 188; economic situation, 472; effect on United States trade, 468-475; egg regulations, 466; farm mechanization, 471; farm output, 471; fishery trade, 169; fruit grading, 127; fruit regulations, 466, 469; grain policy, 463-465, 467-469, 472; import levies, 368, 463; import regulations, 463-470; meat imports, 149, 155; meat production, 155; pork regulations,

- 466, 469; poultry regulations, 465, 469; Sino-Soviet bloc trade, 344; state trading, 331; tariff negotiations, 381; trade agreement, 379; trade policies, 462-470, 472-475; trade with United States, 368; vegetable regulations, 466, 469; wheat imports, 34; wine regulations, 466
- European Free Trade Association, 344, 456
- European migration, 25
- European Parliament, 461
- European Productivity Agency, 450
- European Seed Testing Association, 426
- Everts, Franklin S., 205-211
- Exhibits, trade promotion, 403-405
- Expanded Program of Technical Assistance, 427, 437, 438
- Export associations, 289
- Export credit sales program, 362, 366, 400-402, 508
- Export-Import Bank, 499, 505
- Export market programs, 392-405
- Export payment assistance program, 367
- Export payment rates, 363, 367, 402
- Exports, and economic growth, 326-329; by cooperatives, 350-357; classification systems, 316; free world, 338-345; Government-program, 366; outlook, 369; price trends, 32, 324; quality control, 390; requirements of buyers, 384-391; Sino-Soviet bloc, 338-345; United States, 358, 361, 365-369; world, trends, 317-320; value, 317; volume, 317; *see also* specific commodity
- Factory ships, 165
- Fair average quality, 298
- Far East, export-import position, 320; food needs, 38; irrigated land, 81; vegetable production, 144
- Farm journals, 7
- Farm output, needs, 35, 576-580
- Farmers, bond with earth, 12-22
- Farming, history, 1-11
- Farming systems, 12-22
- Farmworkers, 97, 471, 577
- Fats, diet needs, 38, 40; East-West trade, 338-345; utilization research, 573
- Federal Food, Drug, and Cosmetic Act, 375
- Federal Import Milk Act, 375
- Federal Plant Pest Act, 374
- Federal Plant Quarantine Act, 374
- Federal Seed Act, 285, 375
- Federal Trade Commission, 288
- Federal Trade Commission Act, 288, 289
- Feed-to-food conversions, 45
- Fertilizers, consumption, 104; need for, 58, 101-105; production, 102-104; world trade, 105
- Fiberboard, production, 215
- Fibers, 218-260; acetate, 259; acrylic, 259; animal, 251-257; banana, 245; bast, 227-236; brush, 243, 247-250, 257; cellulose, 258; classification, 219; fur, 257; glass, 259;istle, 243; malveaceous, 235; manmade, 258-260; mauritius, 244; mineral, 219; nettle, 236; noncellulosic, 259; palm, 247-250; Panama hat, 249; paper mulberry, 236; pineapple, 245; polyamide, 259; polyester, 259; polyvinyl, 259; protein, 259; sida, 236; synthetic, 258-260; textile, 220-236, 251-
- 260; tree, 236, 246-250; uses, 218; vegetable, 220-250
- Financial services, 508-514
- Finland, cooperatives, 350, 357; state trading, 333
- Finn, William G., 449-452
- Finner, Winn F., 581-585
- Fish, acre yields, 162; conservation, 172; exports, 168; flour, 46; import duties, 171; imports, 169; locating, 164; oils, 168; preservation, 167; protein concentrate, 46, 168; source of protein, 46; storage temperatures, 305; uses, 161, 167; world catch, 162, 165
- Fisheries, 161-177; aid programs, 172, 175
- Fisheries Loan Fund, 172
- Fisherman's Collective Marketing Act, 288
- Fishery conventions, 172-175
- Fishery limits, 177
- Fishing, abstention principle, 173; equipment, 164; international agreements, 172; regulations, 172; vessels, 163-165
- Fishing Vessel Mortgage Insurance Program, 172
- Fishmeal, 168
- FitzGerald, D. A., 495-508
- Flax fiber, production, 230-232
- Flood control, loans for, 93; projects, 83-89
- Food, distribution systems, 279-281; health laws, 387; income elasticity coefficient, 54; preservation, 301, 309-313; processing, 309-313, 581; standards, 388; supplies, 53-57, 561; *see also* Nutrition
- Food-aid programs, 366, 514-518, 532
- Food and Agriculture Organization, 37, 42, 60, 61, 159, 175, 417, 422, 425, 434-442, 489
- Food and Drug Act, 375
- Food and Drug Administration, 375
- Food balances, 37, 418
- Food Code Commission, 388, 438, 439
- Food consumption, and income, 53-57, 327; per capita, 54; trends, 55
- Food demands, equation for estimating, 55; study, 328
