

*Annual Report*  
of the  
Arizona  
Agricultural Experiment Station

FOR THE 65TH YEAR  
ENDING JUNE 30, 1954



AGRICULTURAL EXPERIMENT STATION  
UNIVERSITY OF ARIZONA, TUCSON

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This report is limited to an inventory of active research projects, an enumeration of publications issued during the year, a roll of staff members, and an account of receipts and disbursements of federal and state funds. The results of completed investigations are published in general and technical bulletins, mimeographed reports, and in technical journals. Reports of research progress, digests of general and technical bulletins, and developments not associated with specific projects are carried in *Progressive Agriculture in Arizona*, a quarterly publication of the College of Agriculture, University of Arizona.

# AGRICULTURAL EXPERIMENT STATION

## I. ACTIVE PROJECTS

### AGRICULTURAL BIOCHEMISTRY

Nutritive value of certain Arizona-produced foods and feeds and their relationship to various factors (Purnell 258A, B, C, and State).

The interdependence and physiological availability of amino acids, vitamins and other nutrients in foods (Bankhead-Jones [9b1,2] 271 and State).

Nutritional status and dietary needs of population groups in selected areas of the West (Bankhead-Jones [9b3] 313-2 and State).

Amino acid metabolism in rheumatoid arthritis (U.S. Public Health Service H-490 [C-3]).

### AGRICULTURAL CHEMISTRY AND SOILS

Lysimeter study of the nitrogen balance in irrigated arid soils (Purnell 169 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 (Bankhead-Jones [9b1,2] 266 and State).

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

Fundamental soil studies on the properties and uses of soil correctives (Purnell 281 and State).

Nature of microflora and their activity in Arizona soils as affected by soil temperature, moisture, salinity, pH, and other factors peculiar to semiarid soils (Purnell 283 and State).

Soil structure and permeability under field conditions as affected by soil amendments and cultural practices (Bankhead-Jones [9b3] 288 and State).

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

Soil plant system with reference to availability and uptake of moisture (State 307).

Uptake of strontium by crops (Atomic Energy Commission and State).

Study of soil aggregate stabilizers (Monsanto Chemical Company and State).

Weather records (State 160).

Control laws—Fertilizer, Feed, Economic Poisons, Agricultural Minerals (State).

Soil survey (State 326).

Analytical laboratory service (State).

## AGRICULTURAL ECONOMICS

Supply-price relationships and trends as they apply to Arizona farm and ranch products (Bankhead-Jones [5] 196 and State).

Marketing research directed at opening up channels of trade for irrigated cotton (Bankhead-Jones [9b1,2,3] 267 and State).

Agricultural credit facilities in Arizona: An analysis of existing structure and problem areas (Bankhead-Jones [5] 312 and State).

Marketing Arizona head lettuce with special reference to packaging and cooling methods and to the possibilities of market control programs (Bankhead-Jones [9b1,2,3] 316 and State).

Marketing livestock from Arizona ranches and feedlots (Bankhead-Jones [9b1,2] 319 and State).

Quality and cost of ginning services in central Arizona (Bankhead-Jones [9b1,2] 321 and State).

## AGRICULTURAL ENGINEERING

Groundwater studies (Adams 1 and State).

Water-supply forecasting and needed areal adjustments in irrigated agriculture during drouths (Hatch 215 and State).

The production and utilization of tamarisk, *Tamarix Articulata* (Purnell 231 and State).

Mechanization of cotton production and harvesting (Bankhead-Jones [9b1,2,3] 269 and State).

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

## AGRONOMY

Comparative value of irrigated pastures for meat production (Bankhead-Jones [5] 248 and State).

Control of weeds on irrigated lands (Bankhead-Jones [5] 261 and State).

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

Mechanization of cotton production and harvesting (Bankhead-Jones [9b1,2,3] 269 and State).

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

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

Culture and improvement of cereals (Bankhead-Jones [9b1,2] 305 and State).

Culture and improvement of flax (State 340).

Alfalfa (State 341).

Grain sorghums (State 342).

## ANIMAL HUSBANDRY

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

Comparative value of irrigated pastures for meat production (Bankhead-Jones [5] 248 and State).

Progeny testing of Hereford sires (Bankhead-Jones [9b1,2,3] 279 and State).

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

Rumen fermentation (State 335).

#### ANIMAL PATHOLOGY

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

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

An investigation of cattle death losses occurring on alfalfa, alfalfa-barley and barley pastures (Purnell 217 and State).

