

Supported Projects 1979-80

Soil and Water

1. Soil Salinity Effects on the Spatial Variability of Hydraulic Conductivity
2. Solute Transport in Heterogeneous Unsaturated Field Soil: Measurements, Prediction, and Application to Crop Production
3. Water Management Model for Drainage of Irrigated Lands in Semi-Arid Zones
4. Salinity Control in Irrigated Agriculture Under Dynamic Conditions
5. Application of Pesticides via Drip Irrigation Systems
6. Effect of Moisture Content, Soil Texture, Soil Structure, ESP, and Soil Solution Concentration on Bulk Soil EC
7. The Chemistry of Soil Crust Management
8. Use of Solar Energy for the Detoxification of Organic Pollutants in Water for Agricultural Reuse
9. The Effect of Clay-Organic Complexes in Soils on the Behavior "and" Activity of Soil Applied Herbicides

Agricultural Engineering

1. Utilization of Waste Heat From Power Plants for Agricultural Uses
2. Greenhouse Operation for Best Aerial Environment
3. Engineering Analysis of Mechanical Damage to Fruits and Vegetables Resulting From Impact
4. Separation of Clods and Rocks in a Fluidized Bed
5. Determining Optimum Performance for Milking Equipment, Procedure, and Systems
6. Engineering and Horticultural Research on Improving the Mechanical Harvesting of Peppers
7. System Analysis and Design of Biofilters for the Three Components of Macrobrachium Production

Plant Protection

1. Spiders as Biological Control Agents of Agricultural Pests
2. Plant Protection by a Plasmid Induced Killer System for a Plant Pathogen
3. Development and Epidemiology of Fungicide-Resistant Plant Pathogens in an Integrated Pest

Management Program for Pome and Stone Fruit Production

4. Forecasting Epidemics of Non-Persistent Viruses in Annual Crops by ELISA and Use of the "Helper" Factor for Resistance Breeding
5. Characterization and Mode of Action of Phytotoxins Produced by *Alternaria dauci* and Other *Alternaria* spp., and Their Potential Use in Selection for Disease Resistant Crop
6. Management of Scale Pests Through Utilization of Their Pheromones, Kairomones, and Natural Enemies
7. The Role of Epicuticular Leaf Waxes in Resistance of Plants Against Powdery Mildews
8. Ascorbic Acid Deficiency in Phytophagous Insects—Its Biochemical Nature and Its Role in Insect Hostplant Relationship
9. Control of Soil-Borne Plant Pathogens by Solarization of Soils by Means of Polyethylene Mulching: Phytopathological, Microbiological, Agronomic, Chemical, and Physical Approaches
10. Responses of Tephritid Fruit Flies to Baits
11. A Study of the Mechanism of Photosynthetic Herbicide Action With the Aim of Improving Weed Control and Thereby Increasing the Efficiency of Water and Soil Utilization
12. Genetic Studies of Meal-Fly Preparatory to Biological Control Using Pseudo-Y Chromosome Meiotic Drive
13. Resistance and Interference phenomena in Plant-Virus Interactions
14. Quantitative Evaluation of Natural Enemy Impact Against the Homopteran Pests of Citrus
15. Management of Bulb Mites (*Rhizoglyphus* spp.) Through a Study of Their Biology and Ecology
16. Biological Control of Sap Beetles Attacking Fruit Crops (Dates and Grapes)
17. Serological Detection of Strawberry Mild Yellow-Edge Virus
18. Studies on Baculoviruses as a Potential Agent for Pest Control
19. Studies of Plant Root-Knot Nematode (*Meloidogyne incognita* and *M. javanica*) Interrelationships
20. Epidemiology and Control of Bacterial Leaf Spot Diseases in Vegetables: *Pseudomonas lachrymans*—Angular Leaf Spot of Cucumbers, *Xanthomonas vesicatoria*—Bacterial Scab of Pepper and Tomato, *Pseudomonas tomato*—Bacterial Speck of Tomato

