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Directory of Activities  
of the  
Bureau of Plant Industry, Soils,  
and  
Agricultural Engineering  
1952

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Agriculture Handbook No. 47

United States Department of Agriculture

**T**HIS DIRECTORY is issued for the information of employees, cooperators, and others interested in the work of the Bureau of Plant Industry, Soils, and Agricultural Engineering. Included are brief statements of the history and functions of the Bureau and a map showing the locations of field activities. The following information is given for each station: (1) The name of the person in charge; and (2) the nature of the research work, showing divisions in charge.

This handbook supersedes Miscellaneous Publication 645.

Beltsville, Md.

Issued September 1952

United States Department of Agriculture  
Agricultural Research Administration

Bureau of Plant Industry, Soils, and  
Agricultural Engineering

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Agriculture Handbook No. 47

UNITED STATES  
GOVERNMENT PRINTING OFFICE  
WASHINGTON : 1952

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Washington 25, D. C. - Price 40 cents

# ORGANIZATION

Chief of Bureau.....	A. H. Moseman
Assistant Chiefs:	
General Bureau Administration.....	F. P. Cullinan
Program Planning and Coordination.....	K. S. Quisenberry
Business Administration.....	Edmund Stephens
<i>Bureau Staff Units</i>	
Divisions of—	
Budget Management.....	V. H. Beach
Fiscal and Business Management.....	E. H. Killen
Personnel Management.....	J. P. McAuley
Information.....	L. E. Childers
Biometrical Services.....	D. D. Mason
<i>Agricultural Engineering Group—E. G. McKibben, Director</i>	
Divisions of—	
Farm Buildings and Rural Housing.....	Wallace Ashby
Farm Electrification.....	T. E. Henton
Farm Machinery.....	R. B. Gray
Mechanical Processing of Farm Products.....	W. M. Hurst
<i>Field Crops Group—(vacancy), Director</i>	
Divisions of—	
Cereal Crops and Diseases.....	H. A. Rodenhiser
Cotton and Other Fiber Crops and Diseases.....	H. D. Barker
Forage Crops and Diseases.....	D. F. Beard
Rubber Plant Investigations.....	R. D. Rands
Sugar Plant Investigations.....	C. H. Wadleigh
Tobacco, Medicinal, and Special Crops.....	D. M. Crooks
Weed Investigations.....	R. L. Lovvorn
<i>Horticultural Crops Group—J. R. Magness, Director</i>	
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Ornamental-Plant Crops and Diseases.....	S. L. Emsweller
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Vegetable Crops and Diseases.....	V. R. Boswell
<i>Soils Group—F. W. Parker, Director</i>	
Divisions of—	
Fertilizer and Agricultural Lime.....	K. D. Jacob
Soil Management and Irrigation Agriculture.....	R. Q. Parks
Soil Survey.....	C. E. Kellogg
National Arboretum (Assistant Director).....	H. A. Gunning
Plant Industry Station Supervision.....	H. P. Sevy and M. C. Miller
Library (Branch of USDA Library).....	L. A. Caswell

# Directory of Activities of the Bureau of Plant Industry, Soils, and Agricultural Engineering: 1952

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## SCOPE OF ACTIVITIES

The Bureau of Plant Industry, Soils, and Agricultural Engineering does research on crops, soil, machinery, storage, transportation, and housing problems of general and specialized farming and gardening. Most of the work is in cooperation with the State agricultural experiment stations. At the close of the fiscal year 1952 the Bureau had research in progress on 925 projects at 199 locations in 45 States, the District of Columbia, Puerto Rico, Canal Zone, and 11 Latin American countries.

*Studies in the plant sciences* are concerned with reducing the hazards of production, improving the yield and quality of crop plants, and lowering costs of producing and marketing crops. They include:

1. Introduction and testing of promising seeds and plants from foreign countries as potential domestic crops and for the genetic improvement of crops now grown. Ladino clover and Korean lespedeza are good examples of introduced crops.

Today's winter-hardy grains, disease-resistant vegetables, and high-yielding forage crops reflect improvements resulting from introduced plants.

2. Breeding plants that will produce crops of high yields and good quality and with resistance to diseases, insects, heat, cold, drought. The research covers field crops, horticultural crops, problems of transportation and storage, and disease investigations of forest and shade trees.

3. Studies of the causes of plant diseases and methods for their control. Crop plant diseases are under continual survey. The Bureau conducts a warning service to alert growers when severe outbreaks of certain major diseases threaten.

4. Fundamental studies of the nature of plants and key factors in their environment. The findings help build up a reservoir of knowledge out of which may come many practical applications. The discovery that plant-growth regulators such as 2,4-D could be used to kill weeds is an example.

*Research on soils and their management* is focused on the relation between the soils and the crops grown on them. It covers:

1. The basic physical and chemical properties of soils and studies of microscopic plants and animals and their effect on crops.

2. Methods of cultivation, irrigation, and crop rotation and problems associated with saline and alkaline soils.

3. Investigations on the development of new fertilizers and other soil amendments, their application to the soil, and new techniques for measuring them precisely with radioactive isotopes.

4. Classification and mapping of the soils of the United States in detail—usually on a county basis—to indicate potentials for production. Studies are in progress in connection with the development of the basins of the Missouri, Colorado, and Columbia Rivers.

*Investigations in agricultural engineering* are concerned with the efficient use of power, labor, machines, and materials in farming. They include:

1. Improvement of farm machinery and equipment for seedbed preparation, planting, fertilizer placement, cultivation, and harvesting of crops, and for protecting the crops from insects and other plant pests.

2. Methods of drying hay and grains, ginning cotton, and processing other crops and farm products on the farm or in rural communities.

3. Studies dealing with income-producing applications of electrical energy in farming, both as power and as radiations that may affect the growth and production of plants or the health and comfort of farm animals.

4. Improvement of designs of farm storage and service buildings for strength and economy in materials and construction, of animal housing with special attention to environmental factors related to the health and production of animals, and of farm housing for more livable homes.

*National Arboretum.*—The Bureau has charge of the development and maintenance of the National Arboretum, established by Congress in 1927. A National Advisory Committee, appointed by the Secretary of Agriculture, assists in the development plans.

## PLANT INDUSTRY STATION

Headquarters of the Bureau are at Plant Industry Station, a part of the 14,000-acre Agricultural Research Center near Beltsville, Md. The Station is on U. S. No. 1, 14 miles north of the Administration Building of the Department of Agriculture in Washington, D. C. It can be reached by Greyhound and Trailway busses traveling between Washington and Baltimore.

Here are located the offices of the Chief of the Bureau, the business staff, heads of all research divisions except those in agricultural engineering, which are located in the North Laboratory of the Center 3 miles away, and nearly half of the Bureau's 2,100 employees. Five three-story red brick buildings house offices and laboratories, the library, and an auditorium. The four ranges of greenhouses, with connecting brick buildings for offices and laboratories of scientists engaged in greenhouse work, cover more than 4 acres of glass. One large greenhouse is used exclusively for research with radioisotopes. A cafeteria at the Station is operated by the USDA Employees Welfare Association.

More than 900 Bureau employees are scientists. The remainder are in the subprofessional, clerical, fiscal, crafts, protective, and custodial jobs required to keep research mov-

ing smoothly. More than 1,000 members of the Bureau staff are employed at field stations or are engaged in cooperative research at the State agricultural experiment stations. In addition the staff includes 705 collaborators, many of whom are outstanding scientists on the staffs of the State experiment stations.

Bureau employees in the Washington area include a small group of workers at the National Arboretum, which covers about 400 acres in the District of Columbia, and at the Plant Introduction Garden at Glenn Dale, Md.

## BACKGROUND

Some of the work of the Bureau goes back more than a century. In 1819 the Treasury Department directed United States consuls to collect seed, plants, and information on climate, soil, propagation, cultivation, and insect pests in the countries where they were assigned. Twenty years later the Commissioner of Patents was authorized to collect foreign seeds and plants for distribution to farmers in the United States. In 1856 the Commissioner employed a botanist in the Agricultural Division and set up a garden on the Mall in Washington for the propagation of sorghum. The distribution of cotton and tobacco seed was begun in 1862, the year the Department of Agriculture was established.

Several lines of research were brought together in 1901 to form the Bureau of Plant Industry. These included the study of fruit and vegetable diseases and physiology, research to improve cereals, fibers, tropical crops, grasses and other forage plants, investigations in the production of tea in the United States, and the introduction of foreign seeds and plants. Many of the studies were carried on in the experimental gardens and grounds of the Mall around the Department in Washington. Some work had been initiated at the Arlington Experimental Farm across the Potomac. Cooperative research with the States has been an important part of the Bureau since its beginning. That first year joint research in grass and forage crops was carried on in 13 States.

Studies in both soils and agricultural engineering were at one time in separate Bureaus. The Bureau of Soils was established in 1901, that of Agricultural Engineering in 1931.

The work in soils was transferred to the Bureau of Plant Industry in the 1930's. When the research in agricultural engineering was combined with that of plants and soils in 1943, the Bureau was given its present name.

The Bureau has been directed by seven Chiefs: Beverly T. Galloway, 1901-13; William A. Taylor, 1913-33; Knowles A. Ryerson, January-October 1934; Frederick D. Richey, 1934-38; E. C. Auchter, 1938-42; Robert M. Salter, 1942-51; and Albert H. Moseman, November 1951 to present time.

## ORGANIZATION

The Office of the Chief of Bureau exercises general supervision over the work of the divisions; formulates general policies; makes decisions as to changes in the trend of research; coordinates the activities of the Bureau in conformity with Federal statutes and governmental regulations; promotes cooperation between divisions to obtain maximum efficiency commensurate with freedom of action necessary to successful research; and develops and makes effective general policies affecting relations with other bureaus of this and other Departments and with State agricultural agencies.

The administrative divisions are responsible for the business contacts and operations of the Bureau, including: The preparation of the budget and estimates, the allotment of funds, and the approval, audit, and maintenance of expenditure records; the appointment of employees and the maintenance of records of all personnel transactions; the purchase of property, supplies, and equipment, and the maintenance of property records; the handling of claims for injury to Federal employees and damage to private or Government property; the preparation of leases; the supervision of cooperative arrangements; and the supervision of the business practices of the Bureau's field stations.

The management of buildings and grounds at the Plant Industry Station is under the direction of two superintendents—one in charge of buildings and utilities, the other in charge of the experimental farm.

Biometrical Services acts primarily as a biometrical consulting service unit to the research staff of the Bureau. The work relates mainly to problems of design of experiments and of sampling schemes and to methods of analysis of ex-

perimental data. Also, some research on applied statistical methodology pertinent to Bureau research problems is carried out. The services of this unit are available to all research personnel of the Bureau.

The Division of Information is responsible for the editing of the scientific, technical, and popular manuscripts of the Bureau and the reviewing and compiling of other research material for publication; for the preparation of material for radio broadcasts and statements for the press on scientific developments of current interest; for special report writing; for the maintenance of photographic and other illustrative material for use within the Bureau; and for aid to free-lance and other writers interested in the Bureau's accomplishments.

The Beltsville Branch Library, located on the third floor of the Administration Building, is a branch of the Library of the United States Department of Agriculture. Through cooperation with that and other libraries and with the Entomology Sub-Branch Library at the Agricultural Research Center, it provides the facilities needed by research workers.

## **AGRICULTURAL ENGINEERING GROUP**

**E. G. MCKIBBEN**, Director of Agricultural Engineering Research.  
Room 225, North Laboratory, Agricultural Research Center.

### **Farm Buildings and Rural Housing**

**WALLACE ASHBY**, head of division. Room 214, North Laboratory, Agricultural Research Center.

The Division of Farm Buildings and Rural Housing conducts research to determine functional requirements of farm dwellings and of buildings for livestock, crop storage, and other farm purposes. The work includes studies of the basic principles governing design, construction, and use of farm buildings, including temperature control, ventilation, and related features. Much of the work in this field is done cooperatively with other agencies of the Department and with State agricultural experiment stations. Close relations are maintained with various industries serving the engineering needs of farmers. Research results are incorporated in designs of improved buildings that are made available to

farmers through the Plan Exchange Services, carried on in cooperation with the State extension services.

### **Farm Electrification**

**T. E. HENTON**, head of division. Room 210, North Laboratory, Agricultural Research Center.

The Division of Farm Electrification is concerned with investigations on farm use of electricity for heat, light, and power. It studies electric radiation, both visible and invisible, to determine the effects on the stimulation or retardation of activity of farm animals, poultry, plants, and insect and other pests. The division conducts research on the utilization of electric motors to drive farm machines and on evaluating new methods and procedures for performing such farm tasks as curing, drying, grain and forage processing, egg candling, and refrigeration. It makes investigations to determine the possibilities and limitations of electric heaters for sterilization, pasteurization, and drying and for plant and animal production. Cooperative relations are maintained with various industries serving the engineering needs of the farmer, with other bureaus of the Department, and with agricultural experiment stations of the various States.

### **Farm Machinery**

**R. B. GRAY**, head of division. Room 218, North Laboratory, Agricultural Research Center.

The Division of Farm Machinery is concerned with research on the efficient use of mechanical power and equipment on farms. This includes experiments in the mechanics of seedbed preparation, fertilizer placement, weed control, pesticide application, and planting, cultivating, harvesting, and handling crops. The studies are designed primarily to develop improved procedures or methods that will enable farmers to get maximum yields of high-quality products at minimum cost. Industry makes use of the results obtained and of new principles discovered to design machines for helping farmers gain these objectives. Research in this field is mainly cooperative with the State agricultural experiment stations, other bureaus of the Department, and industries serving agricultural engineering needs of the farmer.

## Mechanical Processing of Farm Products

W. M. HURST, head of division. Room 222, North Laboratory, Agricultural Research Center.

The Division of Mechanical Processing of Farm Products conducts research on the development of better mechanical processing methods and equipment for farm and rural community use in preserving or changing the form of agricultural products for market and in processing or manufacturing farm supplies such as feeds and fertilizer. Investigations include cotton ginning, processing fiber flax and special fiber crops, community canneries, locker plants, fruit and vegetable handling and processing, feed milling, and the processing of poultry and some dairy products. The work is carried on in cooperation with other agencies of the Department and with State agricultural experiment stations, and close relations are maintained with industrial concerns interested in this phase of agricultural engineering.

## FIELD CROPS GROUP

[Vacancy], Director of Field Crops Research. Room 127, South Building, Plant Industry Station.

## Cereal Crops and Diseases

H. A. RODENHISER, head of division. Room 124, South Building, Plant Industry Station.

The Division of Cereal Crops and Diseases is responsible for research on the production, breeding, and improvement of the cereal crops—corn, wheat, oats, barley, rice, sorghums, and rye—and on seed flax. This research includes studies on seedbed preparation; date, rate, depth, and manner of seeding; cultivation; fertilizers; rotations; harvesting; storage; diseases and their control; and the basic laws of cereal-crop physiology, genetics, and pathology, which are the necessary basis for crop breeding and improvement and for adjusting methods of production to obtain maximum yield and quality. The primary object of this research is to stabilize crop production and quality and to reduce production costs by removing such hazards as disastrous effects of disease and susceptibility to drought, heat, and cold. This research is

cooperative with other Federal agencies and several State agricultural experiment stations.

### **Cotton and Other Fiber Crops and Diseases**

H. D. BARKER, head of division. Room 303, Administration Building, Plant Industry Station.

The Division of Cotton and Other Fiber Crops and Diseases has charge of research on the production of fiber crops. It studies cultural practices for growing cotton; the botanical and morphological characters of this and other fiber plants; diseases of fiber crop plants and methods of control and breeding for disease resistance; genetic, physiological, and ecological conditions; the breeding of superior cotton varieties, including Egyptian and sea-island cottons; the effect of soil, climate, and other factors on yield, quality, and value of fiber; the chemical, physical, and other properties of fibers that determine values for specific uses, and the measurements of these properties; and the utilization and maintenance of superior strains of cotton through the organization of single-variety communities. It makes similar investigations of hemp and flax fiber production and of hard fibers used for ropes, twines, and other purposes. These activities are conducted in cooperation with other divisions of this Bureau; with other agencies of the Department, particularly the Bureau of Agricultural and Industrial Chemistry, the Bureau of Entomology and Plant Quarantine, and the Production and Marketing Administration; with the State agricultural experiment stations and extension services; and with counties and farm-group organizations.

### **Forage Crops and Diseases**

D. F. BEARD, head of division. Room 335-A, South Building, Plant Industry Station.

The Division of Forage Crops and Diseases is concerned with the study of all plants used as forage, whether for hay, silage, pasture, or range, and also for cover, green manure crops, and turf. This includes the development of improved varieties by selection and breeding, improved cultural, production, and management practices and better methods of seed production. The Division also studies forage crop diseases, physiology, breeding behavior, and other factors of

forage plants related to their improvement and culture. The Division, through the Foundation Seed Program, develops and coordinates the increase of breeders seed and foundation seed of improved forage varieties. The research of the Division is conducted in cooperation with 34 of the 48 State agricultural experiment stations, other bureaus of the Department, crop improvement associations, and commercial industries and growers.

### **Rubber Plant Investigations**

**R. D. RANDS**, head of division. Room 235, South Building, Plant Industry Station.

The Division of Rubber Plant Investigations is concerned with studies leading toward the development of sources of rubber within the United States and Latin America. It conducts a cooperative project with 11 Latin American governments, involving long-term research and encouragement of plantation development of the hevea rubber tree in the American Tropics, distributes improved strains from three regional field stations to cooperating agencies and individuals in suitable localities, and provides technical assistance on all phases of hevea rubber production. Investigations include study and control of important diseases, factors affecting growth and yield, and, through jungle selections and a comprehensive breeding program, the development of superior strains combining resistance, high yield, and other desirable qualities. It makes field and laboratory studies of guayule and other native and introduced plants that can be grown in the United States as possible domestic sources of rubber. Investigations include selection, breeding, and disease studies to develop strains with improved growth and yield characteristics. It furnishes information on wild or cultivated rubber-bearing plants to other governmental agencies, private companies, and individuals interested in sources of rubber for normal or emergency needs.