- Food for Peace program, 157, 514-518
- Food production, needs, 64, 578; potentials, 57-69
- Food-and-mouth disease, 146
- Forages, preservative treatment, 574
- Ford Foundation, 524, 527-530, 531
- Fordney-McCumber tariff bill, 375
- Foreign Agricultural Service, 392, 403, 409, 411, 420
- Foreign assistance, authorization of funds, 504; benefits to United States, 506, 516; by private groups, 523-534; costs, 495-502; financial, 93-95, 448, 503, 508-514; food shipments, 366, 400-402, 514-518, 532; nonproject, 500; objectives, 507; programs, 495-508; project, 502; technical, 69, 502, 518-532
- Foreign Assistance Act, 290, 503, 505
- Foreign Operations Administration, 502
- Forestry, 211-217; research, 542-546, 569
- Forests, acreage, 211; broadleaf, 212; coniferous, 212; timber removed, 213; volume of growing stock, 213
- Forest products, 211-217; nonwood, 215; processed, 214; production trends, 217
- Formosa. *See* Taiwan
- Foster, Phillips W., 22-29
- Foundations, private, 523-534
- France, aid programs, 95; cooperatives, 350; flax production, 231; food preservation, 6; fruit production and trade, 127, 128, 130, 135; grain exports, 125; irrigated land, 79; meat output, 148; potassium reserves, 103; state trading, 332; wheat yields, 122; wine trade, 136; wool imports, 255; *see also* European Economic Community
- Franco-Italian customs union, 458
- Freedom From Hunger campaign, 439
- Freeman, Orville L., 452
- Free trade area, 453
- Free world, trade with Sino-Soviet bloc, 338-345
- Fresh produce, losses, 291; packing, 299; precooling, 295; preservative treatments, 294, 295, 307; storage temperature, 299
- Frozen foods, storage temperature, 305
- Fruit, consumption, 137; East-West trade, 338-345; exports, 127; imports, 127, 372; production, 126-138; standards, 127, 298; storage temperature, 305; *see also* specific kind
- Fruit juices, production, 137
- Fungi, protein-producing, 51
- Fungicides, 109
- Futures trading, 283
- Future Trading Act, 284
- Gastineau, Robert L., 482-486
- Gate price, 465
- General Agreement on Tariffs and Trade, 331, 359, 381, 426, 440, 476-481
- General trade system, 316
- General Treaty of Economic Integration, 456
- Germany, East, apple imports, 128; potassium reserves, 103; *see also* Sino-Soviet bloc
- Germany, West, fruit consumption, 137; fruit production and trade, 127, 128, 130, 135; irrigated land, 79; meat output, 148; potassium reserves, 103; state trading, 332; synthetic fiber production, 260; wine imports, 136; wool imports, 255; *see also* European Economic Community
- Ghana Cocoa Research Institute, 204
- Ghee, 157
- Gibberellic acid, 112
- Gibbons, Charles A., 314-320
- Ginger, production, 199
- Girard, Clarence H., 282-291
- Goatmeat, 147, 148
- Goats, for fiber production, 255
- Golumbic, Calvin, 291-302
- Gourds, 250
- Government - industry marketing programs, 392-405
- Governments, trading by, 330-338
- Grade standards, 388
- Grading, 273, 296, 583
- Grain, acre yields, 122-124; cleaning, 296; consumption, 121; drying, 295, 299; East-West trade, 338-345; exports, 124; history, 119; imports, 373; moisture control, 292, 295, 299, 307; production, 118-125; standards, 298, 389; storage, 299, 307; uses, 120; world acreage, 118; *see also* specific kind
- Grain Futures Act, 284

- Grain Standards Act, 282
 Grapefruit, exports, 132; production, 131
 Grapes, exports, 135; production, 134
 Greece, fruit exports, 127, 133; irrigated land, 79
 Greenshields, Elco L., 75-96
 Gross domestic product, 30
 Guatemala, irrigated land, 77
 Guinea bowstring, 245
 Gums, 215
 Gur, 46
 Guttapercha, 216
 Gyplure, 117
- Haines, Kenneth A., 434-442
 Haiti, irrigated land, 77
 Hakluyt, Richard, 327
 Hall, Stanley A., 113-117
 Hard Fibers Study Group, 237
 Harness, Vernon L., 220-226
 Harrington, H. L., 387
 Harrison, Phoebe, 69-75
 Harvey, William E., 518-522
 Havana Charter, 487
 Health, nutritional, 37-43
 Hearne, Cannon C., 318-522
 Heckman, John H., 346-357
 Hecogenin, 239
 Hedges, Irwin R., 379-384
 Heifer Project, 533
 Hemp, production, 232; world output, 233
 Henderson, Harry W., 514-518
 Henequen, 239-241
 Herbicides, 107
 Hibbard, B. H., 359
 Hides, imports, 373; market promotion, 398
 Hill, F. F., 523-534
 Hill, W. L., 101-105
 Hockensmith, Roy D., 69-75