Food Technology

1. Design and Delivery of Optimal Thermal Sterilization Processes for Low-Acid Canned Foods
2. The Role of Calcium in Fruit Ripening and in Alleviating Post-Harvest Physiological Disorders
3. Biochemical Aspects of the Effect of Altered Compositions of Atmospheric Gases on Stored Product Insects
4. Production, Regulation, and Mode of Action of Ethylene in Fruit Ripening, Senescence, and Decay
5. Kinetics of Oxidation of Dehydrated Food at Low Oxygen, and Development of Accelerated Tests
6. Mechanism of Heat and Irradiation Synergism
7. Physiology and Prevention of Latent Infections in Fruits
8. Application and Mode of Action of Plastic Film to Extend Life of Fruits and Vegetables
9. Improving the Keeping Quality of Agricultural Perishable Commodities Under Controlled Atmospheres
10. Prevention of Browning in Fruits and Vegetable Foods

Field Crops

1. Breeding Potential of the Wild Genepool of Lentil
2. The Collection, Evaluation, and Utilization of Wild Emmer (*Triticum dicoccoides*) for Wheat Breeding
3. Genetic Resources Information System for Israel and the United States: A Feasibility Study
4. The Effect of Water Stress on *Solarium* Species of Potential Use as Source of Steroidal Drugs; Physiological, Biochemical, Agricultural, and Genetical Aspects
5. Physiological Disorders in Vegetable Crops: Basic and Practical Aspects
6. Development of Melons Suitable for Once-Over Mechanical Harvest
7. Physiological Genetics of Cold Tolerance in the Tomato
8. Development of a Management-Oriented Dynamic Simulation Model for Cotton Production
9. *Pennisetum americanum* X *purpureum*: A Potential Forage Crop for Maximum Production of Digestible Nutrients Under Subtropical Conditions
10. Utilization of System Analysis for the Development and Implementation of Improved Decision Criteria for Cotton Crop Management

11. Peanut Breeding for Higher Yields and Quality and Evaluation of Methodology
12. Heritability and Physiology of Anther Culture and Inhibitor Selections in Wheat
13. The Dynamic Aspects of Heterosis in Interspecific Crosses of Cotton—A Plant Modeling Approach

Horticulture

1. Concentration and Metabolism of Indolyl Growth Hormones in Fruit Trees
2. Citrus Protoplasm Fusion
3. Climatic Requirements for Rest Completion in Dormant Peach and Apple Buds
4. Improvement of Yield Levels in Citrus With Special Emphasis on Shamouti and Valencia Oranges: Hormone and Carbohydrate Interactions
5. Administration and Management of Citrus Groves With Aerial Color Infra-red Photography Using Low-Cost Microprocessors
6. Development of a Mechanized Meadow Orchard System for Fresh Market Peaches
7. Vegetative Propagation of Selected Clones of *Eucalyptus camaldulensis* Dehn

Animal Production

1. Optimization of Dairy Cattle Breeding Strategy in Israel and in the United States
2. Investigation of Genetic and Physiological Variability of Milking Cows by Biochemical and Metabolic Studies of Milk Production in Udder, on the Cellular Level
3. Oyster production in the Outflow of Salt Water Fish Ponds
4. Introduction of the Giant Malaysian Prawn *Macrobrachium rosenbergii* (de Man) Into Brackish Water Aquiculture
5. Nutrition and Reproduction of Turkeys Under Different Environmental Conditions
6. Genetic Variation in Minimum Body Weight Required for the Onset of Sexual Maturity in Broiler Chickens, and Its Genetic Covariation With Growth-Rate Components
7. Breeding Efficiency and Milk Yield of Dairy Cows in Relation to Nutritional Status and Planned Differences in Conception Intervals
8. The Control of Meiotic Maturation in Mammals
9. Study of Systemic Granuloma, a Diet Related Disease of the Cultured Marine Fish *Sparus aurata*
10. Selective Breeding of Farmed Fish
11. Hormone Production by the Bovine Blastocyst