### **Sugar Plant Investigations**

**C. H. WADLEIGH**, head of division. Room 215, South Building, Plant Industry Station.

The Division of Sugar Plant Investigations, in cooperation with State agricultural experiment stations and with

organizations representing farmers and factories comprising the sugar beet and sugarcane industries, conducts research on production of sugar beets and sugarcane, the important domestic sources of sugar, and on sugar sorghum, now grown for sirup but recognized as a potential new source of sugar. The research objectives are to discover more efficient methods of crop production by means of breeding, agronomy, plant physiology, and plant pathology investigations.

Breeding is conducted to develop varieties of sugar beets, sugarcane, and sugar sorghums improved in disease resistance and with yield and quality maintained or increased. Foundation stocks of seed and plant cane of the varieties produced in the breeding programs for the three sugar plants are supplied to cooperating agencies to make large-scale increases of the new and improved sorts whereby they may be promptly furnished to growers. In the phases of work that deal with multiplication of the improved planting stocks, cooperation with the industry is particularly valuable. In agronomic research more efficient methods in growing the sugar plants are investigated, including restudy of cropping practices to make possible greater mechanization of operations. In plant pathological investigations, measures are sought to protect the sugar crops from losses from plant diseases, including prevention of deterioration of sugar beets and sugarcane while stored prior to processing. Recent research has stressed the development, by breeding, of sugar beet and sugarcane varieties suited to a fully mechanized program of crop production.

### **Tobacco, Medicinal, and Special Crops**

D. M. CROOKS, head of division. Room 106, South Building, Plant Industry Station.

The Division of Tobacco, Medicinal, and Special Crops conducts investigations of substantially all phases of growing, curing, and handling tobacco, except those relating to marketing and to tobacco insects and their control. These activities include studies of tobacco diseases and their control; breeding for improved varieties for better quality, yield, and disease resistance; laboratory and field research on the factors influencing the quality of leaf tobacco; and field investigations in the improvement of varieties and methods of

fertilization, growing, curing, and handling different types of leaves, as each distinctive class of tobacco presents special cultural problems. Research on medicinal and special crops includes investigations of various plants for drugs, essential and fixed oils—particularly mints, castorbeans, and safflower—flavoring materials and condiments, insecticides, raticides, and tannins; and of the hop plant for its beverage-flavoring properties. This work includes studies on cultural requirements; adaptation to soil and climate as related to yield and quality; and breeding and selection for improved yield, disease resistance, and better quality. The Division conducts laboratory studies to evaluate the plants and their products and their commercial usefulness. Much of the research on these crops is conducted in cooperation with the State agricultural experiment stations.

### **Weed Investigations**

**R. L. LOVVORN**, head of division. Room 116, South Building, Plant Industry Station.

The Division of Weed Investigations is responsible for research in methods of controlling weeds, especially noxious species, by the use of herbicides and by other means. The work involves weed control in field crops, horticultural crops, grasslands and ranges, and for aquatic weeds and perennial weeds; basic physiological work on the killing action of herbicides; and screening for new chemical compounds. The primary purpose of this research is to reduce production costs, improve quality of crops, and aid in greater efficiency through mechanization. This research work is done in cooperation with other Federal agencies and several State agricultural experiment stations.

### **HORTICULTURAL CROPS GROUP**

**J. R. MAGNESS**, Director of Horticultural Crops Research. Room 307, South Wing, Administration Building, Plant Industry Station.

### **Forest Pathology**

**L. M. HUTCHINS**, head of division. Room 114, North Building, Plant Industry Station.

The Division of Forest Pathology investigates diseases of forest, shade, and ornamental trees and decay and deteriora-

tion of forest products. Throughout the lifetime of trees, in the nursery, plantation, or forest, they are exposed to many organisms that may reduce their growth rate, kill them, or otherwise destroy their value for commercial, esthetic, or other uses. Forest products are subject to decay and degrade by fungi. The Division conducts surveys, including airplane surveys, to determine distribution and rates of spread and intensification of forest-tree diseases. The Division studies the causes of native and introduced diseases and devises practical control measures for them. The Division maintains 19 field laboratories and in its activities cooperates with other Federal agencies. It is directly responsible for forest-disease research for the Forest Service, the Soil Conservation Service, and the National Park Service. Cooperation is also maintained with State agricultural experiment stations and State and municipal forest and shade-tree officials, with colleges and universities, and with private timberland owners. The Division conducts investigations on decay in buildings in cooperation with the Housing and Home Finance Agency and investigations on decay in ships and in wooden containers for the Federal defense agencies.

### **Fruit and Nut Crops and Diseases**

**J. R. MAGNESS**, director of horticultural research, acting head of division. Room 307, South Wing, Administration Building, Plant Industry Station.

The Division of Fruit and Nut Crops and Diseases conducts research on deciduous fruits such as apple, pear, peach, and other stone fruits; grape; and small fruits such as strawberry, blackberry, raspberry, blueberry, and cranberry; citrus and subtropical fruits such as date, avocado, mango, and fig; edible nuts such as pecan, almond, walnut, filbert, and chestnut; and the oil-bearing tung. The research includes studies of the nutritional requirement of the various crops and of cultural methods and practices and their relations to size, regularity, and quality of the crop; studies of varieties to determine their suitability for diverse uses and conditions; studies of rootstocks for resistance to fungi, nematodes, and other disease-producing agents, salt tolerance, and compatibility; breeding and selection to obtain varieties of greater merit for different purposes and to extend

ranges of adaptation, partly through detection and induction of polyploidy (basic studies that make possible some valuable crosses); and studies of fungus, bacterial, and virus diseases, physiological disorders, and nutritional deficiencies and their prevention or control. In these lines of research extensive cooperation is maintained with other Federal agencies and with State agricultural experiment stations and less extensive cooperation is maintained with commercial and grower groups.

### **Handling, Transportation, and Storage of Horticultural Crops**

W. T. PENTZER, head of division. Room 212, South Wing, Administration Building, Plant Industry Station.

The Division of Handling, Transportation, and Storage of Horticultural Crops is concerned with improving methods and equipment used for harvesting, preparation for market, packing, loading, shipment, precooling, storage, and retail display of fruits and vegetables and other horticultural crops. It includes methods of determining harvest maturity; quality evaluation for fresh, frozen, or canned use; various methods of packaging, including consumer packages; packing-house practices such as washing and waxing; precooling methods, including warehouse precooling, vacuum cooling, hydrocooling, and car precooling; refrigeration and protection against freezing during transport in refrigerator cars, trucks, airplanes, and ships; development of best methods of storing horticultural crops and displays in retail stores; and means of controlling diseases that cause damage to the crop during shipment, storage, and marketing. The Division tests various types of equipment developed for transporting fruits and vegetables and assists in drawing up specifications for improving construction of refrigerator cars, trucks, air cargo compartments, and refrigerated ships' holds. Particular attention is given to rail refrigeration services best suited to the commodity, considering cost and temperature required. It investigates the physiological response of horticultural crops to temperature, relative humidities, and modified atmospheres that may be encountered in storage or shipment. The diseases that cause most damage to horticultural crops after harvest are identified and studied

to determine what transit and storage temperatures are needed to retard their growth. Tests are made with chemical washes, treated wrappers, and volatile fumigants to perfect means of reducing losses from post-harvest diseases. The general aim of the work is to improve the quality of fruits and vegetables offered for sale to the consumer and to prevent needless loss by the use of faulty practices or equipment. This research is conducted in cooperation with State agricultural colleges and experiment stations, other Federal agencies, growers, shippers, marketing groups, and transportation agencies.

### **Mycology and Disease Survey**

J. A. STEVENSON, head of division. Room 24, North Building, Plant Industry Station.

The Division of Mycology and Disease Survey is responsible for systematic collection and indexing of current information on the distribution and prevalence of plant diseases and on the losses caused by them; the periodical dissemination of this information to plant pathologists and others concerned; and for publication of periodical summaries of host plants and disease agents and of the literature pertaining to pathological and mycological studies. For other Federal and State cooperators and the general public, the Division also identifies fungi, particularly the forms causing plant diseases or deterioration of plant products, those concerned in industrial mycology, and the poisonous or edible types. The Division also maintains one of the largest fungus herbariums in the country; investigates problems of classification of economic fungus groups and the stabilization of fungus nomenclature.

### **Nematology Investigations**

G. STEINER, head of division. Room 12, Greenhouse Range 2, Plant Industry Station.

The Division of Nematology conducts research on nematodes, or eelworms, that parasitize plants or are associated with plant diseases and on the development and improvement of control measures; studies nematodes living free in the soil or elsewhere and those attacking insects and other invertebrates, especially those that parasitize and destroy these and

similar agricultural pests; and handles routine inquiries, specimen examinations, and determinations for cooperators and others interested, regulatory matters, and related problems concerning all nematodes other than those that parasitize man and vertebrate animals.

### **Ornamental-Plant Crops and Diseases**

**S. L. EMSWELLER**, head of division. Room 202, North Wing, Administration Building, Plant Industry Station.

The Division of Ornamental-Plant Crops and Diseases conducts research on breeding, genetics, culture, handling, and diseases of floricultural and ornamental plants, including those for farm windbreaks. The research includes improving varieties and developing new types by inducing polyploidy, breeding, and selection; determination of the optimum nutrient requirements; study of fungus, bacterial, and virus diseases and physiological disorders and their prevention or control; and the relation of preplanting treatments and other factors to control time of flowering and quality of cut flowers, especially of perennials, bulbs, and other greenhouse plants. In these lines of research cooperation is maintained with other Federal agencies, State agricultural experiment stations, nurserymen, and commercial florists.

### **Plant Exploration and Introduction**

**C. O. ERLANSON**, head of division. Room 234, North Building, Plant Industry Station.

The Division of Plant Exploration and Introduction serves as a coordinating agency for obtaining from all parts of the world new, rare, and promising plants. These may be useful in the development of new crop industries directly, for the diversification or expansion of economic needs, or as material to be used by plant breeders, especially as related to the development of disease-resistant and insect-resistant crops. The Division provides initial protection against the introduction of foreign insects and diseases through inspection and quarantine propagation in cooperation with the Bureau of Entomology and Plant Quarantine. Through Federal and cooperative introduction stations, propagation and preliminary testing of plant introductions are undertaken, followed

by distribution to growers or by the maintenance of important germ-plasm for future breeding programs. The Division conducts studies of potential crop plants and of soils and climates of foreign countries as compared with those of this country, with a view to introducing materials best adapted to the needs here. It is also responsible for the correct names of wild and cultivated flowering plants being investigated by the Bureau. In these activities it cooperates with crop specialists of the Department, State agricultural experiment stations, botanic gardens and nurserymen, and with specially qualified private individuals.

### **Vegetable Crops and Diseases**

**V. R. BOSWELL**, head of division. Room 302, North Wing, Administration Building, Plant Industry Station.

The Division of Vegetable Crops and Diseases is concerned with the development through research of new varieties, new methods and practices, or both: To reduce the cost of vegetable production; to decrease the hazards from diseases; to increase yields and nutritive value; and to improve the quality of the crops for various regions and seasons, for diverse or specific home, farm, and industrial uses, and for different methods of culture, handling, and processing. In addition to vegetable crops, research on peanuts, mushrooms, and vegetable seeds is also included. To obtain the objectives, basic and applied research is done by plant breeders, phytopathologists, plant physiologists, horticulturists, and other specialists of the Division in cooperation with other Federal agencies, State agricultural experiment stations, and industrial and other commercial agencies including growers, seedsmen, shippers, food processors, and manufacturers.

### **SOIL GROUP**

**F. W. PARKER**, Director of Soils Research. Room 237, Soils Building, Plant Industry Station.

### **Fertilizer and Agricultural Lime**

**K. D. JACOB**, head of division. Room 236, Soils Building, Plant Industry Station.

The Division of Fertilizer and Agricultural Lime conducts research on the preparation, technology, and use of fertiliz-

ers, liming materials, and soil amendments; develops standards and methods for analysis of these products; and compiles statistics on the resources, supplies, production, consumption, and trade.

### **Soil Management and Irrigation Agriculture**

R. Q. PARKS, head of division. Room 323, Soils Building, Plant Industry Station.

The Division of Soil Management and Irrigation Agriculture conducts research on soil management practices to develop successful agricultural systems that are capable of maintaining or raising the level of soil productivity under dry-land agriculture, under humid conditions, under irrigation and drainage, and on saline soils; conducts basic research on factors governing soil productivity and plant growth and quality, such as physical, chemical, and biological factors affecting fertilizer requirements, salinity, organic matter, and soil organisms, and studies the genesis, morphology, and nomenclature of soils.

### **Soil Survey**

C. E. KELLOGG, chief of division. Room 328, North Building, Plant Industry Station.

The Division of Soil Survey carries on a Nation-wide program of classifying and mapping the soils of the United States. In this program, known as the Soil Survey, the soils of the entire country will eventually be mapped in such detail that anyone who is interested in them—farmer, land buyer, agronomist, horticulturist, appraiser, tax assessor, or highway engineer—can locate the kinds found on each farm, know their characteristics, and compare them directly with the soils on any other farm. Such a survey tells the farmer whether his soils are like those on other farms in his county, State, or region or on the experimental plots or fields of his State agricultural experiment station where new crops, tillage methods, fertilizer practices, or drainage or irrigation practices are being tried or have proved successful. It enables him, therefore, to tell with more certainty whether

the introduction of a new crop, variety, or farm practice is likely to succeed on his farm. All this work involves the identification, definition, description, classification and correlation, and mapping of many kinds of soil types throughout the country. The published reports on each survey, whether county-wide or of less extent, describe each soil as to depth, drainage, stoniness, slope, thickness, friability, and permeability of layer, its texture, and the important chemical characteristics that affect its fertility. In addition to this program, which is directed under four regions, with headquarters, respectively, in Maryland, Tennessee, Nebraska, and California, the Division cooperates with State agricultural experiment stations, the Soil Conservation Service, the Forest Service, the Tennessee Valley Authority, and other agencies by furnishing experienced correlators to assist in classifying the soils in terms of the Nation-wide system, so that the work of these agencies will help complete the soil survey coverage of the whole country.

### National Arboretum

H. A. GUNNING, assistant director, acting in charge. Twenty-eighth and M Streets NE., Washington, D. C.

The National Arboretum was established by act of Congress approved March 4, 1927, for purposes of research and education concerning tree and plant life. Major interest is focused on woody plants both native and exotic that are hardy and successfully grown in the climate of the Washington area. It also maintains and develops a collection of plant specimens in its herbarium (located at the Plant Industry Station, Beltsville, Md.), available for reference to scientists, students, and others.

### FIELD ACTIVITIES

The field stations of the Bureau of Plant Industry, Soils, and Agricultural Engineering are shown in **bold-faced type**, and the other activities of the Bureau in field and laboratory, frequently in cooperation with a State, appear in *italic*. Italics are also used to designate divisions or projects of the Bureau under which certain lines of

work at stations are conducted. The individual listed under each project is in charge. The locations are shown on the map following page 131.

## ALABAMA

### Auburn

*Agricultural Experiment Station, Alabama Polytechnic Institute (cooperative investigations).*—About  $\frac{3}{4}$  mile from railroad station (Western Railway of Alabama) and  $\frac{1}{2}$  mile from Greyhound bus station. Can be reached by taxi.

*Cotton and Other Fiber Crops and Diseases.*—Investigations in cotton breeding, genetics, improvement, and diseases. A. L. SMITH, pathologist.

Cotton improvement in standardized one-variety communities. O. N. ANDREWS, agent.

*Farm Machinery.*—Investigations of tillage tools and of machinery for producing and harvesting southern crops such as peanuts and tung nuts. I. F. REED, agricultural engineer. On Alabama Agricultural Experiment Station campus, three-eighths mile west of U. S. No. 29 on "Farm Road"; about 1 mile southwest of railroad and bus stations.

Investigations to develop and improve methods and equipment for production and harvesting of cotton. C. M. STOKES, agent (agricultural engineer). In Agricultural Engineering Department.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under humid conditions; fertilizer requirements and placement for corn, cotton, and other field crops; investigations of the component factors of soil tilth and their relationship to plant growth; effect of crop and soil management, moisture, tillage, fertilization, and cover crops on soil properties and productivity (cooperation with Soil Conservation Service). R. W. PEARSON, soil scientist.

*Soil Survey*—Subheadquarters, Southern States. (See Tennessee, Knoxville: Soil Survey Office.) G. A. SWENSON, soil scientist.

*Vegetable Crops and Diseases.*—Breeding and testing improved vegetable strains and varieties for superior adapta-

tion (cooperation with U. S. Regional Vegetable Breeding Laboratory at Charleston, S. C.). WALTER GREENLEAF, collaborator.

### Fairhope

*Gulf Coast Substation, State Agricultural Experiment Station (cooperative investigations).*—About 3 miles from Fairhope and 19 miles from Mobile. Greyhound busses from Mobile and Pensacola pass the substation.

*Forage Crops and Diseases.*—Soybean investigations. OTTO BROWN, collaborator.

*Fruit and Nut Crops and Diseases.*—Tests of early ripening and hardy varieties of the Satsuma orange; cultural methods and rootstock studies. Directed by F. E. GARDNER, horticulturist, Orlando, Fla.; local supervision by H. F. YATES, agent.