Effect of rumen organisms on growth of calves (State 325).

Influence of salt on the physiology of ruminants (State 337).

Abortion in range cattle (State 338).

Diagnostic laboratory service (State 339).

The incidence of leptospirosis in domestic animals in Arizona (Department of Health, Education and Welfare and State).

Study of coccidioidomycosis in animals (Department of Health, Education and Welfare and State).

#### BOTANY AND RANGE MANAGEMENT

Range resources of Arizona (Purnell 232 and State).

Nutritional requirements for increased fat production by selected crop plants (Purnell 250 and State).

Control of noxious shrubs on Southwestern ranges (Bankhead-Jones [9b1,2] 285 and State).

Factors affecting the noxious shrub control program on Arizona rangelands (Bankhead-Jones [5] 292 and State).

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

University of Arizona herbarium (State 327).

Poisonous plants of Arizona (State 328).

Asphalt-paved runoff basins as a source of stock water on semiarid ranges (Arizona Game & Fish Commission and State 330).

Weeds of Arizona (State 331).

Uranium accumulation in plants as an indicator of uranium deposits in the soil (Atomic Energy Commission and State).

Synthesis of fatty acids in a higher plant (Atomic Energy Commission and State).

Biosynthesis of waxes by higher plants (Johnson & Son, Inc. and State).

#### DAIRY HUSBANDRY

Dry lot feeding vs. pasture for dairy calves (Hatch 274 and State).

Dehydrated alfalfa pellets for dairy heifers (State 291).

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

Some factors related to oxidation reactions in milk, milk products, and milk constituents (Bankhead-Jones [5] 320 and State).

Effect of rumen organisms on growth of calves (State 325).

Effect of sulfur on forage yield (State 332).

#### ENTOMOLOGY

Insect pests of Arizona 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).

Insects and mites affecting alfalfa in Arizona (Hatch 322 and State).

#### HOME ECONOMICS

Space requirements for activities and storage for the care of infants and young children (Bankhead-Jones [9b3] 323 and State).

#### HORTICULTURE

Improvement of pecan production and quality in Arizona (Purnell 262 and State).

Date maturation, storage and quality (Bankhead-Jones [9b1,2] 270 and State).

Breeding and improvement of melon varieties (Purnell 295 and State).

Factors affecting the quality of Arizona melons (Purnell 296 and State).

Lettuce breeding in Arizona (Purnell 297 and State).

Cultural factors affecting the production of Arizona lettuce (Purnell 298 and State).

Factors affecting the production of citrus in Arizona (Purnell 299 and State).

Factors affecting the shipping quality and consumer acceptability of Arizona-grown vegetables (Bankhead-Jones [9b1,2] 308 and State).

Cardinal grape maturity and culture (State 343).

Deciduous fruit variety adaptation (State 344).

Vegetable variety adaptation (State 345).

Breeding miscellaneous vegetable crops (State 346).

Cultural management and physiology of miscellaneous vegetables (State 347).

Improving irrigated turfs in Arizona (State 348).

Propagation of horticultural materials (State 349).

Introduction of landscaping materials (State 350).

Temperature relations in horticulture (State 353).

Industry developments in horticulture (State 354).

## PLANT BREEDING

Study of variability in adapted commercial alfalfa varieties and methods for their improvement (Adams 4 and State).

Study of the inheritance of fiber qualities in selfed lines of hybrids of Upland cottons (Adams 47 and State).

Breeding cotton for disease and insect resistance and for plant types suitable for mechanical harvesting (Bankhead-Jones [9b1,2] 278 and State).

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

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

Breeding sorghums for increased uniformity in the field and for improved agronomic characteristics and increased production of grain and forage (Bankhead-Jones [5] 309 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 root diseases of citrus (Purnell 222 and State).

Development of wilt-resistant alfalfa varieties adapted to Arizona (Adams 227 and State).

Verticillium wilt of cotton (Adams 256 and State).

Virus diseases of vegetable crops, including melons, in Arizona (Bankhead-Jones [9b,2] 286 and State).

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

Cause and control of cantaloupe crown blight (State 317).

Cause and control of lettuce rib discoloration (State 318).

Control of sore-shin of cotton (State 356).

Lettuce rosette (State 357).

*Fusarium oxysporum* f. *niveum* is seed borne (State 358).