12. The Promotion of Prolific Strains of Sheep by Crossbreeding and by Nutritional and Managerial Means
13. Rotifer Resting Eggs and Their Application to Marine Aquaculture
14. Development of Systems for Integrating Aquaculture With Water Storage and Irrigation

Animal Protection

1. Genetic Factors Affecting the Rate of Development of Immunological Maturity With Respect to Disease Agents in Poultry
2. Studies on the Ecology of Animal Influenza Viruses in Israel
3. Virologic, Immunologic, Epidemic, and Pathogenetic Studies of Slow Viral Lung Diseases in Sheep
4. Study of the Lymphoproliferative Disease of Turkey and Its Causative Virus
5. Specific Biochemical Test for Detecting Fatty Liver in Farm Animals
6. Early Embryonic Environment and Early Embryonic Death in Dairy Cattle
7. Development of a Method for Obtaining Salmonella-Free Poultry Feed. Pilot Scale Study for Subsequent Large Scale Implementation
8. Physiological Age-Grading and Survival Rate in *Culidoides* (Diptera: Ceratopogonidae) as a Means of Determining Vector Capacity
9. Endocrine Control of Prolapsed Oviduct in Hens
10. Bacterial and Leucocytic Contents and Enzyme Levels in Milk as Methods for the Determination of Milk Quality and for the Early Detection of Mastitis
11. Interaction of Newcastle Disease Virus Strains of Different Virulence With Cell Receptors
12. Vaccination of Chickens Against *Mycoplasma gallisepticum*

Agricultural Economics

1. Agricultural Planning With Production Rigidities: Theory and Practice
2. Grain Stocks and Price Policies in Israel
3. Some Dynamic Aspects of Technological Change in Agriculture
4. Multi-Product Agricultural Supply Response Estimation in Israel and the United States
5. Analysis of Efficient Regional Allocation of Irrigation Water With Emphasis on Salinity and the Related Cost Sharing Scheme
6. Agricultural Growth-Methodology, Measurement, and Applications to Israeli Agriculture
- i'. Welfare Implications of Price Stabilization Pol-

- icies Implemented by Israeli Agricultural Marketing Boards
8. The Impact of Inflation on Investment in Agricultural Capital
9. Estimation of an Agricultural Production Function From Data Obtained From Complex Sample Surveys

General

1. The Mechanism of Osmotic Accommodation to Water and Saline Stress in Plant Cells; and the Role of Hormones in Modulating This Response
2. The Role of Polyamides in Growth and Senescence of Plants Under Stress Conditions With Special Reference to Horticulturally Important Organs and Tissues
3. The Chemical Identity and Physiological Action of Regulatory Peptides in Reproductive Maturation of Insects
4. Drought and Freezing Damage to Plants in Relation to the Structure and Function to the ATP Synthesizing Enzyme From Chloroplasts
5. Improvement of Salt Tolerance in Higher Plants—Research on the Levels of the Whole Plant, Isolated Tissues, and Cells
6. Development of Somatic Hybridization Systems Involving Cytoplasmic Traits
7. Plasmid Manipulation in Plant Protoplasm Systems
8. Planning of Research in Agricultural Extension and Extension Training
9. Interactions Between Ethylene and Other Growth Regulators in Aging Tissues
10. The Effect of Plant and Environmental Factors on Photosynthetic Efficiency
11. Factors Determining the Sensitivity of Abscising Plant Organs to Ethylene, With Special Reference to Auxin Metabolism and Transport
12. The Introduction of Vesicular-Arbuscular Mycorrhizae Into Modern Crop Production Practices
13. Development of Gene Transplant Technology for Crop Plants
14. A Comparison of the Mechanism of Cellulose Synthesis in Bacteria and Higher Plants
15. Resistance to Water and Salt Stress Through Somatic Cell Selection