## ARIZONA

### Mesa

*Field Investigations with Special Crops (cooperation with University of Arizona).*—16 Post Office Building.

*Tobacco, Medicinal, and Special Crops.*—Investigations in developing canaigre as a field crop for a domestic source of tannin; investigations of medicinal plants and crops. N. W. GILBERT, agronomist.

### Phoenix

*Weed Control Studies (cooperation with Bureau of Reclamation).*—24 Post Office Building.

*Weed Investigations.*—Investigations of aquatic-weed problems in irrigation canals and ditches and of land weeds on adjacent ditchbanks and farm lands. H. F. ARLE, physiologist.

### Sacaton

**United States Field Station** (*cooperation with Bureau of Indian Affairs*).—On Pima Indian Reservation, 15 miles north of Casa Grande, 15 miles west of Coolidge, and 42 miles southeast of Phoenix. Can be reached by bus from Phoenix. Transportation arrangements

should be made in advance with R. H. PEEBLES, superintendent.

*Cereal Crops and Diseases.*—Experiments with introduced wheat, barley, oats, and sorghums to determine varietal identity, spring and winter habit, and freedom from destructive diseases; varietal comparisons of barley in the nursery; and genetic studies on fundamental problem of inheritance in barley. Directed from Beltsville, Md.; local supervision by R. H. PEEBLES, agronomist.

*Cotton and Other Fiber Crops and Diseases.*—Investigations on cotton culture and physiology, breeding and improvement, genetics, botany, and morphology, and on disease control; production of foundation-stock seed of cotton (cooperation with State agricultural experiment station). R. H. PEEBLES, agronomist.

*Nematology Investigations.*—General problems related to nematode diseases of plants in southwestern United States, including cotton, citrus, alfalfa, carrots, sugar beets, and grapes; soil fumigation and fallow-land treatment and other cultural practices in relation to control. H. W. REYNOLDS, nematologist.

### Tucson

*State Agricultural Experiment Station (cooperative investigations).*—One and one-half miles from Southern Pacific railroad station; 4 miles northwest of post office. Can be reached by bus.

*Fruit and Nut Crops and Diseases.*—Investigations on pecan production. LELAND BURKHART, collaborator.

*United States Forest Pathology Field Laboratory (cooperation with State Agricultural Experiment Station, National Park Service, and Forest Service).*—216 West Stadium Building, University of Arizona. Can be reached by bus from railroad and bus stations.

*Forest Pathology.*—Investigations of diseases of cacti in national parks and monuments. W. C. BRYAN, pathologist.

### Yuma

*Yuma Mesa Soil and Crop Laboratory (cooperation with Bureau of Reclamation, Soil Conservation Service, and*

*State Agricultural Experiment Station*).—At the United States Air Base, 8 miles southeast of Yuma on U. S. No. 80. Can be reached by Greyhound bus, or transportation arrangements may be made by communicating with the laboratory.

*Soil Management and Irrigation Agriculture*.—Soil management and crop production under irrigation; irrigation methods and water requirements of crop plants; fertilization, crop-water use, crop adaptation, and plant-disease control on newly irrigated lands. C. O. STANBERRY, soil scientist.

## ARKANSAS

### Fayetteville

*State Agricultural Experiment Station (cooperative investigations)*.—Within 8 blocks from the St. Louis-San Francisco Railway station.

*Cotton and Other Fiber Crops and Diseases*.—Investigations in cotton breeding and improvement, genetics, and fiber properties. J. O. WARE, agronomist.

Cotton-plant nutrition and related physiological investigations. R. O. THOMAS, physiologist.

*Forage Crops and Diseases*.—Soybean investigations. P. E. SMITH, collaborator.

*Vegetable Crops and Diseases*.—Breeding and testing improved vegetable strains and varieties for superior adaptation (cooperation with U. S. Regional Vegetable Breeding Laboratory at Charleston, S. C.). J. L. BOWERS, collaborator.

### Little Rock

*Cotton Field Office (cooperation with State Agricultural Extension Service)*.—Post Office Building.

*Cotton and Other Fiber Crops and Diseases*.—Cotton improvement in standardized one-variety communities. R. H. SLOAN, agent.

### Marianna

*Cotton Branch Experiment Station, State Agricultural Experiment Station (cooperative investigations)*.—About

40 miles south of Memphis on the Missouri Pacific Railroad. Contact J. L. DAMERON, superintendent.

*Cotton and Other Fiber Crops and Diseases.*—Investigations in cotton breeding and improvement. C. A. MOOSBERG, agronomist.

### Stuttgart

*Rice Branch Experiment Station, State Agricultural Experiment Station (cooperative investigations).*—Nine miles southeast of Stuttgart on State Route 30 (St. Louis Southwestern Ry. and Southwestern Greyhound bus line).

*Cereal Crops and Diseases.*—Investigations on the production, improvement, and diseases of rice, oats, and barley. C. R. ADAIR, agronomist and rice project leader.

## CALIFORNIA

### Berkeley

*University of California.*—Field plantings opposite Canyon Botanical Gardens in Strawberry Canyon. J. M. WEBBER, 1800 Spruce Street.

*Cotton and Other Fiber Crops and Diseases.*—Investigations on the growth and production of phormium. J. M. WEBBER, agronomist.

*Soil Survey Office, Far Western States.*—322 Woolsey Building, 2168 Shattuck Avenue.

*Soil Survey.*—Soil types are identified, defined, and classified on the basis of their characteristics, and county soil maps are prepared, showing their distribution. Soil survey reports are written, describing the soil types in terms of both their morphology and their crop adaptability and production under farm practices. This work is carried on cooperatively with the State agricultural experiment stations of the region and in many counties with the Soil Conservation Service or other interested Federal agencies. Soil maps and relevant soil data are used to guide regional programs of agricultural production, adjustment, and conservation and

for the demonstration and extension of scientific and practical farm practices and rural-land utilization. The work of the senior soil correlators, correlators, analyst, and other soil scientists is under the supervision of R. C. ROBERTS, soil scientist. *Subheadquarters*: Riverside, Calif.; Logan, Utah.

### Biggs

**Biggs Rice Field Station** (*cooperation with State Agricultural Experiment Station and California Cooperative Rice Research Foundation*).—Four miles northwest of Biggs (Southern Pacific R. R.). Transportation arrangements can be made by communicating with A. H. WILLIAMS.

*Cereal Crops and Diseases*.—Rice culture experiments, including ones on fertilizers, rotations, seeding rates, and seed treatment. Rice breeding to develop higher yielding, improved quality, and better adapted varieties; and to increase and distribute pure-seed lots. A. H. WILLIAMS, agronomist.

### Brawley

**Southwestern Irrigation Field Station** (*cooperation with Imperial Valley Farmers' Association, State Agricultural Experiment Station, and U. S. Soil Conservation Service*).—One and one-half miles south of Brawley (Southern Pacific R. R.) on U. S. No. 99. Can be reached by Greyhound bus or by taxi. E. G. NOBLE, superintendent.

*Cereal Crops and Diseases*.—Testing varieties and breeding flax for yield, quality, and adaptation for southern California and contiguous sections. Incidental tests with other cereals are conducted as conditions may warrant. V. E. COMSTOCK, agronomist.

*Forage Crops and Diseases*.—Seed production studies of general forage and turf crops; alfalfa and soybean investigations. J. P. TRIMBLE, agronomist.

*Soil Management and Irrigation Agriculture*.—Soil management and crop production under irrigation, including the use of fertilizers and soil amendments, spacing, date of plant-

ing and variety studies, and salt tolerance of such crops as castorbeans, cotton, flax, sugar beets, sweet sorghum, corn, and other crops. B. A. KRANTZ, soil scientist.

*Vegetable Crops and Diseases.*—Breeding improved disease-resistant varieties of lettuce, melons, and onions. T. W. WHITAKER, geneticist.

*Weed Investigations.*—The control of weeds on irrigated lands with emphasis on wild sugar beets. J. P. TRIMBLE, agronomist.

### Chico

**United States Plant Introduction Garden.**—About 4 miles south and east of the post office at Chico on the Humbug Road (Chico may be reached by railroad, bus, or airline from Sacramento). Visitors will be met at Chico by car from station.

*Plant Exploration and Introduction.*—Propagation, testing, and distribution of rare and valuable economic and ornamental plants from foreign countries and United States possessions. L. E. JOLEY, horticulturist.

### Davis

*University Farm (cooperative investigations).*—On the Southern Pacific railroad; can be reached from Sacramento by busses of the California Transit Co. and the River Auto Stage.

*Cereal Crops and Diseases (some entomological cooperation with the Division of Cereal and Forage Insects of the Bureau of Entomology and Plant Quarantine).*—Experiments with barley, wheat, and oats for varietal evaluation, breeding, genetic, pathologic, and physiologic applications. C. A. SUNESON, agronomist.

*Farm Buildings and Rural Housing.*—Investigations of environmental factors influencing development, production, and health of animals in warm climates and design of buildings to meet requirements. T. E. BOND, agricultural engineer.

*Vegetable Crops and Diseases.*—The breeding of disease-resistant varieties of lettuce, melons, and onions. G. N. DAVIS, collaborator.

## Fresno

**United States Grape Field Station.**—Four miles southeast of Fresno (Atchison, Topeka & Santa Fe Ry. and Southern Pacific R. R.).

*Fruit and Nut Crops and Diseases.*—Stone fruit and grape production and breeding investigations. ELMER SNYDER, horticulturist.

*Handling, Transportation, and Storage of Horticultural Crops.*—Investigations in handling, transportation, storage, and post-harvest diseases of deciduous fruits, vegetables, and other horticultural crops. A. L. RYALL, horticulturist.

## Indio

**United States Date Field Station.**—Two miles west of Southern Pacific railroad station at Indio. Automobile available to station on notice.

*Fruit and Nut Crops and Diseases.*—Investigations in growing of date palms, including pollination, pruning, nutrition, water requirements, and variety adaptation; citrus breeding and the effect of irrigation and other cultural practices on productivity of citrus in desert areas of the Southwest. J. R. FURR, physiologist.

## La Jolla

**United States Horticultural Field Station.**—Six miles north of La Jolla on U. S. No. 101. Station can be reached by bus from San Diego. Transportation arrangements can be made in advance by communicating with T. W. WHITAKER, geneticist.

*Vegetable Crops and Diseases.*—Investigations of diseases of cantaloup and lettuce, especially breeding of disease-resistant strains of high market quality. T. W. WHITAKER, geneticist.

## Los Angeles

*University of California, College of Agriculture, Division of Botany (cooperative investigations).*—Sunset Boulevard between Beverly Hills and Brentwood Park. Can be reached by bus.

*Cotton and Other Fiber Crops and Diseases.*—Cotton cultural and physiological investigations, including factors influencing the defoliation process. V. T. WALHOOD, agronomist.

### Pasadena

*California Institute of Technology (cooperative investigations).*—University can be reached by taxi.

*Cereal Crops and Diseases.*—Investigations of corn cytology, histology, and morphology. A. E. LONGLEY, geneticist.

### Pomona

*United States Horticultural Field Laboratory.*—New Post Office Building.

*Handling, Transportation, and Storage of Horticultural Crops.*—Investigations in handling, transportation, and storage of citrus and subtropical fruits. E. M. HARVEY, physiologist.

Investigations in handling, transportation and storage of dates and other horticultural crops. G. L. RYGG, physiologist.

### Riverside

*Citrus Experiment Station, State Agricultural Experiment Station (cooperative investigations).*—About 3 miles from Riverside. Can be reached by bus from Riverside post office.

*Fruit and Nut Crops and Diseases.*—Investigations of virus diseases of stone fruits. L. C. COCHRAN, pathologist.

**United States Salinity Laboratory.**—At the foot of Mount Rubidoux, about 1 mile west of the business district, at Fourteenth Street and Glenwood Drive. Can be reached by taxi.

*Soil Management and Irrigation Agriculture.*—Investigations of the relationships of saline and alkali soils and irrigation waters to plant growth in irrigated agriculture. Basic research on the problems encountered in producing crops on saline and alkali soils, including the reclamation of such soils; the relationship of soil salinity to physical and chemical properties as affecting irrigation, drainage, and

soil management practices; and the salt tolerance of crops. (Some of these studies are cooperative with the agricultural experiment stations of the 17 Western States and Hawaii, the Division of Soil Survey, the Soil Conservation Service, and other Federal agencies.)

Analytical investigations on the quality of irrigation and drainage waters and their agricultural significance, including determinations of salt content, salt constituents, boron, and tolerance limits of crop plants. Methods of characterizing alkali and saline soils as an aid to reclamation. H. E. HAYWARD, director.

*Soil Survey.*—Subheadquarters, Far Western States. See California, Berkeley: Soil Survey Office. W. G. HARPER, soil scientist, soil correlator.

*United States Sugar Plant Field Laboratory.*—Tenth Street at Lime.

*Sugar Plant Investigations.*—Sugar beet curly top pathology, breeding, and agronomy investigations. EUBANKS CARNSNER, pathologist.

### Sacramento

*United States Horticultural Field Office.*—219 Federal Building.

*Fruit and Nut Crops and Diseases.*—Walnut and almond production and improvement investigations. M. N. WOOD, pomologist.

### Salinas

**United States Natural Rubber Research Station** (*cooperation with Bureau of Agricultural and Industrial Chemistry.*)—About 2½ miles from Salinas. Transportation arrangements can be made by telephoning H. M. TYSDAL, or station can be reached by taxi.

*Rubber Plant Investigations.*—Crop improvement studies on guayule, breeding investigations, hybridization studies, progeny testing and increase; plant improvement studies on kok-, tau-, and krim-saghyz. H. M. TYSDAL, geneticist.

*United States Sugar Plant Field Laboratory.*—Located at United States Natural Rubber Research Station.

*Sugar Plant Investigations.*—Sugar beet breeding investigations. J. S. McFARLANE, geneticist.

### San Francisco

*United States Forest Pathology Field Laboratory* (cooperation with Forest Service, National Park Service, and State Department of Agriculture).—720 Appraisers Building, 630 Sansome Street. Can be reached by bus from railroad and bus stations.

*Forest Pathology.*—Investigations of tree diseases, including those that affect timber stands, young natural stands and plantations, forest nurseries, street and shade trees, and trees in national parks and Federal recreational areas; and of decay and deterioration of forest products. W. W. WAGNER, pathologist.

### Shafter

*United States Cotton Field Station* (cooperation with Kern County, Calif., and California Planting Cotton Seed Distributors).—On Shafter Avenue, 2 miles north of Shafter (Atchison, Topeka & Santa Fe Ry.). Visitors will be met by automobile from field station.

*Cotton and Other Fiber Crops and Diseases.*—Investigations in cotton breeding and improvement, genetics, fiber properties, plant physiology, culture, and disease control; also in promoting farm use of improved seed stocks. E. G. SMITH, agronomist.

*Farm Machinery.*—Investigations to develop and improve methods and equipment for the production and harvesting of cotton (cooperation with State Agricultural Experiment Station). H. F. MILLER, JR., agent (agricultural engineer).

*Rubber Plant Investigations.*—Field studies on guayule. Directed from Salinas, Calif.; local supervision by E. G. SMITH, agronomist.

*Tobacco, Medicinal, and Special Crops.*—Agronomic investigations of castorbeans, especially breeding for better varieties. Some other special-crop investigations. L. H. ZIMMERMAN, agronomist.

**CANAL ZONE****Pedro Miguel (Summit)**

*Canal Zone Plant Introduction Garden (cooperation with Panama Canal Co.).*—Can be reached from Ancon or Balboa by taxi or by bus marked "Ganboa."

*Rubber Plant Investigations.*—Hevea breeding garden. Directed from Turrialba, Costa Rica. Local supervision, ROY SHARP, superintendent.

**COLORADO****Akron**

**United States Akron Field Station.**—Five miles east of Akron (Chicago, Burlington & Quincy R. R.) on U. S. No. 34. Transportation arrangements can be made by communicating with J. F. BRANDON, superintendent.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under dry-land conditions; variety trials of grains and other crops; and cattle-fattening and wintering experiments with calves, using locally grown feeds. (Cooperation with State Agricultural Experiment Station.) J. F. BRANDON, agronomist.

**Denver**

*Weed Control Studies (cooperation with Bureau of Reclamation).*—Building 1-B, Federal Center, Denver 2, Colo.

*Weed Investigations.*—Studies of the physiological actions of chemical weed killers, particularly those suitable for use in canals and other waterways to control aquatic vegetation. E. T. OBORN, physiologist.

**Fort Collins**

*State Agricultural Experiment Station (cooperative investigations).*—On campus of Colorado Agricultural and Mechanical College. Can be reached by Union Pacific

Railroad, Colorado Motorways, and Burlington bus line.

*Forage Crops and Diseases.*—Coordination of the production of breeders, foundation, and registered seed of superior grass and legume varieties in the western half of the United States. J. G. DEAN, JR., agronomist.

*Soil Management and Irrigation Agriculture.*—Field headquarters for the 17 Western States. O. J. KELLEY, soil scientist. Soil management under irrigation. L. B. NELSON, soil scientist. Soil management dry-land conditions. C. E. EVANS, soil scientist. In Industrial Research Building. Soil phosphorus research laboratory (cooperative with agricultural experiment stations of the Western States). S. R. OLSEN, soil scientist. In Agronomy Building.

*Sugar Plant Investigations.*—Sugar beet production and genetic investigations. G. W. DEMING, agronomist. In Agronomy Building.

Sugar beet pathology and breeding investigations for leaf spot resistance and improved keeping quality. J. O. GASKILL, pathologist. In Botany Building.