Antibiotics in relation to plant disease control (State 359).

Three diseases of lippia new to Arizona (State 361).

## POULTRY HUSBANDRY

Establishing a sixth character to be added to the present five-character system (Purnell 229C, Hatch and State).

Effect of inbreeding and hybrids upon egg production (Purnell 314 and State).

Establishing a heat-resistant strain of white leghorns (Hatch 363 and State).

Utilization of Arizona crops in chick diets (Purnell 364 and State).

Arizona egg-laying test (State 53).

Poultry feeding (Hormone) (State 90).



## II. PUBLICATIONS

## TECHNICAL BULLETINS

129. The Influence of Soil Aggregate Stabilizers on Stand, Composition, and Yield of Crops on Calcareous Soils of Southern Arizona, by W. H. Fuller, N. C. Gomness, and L. V. Sherwood.

## GENERAL BULLETINS

249. Reseeding Desert Grassland Ranges in Southern Arizona, by Darwin Anderson, Louis P. Hamilton, Hudson G. Reynolds, and Robert R. Humphrey.
250. Sprinkler Irrigation, by H. C. Schwalen, K. R. Frost, and W. W. Hinz.
251. Seasonal Variation in Prices and Shipments of Arizona Beef Cattle, by R. E. Seltzer.
252. Arizona Agriculture 1954, by George W. Barr.
253. Watery Brown Rot of Vegetables in Arizona, by Paul D. Keener.
254. More Efficient Marketing of Arizona Cattle, by Frederick L. Thomsen.
255. Barriers to the Interstate Movement of Milk and Dairy Products in the Eleven Western States, by J. S. Hillman, J. D. Rowell, and V. L. Israelsen.
256. Virus Diseases of Plants in Arizona. I. Field and Experimental Observations on Mosaics Affecting Vegetable Crops, by Paul D. Keener.
257. Tillage Practices for Irrigated Soils, by Karl Harris, D. C. Aepli, and W. D. Pew.
258. Citrus Growing in Arizona, by R. H. Hilgeman and C. W. Van Horn.

## REPORTS

112. Restrictions on the Production and Interstate Distribution of Margarine in the Eleven Western States, by J. D. Rowell and J. S. Hillman.
113. A Statistical Handbook for the Western Lettuce Industry, by M. V. Waananen and J. S. Hillman.

## OTHER TECHNICAL AND SEMI-TECHNICAL PUBLICATIONS

- Eighth Annual Report Economic Poisons Control.  
Sixteenth Annual Report, Feed Control Office of Arizona.  
Sixteenth Annual Report of the Arizona Fertilizer Control Office—Fertilizers and Agricultural Minerals.
- Breazeale, E. L., and McGeorge, W. T.: Influence of Atmospheric Humidity on Root Growth, *Soil Science* 76:361, Nov. 1953.
- Chamberlain, D. W., and McAlister, D. F.: Factors Affecting the Development of Brown Stem Rot of Soybean, *Phytopathology* 44:4-6, 1954.
- Folkner, J.: Use of Native Plants as Landscape Material, *Journal of the Colorado Horticulture and Forestry Association*, Feb. 1953.