 Hodgson, Ralph E., 564-567
 Hoecker, R. W., 279-281
 Hogs, numbers, 147; slaughter methods, 292
 Honduras, irrigated land, 77
 Honey, production, 182
 Honey bees, 182
 Hong Kong, vegetable production, 144
 Hornbeck, Bernice M., 251-260
 Horsemeat, 147, 148
 Howard, James O., 384-391
 Humane Slaughter Act, 292
 Hume, David L., 392-398
 Hungary, apple exports, 128; corn yields, 123; *see also* Sino-Soviet bloc
 Hurt, Leslie C., 177-189
 Hussey, Obed, 8
 Hydrocooling, 294
 Hydrol, 183
 Hydroponic culture, 139
- Identity Preserved system, 389
 Imperial College of Agriculture, 203, 204
 Import duties. *See* Tariffs
 Imports, advance deposits, 323; and economic growth, 326-329; by cooperatives, 355; classification systems, 316; complementary, 373; controls, 321-325, 371, 374-379; free world, 338-345; quotas, 181, 377; Sino-Soviet bloc, 338-345; supplementary, 370, 371; United States, 358, 365, 370-374; world, trends, 317-320; *see also* specific commodity
 Incaparina, 361
 Income, and food consumption, 53-57, 327; effects on trade, 326-329, 578; per capita, 54
 Income elasticity coefficient, 54
- India, cattle numbers, 147; cigarette consumption, 210; conservation program, 74; corn yields, 123; farming history, 4; fiber production, 228, 230, 234, 247; grain output, 124; irrigated land, 81; labor force, 100; nitrogen production, 104; rivers, 91; state trading, 335; tea consumption, 194; tea trade, 193, 194; training programs, 527; utilization research, 574; water project, 89, 94
 Indian Jute Mills Association, 229
 Indians, American, migration, 23
 Indonesia, forests, 213; rice output, 124; sisal production, 238; state trading, 336; tea trade, 193, 194
 Indus Water Treaty, 89
 Insecticides, use, 113-117
 Insects, attractants, 117; beneficial, 552; biological control, 116, 553; control problems, 546-554; eradication programs, 116; identification service, 554; resistance to insecticides, 115; sterilization, 116, 547; taxonomy, 553
 Inspection, 273, 296
 Institute of Inter-American Affairs, 502
 Inter-American Cacao Center, 204
 Inter-American Coffee Agreement, 493
 Inter-American Committee on Agricultural Development, 447
 Inter-American Conference, 443
 Inter-American Development Bank, 444, 511
 Inter-American Institute of Agricultural Sciences, 425, 440
 Inter-American Statistical Institute, 431
 Inter-American System, 443-448
 Interdepartmental Committee on Nutrition for National Defense, 41
 Interdepartmental Committee on Scientific and Cultural Cooperation, 520
 Interest rates, 325; *see also* Loans
 Intergovernmental Oceanographic Commission, 176
 Interior, Department of the, 412
 International Agricultural Development Service, 414, 521
 International Atomic Energy Agency, 430, 440
 International Bank for Reconstruction and Development, 93, 428, 510
 International cereal rust nurseries, 557
 International Civil Aviation Organization, 430
 International Coffee Agreement, 189, 494
 International Coffee Council, 494
 International Coffee Organization, 426, 494
 International Coffee Study Group, 493
 International Commission on Agriculture, 424
 International Conference of American States, 443
 International Cotton Advisory Committee, 426, 490
 International Development Association, 94, 428, 511
 International Development Services, 532
 International Emergency Food Council, 441
 International Federation of Agricultural Producers, 462
 International Finance Corporation, 428, 511
- International financial services, 508-514
 International Institute of Agriculture, 415, 424
 International Labor Organization, 430, 440
 International Maritime Consultative Organization, 430
 International Meteorological Organization, 430
 International Monetary Fund, 428, 508, 512
 International Olive Oil Council, 426
 International organizations, 423-433
 International Plant Protection Convention, 438
 International Rice Research Institute, 524
 International Sanitary Bureau, 431
 International Seed Testing Association, 426
 International Statistical Institute, 431
 International Sugar Council, 426, 491
 International Trade Organization, 426, 477
 International Veterinary Congress, 424
 International Whaling Commission, 175
 International Wheat Advisory Committee, 426
 International Wheat Agreement, 34, 492
 International Wheat Council, 426, 493
