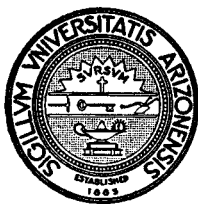


Annual Report
of the
Arizona
Agricultural Experiment Station

FOR THE 63RD YEAR
ENDING JUNE 30, 1952



AGRICULTURAL EXPERIMENT STATION
UNIVERSITY OF ARIZONA, TUCSON

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WALTER R. BIMSON, President.....January, 1955
LYNN M. LANEY, B.S., J.D.....January, 1955
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JOHN M. JACOBS.....January, 1959
EVELYN JONES KIRMSE, A.M.....January, 1959
ALEXANDER G. JACOME, B.S.....January, 1961
WILLIAM R. MATHEWS, A.B., Secretary.....January, 1961

RICHARD A. HARVILL, Ph.D.....President of the University
ROBERT L. NUGENT, Ph.D.....Vice-President of the University
ALFRED ATKINSON, D.Sc.....Executive Advisor to the Board of Regents

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I. DEVELOPMENTS NOT ASSOCIATED WITH SPECIFIC PROJECTS

BUILDING PROGRAM AT MESA STATION

The most significant general development of the year was the authorization by the Arizona Legislature for a \$215,000 building program at the Mesa Station. The major item in this program will be a laboratory building to provide offices and laboratories for technicians of the Arizona Agricultural Experiment Station and the State Chemist. Experiment Station operations planned for the immediate future in connection with the laboratory will include research by the departments of horticulture, plant pathology, entomology, and soils. The offices and laboratories of the State Chemist in the new building will be used for analytical work on feeds, fertilizers, insecticides, and agricultural minerals which has heretofore been carried on in the College of Agriculture building in Tucson. In addition to seven specialized laboratories and ten offices, the new building will contain soil preparation and nitrogen rooms, a seed analysis room, a photographic darkroom, four temperature control rooms (for vegetable storage investigations) and a room to be used as a conference room and library.

Other facilities included in the building program at the Mesa Station are three 25-foot greenhouses equipped with a headhouse. A 40 x 40 feet utility building for storing and mixing fertilizers and insecticides and for storing seeds will also be constructed. Attached to this utility building will be a seed storage room made available by special provision of the Arizona Crop Improvement Association. This storage space will be used by the Association in its seed improvement work, much of which is carried on co-operatively with the Experiment Station. A feed mill building for grinding, mixing, and storing feeds, and eight cattle feeding lots each 60 x 60 feet with necessary working lots are to be built for an expanded program of animal husbandry research. It is anticipated that all parts of the building program will be completed by mid-summer 1953.

DISPOSITION OF DATE ORCHARD AND VEGETABLE RESEARCH AREA NEAR TEMPE

A 25-acre tract south of Tempe formerly used for vegetable and date investigations was sold in order to make fullest use of new facilities at the Mesa Station and to provide greater research emphasis on area differences in Arizona's vegetable production. Although research on date production had not been carried on in recent years at the Tempe Station, the work which began in co-operation with the U.S. Department of Agriculture about 1900 with offshoots from Algeria formerly received widespread attention. During the 1930's the entire 25 acres were planted to date varieties and breeding material. During this period, the more promising varieties were transferred to the University's Experiment Station near Yuma. At the time the tract was sold, approximately 7 acres remained in date production. In moving from the Tempe Station, the Horticulture De-

partment expects to use the homogenous soil of the Mesa Station for its vegetable breeding and physiology investigations. Fertilizer tests on vegetables will be conducted in co-operation with growers in the various production areas.