Approved Subjects 1982

Soil and Water

- Slow-release water-borne microparticles for incorporation of pesticides into soils

The mineralogical and chemical forms of boron, molybdenum, and selenium in fly ash and their mobility and interaction in soils

Reactions in soil and response of plants to various fluorine sources

Control of nonfumigant nematicide distribution and activity in irrigated soils

Improving estimates of evapotranspiration from meteorological data for the control of irrigation for cotton and other field crops

Managing multi-source irrigation water of different qualities for optimum crop production

Crop response to saline water management in the presence of spatially variable soil water properties

Developments of methods for designing drainage systems for irrigated lands with nonuniform boundary conditions

Agricultural Engineering

Separation of extraneous matter from agricultural products by the difference in the coefficient of restitution

Long distance vertical spreader for granular materials

Plant Protection

Naturally occurring steroids from solanaceous plants as potential insect antifeedants

Natural arthropod defense mechanisms of deciduous trees, adaptable for use in agriculture

Evaluation of parasitoids for the control of whiteflies

Genetic and biological control of Septoria diseases of wheat

Double stranded RNA-infectious hypovirulence factors in plant protection

Genetic manipulation of almond moth (*Ephesia cautella*) populations as a means of reducing or preventing insecticide resistance

Enhancement of citrus resistance to tephritid fruit flies

Studies on nutrition, physiology, and molecular genetics of spiroplasmas with reference to diagnosis and pathogenesis

Food Technology

Chilling injury during avocado and mango fruit storage: development and prevention

Mechanisms and prevention of lipid oxidation in muscle foods

Protection of grain from insect damage through storage in semiarid and arid regions

Post-mortem quality changes of the freshwater prawn *Macrobrachium rosenbergii* during refrigerated/ice-chilled storage

Factors influencing the quality characteristics of frozen and dehydrated fruits and vegetables

Field Crops

Regulation of corn dormancy

Testing the efficiency of different lamps and illumination regimes for photoperiodic irradiation of agricultural crops

Development of cantaloupe varieties and advanced breeding lines with resistance to the fungus disease complex in both the USA and Israel with special emphasis on resistance to downy mildew

Genetic diversity of wild emmer wheat, *Triticum dicoccoides*, in the Near East in relation to wheat breeding

Genetic and chemical control of alkaloid biosynthesis in *Papaver bracteatum* and *Papaver somniferum*

Studies on carcinogenic solarium plants of potential value as source of active vitamin D-like derivatives

Study of cytoplasmic male sterility in lentil

Horticulture

Isozyme markers as a tool in avocado research

Avocado fruit abscission

Response of peach and nectarine germ plasm to an annual top removal pruning system

Animal Protection

Physiological criteria for improvement of production efficiency in beef cows subjected to nutritional and environmental 'stress' due to fluctuating seasonal grazing conditions

Development of improved methodology for estimating genetic merit of bulls and cows in the USA and Israel

Nutrition-physiology-environment interactions in turkeys

Stable isotope ratio as naturally occurring tracers in the aquiculture food web

An integrated approach to the breeding, nutrition, reproduction, and management of geese

Animal Protection

Detection of rift valley fever ELISA antibody and antigen in livestock

Studies of pathogenesis and prevention of milk fever of dairy cows

Immunization of cattle with antigens derived from continuous *in vitro* cultures of *Babesia bovis*
Evaluation of polyethylene intramammary device (IMD) in mastitis control

Agricultural Economics

Grain stocks and price policies in Israel; an evaluation of alternative policy combinations and their performance under rapid inflation
Pricing and R&D for quality of agricultural products: the case of tomatoes

Economic development and changing structure of the family farm

General

Photoacoustic monitoring of plant leaves, in combination with photothermal radiometry and fluorescence—tools for assessing plant condition, photosynthesis, and productivity

O