 International Wool Study Group, 426
 Intervention price, 464
 Ioanes, Raymond A., 358-364
 Ireland, state trading, 333; wheat yields, 123
 Irradiation, food, 301
 Irrigation, acreages, 76; loans for, 93; problems, 541; projects, 77-82
 Irving, George W., Jr., 571-575
 Israel, conservation practices, 71; fertilizer production, 103, 104; irrigated land, 79, 86; land settlement, 20, 29; orange production, 130; water projects, 86
 Italy, corn yields, 123; fruit exports, 127, 128, 133; fruit production, 128, 129, 130, 132, 133, 135; irrigated land, 79; meat output, 148; synthetic fiber production, 260; wool imports, 253; *see also* European Economic Community
- Jaggery, 46
 Jamaica, irrigated land, 77
 Japan, agricultural development, 9; coffee consumption, 188; cooperatives, 350, 357; dairy industry, 159; economic growth, 326; farming system, 21; fisheries, 165, 169; fruit production, 128-130; irrigated land, 82; luffa production, 250; meat consumption, 148; milk imports, 157; nitrogen production, 104; rice output, 124; silk production, 253; Sino-Soviet bloc trade, 344; state trading, 333; supermarkets, 281; synthetic fiber production, 260; tea exports, 194; tea output, 193; wool imports, 255
 Jaumave, 244
 Jefferson, Thomas, 7
 Jones-Costigan Act, 376
 Jordan, potassium reserves, 103
 Jute, production, 227

Kapok, 246
Kellogg, Charles E., 57-69
Kellogg, W. K., Foundation, 530
Kenaf, 230
Kenya, conservation program, 73;
food stores, 281; tea exports,
194
Kevorkian, Arthur G., 190-205
Kibbutz, 21, 29
Kiger, Hugh C., 205-211
Kirby, Riley H., 37-43
Kitul, 249
Kolkhoz, 17
Krogh, Kenneth K., 403-405
Kubitschek, Juscelino, 443, 444
Kwashiorkor, 41, 560

Labeling requirements, 386
Labor, Department of, 412
Labor force, 29
Lamb, proportion of meat supply,
147; world output, 148
Lamprey, control, 174
Land, abuse of, 31; arable, 60-64,
76, 77; irrigated, 76
Land reform, 16
Land use, conversions, 70; poten-
tial, 61-64, 99; world, 60
Landed estates, 25
Lane, Ferdinand C., 92
Lane, John, 8
Larvicide, 115
Latexes, 216
Latifundia system, 25
Latin America, agrarian reform,
16; cacao culture, 202; coffee
production, 188; cooperatives,
357; export-import position,
319; farming system, 20, 25;
food needs, 38; population,
446
Latin American Free Trade Associa-
tion, 446, 455
Laval, Carl de, 10
Learn, Elmer W., 473
Lemons, production, 132
Leverton, Ruth M., 44-52, 558-564
Libya, conservation practices, 75
Liebig, Justus von, 8
Limes, 132
Liming, need for, 101, 537
Linen, 230
Link, Robert O., 398-399
Linseed oil, utilization research,
572
Livestock, East-West trade, 338-
345; grants, 533; historical de-
velopments, 1-11; production,
146-155; production problems,
564-567; slaughtering, 292
Livestock products, East-West trade,
338-345
Llama, for fiber production, 257
Loans, 93-95, 172, 325, 448, 495-
505, 508-514
Locusts, 548
Long-Term International Cotton
Textile Arrangement, 226
Lubin, David, 415, 424
Lufas, 250
Lumber, world output, 214
Lunin, Jesse, 535-542
Luxembourg. *See* European Eco-
nomic Community

McCabe, Terrence W., 374-379
McCance, R. A., 119
McClellan, W. D., 106-112
McCormick, Cyrus H., 8
Machinery, farm, 5, 8, 96
Mace, production, 199
McKibben, E. G., 96-101
Mackie, Arthur B., 326-329
Magness, John R., 128
Malagasy Republic, conservation
program, 73
Malnutrition, 40, 559
Malthus, Thomas Robert, 53
Mansholt, Sicco, 382, 473

Marggraf, Andreas, 6, 177
Market development programs,
392-405
Market-sharing arrangement, 360
Market structures, 269-278
Marketing, cooperative, 275; costs,
581; direct, 266; government
aid, 268; problems, 31, 271,
581-585; regulations, 274, 276,
282-291; research, 570; retail,
266
Marketing agreements, 276, 286
Marketing boards, 276
Marketing orders, 276, 286
Marketing systems, 269-278, 281
Markets, evolution, 261-269; re-
tail food, 279-281
Marshall, George C., 497
Marshall plan, 446, 449, 458, 497
Marston, Henry W., 568-571
Martin, John H., 554-558
Meat, aging, 302; consumption,
148; demand for, 147; produc-
tion and trade, 146-155; stor-
age temperatures, 305; world
output, 146
Mechanization, farm, 96-101, 471
Mehr, Stanley, 126-138
Mexico, corn yields, 123; fiber
production, 240, 243; irrigated
land, 76; rivers, 91; state
trading, 335; vegetable produc-
tion, 141
Micro-organisms, sources of pro-
tein, 51