- Fuller, W. H., Martin, W. P., and McGeorge, W. T.: Behavior of Nitrogenous Fertilizers in Alkaline Calcareous Soils; II Field Experiments With Organic and Inorganic Nitrogenous Compounds, *Agricultural Chemical Review* 91, 12 October 1953.
- Harris, Robert M., and Phinney, Bernard: Auxin Relations in a Dwarf Mutant of Zea Mays L., *Genetics: Vol. 38, No. 6*, Nov. 1953.
- Harris, Robert M., and Phinney, Bernard: Auxin Relations in a Dwarf—1 Allele of Zea Mays L., *Records of the Genetics Society of America*, No. 22, 1953.
- Heywang, B. W., Bird, H. R., and Kemmerer, A. R.: The Level of Protein in the Diet of Growing New Hampshire Chickens During Hot Weather. *Poultry Science*, 32, 718-785, 1953.
- Hilgeman, R. H.: The Differentiation, Development and Anatomy of the Axillary Bud, Inflorescence and Offshoot in the Date Palm. *Date Growers Institute 31st Annual Report*, April 1954.
- Keener, Paul D.: Western X-disease of peach in Arizona, U.S.D.A., *Plant Disease Reporter*, 37(10):508, Oct. 15, 1953.
- Keener, Paul D.: Tobacco Mosaic Virus in *Datura Meteloides* DC. and *Nicotiana Glauca* Graham in Arizona, U.S.D.A., *Plant Disease Reporter*, 38(5):330-332, May 15, 1954.
- Keener, Paul D.: Book review of General Virology by S. E. Luria, *Bios* 25(2):113-114, May 1954.
- Kurtz, Edwin B.: Editor, Morphology of Cactus Genera I. Leuchtenbergia, by Franz Buxbaum, *Cactus and Succulent Jour.* 25:82-84, 1953.
- Kurtz, Edwin B.: Editor, Chromosome Numbers and Polyploidy in Certain *Cactaceae* by Sigeru Katagiri, *Cactus and Succulent Jour.* 24:141-143, 1953.
- Kurtz, Edwin B.: Editor, Morphology and Cacti Sec. II Flowers by Franz Buxbaum, *Abbey Garden Press*, Pasadena, Calif., 1953.
- Kurtz, E. B.: Editor, Morphology of Cactus Genera II Bartschella, by Franz Buxbaum, *Cactus and Succulent Journal*, 26:86-87, 1954.
- Mason, Charles T.: Plant Genera—Their Nature and Definition by G. H. M. Lawrence (A Review), *Bios* May, 1954.
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- Pew, W. D.: Vermiculite: Aid to Lettuce. *Chemurgic Digest*, 1954.
- Phillips, Walter S.: Editor, Second edition of *Manual of Southwest Desert Trees and Shrubs* by Lyman Benson.
- Sharples, G. C.: Effect of Thinning and Girdling upon Quality of Cardinal Grapes. *University of Arizona Progress Report*, Feb. 1954.
- Stanfield, A. B., Brodie, E. C., and Yeoman, E. E.: Butazolidine Plasma Concentrations and Urinary Excretions in Normal Individuals and in Patients with Rheumatoid Spondylites, *Pro-*

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- Stull, J. W., and Davis, R. N.: The Effects of Certain Treatments on the Stability of Ascorbic Acid Milk, *Journal of Dairy Science*, (Abs.) 37:641, 1954.
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- Tuttle, D. M.: Notes on the Bionomics of Six Species of Apion (Curculionidae, Coleoptera), *Annals Entomological Society of America* 47<sup>2</sup>:301-307, 1954.
- Van Horn, C. W.: Effect of Rootstock on Production of Citrus on the Yuma Mesa, *University of Arizona Agricultural Experiment Station Progress Report*, April 1954.
- Vavich, M. G., Wertz, Anne, and Kemmerer, A. R.: Growth Stimulating Factors in Alfalfa for Chicks, *Poultry Science*, 32, 433-436, 1953.

## ARTICLES IN "PROGRESSIVE AGRICULTURE IN ARIZONA"

Published Quarterly by  
The College of Agriculture  
of the University of Arizona

- Bryan, W. E., Pima S-1 Cotton, Vol. V, No. 2
- Butler, George D., Jr., and Hopkins, Lemac, Grow Worm-Free Sweet Corn by Controlling Pesky Earworm, Vol. V, No. 4
- Day, Arden D., Opportunities in Agronomy, Vol. VI, No. 1
- Everson, E. H., and Arie, H. F., Good Kills on Weeds in Cotton, Vol. V, No. 4
- Fazio, Steve, Merion Bluegrass—Both Good and Bad, Vol. V, No. 4
- Foster, R. E., First Certified Lettuce Seed!, Vol. V, No. 2
- Harris, Karl, Grow Cotton with Less Water?, Vol. VI, No. 1
- Holekamp, Emmett R., Weed Control by Flame Cultivation, Vol. VI, No. 1
- Jensen, Mildred R., Characteristics of New Fibers Studied, Vol. V, No. 2
- Marlatt, Robert B., Melon Crown Blight, Vol. VI, No. 1
- Pahnish, O. F., Summer Feeding of Steers, Vol. VI, No. 1
- Pew, W. D., Spring Lettuce Fertilization, Vol. V, No. 4
- Pressley, E. H., Cotton Variety Tests Continue, Vol. V, No. 2
- Pressley, E. H., Mill Acceptance of Arizona Cotton, Vol. VI, No. 1
- Reed, R. E., Control Mastitis, Vol. V, No. 4
- Smith, H. V., Miniature Farm on U of A Campus, Vol. V, No. 2
- St. Clair, James S., Does Arizona 44 Meet Trade Needs?, Vol. V, No. 2
- Streets, R. B., Texas Root Rot—How Deep?, Vol. V, No. 2
- Streets, R. B., Treat Cotton Seed, Vol. V, No. 4