ENLARGEMENT OF RESEARCH TRACT NEAR MARANA

Twenty acres were added during the year to the 208 acres previously purchased near Marana. This addition was accomplished by selling 20 acres lying in a strip about 535 feet wide on the eastern side of the 208-acre tract and adding by purchase a 40-acre block on the southwestern corner. In addition to enlarging the total area these changes squared up the tract, making for generally more efficient farming operations and irrigation management. Disposition of the eastern 20 acres reduced highway frontage by 696 feet but left nearly a quarter of a mile that borders on State Highway 84. Development of the 228-acre tract for research purposes is expected during the fiscal year 1952-53. Plans call for utilizing the area primarily for an enlarged program of animal husbandry investigations. Moving animal husbandry work to the new site will also aid the research programs of other departments, particularly dairy husbandry, by releasing land and other facilities near Tucson.

II. ACTIVE PROJECTS

AGRICULTURAL CHEMISTRY AND SOILS

Lysimeter study of the nitrogen balance in irrigated arid soils (Purnell 169, Hatch and State)

Nutritional, chemical, and physical studies on the more important soil types in Arizona (Purnell 265 and State)

Fertilization of field crops on alkaline-calcareous soils of different types, under semiarid and irrigated conditions (Research and Marketing 266 and State)

Availability of native soil phosphate and new commercial phosphate fertilizers in Arizona calcareous soils (Purnell 280 and Atomic Energy Commission)

Fundamental soil studies on the properties and use of soil correctives (Purnell 281, Hatch and State)

Soil structure and permeability under field conditions as affected by soil amendments and cultural practice (Regional Research 288 and State)

A study of the effect of temperature variation on various chemical and physical soil properties which affect fertility (Purnell 289 and State)

The soil plant system with reference to availability and uptake of moisture (State 307)

Weather records (State)

Fluoridation of drinking water (State)

Soil survey (State)

Control laws (Registration and Tonnage Fees)

Analytical service (State)

AGRICULTURAL ECONOMICS

Supply-price relationships and trends as they apply to Arizona farm and ranch products (Bankhead-Jones 196 and State)

Marketing research directed at opening up channels of trade for irrigated cotton (Research and Marketing 267 and State)

Differential in prices between the producer and consumer that may be attributed to trade barriers in the Western Region (Research and Marketing 300, Regional Research and State)

An analysis of the cost of pumping water for irrigation in Pinal County, 1951 (Bankhead-Jones 306 and State)

AGRICULTURAL ENGINEERING

Groundwater studies (Adams 1, Hatch and State)

Sprinkler irrigation studies under arid Southwestern conditions (Adams 303, Hatch and State)

Water-supply forecasting and needed areal adjustment in irrigated agriculture during drouths. The annual water supply forecast (Hatch 215 and State)

Mechanization of cotton production and harvesting (Research and Marketing 269, Regional Research and State)

The production and utilization of tamarisk. The tamarisk tree and its wood preservative treatment of tamarisk fence posts (Purnell 231, Hatch and State)

AGRONOMY

The culture and improvement of cereals (Research and Marketing 305 and State)

The control of weeds on irrigated lands (Bankhead-Jones 261 and State)

The culture and improvement of flax (State)

Oil seed crops, yield and quality as affected by heredity, soil, climate, and other environmental factors (Purnell 275 and State)

Cotton yield and quality as affected by soil and climatic environment (Purnell 264 and State)

Seed production and special forage grasses and legumes (Purnell 304 and State)

Alfalfa (State)

Grain sorghums (State)

Irrigated pastures (Bankhead-Jones 248 and State)

ANIMAL HUSBANDRY

Investigation of an achondroplasia-like condition in Hereford cattle (Purnell 282 and State)

Progeny testing of Hereford sires (Research and Marketing, Regional Research) (Reg. No. W-1)

Comparative value of irrigated pastures for meat production (Bankhead-Jones 248 and State)

Nutritional studies of Arizona range plants and animals (Purnell 183 and State)

The effect of shade location on summer gains of fattening cattle (State)

ANIMAL PATHOLOGY

Range livestock losses from poisonous plants (Purnell 171 and State)

Infectious keratitis in cattle on range and feed lots (Purnell 199, Hatch and State)