Middle East, farming system, 20;
origin of agriculture, 1
Migration, and agriculture, 22-29
Milk, consumption, 156; marketing
orders, 287; production, 155-
160; standards, 159; supply-
demand situation, 160; sup-
port prices, 159; world output,
156
Milk Ordinance and Code, 159
Mills, Theodora, 338-345
Minimum import price, 465
Mohair, 255
Molasses, 182
Monetary problems, and trade,
321-325
Monnet, Jean, 459
Montel, John E., 458-475
Montevideo Treaty, 455
Morocco, irrigated land, 76; phos-
phate deposits, 102
Moseman, A. H., 523-534
Moshav, 21
Moslem migration, 25
Most-favored-nation principle, 381,
478, 482-486
Mozambique, tea exports, 194
Multilateral contract, 487
Multiple exchange rate system, 322
Murphy, Patrick J., 453-457
Murray, Kenneth L., 118-125
Mushrooms, production, 142
Mutton, proportion of meat supply,
147; world output, 148
Mutual Security Act, 504

National Cotton Council, 221
Negroes, migrations, 27
Nematocides, 110
Netherlands, apple exports, 128;
cigarette consumption, 210;
cooperatives, 350, 356; flax
production, 231; irrigated
land, 79; land reclamation, 82;
market promotion, 397; orange
imports, 130; vegetable pro-
duction, 142; wheat yields,
122; *see also* European Eco-
nomic Community
New Zealand, cooperatives, 350;
farming history, 9; market
promotion, 397; meat con-
sumption, 148; meat produc-
tion and trade, 149, 152;

phosphium production, 244;
phosphorus production, 104;
sheep numbers, 147; state
trading, 334
Nicaragua, irrigated land, 77
Nichols, Andrew J., 518-522
Nigeria, population, 100
Nitrogen, 102, 104, 105
Nomadic agriculture, 12
North America, agricultural his-
tory, 4; fertilizer production,
104; fisheries, 166; irrigated
land, 76; rivers, 92
North Atlantic Treaty Organiza-
tion, 459
Norway, cooperatives, 350, 357;
irrigated land, 79
Nutmeg, production, 199
Nutrition, problems, 558-564; pro-
grams, 42; standards, 37; sur-
vey, 37, 41; world status,
37-43
Nuts, storage temperature, 305
Oats, production, 123
Oceania, cigarette output, 211; ex-
port-import position, 318; ir-
rigated land, 76; phosphate
deposits, 102; wheat yields,
123
Ogdon, Montell, 30-36
Oils, East-West trade, 338-345;
imports, 372; processing, 313
Oilseed cake, world trade volume,
317
Oilseeds, East-West trade, 338-
345; moisture control, 292,
295; protein content, 47;
utilization research, 573
Olson, Robert L., 309-313
Oman, Paul, 546-554
Oranges, production, 129; trade,
130; utilization research, 572;
world output, 129
Organization for Economic Cooper-
ation and Development, 137,
176, 331, 429, 449-452
Organization for European Eco-
nomic Cooperation, 331, 429,
449-452, 458
Organization for Trade Coopera-
tion, 478
Organization of African Unity, 454
Organization of American States,
429, 443
Organizations, international, 423-
433; private, 523-534
Orvedal, A. C., 61
Packaging, materials, 298; prob-
lems, 386
Packers and Stockyards Act, 283
Pakistan, conservation program,
74; irrigated land, 81; jute
production, 228; nitrogen pro-
duction, 104; rice output, 124;
rivers, 91; tea output, 193;
training program, 529; water
treaty, 89
Palmetto, 249
Palms, 216
Palmyra, 249
Pamley, Walter H., 61
Pan American Health Organiza-
tion, 431
Pan American Sanitary Bureau, 431
Pan American Union, 444
Panama, irrigated land, 77
Panama, 46
Paper, world output, 214
Paraguay, irrigated land, 77
Paris Accords, 459
Particle board, production, 215,
217
Payment-in-kind program, 401
Paysans, 16
Peace Corps, 522
Peaches, production and trade, 133

- Peanuts, drying, 295; import quotas, 378; protein content, 47
- Pears, production and trade, 130
- Peas, protein content, 47
- Pepper, production, 195
- Perishable Agricultural Commodities Act, 285
- Perkins, Jacob, 304
- Peru, fishmeal exports, 169; irrigated land, 77
- Pesticides, 106-117
- Peter, D., 201
- Philippines, abaca production, 241; conservation program, 73; crops research, 524; nitrogen production, 104
- Phillips, Ralph W., 423-442
- Phipard, Esther F., 37-43
- Platinum, 244
- Phosphorus, 102-104
- Piassava, 248
- Pineapple, production and trade, 136
- Plant collection program, 48
- Plant diseases, 108, 549
- Plant growth regulators, 111
- Plant nutrients, 58, 101, 538
- Plant proteins, 46
- Plantains, 131
- Plantiful Foods program, 277
- Plums, production, 133
- Pluricarencial infantil, 560