- Stull, J. W., Dairy Husbandry—Production & Technology, Vol. V, No. 2  
 Tschirley, F. H., Chaparral—Still a Problem, Vol. VI, No. 1  
 Van Horn, C. W., More Lemons in Arizona, Vol. V, No. 4  
 Van Horn, C. W., and Todd, Frank E., Bees, Bouquets & Better Tangerines, Vol. VI, No. 1  
 Vanvig, Andrew, Farm Credit in 1954, Vol. VI, No. 1

### III. STAFF

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

#### AGRICULTURAL BIOCHEMISTRY DEPARTMENT

ARTHUR R. KEMMERER.....	Nutrition Chemist
MITCHELL G. VAVICH.....	Associate Nutrition Chemist
*EMILY C. BRODIE.....	Research Associate
*ALICE B. STANFIELD.....	Research Associate
WINIFRED S. FLEMING.....	Research Assistant
†WILLIAM F. MCCAUGHEY.....	Research Assistant
NICHOLAS RAICA, JR.....	Research Assistant

#### 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
JAMES L. ABBOTT.....	Assistant 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.....	Associate Agricultural Economist
JIMMYE S. HILLMAN.....	Assistant Agricultural Economist
JAMES S. ST. CLAIR.....	Assistant Agricultural Economist
ANDREW VANVIG.....	Assistant Agricultural Economist
MARTIN V. WAANANEN.....	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
RICHARD J. SHAW.....	Assistant Agricultural Engineer

#### AGRONOMY DEPARTMENT

DEAN F. MCALISTER.....	Agronomist
KARL HARRIS.....	Associate Irrigation Engineer (Phoenix)
HOWARD P. CORDS.....	Assistant Agronomist
ARDEN D. DAY.....	Assistant Agronomist
KENNETH O. RACHIE.....	Assistant Agronomist

\*In co-operation with Southwestern Clinic

†In co-operation with American Dehydrators' Assn.

‡On Leave

§Retired June 30, 1954

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

## AGRICULTURAL EXPERIMENT STATION

## ANIMAL HUSBANDRY DEPARTMENT

ERNEST B. STANLEY.....	Animal Husbandman
¶BARTLEY P. CARDON.....	Associate Animal Husbandman
¶THEODORE P. JARDINE, JR.....	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.....	Associate Animal Pathologist
RAYMOND E. REED.....	Assistant Animal Pathologist
ROBERT J. TRAUTMAN.....	Research Assistant

## BOTANY AND RANGE MANAGEMENT DEPARTMENT

WALTER S. PHILLIPS.....	Botanist
JOHN J. THORNER.....	Taxonomist
ROBERT R. HUMPHREY.....	Associate Range Ecologist
EDWARD B. KURTZ, JR.....	Assistant Botanist
CHARLES T. MASON, JR.....	Assistant Taxonomist
DAVID G. WILSON.....	Assistant Range Ecologist
ROGER Y. ANDERSON.....	Research Assistant
WALTER P. GIBBLE.....	Research Assistant
FRED H. TSCHIRLEY.....	Research Assistant
S.C.S. NURSERY:	
LOUIS P. HAMILTON.....	Nursery Manager
ELLSWORTH G. HENDRICKS.....	Nursery Foreman
EDGAR H. MORGAN.....	Farm Technician

## DAIRY HUSBANDRY DEPARTMENT

RICHARD N. DAVIS.....	Dairy Husbandman
*F. GORDON HARLAND.....	Assistant Dairy Husbandman
JOHN W. STULL.....	Assistant Dairy Husbandman
ALFRED W. AUSTIN.....	Assistant

## ENTOMOLOGY DEPARTMENT

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

## HOME ECONOMICS (School of)

MILDRED R. JENSEN.....	Acting Director
FAYE C. JONES.....	Home Economist

## HORTICULTURE DEPARTMENT

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

¶Resigned June 30, 1954

\*\*On Leave

## PLANT BREEDING DEPARTMENT

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

## PLANT PATHOLOGY DEPARTMENT

RUBERT B. STREETS.....	Plant Pathologist
††JAMES G. BROWN.....	Plant Pathologist
ROSS M. ALLEN.....	Assistant Plant Pathologist
ALICE M. BOYLE.....	Assistant Plant Pathologist
PAUL D. KEENER.....	Assistant Plant Pathologist
ROBERT B. MARLATT.....	Assistant Plant Pathologist (Mesa)