*Vegetable Crops and Diseases.*—Nature of disease resistance in potatoes, including breeding potatoes for resistance to virus, bacterial, fungus, and physiological diseases. L. A. SCHAAL, pathologist.

Onion improvement. A. M. BINKLEY, collaborator.

*United States Forest Pathology Field Laboratory (cooperation with State Agricultural Experiment Station, National Park Service, Forest Service, and Bureau of Entomology and Plant Quarantine.*—208 Botany and Plant Pathology Building.

*Forest Pathology.*—Investigations of tree diseases that affect timber stands, reduce lumber production, and influence logging operations; rate of deterioration of insect-killed timber; and diseases of trees in national parks. R. W. DAVIDSON, pathologist.

### Grand Junction

*State Agricultural Experiment Station and Soil Conservation Service.*—Office and laboratory located at Mesa

Junior College, 1 mile west of Grand Junction (United and Frontier Airlines; Denver & Rio Grande Western R. R.). Can be reached by taxi.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under irrigation; irrigation and soil management studies on high-altitude meadows (cooperative with State Agricultural Experiment Station and U. S. Soil Conservation Service). F. M. WILLHITE, agronomist.

### Greeley

**Colorado Potato Experiment Station.**—About 3½ miles northeast of railroad station at Greeley (Colorado & Southern Ry. and Union Pacific R. R.). Union Pacific motorbus connection between Greeley and La Salle, 4 miles from Greeley. Transportation arrangements can be made by communicating with W. C. EDMUNDSON, superintendent.

*Vegetable Crops and Diseases (cooperation with Colorado State Board of Agriculture and State Agricultural Experiment Station).*—Investigations on potato breeding and culture; effects of spray materials on growth, yield, and disease transmission; and investigations on onion culture, breeding, and diseases. W. C. EDMUNDSON, horticulturist.

Investigations of bean and pea diseases and methods for their control; breeding and selection for resistance to disease, higher yields, and improved table quality. W. J. ZAUMEYER, pathologist. (Field investigations conducted during summer months; laboratory and greenhouse work at Beltsville, Md.).

## CONNECTICUT

### New Haven

*United States Forest Pathology Field Laboratory (cooperation with Yale University, Bureau of Entomology and Plant Quarantine, and Forest Service.)*—360 Prospect Street. Can be reached by streetcar or bus from railroad and bus stations.

*Forest Pathology.*—Investigations of tree diseases, including those that affect timber stands, young natural stands and

plantations, forest nurseries, street and shade trees, trees in national parks and Federal recreational areas; and of decay and deterioration of forest products. J. R. HANSBROUGH, pathologist.

### Storrs

*Storrs Agricultural Experiment Station of University of Connecticut (cooperative investigations).*—Take New York, New Haven & Hartford Railroad to Willimantic, then take taxi to Storrs.

*Farm Electrification.*—Investigations to develop methods and equipment for moisture control in poultry houses; and improvement of facilities and equipment for curing cigar tobaccos (cooperation with New Haven Agricultural Experiment Station). W. A. JUNNILA, agricultural engineer.

## DELAWARE

### Newark

*University of Delaware (cooperative investigations).*—On Baltimore & Ohio and Pennsylvania Railroads.

*Mycology and Disease Survey.*—Research on forecasting plant disease epidemics. R. A. HYRE, pathologist.

## DISTRICT OF COLUMBIA

### Washington

**National Arboretum.**—Present entrance to the National Arboretum is at Twenty-eighth and M Streets NE. There is no public transportation to the entrance, and the National Arboretum is not open to the general public. Visitors should make arrangements with the Arboretum office.

Established by act of Congress, for purposes of research and education concerning tree and plant life. Major interest focused on woody plants, both native and exotic, that are hardy and successfully grown in climate of Washington area. H. A. GUNNING, assistant director. FRANCIS DE VOS, horticulturist, curator of living plant collection.

**United States Department of Agriculture Inspection House.**—224 Twelfth Street SW.

*Plant Exploration and Introduction.*—Reception, inventory, and shipment of plant materials in accordance with quarantine and inspection regulations. M. L. HAINES, administrative assistant.

## FLORIDA

### Belle Glade

*Everglades Experiment Station (cooperation with State Agricultural Experiment Station).*—Take bus from West Palm Beach.

*Cotton and Other Fiber Crops and Diseases.*—Fiber laboratory. Studies of sansevieria, ramie, kenaf, and other fiber crops. E. O. GANGSTAD, agronomist.

*Mechanical Processing of Farm Products.*—Mechanical processing of such special fibers as sansevieria, ramie, and kenaf, including the development of planting and harvesting machinery. H. D. WHITTEMORE, agricultural engineer.

### Canal Point

**United States Sugar Plant Field Station.**—One-half mile north of post office (on branch line of Florida East Coast Ry., from Okeechobee City; also bus from West Palm Beach, Evernia and Olive Sts.) on Canal Point-Okeechobee City highway.

*Sugar Plant Investigations.*—Investigations in sugarcane breeding; production of improved disease-resistant varieties of cane; agronomic trials of new varieties. B. A. BELCHER, agronomist.

### Cocoa

*United States Tobacco and Special Crops Field Location.*—Ten miles south on Merritt Island.

*Tobacco, Medicinal, and Special Crops.*—Investigations in increasing tobacco and special crops seed stocks during the winter season. H. B. ENGLE, physiologist.

### Coconut Grove

**United States Plant Introduction Garden.**—Thirteen miles south of Miami;  $4\frac{1}{2}$  miles south of South Miami; and 7 miles south of Coconut Grove. Arrangements for transportation to station can be made in advance; no public transportation service is available.

*Plant Exploration and Introduction.*—Propagation, testing, and distribution of rare and valuable economic and ornamental plants from foreign countries and United States possessions. H. F. LOOMIS, agronomist.

*Rubber Plant Investigations.*—Special hevea breeding investigations supplementing tropical stations; study of growth and yield of native and introduced rubber-bearing plants. H. F. LOOMIS, agronomist.

Plantation management advisory services to cooperating Latin-American countries. WILLIAM MACKINNON, agriculturist (consultant).

### Fort Lauderdale

*United States Bean Disease Field Laboratory (cooperation with State Agricultural Experiment Station).*—501 South Andrews Avenue, near Florida East Coast Railway and Greyhound bus stations, 2 miles from Seaboard Air Line Railroad station.

*Vegetable Crops and Diseases.*—Investigations of watery soft rot of beans and other vegetable crops, including studies on relation of weather conditions to disease dissemination and on control measures under field and transportation conditions. W. D. MOORE, pathologist.

### Gainesville

*State Agricultural Experiment Station (cooperative investigations).*—About  $1\frac{1}{2}$  miles from railroad stations at Gainesville (Atlantic Coast Line R. R., and Seaboard Air Line R. R.) (University of Florida).

*Cereal Crops and Diseases.*—Investigations on the diseases of wheat, oats, barley, and rye as a basis for breeding programs to develop resistant varieties. R. W. EARHART, pathologist.

*Cotton and Other Fiber Crops and Diseases.*—Cotton breeding and improvement investigations. F. H. HULL, collaborator.

*Forage Crops and Diseases.*—Investigations of grasses and legumes adapted to the Southeastern States. F. H. HULL, collaborator.

*United States Field Laboratory for Tung Investigations (cooperation with State Agricultural Experiment Station).*—University of Florida campus. Take bus running west on University Avenue as far as University campus.

*Fruit and Nut Crops and Diseases.*—Tung investigations, including breeding and selection for high-yielding varieties, cultural practices, mineral nutrition, maintenance of soil fertility, and suitability of soil types for tung production. F. S. LAGASSE, pomologist.

*Soil Survey.*—Subheadquarters, Southern States. See Tennessee, Knoxville: Soil Survey Office. R. G. LEIGHTY, soil scientist.

*Vegetable Crops and Diseases.*—Breeding and testing improved vegetable strains and varieties for superior adaptation (cooperation with U. S. Regional Vegetable Breeding Laboratory at Charleston, S. C.). F. S. JAMISON, collaborator.

### Lake City

*United States Forest Pathology Field Laboratory (cooperation with Forest Service).*—Located at Southeastern Forest Experiment Station, Post Office Building. Field station at Olustee Experimental Forest, Olustee, Fla., 12 miles east of Lake City. Can be reached by bus from Lake City or Jacksonville.

*Forest Pathology.*—Investigations of pathological factors affecting pines and influencing production of turpentine and rosin. R. B. CLAPPER, pathologist.

### Orlando

*United States Horticultural Field Laboratory.*—Located at 415 North Parramore Street (near West Amelia St.),

2½ miles from Atlantic Coast Line Railroad station; 1 mile from hotels and post office.

*Fruit and Nut Crops and Diseases.*—Citrus, avocado, and other subtropical fruit breeding, production, disease, and soil fertility investigations. F. E. GARDNER, horticulturist.

*Handling, Transportation, and Storage of Horticultural Crops.*—Investigations in handling, transportation, and post-harvest diseases of citrus, vegetables, and subtropical fruits. J. R. WINSTON, horticulturist.

Investigations in storage, physiology, and maturity and quality evaluation of citrus. P. L. HARDING, physiologist.

## Sanford

*Central Florida Experiment Station (cooperative investigations).*—On Celery Avenue about 1 mile east of the business section of Sanford, near baseball park. Bus service is not available; visitors will be met by station automobile.

*Nematology Investigations.*—General problems related to plant diseases caused by nematodes in Florida and adjoining areas; investigations on nematode diseases of winter-grown vegetables, ornamentals, and trees and shrubs, with emphasis on the sting nematode, the stubby-root nematodes, the root-knot nematodes, and the dagger nematodes. Screening tests to find chemicals with nematocidal properties. J. R. CHRISTIE, nematologist.

## GEORGIA

### Albany

*United States Pecan Field Laboratory.*—Office and laboratory, 1503 North Jefferson Street, about 1 mile northwest of Union Station. Visitors will be met at station.

*Fruit and Nut Crops and Diseases.*—Studies in pecan-orchard management; factors affecting growth, flowering, and nut set and filling; biennial bearing, mineral nutrition, and soil fertility investigations. J. H. HUNTER, soil technologist.

Pecan disease investigations. J. R. COLE, pathologist.

### Athens

*College of Agriculture of the University of Georgia (cooperative investigations).*—On Seaboard Air Line Railroad and Southern Railway.

*Cotton and Other Fiber Crops and Diseases (cooperation with State Agricultural Extension Service).*—Cotton improvement in standardized one-variety communities. E. C. WESTBROOK, agent. In Agricultural Extension Building.

*Farm Buildings and Rural Housing.*—Investigations of crop drying and storage in the Southeastern States, including grain, blue lupine seed, sweetpotatoes, and other crops. General supervision by W. V. HUKILL, agricultural engineer, Ames, Iowa; local supervision by J. W. SIMONS, agricultural engineer. In Barrow Hall.

*Mechanical Processing of Farm Products.*—Investigations of labor-saving machinery developments for rural enterprises such as community canneries, locker plants, and feed mills (cooperation with Agricultural Engineering Department, University of Georgia). W. M. BRUCE, agricultural engineer. In Barrow Hall.

*Forest Pathology Field Laboratory (cooperation with School of Forestry, University of Georgia, and U. S. Forest Service).*—School of Forestry, University of Georgia. Can be reached by bus or taxi from railroad station.

*Forest Pathology.*—Investigations of diseases that affect timber stands, reduce lumber production, and influence logging operations, including little leaf disease of pine and diseases of young natural stands and plantations. W. A. CAMPBELL, pathologist.

### Atlanta

*Cotton Field Office (cooperation with extension services of the Southeastern States).*—728 Ten Forsyth Street Building. Can be reached by streetcar.

*Cotton and Other Fiber Crops and Diseases.*—Regional office for cotton improvement in standardized one-variety communities in the Southeastern States. C. A. McLENDON, agronomist.

## Cairo

*United States Field Laboratory for Tung Investigations.*—

On U. S. No. 84, in eastern part of town.

*Fruit and Nut Crops and Diseases.*—Investigations on tung propagation, culture, breeding, and selection and on maintenance of soil fertility, nutrition, and disease control. M. S. NEFF, physiologist.

*United States Sugar Plant Field Laboratory.*—Office in Post Office Building at Cairo (Atlantic Coast Line R. R.). Field operations are 2½ miles north. Can be reached by driving north on Broad Street to fork in road, then taking left road about 2 miles to corrugated-iron sirup mill on left. Visitors will be met at Post Office Building by automobile if advance arrangements are made.

*Sugar Plant Investigations.*—Studies of sugarcane and sugar sorghum varieties for sirup production, and testing response of disease-resistant varieties to fertilizers and agronomic practices. E. S. LYONS, technologist.

## Experiment

*Georgia Experiment Station (cooperative investigations).*—

Located on edge of Griffin, Ga. (Central of Georgia Ry. and Southern Ry.).

*Cereal Crops and Diseases.*—Investigations of fall-sown cereals (wheat, oats, barley, and rye), including studies of diseases, winter hardiness, varieties, breeding, and culture. Directed from Beltsville, Md.; local supervision by U. R. GORE, of the experiment station.

*Cotton and Other Fiber Crops and Diseases.*—General cotton breeding and improvement investigations. W. W. BALLARD, agronomist.

*Forage Crops and Diseases.*—Investigations on seed storage with lupines. R. E. BURNS, physiologist.

*Plant Exploration and Introduction.*—Headquarters for cooperative investigations in the southern region covering the propagation, testing, and distribution of rare and valuable economic and ornamental plants from foreign countries and United States possessions. EDWIN JAMES, agriculturist.

*Vegetable Crops and Diseases.*—Investigations on sweet-potato culture and variety improvement and testing. A. H. DEMPSEY, collaborator.

Peanut investigations, including fertilizers, spacing, seed stock, quality, variety, and hybrid-strain testing. B. B. HIGGINS, collaborator, and W. K. BAILEY, horticulturist.

Breeding and testing improved vegetable strains and varieties for superior adaptation (cooperation with U. S. Regional Vegetable Breeding Laboratory at Charleston, S. C.). A. H. DEMPSEY, collaborator.

*Weed Investigations.*—Investigations of practical methods for the control of nutgrass on agricultural lands, particularly the use of herbicides and the relationships of the physiology of the plant to cultural and soil management practices. E. S. HAGOOD, agent.

### Fort Valley

*United States Horticultural Field Laboratory.*—About 2 miles east of Fort Valley going out Church Street. Laboratory is about one-half mile north of the highway, on the Baird plantation. Visitors will be met by automobile.

*Fruit and Nut Crops and Diseases.*—Investigations on peach breeding; phony peach and other diseases of peaches. J. H. WEINBERGER, horticulturist.

Virus disease investigations. G. E. KENKNIGHT, pathologist.

### Savannah

*United States Barbour Lathrop Plant Introduction Garden.*—Twelve and one-half miles southwest of Savannah, on U. S. No. 17. Greyhound bus lines and Service Coach Trailway busses pass the station.

*Plant Exploration and Introduction.*—Propagation, testing, and distribution of rare and valuable economic and ornamental plants from foreign countries and United States possessions. D. A. BISSET, scientific aid.

### Tifton

*Georgia Coastal Plain Experiment Station (cooperative investigations).*—About 2 miles northwest of Tifton (At-

lantic Coast Line R. R.) on State Route 7. Transportation arrangements can be made by calling the station.

*Cereal Crops and Diseases.*—Breeding corn varieties and hybrids that are adapted to Coastal Plain conditions and are high yielding, resistant to diseases and rice weevil attack, and drought-resistant. Conducting performance trials of corn hybrids at various locations on the Coastal Plain. Maintaining inbred lines and producing foundation single crosses of hybrids in commercial production. Yield tests of wheat and oats. W. H. FREEMAN, agronomist.

*Cotton and Other Fiber Crops and Diseases.*—Cotton breeding and improvement investigations. J. G. JENKINS, agronomist.

*Farm Machinery.*—Research on peanut production, harvesting, and handling machinery. General supervision by I. F. REED, agricultural engineer, Auburn, Ala.; local supervision by M. O. BERRY, agricultural engineer.

*Forage Crops and Diseases.*—Miscellaneous legume improvement and general forage and pasture investigations; soybean production investigations. J. L. STEPHENS, agronomist.

Grass breeding, improvement, and seed production studies; turf production and management, and piney woods range investigations. G. W. BURTON, geneticist.

*Nematology Investigations.*—Investigations relating to nematode diseases of plants and their control, principally root knot and other nematode pests of the South. Soil-fumigation studies. J. H. MACHMER, nematologist.

*Ornamental-Plant Crops and Diseases.*—Investigations on azalea flower spot disease and other diseases of ornamentals. D. L. GILL, pathologist.

*Rubber Plant Investigations.*—Plot tests of kok- and krim-saghyz. OTIS WOODARD, collaborator.

*Tobacco, Medicinal, and Special Crops.*—Improvement and standardization of flue-cured tobacco varieties, including control of blue mold, root knot, and other diseases. J. G. GAINES, pathologist.

Improvements in fertilization, crop rotation, and cultural practices for flue-cured tobacco. Preparation and management of flue-cured tobacco plant beds. IVAN NEAS, agronomist.

*Vegetable Crops and Diseases.*—Investigations on sweet-potato improvement and culture. OTIS WOODARD, collaborator.

Peanut investigations, including fertilizers, spacing, seed-stock quality, variety, and hybrid-strain testing. Directed from Experiment, Ga.; S. A. PARHAM, collaborator.

Investigations of diseases of vegetable-seedling plants, particularly tomatoes, grown for shipment to the North; cultural operations in seedling-plant production. H. I. BORDERS, pathologist.