The influence of salt on the physiology of ruminants (State)

Abortion in range cattle (State)

Diagnostic laboratory service (State)

The incidence of leptospirosis in domestic animals in Arizona (Federal Security Agency)

BOTANY AND RANGE ECOLOGY

The range resources of Arizona (Purnell 232 and State)

The nutritional adaptation of selected crop and forage plants for growth under alkaline soil conditions (Purnell 250 and State)

Artificial revegetation of deteriorated semidesert grassland ranges (Purnell 263 and State)

Control of noxious shrubs on Southwestern ranges (Research and Marketing 285 and State)

Factors affecting the noxious shrub control program on Arizona range lands (Bankhead-Jones 292 and State)

Grasses of Arizona (Grazing value and management of some common Arizona range grasses) (State 174)

Asphalt-paved runoff basins as a source of stock water on semi-arid ranges (American Bitumuls & Asphalt Company, Arizona Game & Fish Commission and State)

University of Arizona herbarium (State)

DAIRY HUSBANDRY

Calf pasture vs. dry lot (Hatch 274 and State)

The effect of feeding practices upon milk production and the composition of milk (Bankhead-Jones 290 and State)

Vitamin-A requirements for dairy cows in a hot, arid climate (Purnell 311 and State)

Soft water vs. hard water for dairy cows (State)

Consumer acceptance of beverages (State)

ENTOMOLOGY

Insect pests of vegetable crops (Purnell 257 and State)

Insect vectors of plant diseases affecting Arizona crops (Hatch 301 and State)

Arizona insects of economic importance (Purnell 302 and State)

Problems associated with the use of insecticides in Arizona (Research and Marketing 310 and State)

HOME ECONOMICS

Indoor play areas for the preschool child (Rural Housing W-8) (Regional Research 287a)

Dining area storage of linen, dishes, silver, glassware, and table appliances used in indoor meal services in rural homes in the Western Region (Regional Research 287b)

HORTICULTURE

Lettuce breeding in Arizona (Purnell 297, Hatch and State)

Lettuce physiology and cultural management (Purnell 298 and State)

The breeding and improvement of melon varieties (Purnell 295, Hatch and State)

Melon physiology and cultural management (Purnell 296 and State)

Citrus physiology and cultural management (Purnell 299, Hatch and State)

Date maturation, storage and quality (Research and Marketing 270 and State)

Cardinal grape maturity and pruning studies (State)

NUTRITION

The nutritive value of certain Arizona-produced foods and their relationship to various factors (Purnell 258 and State)

The interdependence and physiological availability of amino acids, vitamins and other nutrients in foods (Research and Marketing 271 and State)

Amino acid metabolism in rheumatoid arthritis (U.S. Public Health Service H-490 [C₂])

PLANT BREEDING

Breeding sorghums for increased uniformity in the field and for improved agronomic characteristics and increased production of grain and forage (Bankhead-Jones 309 and State)

Breeding small grains for increased yield, strength of straw and disease resistance (Adams 293 and State)

Breeding long staple cotton (*Gossypium Barbadosense*) for length, fineness and strength of fiber and improved type of plant with high production (Adams 294 and State)

A study of variability in adapted commercial alfalfa varieties and methods for their improvement (Adams 4, Hatch and State)

Upland cotton breeding (Adams 47, Hatch and State)

PLANT PATHOLOGY

Control of *Phymatotrichum* (Cotton or Texas) root rot on irrigated lands (Adams 42 and State)

Control of dry root rot and other diseases of citrus (Purnell 222 and State)

Development of wilt-resistant varieties of alfalfa (Adams 227, Hatch and State)

Vercillium wilt of cotton (Adams 256, Hatch and State)

Virus diseases of vegetable crops, including melons, in Arizona (Research and Marketing 286 and State)

The control of drop or watery brown rot (*Sclerotinirose*) in lettuce and other vegetables through the use of Aero calcium cyanamide (American Cyanamid Company)