## POULTRY HUSBANDRY DEPARTMENT

MYRON W. PASVOGEL.....	Poultry Husbandman
HUBERT B. HINDS.....	Associate Poultry Husbandman

## SUBSTATIONS

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

## APPOINTMENTS

ROGER Y. ANDERSON.....	Research Assistant
ALFRED W. AUSTIN.....	Dairy Assistant
ARDEN D. DAY.....	Assistant Agronomist
WINIFRED S. FLEMING.....	Research Assistant
WALTER P. GIBBLE.....	Research Assistant
LEMAC HOPKINS.....	Assistant Entomologist (Mesa)
THEODORE P. JARDINE, JR.....	Assistant Animal Husbandman
CHARLES T. MASON, JR.....	Assistant Taxonomist
MYRON W. PASVOGEL.....	Poultry Husbandman
FRANK PRITCHARD.....	Superintendent, Yuma
KENNETH O. RACHIE.....	Assistant Agronomist
ROBERT J. TRAUTMAN.....	Research Assistant
MARTIN V. WAANANEN.....	Assistant Agricultural Economist

## RESIGNATIONS

A. MARK BLISS.....	Superintendent, Safford
BARTLEY P. CARDON.....	Associate Animal Husbandman, Associate Animal Pathologist
LOEL R. COOPER.....	Foreman, Yuma Station
EVERETT W. EVERSON.....	Assistant Agronomist
DONALD W. GEORGE.....	Assistant Plant Breeder
THEODORE P. JARDINE, JR.....	Assistant Animal Husbandman
KITTIE F. PARKER.....	Assistant Taxonomist
JOHN D. ROWELL.....	Assistant Agricultural Economist

IV. FINANCIAL STATEMENT, 1953-54, UNIVERSITY OF ARIZONA,  
AGRICULTURAL EXPERIMENT STATION

	Hatch	Adams	Purnell	Bankhead- Jones (5)	Bankhead- Jones (9b1&2)	Bankhead- Jones (9b3)	Non-Federal	Total
RECEIPTS								
Received from the Treasurer of the U.S. ....	\$15,000.00	\$15,000.00	\$60,000.00	\$16,740.68	\$37,866.36	\$28,700.00		\$173,307.04
State Appropriations							\$272,749.10	272,749.10
Main Station .....							161,298.10	161,298.10
Sub-Stations .....							28,540.16	28,540.16
Special Endowments .....							39,324.60	39,324.60
Sales .....								
Total Receipts .....	\$15,000.00	\$15,000.00	\$60,000.00	\$16,740.68	\$37,866.36	\$28,700.00	\$501,911.96	\$675,219.00
DISBURSEMENTS								
Personal Services .....	14,263.27	11,822.79	42,129.03	11,862.57	26,382.68	21,546.46	345,865.93	473,872.73
Travel .....	33.77	1,748.98	3,139.06	1,741.19	3,091.87	1,141.18	12,810.99	23,707.04
Transportation of Things .....		17.92	528.64	245.49	1,066.64	307.20	5,919.74	8,085.63
Communication Service .....	6.44	65.54	191.97	90.83	153.96	18.45	4,177.80	4,704.99
Rents and Utility Service .....		47.90	75.00		724.10		8,649.67	9,496.67
Printing and Reproduction .....			375.40	27.80		406.46	8,951.27	9,760.93
Other Contractual Services .....		36.49	600.73	160.36	586.90	1,446.96	12,188.27	15,019.71
Supplies and Materials .....	33.08	576.76	7,056.28	769.12	3,208.32	2,368.18	42,373.31	56,385.05
Equipment .....			3,961.13	1,295.79	1,663.06	300.00	53,669.59	60,889.57
Land and Structures .....							4,515.82	4,515.82
Contributions to Retirement .....	663.44	683.62	1,942.76	575.33	961.03	1,165.11	942.21	6,933.50
Industrial Insurance .....							1,847.36	1,847.36
Total Disbursements .....	\$15,000.00	\$15,000.00	\$60,000.00	\$16,740.68	\$37,866.36	\$28,700.00	\$501,911.96	\$675,219.00