- Plywood, production, 215, 217
- Point 4 projects, 502
- Poland, flax production, 231; irrigated land, 79; meat output, 148; rye output, 124; state trading, 333; *see also* Sino-Soviet bloc
- Pollination, 552
- Population, and food consumption, 53-57; and mechanization, 99; growth, 34, 53, 577; problems, 30; world, 53
- Pork, proportion of meat supply, 147; world output, 148
- Porter, Horace G., 218-226, 251-257
- Portugal, wine exports, 136
- Potassium, 102, 105
- Potatoes, protein content, 47; storage, 303; utilization research, 572
- Poultry, imports, 371; market promotion, 398; processing, 293, 294; quality losses, 292; research, 565; slaughter methods, 292
- Pound, F. J., 202, 203
- Precooling rooms, 305
- Preferential arrangements, 478, 482-486
- Preservatives, chemical, 294, 307, 312, 574
- Price, Walter V., 156
- Price programs, 277
- Prices, export, fluctuation, 324; problems, 32, 584; trends, 32, 36
- Pricing policy, 361
- Private trading, competition, 336
- Protectionism, 358, 382
- Protein, animal conversion, 45; body needs, 44; daily requirement, 46; leaf, 48; products, 561; sources, 39, 44-52, 559; standards, 38
- Protzman, Cecille M., 227-250
- Prunes, 133
- Puerto Rico, irrigated land, 77
- Pulp, world output, 214
- Pulses, protein content, 47
- Purves, Clarence M., 415-422
- Quinine, 216
- Quota agreement, 487
- Raeder, Charles E., 400-402
- Rahe, Dewain H., 365-369
- Raiffeisen, Friedrich Wilhelm, 346
- Raisins, 134, 136
- Ramie, production, 234
- Rasmussen, Clyde L., 309-313
- Rasmussen, Wayne D., 1-11
- Rattans, 216
- Rayon, 258
- Reciprocal Trade Agreements Act, 359, 380, 484
- Reclamation, Bureau of, 83
- Refrigerants, 304
- Regional economic groups, 453-475
- Regrowth inhibitors, 112
- Research agreements, 568-571
- Resins, 215
- Retailing, 279-281
- Revenue Act, 290
- Rhea, 234
- Rhodes, M. M., 556
- Rhodesia and Nyasaland, Federation of, tea exports, 194
- Rice, exports, 125; milling, 121; production, 124; protein content, 46; world trade volume, 317
- Rivers, 83-85, 89-92
- Roberts, Richard H., 330-338
- Robinson-Patman Act, 287
- Rockefeller Foundation, 43, 524-527, 531
- Rolfe, John, 5
- Rome Treaty, 460
- Ronaldson, James, 178
- Roselle, 230
- Rubber, East-West trade, 338-345; imports, 374; world export value, 317
- Ruffin, Edmund, 8
- Rumania, corn yields, 123; *see also* Sino-Soviet bloc
- Russia. *See* Sino-Soviet Union
- Russian migrations, 26
- Ryall, A. Lloyd, 303-308
- Rye, production, 123, 124
- Saccharin, 182
- San hemp, 234
- Saunders, Charles E., 9
- Sawmilling industry, 214
- Scholl, John C., 177-189, 486-494
- School lunch programs, 43, 515
- Schuman, Robert, 459
- Seas, exploration programs, 176
- Seaweeds, 49, 50, 163
- Seed cotton, drying, 296
- Seeds, cleaning, 296; protein content, 48; storage, 299; treatments, 109
- Senegal, phosphate deposits, 102
- Shapiro, Sidney, 161-177
- Sheep, world numbers, 147, 253; *see also* Livestock production
- Sherman Act, 287, 288
- Shull, G. H., 556
- Silk, exports, 253; production, 251; world output, 253
- Sinclair, John, 6
- Sino-Soviet bloc, trade with free world, 338-345
- Sirup, 181, 183
- Sisal, 237-239
- Skins, imports, 373
- Smoot-Hawley Tariff Act, 359, 375
- Snuff, 210
- Social Progress Trust Fund, 512
- Societies, agricultural, 7
- Soil conservation, 69-75
- Soil Conservation Service, 61, 74, 85
- Soil maps, availability, 67; need for, 66; scales, 68
- Soils, arable, 60-64; essentials for good production, 58; nutrients, 58, 101, 536; problems, 535-538; productivity, 57-69, 101; tropical, 61; world, map, 63
- Sorghums, production, 124
- South Africa, conservation practices, 71; corn exports, 125; corn yields, 123; fruit exports, 127, 133; immigration, 27; phosphate deposits, 102; state trading, 334; vegetable production, 145
- South America, agricultural history, 4; cigarette output, 210; fisheries, 166; forest areas, 212; irrigated land, 76, 77; rivers, 91; vegetable production, 145; wheat yields, 123
- South Korea, nitrogen production, 104
- South Pacific Commission, 429
- Soviet bloc, export-import position, 318