## IDAHO

### Aberdeen

*Aberdeen Substation, State Agricultural Experiment Station (cooperative investigations).*—Can be reached by Overland Stage bus from Blackfoot. Transportation arrangements can be made by calling substation.

*Cereal Crops and Diseases.*—Barley, wheat, oats, and flax production, breeding, disease, and quality investigations; development of improved breeding methods. Regional barley and oat work (cooperation with stations in States of Pacific Northwest). HARLAND STEVENS, agronomist.

*Vegetable Crops and Diseases.*—Breeding improved disease-resistant varieties of potatoes. J. G. MCLEAN, horticulturist.

### Boise

*Weed Control Studies (cooperation with Bureau of Reclamation and State Agricultural Experiment Station).*—Care of Ada County Weed Control, Box 787, Meridian, Idaho.

*Weed Investigations.*—Investigations on methods for weed control in irrigated ditches and on irrigated land. J. M. HODGSON, agronomist.

## Moscow

*State Agricultural Experiment Station (cooperative investigations).*—About  $\frac{1}{2}$  mile from railroad station at Moscow (Great Northern Ry., Northern Pacific Ry., and Union Pacific R. R.).

*Vegetable Crops and Diseases.*—Study of techniques involved in production of hybrid onions. G. W. WOODBURY, collaborator.

*Weed Investigations.*—Investigations on the control of noxious weeds. C. I. SEELY, agent.

## Parma

*Branch Experiment Station (cooperation with State Agricultural Experiment Station).*—Located approximately 1 mile north of Parma. Arrangements for transportation may be made by calling D. F. FRANKLIN, superintendent.

*Vegetable Crops and Diseases.*—Breeding hybrid onions adapted to the West and resistant to insects and diseases. A. E. CLARKE, geneticist.

## Twin Falls

*United States Sugar Plant Field Laboratory.*—In Entomology Building, 1 mile north on Blue Lake Boulevard from post office in Twin Falls (Union Pacific R. R.; can also be reached by bus from Minidoka, Pocatello, and Jerome, Idaho, or from Wells, Nev.).

*Sugar Plant Investigations.*—Agronomic and plant pathological investigations on sugar beet production in relation to curly top. A. M. MURPHY, agronomist.

*Vegetable Crops and Diseases.*—Breeding improved disease-resistant beans for food and seed purposes. V. E. WILSON, pathologist.

## ILLINOIS

### Chicago

*United States Market Pathology Laboratory (cooperative with Production and Marketing Administration and*

*University of Chicago*).—Laboratory investigations conducted in 103 Barnes Laboratory, University of Chicago, 5630 Ingleside Avenue, Chicago 37, Ill.

*Handling, Transportation, and Storage of Horticultural Crops*.—Investigations in the handling, transportation, and storage of fruits and vegetables, with particular reference to diseases that cause spoilage during transit and on the market. G. B. RAMSEY, pathologist.

### Urbana

*State Agricultural Experiment Station (cooperative investigations)*.—About 1½ miles from railroad station at Urbana (Cleveland, Cincinnati, Chicago & St. Louis Ry.). Can be reached by bus or streetcar from railroad station at either Urbana or Champaign.

*Cereal Crops and Diseases*.—Investigations on loose smut of wheat. Pathologic phases of the wheat, oats, and barley breeding program. W. M. BEVER, pathologist.

*Farm Buildings and Rural Housing*.—Studies of chore time, travel, and efficient lay-out for dairy and beef cattle buildings (cooperation with Illinois Agricultural Experiment Station and U. S. Bureau of Agricultural Economics). THAYER CLEAVER, agricultural engineer. In Agricultural Engineering Building.

*Farm Electrification*.—Investigations on the development of automatic feed grinding, mixing, and elevating equipment, and motor-driven conveyors to deliver feed and forage to mangers and feed bunks to reduce farm chore labor. L. S. FOOTE, agent.

**United States Regional Soybean Laboratory** (*cooperation with 12 North Central States, 12 Southern States, and U. S. Bureau of Agricultural and Industrial Chemistry*).—In Davenport Hall, University of Illinois.

*Forage Crops and Diseases*.—Research on soybeans in the North Central States and Southern States involving breeding and development of improved varieties for industrial purposes; physiological and chemical studies; study of organisms causing soybean diseases and development of control methods. J. L. CARTER, director.

## INDIANA

## Lafayette

*Agricultural Experiment Station, Purdue University (co-operative investigations).*—At West Lafayette, about 1½ miles from Lafayette. Can be reached by streetcar from Lafayette.

*Cereal Crops and Diseases.*—Breeding and genetic experiments with dent and sweet corn and popcorn, with special emphasis on breeding for disease resistance and resistance to European corn borer. A. M. BRUNSON, agronomist.

Breeding disease- and insect-resistant varieties of wheat, oats, and barley; pathologic studies on the leaf rusts. R. M. CALDWELL, colliaborator.

*Farm Buildings and Rural Housing.*—Studies of corn and grain drying and storage (cooperation with Indiana Agricultural Experiment Station and U. S. Production and Marketing Administration). Directed from Ames, Iowa. Local supervision, G. H. FOSTER, agricultural engineer. In Agricultural Engineering Building.

*Farm Electrification.*—Research on the attractiveness of electric radiation to corn borer moths, particularly the European corn borer moth, and development of electric traps for destroying them, directed from Beltsville, Md.; brooding chicks with infrared lamps (cooperation with Virginia Agricultural Experiment Station); and requirements of electrical radiant heat sources for prevention of pig losses. J. G. TAYLOR, agricultural engineer.

*Forage Crops and Diseases.*—Investigations on breeding and culture of soybeans in relation to their adaptation to industrial utilization. A. H. PROBST, agronomist.

Soybean disease investigations. K. L. ATHOW, agent.

## IOWA

## Ames

*State Agricultural Experiment Station (cooperative investigations).*—About 1 mile west of railroad station. Can be reached by bus, interurban railway, or streetcar.

*Cereal Crops and Diseases.*—Breeding field corn hybrids for Corn Belt conditions that are high yielding, disease re-

sistant, and resistant to the European corn borer (cooperative with Bureau of Entomology and Plant Quarantine). Conducting performance trials with hybrids at various locations in Iowa. The development of improved methods of breeding corn for high yield, chemical composition, and quality. G. F. SPRAGUE, agronomist.

Breeding oat, barley, and wheat varieties resistant to diseases, and studies on diseases of these crops and their control. H. C. MURPHY, pathologist and oat project leader.

*Farm Buildings and Rural Housing.*—Headquarters for crop drying and storage studies, including corn and grain drying and storage studies carried on at this station in cooperation with the Production and Marketing Administration; grain storage and drying studies at Lafayette, Ind.; grain sorghum drying and storage studies at Beville, Tex.; crop storage studies at Athens, Ga.; potato storage studies at East Grand Forks, Minn., and New Brunswick, N. J.; and apple storage studies at Wenatchee, Wash. W. V. HUKILL, agricultural engineer. In Agricultural Engineering Building.

*Farm Electrification.*—Determination of farm electrical demand (cooperation with Rural Electrification Administration); and study on automatic electrically heated waterers for hogs. L. B. ALTMAN, JR., agricultural engineer.

Research on electric lamps and traps for insect control with special reference to the European corn borer moth. General supervision by J. G. TAYLOR, Lafayette, Ind.; local supervision by D. L. CALDERWOOD, agent.

*Farm Machinery.*—Investigations of machinery for weed control. W. G. LOVELY, agricultural engineer. In Agricultural Engineering Building.

*Forage Crops and Diseases.*—Investigations on breeding and culture of soybeans in relation to their adaptation to industrial utilization. C. R. WEBER, agent.

Soybean disease investigations. J. M. CRALL, agent.

*Fruit and Nut Crops and Diseases.*—Breeding of tree fruits. H. L. LANTZ, agent.

*Mycology and Disease Survey.*—Research on forecasting plant disease epidemics. J. R. WALLIN, pathologist.

*Plant Exploration and Introduction.*—Headquarters for cooperative investigations in the North Central region, covering the propagation, testing, and distribution of rare and valuable economic and ornamental plants from foreign countries and United States possessions. M. M. HOOVER, agriculturist.

*Soil Management and Irrigation Agriculture.*—Soil microbiological research, with particular emphasis on the organisms associated with plant roots and with organic matter transformations. F. E. CLARK, bacteriologist.

Soil phosphorus research project (cooperative with agricultural experiment stations of the North Central States). [Vacancy], soil scientist.

*Soil Survey.*—Subheadquarters, Northern States. See Maryland, Beltsville: Soil Survey Office. A. J. CLINE, soil scientist. Room 2, Landscape Architecture Building.

*Vegetable Crops and Diseases.*—Breeding improved and disease-resistant potatoes and onions. C. E. PETERSON, horticulturist.

## KANSAS

### Colby

*Colby Branch Station, State Agricultural Experiment Station (cooperative investigations).*—One mile west and 1/2 mile south of Colby (Rock Island and Union Pacific Railroads), just off U. S. No. 24. Can be reached by taxi, or transportation arrangements can be made by calling E. H. COLES, superintendent.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under dry-land conditions. E. H. COLES, agent (agronomist).

### Garden City

*Garden City Branch Experiment Station, State Agricultural Experiment Station (cooperative investigations).*—Four miles northeast of Garden City (Atchison, Topeka & Sante Fe Ry.) on U. S. No. 50. Can be reached by local taxi, or transportation arrangements can be made by calling A. B. ERHART, superintendent.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under dry-land conditions. A. B. ERHART, agent (agronomist).

### Hays

*Fort Hays Branch Experiment Station, State Agricultural Experiment Station (cooperative investigations).*—One-half mile south of Hays (Union Pacific R. R.) on U. S. No. 183. Transportation arrangements can be made by calling W. W. DUTSMAN, superintendent.

*Cereal Crops and Diseases.*—Agronomic investigations of wheat, sorghum, barley, and oats. Plant breeding work with wheat, sorghum, and barley. Agronomic investigations include varietal comparisons, experiments with rates and dates of seeding, seedbed preparation, and quality studies of the several crops. W. M. ROSS, agent.

Investigations on wheat mosaic. R. C. BELLINGHAM, agent.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under dry-land conditions. P. L. BROWN, soil scientist.

*Weed Investigations.*—Investigations on the physiology and growth of weeds; the use of competitive crops; the effect of cultural practices and crop sequences, and of chemical weed killers on weed control (cooperation with State Department of Agriculture and other action agencies). W. M. PHILLIPS, agronomist.

### Manhattan

*State Agricultural Experiment Station (cooperative investigations).*—About 2 miles northwest of railroad station (Union Pacific R. R. and Chicago, Rock Island & Pacific Ry.) on the northwestern limits of the city. Can be reached by bus.

*Cereal Crops and Diseases.*—Research on the rusts of wheat and oats, including breeding for resistance, identification of physiologic races (especially those of leaf rust of wheat), studies on the inheritance of resistance, on the relation of leaf rust infection to the physiology, yield, and grain quality of wheat, and on factors governing the initiation and

development of rusts epiphytotic. C. O. JOHNSTON, pathologist.

Research on mosaic, septoria, leaf blotches, and foot rots of wheat. HURLEY FELLOWS, pathologist.

Agronomic investigations of wheat, oats, and sorghum, especially breeding for better grain and plant characters in combination with resistance to diseases and insects. D. E. WEIBEL, agronomist. E. G. HEYNE, agent.

Quality evaluation of wheat varieties produced in the breeding programs of the hard red winter wheat region, and studies on the relationship of protein, grain texture, and other characteristics to the value of grain for commercial usage in the production of bakery products. Also, the relationship of environmental factors to the quality characters of grain. J. A. SHELLENBERGER, agent. (Hard Winter Wheat Quality Laboratory.)

*Farm Electrification.*—Investigations on heat pump (reverse-cycle refrigeration). (Cooperation with Kansas Committee on the Relation of Electricity to Agriculture.) General supervision by H. L. GARVER, Beltsville, Md.; local supervision by C. P. DAVIS, JR., agricultural engineer.

*Forage Crops and Diseases.*—Alfalfa breeding and improvement investigations. C. O. GRANDFIELD, agronomist.

Grass breeding and improvement; pasture and range investigations. K. L. ANDERSON, collaborator.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under dry-land conditions. [Vacancy], soil scientist.

*Soil Survey.*—Subheadquarters, Great Plains States. See Nebraska, Lincoln: Soil Survey Office. C. H. ATKINSON, soil scientist. In Agronomy Department.

## KENTUCKY

### Lexington

*State Agricultural Experiment Station (cooperative investigations).*—About 1 mile from downtown Lexington.

*Forage Crops and Diseases.*—Investigations with red clover, including studies of diseases. E. N. FERGUS, collaborator.

*Tobacco, Medicinal, and Special Crops.*—Investigations on burley tobacco for quality improvement. C. E. BORTNER, agent.

*Vegetable Crops and Diseases.*—Breeding and testing improved vegetable strains and varieties for superior adaptation (cooperation with U. S. Regional Vegetable Breeding Laboratory at Charleston, S. C.). E. M. EMMERT, collaborator.

### Princeton

*Western Kentucky Experiment Station (cooperative investigations).*—Within 1 mile of Illinois Central Railroad station.

*Cotton and Other Fiber Crops and Diseases.*—Investigations on the growth and production of hemp. Directed by C. V. FEASTER, agronomist, Beltsville, Md.

## LOUISIANA

### Baton Rouge

*State Agricultural Experiment Station (cooperative investigations).*—Two and one-half miles south of Baton Rouge. Can be reached by bus.

*Cereal Crops and Diseases.*—Corn breeding and cultural investigations, breeding field corn for the South, performance trials of corn hybrids and hybrid seed-corn production. Experiments on the relation of husk characters to damage by weevils and corn earworm. HUGO STONEBERG, agronomist.

*Cotton and Other Fiber Crops and Diseases.*—Cotton disease investigations, with special reference to control methods. D. C. NEAL, pathologist.

Cotton improvement in standardized one-variety communities. I. W. CARSON, agent.

*Farm Electrification.*—Investigations on dielectric treatment of rice and effects on micro-organisms and nematodes (cooperation with Division of Farm Buildings and Rural Housing). F. T. WRATTEN, agricultural engineer.

*Forage Crops and Diseases.*—Investigations of breeding and culture of soybeans in relation to their adaptation to industrial utilization. J. P. GRAY, collaborator.

Soybean disease investigations. J. G. ATKINS, Jr., collaborator.

*Soil Survey.*—Subheadquarters, Southern States. See Tennessee, Knoxville: Soil Survey Office. S. A. LITTLE, soil scientist. In Agronomy-Horticulture Building.

*Vegetable Crops and Diseases.*—Sweetpotato breeding and improvement and variety testing. J. C. MILLER, collaborator.

Potato diseases, including breeding varieties resistant to insects and diseases and especially adapted to the requirements of the early southern crop. T. P. DYKSTRA, pathologist.

Investigations on onion culture and resistance to diseases and insects. Breeding and testing improved vegetable strains and varieties for superior adaptation (cooperation with U. S. Regional Vegetable Breeding Laboratory at Charleston, S. C.). J. C. MILLER, collaborator.

### Bogalusa

*United States Field Laboratory for Tung Investigations.*—In Post Office Building, 301 Avenue B. Field work at Mississippi Cooperative Tung Farm (South Mississippi Branch Experiment Station), 13 miles east of Bogalusa, on road to Poplarville, Miss.

*Farm Machinery.*—Investigations of tung nut production, gathering, and handling equipment (cooperative with Mississippi Agricultural Experiment Station). General supervision by I. F. REED, Auburn, Ala.; local supervision by R. E. JEZEK, agricultural engineer.

*Fruit and Nut Crops and Diseases.*—Investigations on tung propagation and culture, breeding and selection, testing varieties, maintenance of soil fertility, and mineral nutrition. G. F. POTTER, physiologist.

### Crowley

*Rice Station, State Agricultural Experiment Station (co-operative investigations).*—About 3 miles northeast of

Crowley, north of U. S. No. 90. Communicate with the superintendent regarding transportation arrangements.

*Cereal Crops and Diseases.*—Cultural, including fertilizer and rotation, experiments on rice. R. K. WALKER, superintendent.

Rice varietal testing, including introductions, hybridization, selection, and genetics; varietal testing of oats. N. E. JODON, agronomist.

### Houma

**United States Sugar Plant Field Station.**—On Little Bayou Black at end of Lafayette Street, about 1 mile south of courthouse. Can be reached by bus from 1520 Canal Street, New Orleans. Visitors will be met at Houma by automobile from station if advance arrangements are made.

*Farm Machinery.*—Investigations to develop and improve equipment and methods of producing and harvesting sugarcane. R. M. RAMP, agricultural engineer.

*Sugar Plant Investigations.*—Sugarcane disease, variety, agronomy, plant physiology, and soil fertility studies. E. V. ABBOTT, pathologist.

### Shreveport

*United States Pecan Field Laboratory.*—607 Courthouse. United States Pecan Field Station at Robson, 14 miles southeast of Shreveport on State Route 20.

*Fruit and Nut Crops and Diseases.*—Studies on pecan orchard management; factors influencing growth, flowering, and nut setting and filling; mineral nutrition; soil fertility; and disease control. C. L. SMITH, physiologist. O. W. HARRIS, agricultural aid and superintendent of station at Robson.

## MAINE

### Presque Isle

*Aroostook Farm State Agricultural Experiment Station (cooperative investigations).*—One and three-fourths miles south of railroad station at Presque Isle (Bangor

& Aroostook R. R. and Canadian Pacific Ry.). Transportation arrangements can be made by calling R. V. **AKELEY**.

*Vegetable Crops and Diseases.*—Potato breeding studies; production studies, especially on new varieties; also investigations on spacing and spraying. **R. V. AKELEY**, horticulturist.