Miscellaneous studies (State)

POULTRY HUSBANDRY

Developing a high egg-producing line of S. C. White Leghorns (Purnell 229B, Hatch and State)

- Establishing a sixth character to be added to the present five-character system (Purnell 229C, Hatch and State)
- Inheritance of egg size (Purnell 229D, Hatch and State)
- Hormone feeding (State 90)
- Preliminary: X-Ray treatment of eggs (State)
- Arizona egg laying test (State 53)

III. PUBLICATIONS

TECHNICAL BULLETINS

- 123. Utilization of Phosphorus from Barley Residues in Calcareous Soils, by W. H. Fuller and R. N. Rogers.
- 124. The Salinity Problem — Safford Experiment Farm — Field Experiments, by W. T. McGeorge, E. L. Breazeale and A. Mark Bliss.
- 125. The Salinity Problem — Safford Experiment Farm — Laboratory Studies, by W. T. McGeorge.
- 126. Indoor Play Areas for the Preschool Child, by B. Eleanor Johnson.

GENERAL BULLETINS

- 236. I. Establishing a High Egg Producing Strain of S. C. White Leghorns, and
II. The 365-Day Egg Production Equivalent Table, by H. Embleton.
- 237. Irrigation Ditch Management on Arizona Irrigated Farms, by Rex Rehnberg.
- 238. American-Egyptian Cotton: An Analysis of Some Economic Factors Affecting Production and Marketing, by Scott Hathorn, Jr.
- 239. The Use of Salt as a Regulator of Supplemental Feed Intake and Its Effect on the Health of Range Livestock, by B. P. Cardon, E. B. Stanley, W. J. Pistor and J. C. Nesbitt.
- 240. Soil Organic Matter, by W. H. Fuller.
- 241. Comparing Foundation and Family Matings as a Means of Increasing Size in Eggs, by H. Embleton.
- 242. Arizona Agriculture, 1952, by George W. Barr and R. E. Seltzer.

REPORTS

- 105. Dried Cantaloupe, Safflower Meal and Salt in Arizona Cattle Fattening Rations, by E. B. Stanley, O. F. Pahnish, C. E. Safley.
- 106. Suggested Construction Methods and Specifications for Concrete-Lined Farm Irrigation Ditches.
- 107. Research Progress.
- 108. Castor Bean Production in Yuma County, 1951, by W. M. Wootton.
- 109. A Summary of Laws Relating to the Interstate Movement of Agricultural Products in the Eleven Western States, by J. S. Hillman and J. D. Rowell.

ANNUAL REPORT

Sixty-second Annual Report for Fiscal Year Ending
June 30, 1951.

OTHER PUBLICATIONS

Quarterly: Progressive Agriculture in Arizona — Vol. III, No. 2,

- July, August, September, 1951; Vol. 111, No. 3, October, November, December, 1951; Vol. III, No. 4, January, February, March, 1952; Vol. IV, No. 1, April, May, June, 1952.
- Fourteenth Annual Report of Arizona Feed Control Office of Arizona.
- Fourteenth Annual Report of the Arizona Fertilizer Control Office — Fertilizers and Agricultural Minerals.
- Sixth Annual Report Economic Poisons Control.
- Monthly and Final Reports of Arizona Egg Laying Test — July, 1951 through June, 1952.
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- Borden, A. L., E. C. Brodie, E. B. Wallraff, W. P. Holbrook, D. F. Hill, C. A. L. Stephens, R. B. Johnson and A. R. Kemmerer: Amino Acid Studies and Clinical Findings in Normal Adults and Rheumatoid Arthritis Patients Treated with ACTH. *Journal of Clinical Investigation* 31:375. 1952.
- Breazeale, E. L., W. T. McGeorge and J. F. Breazeale: Water Absorption and Transpiration By Leaves. *Soil Science* 72:239.
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- Burkhart, L.: Arizona Lettuce Men Aided by Research. *Western Grower and Shipper*. September, 1951.
- Burkhart, L.: Arizona Producers Play Important Role in National Salad Diet. *Western Grower and Shipper*. Annual Issue, November, 1951.
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- Hilgeman, R. H.: Irrigation of Valencia Oranges. *California Citrograph*. July, 1951.
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- Hirsch, J. S., A. D. Niles and A. R. Kemmerer: The Essential Amino Acid Content of Several Vegetables. *Food Research* (In Press) 1952.