- Soviet Union, conservation practices, 72; farming history, 10; farming system, 17; farmland, 79; fertilizer production, 102, 103; fiber production, 231, 233, 260; fisheries, 165; forest area, 212; fruit imports, 128, 130; grain production, 122, 123, 124; irrigated land, 76; irrigation projects, 80; land use conversions, 70; livestock numbers, 147; meat consumption, 148; meat output, 148; rivers, 90; tea output, 193; vegetable production, 143; water resources, 79; wool imports, 255; *see also* Sino-Soviet bloc; Soviet bloc
- Sovkhoz, 18
- Soybean concentrate, 47
- Soybean oil, market promotion, 397; research, 568
- Soybeans, East-West trade, 338-345; protein content, 47
- Spain, fruit exports, 127, 130; fruit production, 129, 130, 132, 135; irrigated land, 79; potassium reserves, 103; wine exports, 136
- Spanish moss, 250
- Special trade system, 316
- Spices, production, 195-200
- Standard Containers Acts, 283
- Standard International Trade Classification, 315
- State, Department of, 412
- State farm, 18
- State trading, 330-338, 584
- Statistical sampling, 420
- Statistics, collecting, 315, 415-422
- Stevens, Robert D., 53-57
- Stiebeling, Hazel K., 558-564
- Stockpiling, farm products, 363; strategic materials, 399
- Storage, atmospheric conditions, 299-301, 305; dry, 303; farm crops, 303-308; hermetic, 300, 306; insect control, 308; preparing crops for, 291-299; refrigerated, 304; structures, 300, 303, 306; temperatures, 299, 305
- Stridsberg, Albert, 385
- Strobel, David R., 155-160
- Sucaryl, 182
- Sudan, irrigation project, 88
- Sugar, centrifugal, 179, 180; consumption, 181; East-West trade, 338-345; exports, 181; government controls, 180; imports, 181, 371; noncentrifugal, 46; processing, 179, 313; production, 177-184; quotas, 181; world export value, 317; world trade volume, 317
- Sugar agreements, 181, 490-492
- Sugarbeets, culture, 179
- Sugarcane, culture, 178, 180
- Sunn, 234
- Supermarkets, 266, 279-281
- Surinam, irrigated land, 77
- Swamplands, 76

- Sweden, apple imports, 128; cooperatives, 350, 357; fruit consumption, 137; irrigated land, 79
- Sweeteners, 177-184
- Sweetpotatoes, protein content, 47; storage, 304
- Switzerland, fruit consumption, 137; fruit imports, 128, 133; irrigated land, 79; state trading, 333
- Taiwan, conservation program, 73; nitrogen production, 104; tea exports, 194; tea output, 193
- Tanganyika, sisal production, 238
- Tannin, 216
- Tannous, Afif I., 12-22
- Tapioca, protein content, 47
- Target price, 464, 468
- Tariff Act (1930), 290; (1939), 379
- Tariff Commission, 376, 380
- Tariffs, effects on trade, 358, 361, 368; rates, 171, 359, 371-373; regulations, 359, 368, 375, 379-384; *see also* Economic Communities; General Agreement on Tariffs and Trade; Preferential Arrangements
- Tea, caffeine content, 191; consumption, 190, 194; exports, 194; imports, 194, 374; production, 190-194; world output, 193
- Technical assistance projects, 502, 518-532
- Technical Cooperation Administration, 502
- Tennessee Valley Authority, 84
- Textile Arrangement, 490
- Textiles, trade, 226
- Thailand, kenaf production, 230; rice exports, 125
- Thieme, J. G., 311
- Threshold price, 464
- Tobacco, consumption, 209; curing, 206; East-West trade, 338-345; exports, 208; factors affecting trade, 209; imports, 372; moisture control, 296; production, 205-211; uses, 205-211; world export value, 317; world output, 207
- Tobacco Inspection Act, 282
- Togo, phosphate deposits, 102
- Tomatoes, utilization research, 573
- Tontz, Robert L., 365-369
- Tools, farm, history, 2, 5
- Toquilla, 249
- Toruia, 51
- Townsend, Charles, 6
- Toynbee, Arnold, 23
- Tractors, 96
- Trade, and economic growth, 326-329, 578; and monetary problems, 321-325; background of, 314-320; East-West, 338-345; nontariff barriers, 321-325, 331, 360, 480; policies, 358-364; regulating, 282-291; world, trends, 317-320
- Trade agreements, 33, 322, 361, 379-384, 426, 453-494
- Trade Agreements Act, 476
- Trade Agreement Extension Acts, 376, 378
- Trade Expansion Act, 290, 360, 368, 378, 379-384
- Trade fairs program, 403-405
- Trade promotion programs, 392-405
- Trading, by governments, 330-338, 584; by private firms, 336
- Training programs, 69, 502, 518-532
- Transportation, and marketing, 272, 582
- Treasury, Department of, 413
- Treaty of Commercial Reciprocity, 484
- Treaty of Paris, 458
- Tree-beard, 250
- Trelogan, Harry C., 261-269
- Tribal agriculture, 12
- Tropical rain forests, 76
- Trypanosomiasis, 548
- Tsetse fly, 13, 24, 116, 548