Investigations of potato diseases and experiments with control measures. **E. S. SCHULTZ**, pathologist. (Field investigations during summer months; laboratory and greenhouse work at Beltsville, Md.)

## MARYLAND

### Beltsville

**Plant Industry Station.**—About 14 miles northeast of Washington; 1 mile southwest of Beltsville (Baltimore & Ohio R. R.). Can be reached from Washington by bus or automobile on the Washington-Baltimore Boulevard.

#### *Field Crops Group*

*Cereal Crops and Diseases.*—Barley production, breeding, disease, and quality investigations. Field and greenhouse experiments on the diseases affecting this crop and the method of control, both by treatment and production of resistant types. **G. A. WIEBE**, agronomist, barley project leader.

Corn production, breeding, disease, and quality investigations. Field and greenhouse experiments on the diseases affecting this crop and the method of control, both by treatment and the production of resistant types. **M. T. JENKINS**, agronomist, corn project leader.

Grain-sorghum disease investigations. Field and greenhouse experiments on the diseases affecting this crop and the method of control by treatment. **R. W. LEUKEL**, pathologist.

Oat production, breeding, disease, and quality investigations. Field and greenhouse experiments on the diseases affecting this crop and the method of control, both by treatment and the production of resistant types. **F. A. COFFMAN**, agronomist.

Wheat production, breeding, disease, and quality investigations. Field and greenhouse experiments on the diseases affecting this crop and the methods of control, both by treatment and the production of resistant types. Also investigations on milling and baking qualities of different selections of wheat. S. C. SALMON, agronomist, wheat project leader.

Regional coordinator for soft red winter wheat and quality laboratories. B. B. BAYLES, agronomist.

Research on diseases of the small grains. Field, greenhouse, and laboratory operations of the Division in connection with agronomic, pathologic, and physiologic work. C. V. LOWTHER, pathologist.

*Cotton and Other Fiber Crops and Diseases.*—Administration and direction of field research throughout the Cotton Belt (including southwestern United States) and in Florida, Kentucky, Oregon, and Wisconsin on cotton and other fiber crops, in cooperation with other Government agencies, State agricultural experiment stations and extension services, commercial interests, and individual farmers and growers. Under general direction of Beltsville project leaders as follows:

Cotton breeding, genetics, and improvement investigations. THOMAS KERR, technologist.

Cotton pathological investigations. J. T. PRESLEY, pathologist.

Cotton physiological investigations. W. H. THARP, physiologist.

Investigations of fibers other than cotton. E. G. NELSON, agronomist.

Laboratory work on structural and physical properties of natural cellulosic fibers and on field damage to cotton. P. B. MARSH, physiologist.

*Forage Crops and Diseases.*—Alfalfa investigations on selection and breeding for disease and insect resistance and increased seed production; testing varieties and selections for regional adaptation, and physiological and pathological studies relating to the longevity of stands. O. S. AAMODT, agronomist.

Clover investigations on selection and breeding for disease and insect resistance in red, Ladino, and crimson clovers;

cultural studies and varietal testing of zigzag, crimson, red, white, and other clover species. E. A. HOLLOWELL, agronomist.

Soybean and related legume investigations: Testing of new introductions and varieties; development of improved varieties by selection and hybridization; and production of seed of desirable strains. M. G. WEISS, agronomist.

Lespedeza, vetch, and lotus investigations: Testing of different species and varieties; increase of seed and cultural studies of desirable species, and studies of other acid-tolerant legumes. P. R. HENSON, agronomist.

Grass breeding and improvement investigations on selection and breeding of grasses adapted to geographic regions. M. A. HEIN, agronomist.

Pasture establishment, improvement, and management investigations; uniform nursery testing; and seed production of new grasses; testing of strains for mixtures of grasses and legumes under various cutting and grazing practices; (cooperation with the Bureaus of Dairy Industry and of Animal Industry). M. A. HEIN and R. E. WAGNER, agronomists.

Turf investigations: Testing of various grasses and mixtures of grasses for use on lawns, fairways, and other turf areas; fertilizer studies; and studies of turf diseases and their control (cooperation with the United States Golf Association, Green Section, under supervision of F. V. GRAU). D. F. BEARD, agriculturist.

Identification and study of fungi, bacteria, and viruses causing diseases of forage grasses and legumes, testing plants for resistance to disease under greenhouse and field conditions; and developing other measures for disease control. K. W. KREITLOW, pathologist.

Foundation seed program. Build up and maintain breeders and foundation seed of superior grass and legume varieties adapted to geographic regions; study genetic stability of each variety through each stage of seed increase. C. S. GARRISON, agriculturist.

*Rubber Plant Investigations.*—Administration and direction of field programs of research on rubber-bearing plants. Liaison with the Office of Foreign Agricultural Relations, the Institute of Inter-American Affairs, the Technical Col-

laboration Administration, and other Government agencies and with private companies, research organizations, and individuals interested in sources of natural rubber. R. D. RANDB, agriculturist.

*Sugar Plant Investigations.*—Sugar beet investigations, including disease studies and breeding for control of cercospora leaf spot, black root, and other diseases. G. H. COONS, pathologist.

Sugarcane and sugar sorghum experiments, including breeding, plant physiological, and plant pathological investigations. Sugarcane importations are grown in quarantine before release to field stations of the Division or to cooperators. C. H. WADLEIGH, physiologist.

*Tobacco, Medicinal, and Special Crops.*—Tobacco production, breeding, disease, and quality investigations, including physiological and biochemical studies of the tobacco plant in laboratory, greenhouse, and field experiments; tobacco nutrition, cropping, and variety tests; tobacco genetics and breeding. J. E. McMURREY, JR., physiologist.

Diseases of tobacco and their control; breeding for disease-resistant tobacco varieties. E. E. CLAYTON, pathologist.

Tobacco quality investigations. C. W. BACON, physiologist.

Experimental culture of plants yielding drugs, insecticides, essential oils, vegetable oils, and related products. L. M. PULTZ, horticulturist.

*Weed Investigations.*—To develop weed control measures, to screen chemicals for herbicidal value, and to study the physiological mechanism involved in the killing action of herbicides. W. C. SHAW, agronomist.

### ***Horticultural Crops Group***

*Forest Pathology.*—Investigations of diseases of American and Asiatic chestnuts; breeding, selecting, and propagating resistant varieties (cooperation with Forest Service). Investigations of sweetgum blight. G. F. GRAVATT, pathologist.

Identification of wood-rotting fungi from cultures; maintenance of large fungus culture collection and herbarium of tree-disease specimens. F. F. LOMBARD, pathologist.

Surveys for diseases of forest trees (cooperation with Forest Service). M. E. FOWLER, pathologist.

Investigations of diseases of forest trees; virus diseases of some forest and shade trees (cooperation with National Park Service, Forest Service, and Bureau of Entomology and Plant Quarantine). L. M. HUTCHINS, pathologist.

Investigations of decay in pulpwood, buildings, ships, and wooden containers (cooperation with Forest Service, Bureau of Entomology and Plant Quarantine, Defense Department, Housing and Home Finance Agency, and Baltimore Housing Authority). C. P. HARTLEY, pathologist.

Investigations of cause and control of shade-tree diseases (cooperation with National Park Service, and Bureau of Entomology and Plant Quarantine); forest-tree nursery diseases (cooperation with Forest Service). CURTIS MAY, pathologist.

*Fruit and Nut Crops and Diseases.*—Headquarters for deciduous fruit investigations on culture, breeding, and diseases affecting deciduous fruit production throughout the United States. G. M. DARROW, horticulturist.

Breeding disease-resistant grapes for humid climate; breeding strawberries, blueberries, raspberries, and other small fruits for improved quality, adaptation, and resistance. D. H. SCOTT, geneticist.

Breeding peaches, plums, and apricots for improved quality, hardiness, and disease resistance; nutritional studies with peaches; orchard-practice investigations. LEON HAVIS, horticulturist.

Investigations of diseases of deciduous tree fruits; development and testing of new fungicide materials. J. C. DUNEGAN, pathologist.

Breeding apples and pears for hardiness, quality, and disease resistance; evaluation of varietal strains; nutritional studies; hormone effects. C. P. HARLEY, physiologist.

Breeding, selection, and variety testing of filberts, walnuts, chestnuts, and hickories; administrative headquarters for pecan and tung investigations conducted at various field laboratories. H. L. CRANE, horticulturist.

*Handling, Transportation, and Storage of Horticultural Crops.*—Headquarters for investigations on handling, transportation, storage, and post-harvest diseases of fruits, vege-

tables, and other horticultural crops. W. T. PENTZER, horticulturist.

Post-harvest disease investigations. Studies on the occurrence, causes, prevention, and control of post-harvest diseases of fruits, vegetables, and other horticultural crops. H. T. COOK, pathologist.

Handling and packaging investigations. Evaluation and development of methods, equipment, and materials for handling, grading, and packing of fruits, vegetables, and other horticultural crops. [Vacancy.]

Storage investigations. Studies on the effect of temperature, humidity, composition of the atmosphere, chemical treatments, and other factors on the storage life, appearance, and physiological processes in stored fruits, vegetables, and other horticultural crops. R. C. WRIGHT, physiologist.

Transportation investigations. Testing, evaluating, and developing methods and equipment for transporting fruits, vegetables, and other horticultural crops by rail, truck, ship, and air. W. H. REDD, mechanical engineer.

Quality evaluation investigations. Development of harvest maturity standards for fruits and vegetables, and study of the effect of variety, growing conditions, maturity, handling, and storage methods on quality and vitamin content of stored and processed fruits and vegetables. W. T. PENTZER, horticulturist.

*Mycology and Disease Survey.*—Maintenance of a fungus herbarium, identification of fungi, monographic, and life history studies of fungi. J. A. STEVENSON, mycologist.

Plant Disease Survey. Collecting information on the current plant disease situation in the United States; distributing this information through a forecasting service, an index of diseases, and a periodical, *The Plant Disease Reporter*. P. R. MILLER, pathologist.

*Nematology Investigations.*—Root-knot nematode investigations.

Bulb or stem nematode and related forms investigations.

Sugar beet nematode and related forms investigations.

Meadow, wheat and grass, citrus, and other plant-parasitic and plant-pathogenic nematode investigations.

Soil and fresh- and marine-waters nematode investigations.

Parasitic and pathogenic to insects and other invertebrates nematode investigations.

Investigations are carried out under field, greenhouse, and laboratory conditions, and include the testing of soil fumigants for nematocidal properties and of the methods of applying them in the soil. G. STEINER, nematologist.

*Ornamental-Plant Crops and Diseases.*—Breeding, selecting, and testing Easter lilies, garden lilies, daffodils, tulips, snapdragons, carnations, chrysanthemums, stocks, phlox, azaleas, lilacs; improved methods of greenhouse forcing; nutrition studies with florist crops. S. L. EMSWELLER, horticulturist.

*Plant Exploration and Introduction.*—National headquarters for all programs involving the introduction of foreign plant material, its preliminary testing, and distribution to growers and plant breeders.

Fruit and vegetable introductions. W. E. WHITEHOUSE, horticulturist.

Field-crop introductions. H. L. HYLAND, agronomist.

Specialty-crop introductions. D. S. CORRELL, botanist.

National cooperative program for the testing and distribution of plant introductions. W. H. HODGE, botanist.

Plant identification and bibliographic investigations. S. F. BLAKE, botanist.

*Vegetable Crops and Diseases.*—Production and improvement of tomato, cucurbits, and leafy vegetables. V. R. BOSWELL, horticulturist.

Diseases of tomatoes, cucurbits, and related crops. S. P. DOOLITTLE, pathologist.

Sweetpotato breeding, culture, and diseases. C. E. STEINBAUER, pathologist.

Pea and bean diseases and improvement. W. J. ZAUMEYER, pathologist.

Headquarters for peanut production; improvement and disease investigations conducted cooperatively at various field locations. V. R. BOSWELL, horticulturist.

Toxic effects and accumulation of agricultural chemicals in soils. A. C. FOSTER, pathologist.

Vegetable-seed culture, production, and standardization. E. H. TOOLE, physiologist.

Potato production and soil fertility investigations. H. A. JONES, horticulturist.

Potato breeding and genetics. F. J. STEVENSON, geneticist.

Potato disease investigations. E. S. SCHULTZ, pathologist.

Onion breeding and genetics. H. A. JONES, horticulturist.

*Basic studies of plant growth and development.*—Investigations of the effects of synthetic growth-regulating substances on plants, the physiological mechanism involved in the killing action of herbicides, and evaluation of plant-growth-regulating substances from agricultural sources. J. W. MITCHELL, physiologist.

Investigations of the effects of light on the growth and development of plants. H. A. BORTHWICK, physiologist.

Investigations on spectrographic studies. A. W. SPECHT.

### **Soils Group**

*Fertilizer and Agricultural Lime.*—Investigates technology, properties, and use of fertilizers, liming materials, and soil amendments. K. D. JACOB, chemist.

Fertilizer materials. W. L. HILL, chemist.

Mixed fertilizers. K. G. CLARK, chemist.

Liming materials. C. W. WHITTAKER, chemist.

Fertilizer supplies and consumption trends. J. R. ADAMS, chemist.

Fertilizer analysis laboratory. W. M. HOFFMAN, chemist.

*Soil Management and Irrigation Agriculture.*—Soil management and irrigation research. Organizes and directs research in soil management and improvement practices under field conditions, as related to soil type, climate, and other factors in humid, dry-land, and irrigated regions. R. Q. PARKS, soil scientist.

Basic soil and plant relationships. Studies relating to types of soil, their physical and chemical composition and properties, basic fertility, chemical, physical, and biological changes occurring in soils, processes of plant nutrition, and the relationship of various factors to crop production and quality. L. T. ALEXANDER, soil scientist.

Soil analysis laboratory supporting soil classification. V. J. KILMER, soil scientist.

Minor elements in soils and plants. W. O. ROBINSON, chemist.

Availability of potash and lime in soils. R. F. REITEMEIER, soil scientist.

Phosphates in relation to soil fertility and plant growth. L. A. DEAN, soil scientist.

Biochemistry and physics as related to soil, fertilizer, and plant research. S. B. HENDRICKS, chemist.

Soil microbiology with reference to legumes. L. W. ERDMAN, bacteriologist.

Nitrogen and organic matter in relation to soils and plant growth. F. E. ALLISON, chemist.

Research with radioactive materials. L. T. ALEXANDER, soil scientist.

*Soil Survey*.—National headquarters. Soil types are identified, defined, and classified on the basis of their characteristics, and county soil maps are prepared showing their distribution. Soil survey reports are written, describing the soil types in terms of both their morphology and their crop adaptability and production under farm practices. This work is carried on cooperatively with the State agricultural experiment stations throughout the country and in many counties with the Soil Conservation Service or other interested Federal agencies. Soil maps and relevant soil data are used to guide programs of agricultural production, adjustment, and conservation and for the demonstration and extension of scientific and practical farm practices and rural utilization.

Supervision of soil classification and soil survey correlation for the United States as a whole. J. K. ABLEITER, soil scientist.

Interpretation of soil classification and mapping throughout the country as it relates to soil use and productivity, crop adaptability, and soil management. W. H. ALLAWAY, soil scientist.

Supervision of soil classification and soil survey correlation in Northern States. (Soil Survey Office, Northeastern and North Central States.) G. D. SMITH, soil scientist.  
*Subheadquarters*: Ames, Iowa; St. Paul, Minn.; Durham, N. H.; Ithaca, N. Y.; Columbus, Ohio; Madison, Wis.

Soil-map compilation and drafting. H. W. WHITLOCK, cartographic engineer.

### *National Arboretum*

*United States National Arboretum Herbarium.*—Develops and maintains collection of plant specimens available for reference to scientists, students, and others. H. A. GUNNING, assistant director. W. A. ARCHER, botanist, curator of plant specimen collection.

**Agricultural Research Center.**—About 17 miles from Washington and 2 miles east of Beltsville. Bus on Washington-Baltimore Boulevard. Station about 1½ miles east of boulevard.

### *Agricultural Engineering Group*

The Divisions of Agricultural Engineering carry on research under the following four Divisions.

*Farm Buildings and Rural Housing.*—Headquarters for field studies of storage of grain, potatoes, and apples directed from Ames, Iowa; livestock-building studies at Urbana, Ill.; Columbia, Mo.; and Davis, Calif.

The following studies are conducted at the Agricultural Research Center:

Investigations of environmental factors influencing development, production, and health of poultry (cooperation with Bureau of Animal Industry). H. L. GARVER, agricultural engineer.

Investigations in planning, equipping, remodeling, and constructing farmhouses. Studies are aimed at developing efficient, economical arrangements of rooms and equipment, improved summer and winter comfort, and low construction and maintenance costs (cooperation with Bureau of Human Nutrition and Home Economics, Farmers Home Administration, and State agricultural colleges). J. R. DODGE, architect.

Preparation of plans for farm-service buildings and farmhouses and information on farm structures that are available to farmers through the State extension services (cooperation with Bureau of Human Nutrition and Home Economics, Farmers Home Administration, and State agricultural colleges). J. R. DODGE, architect.

*Farm Electrification.*—Headquarters for studies on the control of insects by electrical methods.

The harvesting, curing, and storing of field-cured, forced-ventilation, barn-cured, and ensiled forages; their value as feed for dairy cattle (cooperation with Bureau of Dairy Industry, Production and Marketing Administration, and the Division of Forage Crops and Diseases); investigations of the effect of ultraviolet radiation on the health and egg production of hens (cooperation with Bureau of Animal Industry); ultrasonic energy application to agricultural use (cooperation with Division of Cereal Crops and Diseases); determination of requirements of stand-by generating equipment for individual farms (cooperation with Delaware, New Jersey, New York, North Dakota, Ohio, and Virginia Agricultural Experiment Stations). L. E. CAMPBELL, agricultural engineer.