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- Humphrey, R. R.: Trees, Brush, Grass and Water. *Arizona Cattlelog*. 7 (9). 1952.
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- Humphrey, R. R.: Arizona Flora. Bulletin of the Torrey Botanical Club. 79(2):190-191. 1952.
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IV. STAFF

PHIL S. ECKERT.....	Director
RALPH S. HAWKINS.....	Vice-Director

AGRICULTURAL CHEMISTRY AND SOILS DEPARTMENT

WILLIAM T. McGEORGE.....	Agricultural Chemist
THEOPHIL F. BUEHRER.....	Physical Chemist
PAUL S. BURGESS.....	Associate Agricultural Chemist
WALLACE H. FULLER.....	Associate Biochemist
HOWARD V. SMITH.....	Associate Agricultural Chemist
EDWARD L. BREAZEALE.....	Assistant Agricultural Chemist
GEORGE E. DRAPER.....	Assistant Agricultural Chemist

AGRICULTURAL ECONOMICS DEPARTMENT

*GEORGE W. BARR.....	Agricultural Economist
RAYMOND E. SELTZER.....	Acting Head of Department
REX D. REHNBERG.....	Assistant Agricultural Economist
JIMMYE S. HILLMAN.....	Assistant Agricultural Economist
JOHN D. ROWELL.....	Assistant Agricultural Economist
JAMES S. ST. CLAIR.....	Assistant Agricultural Economist

AGRICULTURAL ENGINEERING DEPARTMENT (Irrigation)

HAROLD C. SCHWALEN.....	Agricultural Engineer
GEORGE E. P. SMITH.....	Agricultural Engineer
KENNETH R. FROST.....	Assistant Agricultural Engineer
*EMMETT R. HOLEKAMP.....	Assistant Agricultural Engineer
ROBERT W. JOHNSTON.....	Assistant Agricultural Engineer
RICHARD J. SHAW.....	Assistant Agricultural Engineer

AGRONOMY DEPARTMENT

DEAN F. McALISTER.....	Agronomist
†KARL HARRIS.....	Associate Irrigation Engineer (Phoenix)
LARUE C. CHAPMAN.....	Assistant Agronomist
HOWARD P. CORDS.....	Assistant Agronomist

ANIMAL HUSBANDRY DEPARTMENT

ERNEST B. STANLEY.....	Animal Husbandman
BARTLEY P. CARDON.....	Associate Animal Husbandman
ARMSTEAD M. MCKINNEY.....	Assistant Animal Husbandman
O. FLOYD PAHNISH.....	Assistant Animal Husbandman
CARL E. SAFLEY.....	Assistant Animal Husbandman

ANIMAL PATHOLOGY DEPARTMENT

WILLIAM J. PISTOR.....	Animal Pathologist
BARTLEY P. CARDON.....	Assistant Animal Pathologist

BOTANY AND RANGE ECOLOGY DEPARTMENT

WALTER S. PHILLIPS.....	Botanist
JOHN J. THORNBER.....	Taxonomist
ROBERT R. HUMPHREY.....	Associate Range Ecologist
ALBERT L. BROWN.....	Assistant Range Ecologist
KITTIE F. PARKER.....	Assistant Botanist
EDWIN B. KURTZ.....	Assistant Botanist