- Tull, Jethro, 5, 6
- Tunisia, conservation project, 74; irrigation program, 76; phosphate deposits, 102
- Turkey, conservation program, 74
- Tussah, 252
- Uganda, food stores, 281
- United Arab Republic, phosphate deposits, 102; training program, 530; water project, 88
- United Kingdom, apple production, 128; butter imports, 158; cigarette consumption, 210; fruit imports, 127, 128, 130, 133; meat imports, 149, 155; meat output, 148; state trading, 334; synthetic fiber production, 260; tariff policy, 483; wheat yields, 122; wool imports, 255
- United Nations, 37, 53, 56, 175, 427, 431, 434-442
- United Nations Children's Fund, 428, 439
- United Nations Educational, Scientific, and Cultural Organization, 61, 430, 440
- United Nations Relief and Rehabilitation Administration, 439, 496
- United Nations Special Fund, 94, 175, 428, 437, 439
- United Nations Water Resources Development Center, 94
- United States, aid programs, *see* Foreign assistance; cattle numbers, 147; consumption, of cigarettes, 210; cocoa, 205; coffee, 188; fish, 171; food, per capita, 54, 55; fruit, 137; meat, 148-150; sugar, 181; tea, 190; cooperatives, 350-356; diet deficiencies, 40; export-import position, 318, 365; exports, 365-369; buyers' requirements, 384-391; fish, 169; fruit, 127, 128, 130, 133; grain, 124, 125; pesticides, 107, 109; value, 358, 361, 365, 370; evolution of markets, 261-269; farm mechanization, 96; farming system, 19; import controls, 374-379; imports, 370-374; cocoa, 205; coffee, 188; fish, 169, 171; fruit, 127; jute, 230; meat, 149-151, 364, 371; spice, 195, 200; sugar, 181; tea, 190, 194; value, 358, 365, 370; wine, 136; wood, 214; wool, 255; income growth, 54, 56; irrigated land, 76, 78; population growth, 53; production, of cotton, 221; fertilizer, 102, 103, 104; fish, 170-172; fruit, 128-135; grain, 118-120, 122, 123, 124; honey, 182; meat, 148, 149; mohair, 255; sirup, 183; sugar, 178, 184; synthetic fiber, 260; tobacco, 206, 207, 208; vegetables, 140; reclamation projects, 83; soil conservation, 70; state trading, 336; tariff regulations, 359, 368, 371, 375, 379; trade, policies, 358-364; promotion programs, 392-405; with European Economic Community, 368; with Latin America, 448; with Sino-Soviet bloc, 344
- United States Warehouse Act, 285
- Uruguay, irrigated land, 77; meat consumption, 148
- Utilization research, 568, 571-575
- Vacuum cooling, 294
- Van Houten, C. T., 201
- Van Slyke, Lucius L., 156
- Vanilla, production, 196
- Variable levy system, 368, 382, 383, 463
- Vavilov, N. I., 558
- Vegetables, consumption, 139; East-West trade, 338-345; imports, 372; marketing, 140; production, 138-145; standards, 298; storage temperature, 305
- Venezuela, irrigated land, 77
- Vertical integration, 267, 277
- Vicuña, 257
- Warehouses, 306, 308
- Washington, George, 7
- Water, and agricultural development, 75-96; availability, 538; conservation, 69-75, 539; problems, 539-542; projects, 77-95; saline, 540
- Water Resources Development Center, 439
- Watersheds, 85
- Watson, Elkanah, 7
- Weather, problems, 30
- Webb-Pomerene Act, 289
- Weeds, control, 107, 552; effect on crop production, 106
- Weights and measures, 386
- Weiss, Martin G., 44-52
- Went, F. W., 111
- West African Customs Union, 454
- West European Union, 459
- Wheat, control programs, 34; exports, 125, 334; import quotas, 377, 378; prices, 34; production, 120, 122; protein content, 46; quality tests, 389; world export value, 317; world output, 122; world trade volume, 317; yields, 122
- Wheat agreements, 492
- Wheat flour, trade volume, 317
- Whitney, Eli, 8
- Wholesaling, 281
- Widdowson, E. M., 119
- Wilson Tariff Act, 288
- Wine, trade, 135-136
- Winters, Robert K., 542-546
- Wood, Jethro, 8
- Wood, consumption, 217; trade, 216; tropical, 214; utilization research, 543
- Wool, imports, 255, 372, 374; production, 253-255; shrink-resistant process, 573; world export value, 317
- World Bank, 93, 428, 510
- World Food Program, 427, 436, 438, 439, 518
- World Health Organization, 113, 430, 439
- World Meteorological Organization, 430, 440
- World Soil Geography Unit, 61
- Worldidge, John, 5
- Xerophthalmia, 42
- Yarn, cotton, 225
- Yeasts, 51
- Young, Arthur, 6
- Yugoslavia, corn yields, 123; irrigated land, 79
- Zikim Dam, 87
- Zimmerman, P. W., 111