Development of egg candling and automatic egg grading equipment (cooperation with Bureau of Animal Industry and Production and Marketing Administration). K. H. NORRIS, agricultural engineer.

Investigations on construction and operation of general-purpose farm refrigeration units (cooperation with Bureau of Human Nutrition and Home Economics; Washington, Texas, and Maryland State Agricultural Experiment Stations). H. L. GARVER, agricultural engineer.

*Farm Machinery.*—Investigations to determine the most effective placement of commercial fertilizer for the various food and other crops and to determine the best machine design and construction for durability and accurate metering and proper placement of fertilizers in different forms (cooperation with State agricultural experiment stations in 17 States and with 8 implement manufacturers). G. A. CUMINGS, agricultural engineer.

Investigations of the use of airplane spraying equipment for control of forest insect pests (cooperation with Bureau of Entomology and Plant Quarantine). D. A. ISLER, agricultural engineer.

*Mechanical Processing of Farm Products.*—Headquarters for field station activities on cotton ginning, fiber flax processing, special fiber crops, and facilities and equipment for rural plants in processing food crops and livestock feed. W. M. HURST, agricultural engineer.

*Forage Crops and Diseases.*—Nutritional studies of grass and legume production under various cultural and management conditions; studies on nitrogen fractions of proteins. (Cooperation with Bureau of Animal Industry.) H. L. WILKINS, chemist.

### Glenn Dale

**United States Plant Introduction Garden.**—Sixteen miles from Washington, D. C. Can be reached by Greyhound Bus to the Glenn Dale Sanatorium, which is about  $\frac{1}{2}$  mile south of station. Visitors will be met when arrangements are made in advance.

*Plant Exploration and Introduction.*—Propagation, testing, and distribution of rare and valuable economic and ornamental plants from foreign countries and United States possessions; propagation under quarantine detention of foreign plants where required by law. J. L. CREECH, horticulturist.

### Upper Marlboro

*Jay Dee Experiment Farm, State Agricultural Experiment Station (cooperative investigations).*—Approximately 4 miles north of Upper Marlboro on the road leading to Largo, Md.

*Tobacco, Medicinal, and Special Crops.*—Investigations on Maryland tobacco, including development of improved strains and varieties through breeding and selections; effects of preceding crops on tobacco; effects of water supply on the crop; fertilizer requirements; relation of magnesium, calcium, sulfur, and other elements to the nutrition of the tobacco plant. J. D. BOWLING, biochemist.

## MASSACHUSETTS

### East Wareham

*Cranberry Substation, State Agricultural Experiment Station (cooperative investigations).*—Mail address, East Wareham; railroad station, Onset (New York, New Haven & Hartford R. R.).

*Fruits and Nut Crops and Diseases.*—Investigations of cranberry diseases, especially false blossom and fruit rots;

and oxygen deficiency of bog water; cranberry breeding; testing of cranberry seedlings and selections and of blueberry selections. H. F. BERGMAN, pathologist.

## MICHIGAN

### East Lansing

*State Agricultural Experiment Station (cooperative investigations).*—East Lansing is about 3 miles from Lansing. Take intercity bus in Lansing marked "College," going east on Michigan Avenue to Abbot Road. College campus is about 2 blocks from there.

*Farm Machinery.*—Investigations to develop machinery for reducing the labor and cost of producing and harvesting sugar beets. G. W. FRENCH, agricultural engineer. In Agricultural Hall.

*Forage Crops and Diseases.*—Soybean investigations. H. R. PETTIGROVE, collaborator.

*Mechanical Processing of Farm Products.*—Fruit and vegetable handling and processing methods and equipment. J. H. LEVIN, agricultural engineer. In Department of Agricultural Engineering.

*Soil Survey.*—Subheadquarters, Northern States. See Maryland, Beltsville: Soil Survey Office. S. D. ALFRED, soil scientist.

*Sugar Plant Investigations.*—Agronomic investigations with sugar beets. J. G. LILL, agronomist. In Agricultural Hall.

Sugar beet black root investigations. H. W. BOCKSTAHLER, plant pathologist. In Sugar Plant Headhouse and Greenhouse, Farm Lane.

*Vegetable Crops and Diseases.*—Breeding improved and disease-resistant varieties of beans; control of bean diseases. A. L. ANDERSON, pathologist.

Potato-breeding investigations. Directed from Beltsville, Md.; local supervision by E. J. WHEELER and H. C. MOORE, collaborators.

Accumulation of toxic agricultural chemicals in soils. R. L. CAROLUS, collaborator.

*Weed Investigations.*—To develop methods of controlling weeds, especially in sugar beets. B. H. GRIGSBY, agent. In Department of Botany and Plant Physiology.

## MINNESOTA

### East Grand Forks

*Red River Valley Potato Research Center (cooperative with Red River Valley Potato Growers' Association, Minnesota and North Dakota Agricultural Experiment Stations).*—On U. S. No. 2, about  $\frac{1}{2}$  mile east of Great Northern Railway station in East Grand Forks, Minn.; 2 miles from Great Northern Railway station in Grand Forks, N. Dak.;  $\frac{3}{4}$  mile from Northern Pacific Railway station in East Grand Forks, Minn. P. O. Box 113, East Grand Forks, Minn.

*Farm Buildings and Rural Housing.*—Studies of buildings for potato storage and handling; headquarters for studies of potato storage at New Brunswick, N. J. A. D. EDGAR, agricultural engineer.

*Farm Machinery.*—Investigations of machinery for harvesting and handling potatoes. A. H. GLAVES, agricultural engineer.

*Handling, Transportation, and Storage of Horticultural Crops.*—Investigations in the handling, transportation, and storage of potatoes. J. M. LUTZ, physiologist.

### St. Paul

*State Agricultural Experiment Station (cooperative investigations).*—University Farm is about 4 or 5 miles from downtown Minneapolis or St. Paul. Take St. Paul streetcar from Minneapolis, or Minneapolis streetcar from St. Paul to University Avenue and Raymond Avenue; take the Raymond Avenue bus to within 1 block of station.

*Cereal Crops and Diseases.*—Agronomic and disease investigations of spring and winter wheat, including varietal comparisons, breeding and genetic studies, with special reference to disease resistance and winter hardiness. (Test-

ing of varieties and other studies conducted at Waseca, Morris, Crookston, Grand Rapids, and Duluth branch stations.) E. R. AUSEMUS, agronomist and regional coordinator for hard red spring wheat.

Research on the distribution, pathogenicity, origin, and other characteristics of races of leaf rust of wheat in the hard red spring wheat area and of leaf rust of barley throughout the United States; studies on the relationship of environmental factors to prevalence and distribution of parasitic races; tests of cereal varieties for reaction to pure rust races as an aid in breeding for resistance; and determinations on the effect of leaf rust on the productivity and quality of cereal varieties under field conditions. M. N. LEVINE, pathologist.

Agronomic, disease, and quality investigations of flax, including varietal comparisons, breeding and genetic studies, and study of fiber qualities of seed-flax straw. (Testing of varieties and other studies also conducted at Waseca, Morris, Crookston, and Grand Rapids branch stations.) J. O. CULBERTSON, agronomist.

Investigations on wheat stem rust. E. C. STAKMAN, collaborator.

*Farm Machinery.*—Investigations of machinery for weed control. [Vacancy.]

*Forage Crops and Diseases.*—Soybean disease investigations. M. F. KERNKAMP, collaborator.

Soybean breeding and cultural investigations. J. W. LAMBERT, collaborator.

*Fruit and Nut Crops and Diseases.*—Fruit breeding. W. H. ALDERMAN, collaborator.

*Soil Survey.*—Subheadquarters, Northern States. See Maryland, Beltsville: Soil Survey Office. I. J. NYGARD, soil scientist. Division of Soils, University Farm.

*Sugar Plant Investigations.*—Sugar beet black root investigations. C. L. SCHNEIDER, pathologist.

*Vegetable Crops and Diseases.*—Investigations on potato culture, breeding, and diseases. F. A. KRANTZ, collaborator.

*Weed Investigations.*—Studies on the control of noxious weeds, including the effect of tillage, cropping, and herbi-

cides. Emphasis on perennial weeds. J. H. MILLER, agronomist. In Department of Plant Breeding and Genetics.

## MISSISSIPPI

### Gulfport

*United States Forest Pathology Field Laboratory (cooperation with Forest Service).*—208 Kremer Building. Within 5 blocks of railroad station.

*Forest Pathology.*—Investigations of decays and disease defects of lumber and other forest products, including sap stains. A. F. VERRALL, pathologist.

### Jackson

*Cotton Field Office (in cooperation with State Extension Services of Mississippi Valley States).*—314 Post Office Building. Can be reached by bus.

*Cotton and Other Fiber Crops and Diseases.*—Regional office for cotton improvement in standardized one-variety communities in Mississippi Valley States. J. E. HITE, agronomist.

### Meridian

*United States Horticultural Field Station.*—Seven miles northeast of post office on Russell-Marion road. Can be reached from U. S. Nos. 45 and 80. A. C. GOSSARD, superintendent.

*Fruit and Nut Crops and Diseases.*—Grape, pear, and strawberry investigations. N. H. LOOMIS, horticulturist.

Pecan production and improvement investigations. A. C. GOSSARD, horticulturist.

*Handling, Transportation, and Storage of Horticultural Crops.*—Investigations in the handling, transportation, and storage of fruits, vegetables, and other horticultural crops. L. J. KUSHMAN, physiologist.

*Vegetable Crops and Diseases.*—Sweetpotato and other vegetable investigations. M. T. DEONIER, olericulturist.

*United States Sugar Plant Field Laboratory (cooperative investigations).*—Adjacent to United States Horticultural Field Station.

*Sugar Plant Investigations.*—Agronomic and breeding experiments with sugarcane and sugar sorghum for sirup. I. E. STOKES, agronomist.

### Poplarville

*South Mississippi Branch Experiment Station, State Agricultural Experiment Station (cooperative investigations).*—On State Route 35, about 13 miles west of Poplarville, Miss., and 13 miles east of Bogalusa, La.

*Farm Machinery.*—Investigations of tung nut production, gathering, and handling equipment. General supervision by I. F. REED, Auburn, Ala.; local supervision by R. E. JEZEK, agricultural engineer.

*Fruit and Nut Crops and Diseases.*—Tung investigations. Directed by G. F. POTTER, Bogalusa, La.

### Saucier

*United States Forest Pathology Field Laboratory (cooperation with Forest Service).*—Located at Harrison Experimental Forest of the Southern Forest Experiment Station. About 20 miles north of Gulfport, Miss. Communicate with station for transportation.

*Forest Pathology.*—Investigations of diseases of conifers, including nursery disease investigations, in the southern region. B. W. HENRY, pathologist.

### State College

*State Agricultural Experiment Station (cooperative investigations).*—Mississippi State College is on Mississippi Route 12 at its junction with U. S. No. 82. Bus station is in Starkville, 2 miles from campus. Bus also stops on campus if flagged. State College can also be reached by taking the Southern Airways to Columbus, Miss., or by the Gulf, Mobile & Ohio Railroad to Artesia, Miss. Transportation from these points to State College can be arranged by communicating with station personnel.

*Cereal Crops and Diseases.*—Breeding corn for the South; breeding sweet corn for canning purposes and popcorn; per-

formance trials of corn hybrids and the development of improved methods of breeding corn (cooperation with the Bureau of Entomology and Plant Quarantine). R. C. ECKHARDT, agronomist.

Diseases of small grains. Investigations of the various diseases of wheat, oats, barley, and rye as a basis for breeding. T. E. SUMMERS, pathologist.

*Cotton and Other Fiber Crops and Diseases.*—Cotton disease investigations. A. B. WILES, agent.

Cotton improvement in standardized one-variety communities. T. M. WALLER, agent.

*Farm Machinery.*—Coordination of the investigations of cotton mechanization in the cotton-producing States. R. F. COLWICK, agricultural engineer.

*Forage Crops and Diseases.*—Grass and forage improvement, and pasture and range investigations. H. W. BENNETT, agent.

Grass and legume seed production studies. W. E. KNIGHT, agent.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under humid conditions; cotton and corn fertilization and culture; effect of fertilization and deep-rooted cover crops on soil properties and productivity. H. V. JORDON, soil scientist.

*Vegetable Crops and Diseases.*—Sweetpotato improvement, testing, and cultural investigations. Accumulation of toxic agricultural chemicals in soil. Breeding and testing improved vegetable strains and varieties for superior adaptation (cooperation with United States Regional Vegetable Breeding Laboratory at Charleston, S. C.). W. S. ANDERSON, collaborator.

*Weed Investigations.*—Investigations on the control of weeds in field crops and pastures, with emphasis on nutgrass control. V. C. HARRIS, agronomist. In Department of Plant Pathology and Physiology.

### Stoneville

*Delta Branch Station, State Agricultural Experiment Station (cooperative investigations).*—Near Stoneville, 1

mile from Leland (Illinois Central R. R.) and 9 miles east of Greenville (Columbus & Greenville Ry. and Illinois Central R. R.).

*Farm Machinery.*—Investigations to develop and improve methods and equipment for the production and harvesting of cotton. E. B. WILLIAMSON, agricultural engineer.

*Forage Crops and Diseases.*—Investigations on breeding and culture of soybeans in relation to their adaptation to industrial utilization. (Regional headquarters for soybean investigations in the 12 Southern States.) E. E. HARTWIG, agronomist.

Soybean disease investigations. R. A. KILPATRICK, pathologist.

Forage crop disease investigations. H. W. JOHNSON, pathologist.

*Weed Investigations.*—The control of weeds in cotton. J. T. HOLSTUN, JR., agronomist.

**United States Cotton Field Station** (*cooperation with State Agricultural Experiment Station*).—Adjoining the Mississippi Delta Branch Station, 1 mile from Leland and 9 miles east of Greenville. Communicate with J. B. DICK, agronomist, regarding transportation.

*Cotton and Other Fiber Crops and Diseases.*—Cotton breeding, physiology, cotton genetic and cytogenetic investigations, culture, and improvement; cotton disease control. J. B. DICK, agronomist.

**United States Cotton Ginning Laboratory** (*cooperation with Production and Marketing Administration and the State Agricultural Experiment Station*).—About 2 miles from Leland, Miss. Located across Deer Creek from the Delta Branch Substation, State Agricultural Experiment Station.

*Mechanical Processing of Farm Products.*—Cotton ginning investigations, including seed-cotton storage, cleaning, drying, ginning, and cottonseed conditioning and storage. C. M. MERKEL, agricultural engineer. Under general supervision of C. A. BENNETT, agricultural engineer.

## MISSOURI

## Columbia

*State Agricultural Experiment Station (cooperative investigations).*—Within 2 miles of the railroad station (Wabash R. R. and Missouri-Kansas-Texas R. R.).

*Cereal Crops and Diseases.*—Genetic investigations of corn and corn relatives. Studies of the frequency and nature of mutations induced by radiations. L. J. STADLER, agent. In 202 Curtis Hall.

Breeding field corn hybrids adapted to Missouri and similar areas, with special reference to yield, resistance to lodging, and disease and insect resistance. Breeding white corn hybrids suitable for dry milling. M. S. ZUBER, agronomist. In 109 Curtis Hall.

Cytogenetic investigations with wheat and wheat relatives. The development of improved methods of breeding wheat. E. R. SEARS, geneticist. In Curtis Hall.

Small grain improvement, wheat, oats, and barley. J. M. POEHLMAN, collaborator.

*Farm Buildings and Rural Housing.*—Investigations of the effect of environmental factors on the growth, health, and production of dairy animals (cooperation with Bureau of Dairy Industry and Bureau of Animal Industry). H. J. THOMPSON, agricultural engineer.

*Farm Machinery.*—Investigations of machinery for weed control. R. E. LARSON, agricultural engineer.

*Forage Crops and Diseases.*—Grass culture and pasture investigations. E. M. BROWN, agronomist.

Miscellaneous legume culture and production investigations. J. D. BALDRIDGE, agronomist.

Investigations on breeding and culture of soybeans in relation to their adaptation to industrial utilization. L. F. WILLIAMS, agronomist.

Soybean diseases. C. M. TUCKER, collaborator.

*Weed Investigations.*—Investigations on the control of weeds and brushy species. To coordinate Bureau weed research program in North Central States. L. M. STAHLER, agronomist. In Department of Field Crops.

*United States Forest Pathology Field Laboratory (cooperation with University of Missouri and U. S. Bureau of Entomology and Plant Quarantine).*—Room 102, Building T-9, University of Missouri. Can be reached by bus from railroad and bus stations.

*Forest Pathology.*—Investigations of oak wilt and its control. T. W. BRETZ, pathologist.

## MONTANA

### Bozeman

*State Agricultural Experiment Station (cooperative investigations).*—About 2 miles from Bozeman (Northern Pacific Ry.; Northland Greyhound bus). Can be reached by bus or taxi.

*Cereal Crops and Diseases.*—Breeding and genetic studies of wheat for quality, hardiness, yield, and disease and insect resistance, including wheat stem sawfly. Studies on physiologic races of bunt. Breeding flax for yield and disease resistance; breeding oats for yield, quality, and smut resistance; breeding barley for yield, disease resistance, and malting quality. F. H. McNEAL, agronomist.

*Forage Crops and Diseases.*—Pasture and range investigations. R. E. STITT, agronomist.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under irrigation. W. E. LARSON, agent (soil scientist).