*On leave

†In co-operation with U.S.D.A., Soil Conservation Service

DAIRY HUSBANDRY DEPARTMENT

‡ AXEL C. EVERSON.....	Research Assistant
RICHARD N. DAVIS.....	Dairy Husbandman
F. GORDON HARLAND.....	Assistant Dairy Husbandman
JOHN W. STULL.....	Assistant Dairy Husbandman

ENTOMOLOGY

LAURENCE A. CARRUTH.....	Entomologist
GEORGE D. BUTLER, JR.....	Assistant Entomologist
DONALD M. TUTTLE.....	Assistant Entomologist (Yuma)

HOME ECONOMICS (School of)

B. ELEANOR JOHNSON.....	Director
ELIZABETH B. HURLEY.....	Research Assistant

(All other members do teaching only)

HORTICULTURE DEPARTMENT

LELAND BURKHART.....	Horticulturist
ROBERT E. FOSTER.....	Associate Horticulturist (Mesa)
ROBERT H. HILGEMAN.....	Associate Horticulturist (Tempe)
CLIFTON W. VAN HORN.....	Associate Horticulturist (Yuma)
STEVE FAZIO.....	Assistant Horticulturist
‡ GLENN A. LUNDEEN.....	Assistant Horticulturist
WEYMOUTH D. PEW.....	Assistant Horticulturist (Mesa)
GEORGE C. SHARPLES.....	Assistant Horticulturist (Tempe)
JOSEPH K. STEWART.....	Assistant Horticulturist (Mesa)

NUTRITION DEPARTMENT

ARTHUR R. KEMMERER.....	Nutrition Chemist
MITCHELL G. VAVICH.....	Associate Nutrition Chemist
§ EMILY C. BRODIE.....	Research Associate
§ ALICE B. STANFIELD.....	Research Associate
WILLIAM F. MCCAUGHEY.....	Research Assistant

PLANT BREEDING DEPARTMENT

WALKER E. BRYAN.....	Plant Breeder
ELIAS H. PRESSLEY.....	Plant Breeder
DONALD W. GEORGE.....	Assistant Plant Breeder
SMITH WORLEY, JR.....	Assistant Plant Breeder

PLANT PATHOLOGY DEPARTMENT

JAMES G. BROWN.....	Plant Pathologist
RUBERT B. STREETS.....	Associate Plant Pathologist
PAUL D. KEENER.....	Assistant Plant Breeder

‡ Resigned June 30, 1952

§ In co-operation with Southwestern Clinic

|| In co-operation with American Dehydrators' Assn.

POULTRY HUSBANDRY DEPARTMENT

ALICE M. BOYLE.....	Research Assistant
ROSS M. ALLEN.....	Research Assistant
HARRY EMBLETON.....	Poultry Husbandman
HUBERT B. HINDS.....	Associate Poultry Husbandman

SUBSTATIONS

D. C. AEPLI.....	General Superintendent and Supt., Mesa
G. E. BELL.....	Foreman, Mesa
A. M. BLISS.....	Superintendent, Safford
L. R. COOPER.....	Foreman, Yuma Mesa, Somerton
R. H. HILGEMAN.....	Superintendent, Salt River Valley Citrus Research
E. H. HUSSMANN.....	Superintendent, University Station, Tucson
F. W. RICHARDSON.....	Superintendent, University Poultry Station, Tucson
¶W. A. RISETTER.....	Foreman, University Poultry Station, Tucson
C. O. STANBERRY.....	Superintendent, Yuma (in co-op. with U.S.D.A., Wellton-Mohawk Div., Gila Irrigation Project)
W. M. WOOTTON.....	Asst. Superintendent, Yuma Mesa, Somerton

APPOINTMENTS

MERLE N. BOYLAN, JR.....	Botany & Range Ecology Fellowship
ARTHUR A. LEE, JR.....	Entomology Fellowship
ROBERT B. MARLATT.....	Paul Steere Burgess Fellowship
RICHARD F. SMITH.....	Nutrition Fellowship
EDWARD P. STANLEY.....	Agronomy Fellowship
ELIZABETH B. HURLEY.....	Research Assistant
EDWIN B. KURTZ, JR.....	Assistant Botanist
DEAN F. McALISTER.....	Agronomist
WILLIAM F. McCAUGHEY.....	Research Assistant
ARMSTEAD A. McKINNEY.....	Assistant Animal Husbandman
C. O. STANBERRY.....	Superintendent, Yuma Station
JAMES S. ST. CLAIR.....	Assistant Agricultural Economist
JOSEPH K. STEWART.....	Assistant Horticulturist (Mesa)
ANNE W. WERTZ.....	Research Associate

RESIGNATIONS

LOCAN L. BRIMHALL.....	Assistant Agricultural Chemist
HAROLD A. CARR.....	Foreman, Salt River Valley Vegetable Research
WILLIAM L. EHRLER.....	Assistant Botanist
AXEL C. EVERSON.....	Research Assistant
SCOTT HATHORN, JR.....	Associate Agricultural Economist
JUNIATA HIRSCH.....	Research Assistant
GLENN A. LUNDEEN.....	Assistant Horticulturist
RAYMOND N. ROGERS.....	Research Assistant
WILLIAM I. THOMAS.....	Assistant Agronomist
ANNE W. WERTZ.....	Research Associate

ON LEAVE

GEORGE W. BARR.....	Agricultural Economist
DOUGLAS E. BEECROFT.....	Manager, Milk Processing, Dairy Husbandry
EMMETT R. HOLEKAMP.....	Assistant Agricultural Engineer

¶On leave until April 1, 1952

V. FINANCIAL STATEMENT, 1951-52, UNIVERSITY OF ARIZONA, AGRICULTURAL EXPERIMENT STATION

	Hatch	Adams	Purnell	Bankhead-Jones	Research & Marketing	Regional Research	Non-Federal Funds	Total
RECEIPTS								
Received from the Treasurer of the U.S.	\$15,000.00	\$15,000.00	\$60,000.00	\$16,740.68	\$32,066.37	\$19,250.00		\$158,057.05
State Appropriations							\$209,130.47	209,130.47
Main Station							124,495.94	124,495.94
Substations							44,292.93	44,292.93
Special Endowments							44,937.83	44,937.83
Sales					2,167.87	4,440.16		6,608.03
Balance Forward								
Total Receipts	\$15,000.00	\$15,000.00	\$60,000.00	\$16,740.68	\$34,234.24	\$23,690.16	\$422,857.17	\$587,522.25

DISBURSEMENTS

Personal Services	14,932.25	11,769.02	41,518.58	11,803.54	19,441.73	11,988.49	307,510.61	418,964.22
Travel		1,398.45	3,912.88	2,630.86	3,203.36	1,369.02	9,397.20	21,911.77
Transportation of Things		210.83	296.11	17.66	246.28	54.16	904.46	1,729.50
Communication Service43	71.21	125.98	68.46	148.38	20.40	2,954.49	3,389.35
Rents and Utility Services		32.50			24.80	109.25	8,404.39	8,570.94
Printing and Reproduction			743.30		78.10	660.56	5,679.68	7,161.64
Other Contractual Services		399.11	1,271.35	131.26	1,566.62	164.92	16,705.80	20,239.06
Supplies and Materials	18.57	852.88	9,512.14	1,567.72	5,462.98	8,627.04	37,354.85	58,396.18
Equipment	48.75	266.00	2,619.66	521.18	4,061.99	675.94	29,577.30	37,770.82
Land and Structures						4,429.45		4,429.45
Industrial Insurance							4,368.39	4,368.39
Balance Forward							590.93	590.93
Total Disbursements	\$15,000.00	\$15,000.00	\$60,000.00	\$16,740.68	\$34,234.24	\$23,690.16	\$422,857.17	\$587,522.25