*Soil Survey.*—Subheadquarters, Great Plains States. See Nebraska, Lincoln: Soil Survey Office. W. C. BOURNE, soil scientist. In Agronomy and Soils Department.

### Havre

*North Montana Branch Station, State Agricultural Experiment Station (cooperative investigations).*—Eight miles southwest of Havre (Great Northern Ry.) on U. S. No. 87. Can be reached by bus, or transportation arrange-

ments can be made by communicating with **J. J. STURM**, superintendent.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under dry-land conditions. **L. O. BAKER**, agent (agronomist).

### Huntley

*Huntley Branch Station, State Agricultural Experiment Station (cooperative investigations).*—Four miles east of Huntley (Northern Pacific Ry.) on U. S. No. 10. Can be reached by Greyhound bus, or local train will discharge passengers at station stop known as Osborn. Transportation arrangements can be made by communicating with **T. S. AASHEIM**, superintendent.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under dry-land conditions; regrassing studies. **A. E. SEAMANS**, agronomist. Soil management and crop production under irrigation. Directed from Bozeman, Mont., by **W. E. LARSON**, soil scientist; local supervision by **T. S. AASHEIM**, agent (agronomist).

### Missoula

*United States Forest Pathology Field Laboratory (cooperation with State Agricultural Experiment Station and U. S. Forest Service).*—3025 Post Office Building. Within 5 blocks of railroad and bus stations.

*Forest Pathology.*—Investigations of forest-tree diseases, including pole blight of western white pine. **C. D. LEAPHART**, pathologist.

### Moccasin

*Central Montana Branch Station, State Agricultural Experiment Station (cooperative investigations).*—About 2 miles west of Moccasin (Great Northern Ry.) on U. S. No. 87. Can be reached by Northland Greyhound bus, or transportation arrangements can be made by communicating with **R. M. WILLIAMS**, superintendent.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under dry-land conditions;

grazing and winter feeding experiments; methods of seeding winter wheat in crop residues (cooperative with Soil Conservation Service). R. M. WILLIAMS, agent (agronomist).

## NEBRASKA

### Lincoln

*State Agricultural Experiment Station (cooperative investigations).*—University Farm is about 3 miles northeast of the center of the city. Can be reached by busses marked "Agricultural College," "University Place," "Betheny," and "Havelock" from Thirteenth and O Streets.

*Cereal Crops and Diseases.*—Agronomic and disease investigations of wheat and oats, including varietal comparisons, breeding, and genetic studies, and studies on winter hardiness of wheat and disease resistance of wheat and oats. (Testing of small-grain varieties also conducted at North Platte, Alliance, and Scotts Bluff substations.) L. P. RETZ, agronomist and regional coordinator for hard red winter wheat.

Agronomic and disease investigations of grain sorghums and barley. O. J. WEBSTER, grain sorghum project leader.

*Farm Electrification.*—Use of radio-frequency and infrared energy for drying and conditioning of farm products and insect control in stored grain (cooperation with Bureau of Entomology and Plant Quarantine). L. H. SODERHOLM, agricultural engineer.

*Forage Crops and Diseases.*—Alfalfa culture, production, breeding, and improvement investigations. H. O. GRAUMANN, agronomist.

Sweetclover culture, production, breeding, and improvement investigations. G. T. WEBSTER, agronomist.

Grass breeding, improvement, and pasture investigations. L. C. NEWELL, agronomist.

*Weed Investigations.*—The control of weeds and brush on grasslands. D. L. KLINGMAN, agronomist. In Department of Agronomy.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under dry-land and irrigated conditions. H. F. RHOADES, agent (agronomist).

*Soil Survey Office, Great Plains States.*—Located at Nebraska Hall, University of Nebraska, City Campus, fourth building on west side of Twelfth Street, north of intersection of Twelfth and R Streets. Entrance south side of building.

*Soil Survey.*—Soil types are identified, defined, and classified on the basis of their characteristics, and county soil maps are prepared showing their distribution. Soil survey reports are written, describing the soil types in terms of both their morphology and their crop adaptability and production under farm practices. This work is carried on cooperatively with the State agricultural experiment stations of the region and in many counties with the Soil Conservation Service or other interested Federal agencies. Soil maps and relevant soil data are used to guide regional programs of agricultural production, adjustment, and conservation, and for the demonstration and extension of scientific and practical farm practices and rural-land utilization. The work of the senior soil correlators, correlators, analyst, and other soil scientists is under the supervision of W. M. JOHNSON, soil scientist. *Subheadquarters:* Manhattan, Kans.; Bozeman, Mont.; Fargo, N. Dak.; Mandan, N. Dak.; Stillwater, Okla.; Brookings, S. Dak.; College Station, Tex.

### Mitchell

*Scotts Bluff Substation, State Agricultural Experiment Station (cooperative investigations).*—Five miles east of Mitchell, or 5 miles north and 1¼ miles west of Scottsbluff (Chicago, Burlington & Quincy R. R. to either Mitchell or Scottsbluff). Transportation arrangements can be made by communicating with LIONEL HARRIS, superintendent.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under irrigation; irrigated rotations and tillage experiments; varietal tests of alfalfa and other field crops; fertilization of potatoes and sugar beets; livestock investigations. LIONEL HARRIS, agent (agronomist).

### North Platte

*North Platte Experimental Substation, State Agricultural Experiment Station (cooperative investigations).*—

Three miles south of North Platte (Union Pacific R. R.) on U. S. No. 83. Transportation arrangements can be made by communicating with J. C. ADAMS, superintendent.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under dry-land conditions. R. E. RAMIG, agent (soil scientist).

## NEVADA

### Fallon

*Newlands Field Station, State Agricultural Experiment Station (cooperative investigations).*—One mile south of Fallon (Southern Pacific R. R.). Can be reached by taxi, or transportation arrangements can be made by communicating with J. A. McCORMICK, superintendent.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under irrigation. J. A. McCORMICK, collaborator.

### Reno

*State Agricultural Experiment Station, University of Nevada (cooperative investigations).*—About 1 mile north-east of railroad station (Union Pacific R. R.).

*Forage Crops and Diseases.*—Alfalfa breeding, improvement, and disease investigations. O. F. SMITH, agronomist.

## NEW HAMPSHIRE

### Durham

*State Agricultural Experiment Station, University of New Hampshire (cooperative investigations).*—Located in center of town. Can be reached by streetcar, taxi, or bus.

*Soil Survey.*—Subheadquarters, Northern States. See Maryland, Beltsville: Soil Survey Office. W. H. LYFORD, agent (soil scientist). Nesmith Hall, College of Agriculture.

**NEW JERSEY****New Brunswick**

*State Agricultural Experiment Station (cooperative investigations).*—School of Agriculture, Rutgers University. Can be reached by taxi or city bus from railroad station (Pennsylvania R. R.).

*Farm Buildings and Rural Housing.*—Studies of white potato storage. Directed from East Grand Forks, Minn. Local supervision, B. C. HAYNES, JR., agricultural engineer. In Agricultural Engineering Building.

*Fruit and Nut Crops and Diseases.*—Investigation of diseases of cranberries and blueberries. (Field work conducted at various points in New Jersey.) A. C. GOHEEN, pathologist. Breeding of blueberries. Directed from Beltsville, Md.

*Vegetable Crops and Diseases.*—Toxicity of and accumulation of agricultural chemicals in soil. B. B. PEPPER, collaborator.

*Weed Investigations.*—Investigations on the control of weeds in horticultural crops, field crops, and grasslands. R. J. ALDRICH, agent. In Department of Farm Crops.

**NEW MEXICO****Albuquerque**

*United States Forest Pathology Field Laboratory (cooperation with National Park Service and Forest Service).*—310 Post Office Building. Within 5 blocks of railroad and bus stations.

*Forest Pathology.*—Investigations of diseases that affect timber stands, reduce lumber production, and influence logging operations; diseases of young natural stands and plantations; and diseases of trees in national parks and monuments. L. S. GILL, pathologist.

**Mesilla Park**

*United States Cotton Ginning Branch Laboratory (cooperation with Production and Marketing Administration and the New Mexico Agricultural Experiment Sta-*

tion).—One mile from the New Mexico A. & M. College; approximately 3 miles from Las Cruces, and 1 mile from the Atchison, Topeka & Santa Fe Railway station at Mesilla Park. Transportation arrangements should be made in advance with field engineer.

*Mechanical Processing of Farm Products.*—Cotton ginning investigations. New developments and cotton gin adaptations for arid conditions, trash disposal, static electricity, and roller gins. V. L. STEDRONSKY, agricultural engineer. Under general supervision of C. A. BENNETT, agricultural engineer, Stoneville, Miss.

### State College

*State Agricultural Experiment Station (cooperative investigations).*—One-half mile from Atchison, Topeka & Santa Fe Railway station at Mesilla Park (3 miles south of Las Cruces, N. Mex.). Can be reached by Continental and Frontier airlines; Greyhound and Burlington Trailways bus lines. Visitors will be met by automobile.

*Cotton and Other Fiber Crops and Diseases.*—Investigations in cotton breeding and improvement, genetics, and promotion of farm use of improved seed stocks. A. R. LEDING, agronomist and superintendent.

Cotton disease investigations. L. M. BLANK, pathologist.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under irrigated and dry-land conditions, with special emphasis on soil fertility and alkali and saline reclamation of irrigated lands. R. W. LEAMER, soil scientist.

*Sugar Plant Investigations.*—Sugar beet breeding and variety testing; experiments on sugar beet seed production. J. C. OVERPECK, agent.

Morphological studies on sugar plants. ERNST ARTSCHWAGER, botanist.

### Tucumcari

*Northeastern New Mexico Substation, State Agricultural Experiment Station (cooperative investigations).*—Three miles northeast of Tucumcari (Chicago, Rock Is-

land, & Pacific Ry. and Southern Pacific R. R.) on U. S. Nos. 66 and 54. Transportation may be arranged by calling D. H. WILLIAMS, superintendent.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under irrigation. C. G. PAINTER, soil scientist.

Soil management and crop production investigations under dry-land conditions. D. R. BURNHAM, agronomist.

## NEW YORK

### Farmingdale

*The Long Island Agricultural and Technical Institute (cooperative investigations).*—Can be reached by Long Island train out of Pennsylvania station, New York.

*Ornamental-Plant Crops and Diseases.*—Investigations on culture and disease control of flower bulbs and other floricultural crops. Directed from Beltsville, Md.; local supervision by W. A. FEDER, agent.

### Hicksville

*Nematode Research Laboratory (cooperation with Bureau of Entomology and Plant Quarantine, New York State Department of Agriculture and Markets, and the Agricultural Experiment Station at Cornell University).*—On Union Avenue, R. F. D. No. 2.

*Nematology Investigations.*—Greenhouse, field, and laboratory investigations on life history and control of the golden nematode of potatoes and on other regional plant nematode problems, with special emphasis on soil fumigation. F. J. SPRUYT, nematologist.

### Ithaca

*Agricultural Experiment Station, Cornell University (cooperative investigations).*—About 1½ miles east of Delaware, Lackawanna & Western and Lehigh Valley Railroad stations and 1 mile west of New York Central railroad station. Take bus to campus and walk ¼ mile to Agricultural College.

*Cereal Crops and Diseases.*—Investigations of cytology and embryogeny of corn. L. F. RANDOLPH, agent.

*Forage Crops and Diseases.*—Alfalfa breeding and seed production studies. S. S. ATWOOD, collaborator.

*Soil Survey.*—Subheadquarters, Northern States. See Maryland, Beltsville: Soil Survey Office. M. G. CLINE, agent (soil scientist). In Department of Agronomy.

*Vegetable Crops and Diseases.*—Potato breeding investigations. Directed from Beltsville, Md.; local supervision by J. R. LIVERMORE, L. C. PETERSON, and MARION MEADOWS, collaborators.

**United States Plant, Soil, and Nutrition Laboratory.**—About 4 miles from Ithaca (Lehigh Valley R. R., Robinson airlines, Greyhound bus lines) on Tower Road. Can be reached by local bus or taxi.

*United States Plant, Soil, and Nutrition Laboratory.*—Basic research concerning the effects on human and animal nutrition of the interrelationships between soils and the nutritional quality of plants, including studies of the effects of soil and geological conditions on the composition of forage and other crops relation to nutritional troubles in animals; factors involved in the production of crops of high nutritive value; effect of environment soil type and soil management on the nutritive quality in crops as measured by animal growth, health, and reproduction; nutrition of animals in relation to certain endemic diseases, with particular emphasis on the micronutrient elements; and the development and application of radioisotope techniques in soil, plant, and animal research. K. C. BEESON, director.

## New York

*United States Market Pathology Laboratory (cooperation with Production and Marketing Administration).*—Room 1022, 641 Washington Street, New York 14.

*Handling, Transportation, and Storage of Horticultural Crops.*—Investigations in the handling, transportation, and storage of fruits and vegetables, with particular reference to diseases that cause spoilage during transit and on the market. [Vacancy], pathologist.

## Syracuse

*New York State College of Forestry (cooperation with New York State College of Forestry, U. S. Bureau of Entomology and Plant Quarantine, and Forest Service).*—Can be reached by streetcar from railroad and bus stations.

*Forest Pathology.*—Investigations of white pine blister rust. R. R. HIRT, agent.

## NORTH CAROLINA

### Asheville

*United States Forest Pathology Field Laboratory (cooperation with Forest Service and Bureau of Entomology and Plant Quarantine).*—Located at Southeastern Forest Experiment Station, 223 Federal Building. Can be reached by bus from railroad and bus stations.

*Forest Pathology.*—Investigations of diseases that affect timber stands, including heart rots, root rots, cankers, and little leaf disease of pine; and diseases of street and shade trees, including mimosa wilt. G. H. HEPTING, pathologist.

### Oxford

*Tobacco Branch Station, State Department of Agriculture, and State Agricultural Experiment Station (cooperative investigations).*—One mile southwest of Oxford (Seaboard Air Line R. R. and Southern Ry.). J. M. CARR, superintendent.

*Farm Electrification.*—Research to determine fundamental properties of bright-leaf tobacco relevant to curing; to study the effects of curing tobacco with forced movement of air in the curing barn; to improve furnace designs; and to develop a progressive type of temperature control. A unit for continuous operation for curing bright-leaf tobacco has been constructed (cooperation with Division of Tobacco, Medicinal, and Special Crops). H. B. PUCKETT, agricultural engineer.

*Tobacco, Medicinal, and Special Crops.*—Flue-cured and aromatic tobacco investigations, including cropping tests;

fertilizer requirements, especially nutrient elements not ordinarily considered in fertilizer practice; tobacco breeding; improvements in tobacco curing. J. M. CARR, agronomist.

Control of black shank, wilt, root knot, and other tobacco diseases with particular emphasis on breeding for quality and disease resistance. E. L. MOORE, pathologist.

### Raleigh

*State Agricultural Experiment Station (cooperative investigations).*—West Raleigh, 2 miles west of Raleigh (Seaboard Air Line R. R. and Southern Ry.; Capital, Eastern, and Piedmont airlines; Greyhound and Trailways bus lines). Can be reached by local bus.

*Cereal Crops and Diseases.*—Corn improvement investigations, dealing chiefly with breeding problems in connection with the development of hybrid strains suitable for all sections of North Carolina. Work in cultural and fertilizer practices is in cooperation with the Division of Soil Management and Irrigation Agriculture. P. H. HARVEY, agronomist.

Diseases of small grains. Investigations of diseases of wheat, oats, barley, and rye as a basis for breeding programs. J. G. MOSEMAN, pathologist.

*Cotton and Other Fiber Crops and Diseases.*—Investigations in cotton quality, genetics, and physiology. S. G. STEPHENS, collaborator.

Investigations in cotton breeding and improvement. P. H. KIME, agronomist.

Cotton improvement in standardized one-variety communities (cooperation with Agricultural Extension Service of the North Carolina College of Agriculture). J. A. SHANKLIN, agronomist.

*Forage Crops and Diseases.*—Miscellaneous legume breeding and improvement investigations. C. H. HANSON, agronomist.

Investigations on breeding and culture of soybeans in relation to their adaptation to industrial utilization. H. W. JOHNSON, agronomist.

Forage crop disease investigations. J. L. ALLISON, pathologist.

*Fruit and Nut Crops and Diseases.*—Breeding and production investigations on muscadine grapes and bramble berries. C. F. WILLIAMS, horticulturist.

Blueberry and strawberry breeding and production investigations. E. B. MORROW, State Agricultural Experiment Station.

*Mycology and Disease Survey.*—Research on forecasting plant disease epidemics. L. H. PERSON, pathologist.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under humid conditions, including studies of fertilization, soil management practices, effects of legume and nonlegume cover crops on the properties of soils and their effects on yields of corn and other field crops; the effects of cultural, drainage, and management practices upon physical and chemical properties of tidewater soils and their effects upon crop yields (cooperative with Soil Conservation Service). W. V. CHANDLER, soil scientist.

*Tobacco, Medicinal, and Special Crops.*—Agronomic investigations on all phases of flue-cured tobacco production, including breeding and disease studies. W. E. COLWELL, agent.

Tobacco disease investigations, with special reference to root knot, black shank, and other disease problems of eastern North Carolina. (Headquarters, Pathology Department, Agricultural Experiment Station, with field experiments conducted at Angier, 9 miles south of Raleigh). F. A. TODD, agent.

*Vegetable Crops and Diseases.*—Breeding and testing improved vegetable strains and varieties for superior adaptation (cooperation with United States Regional Vegetable Breeding Laboratory at Charleston, S. C.). F. D. COCHRAN, collaborator.

Potato breeding investigations. Directed from Beltsville, Md.; local supervision by M. E. GARDNER, collaborator.

## Statesville

**United States Cotton Field Station** (*cooperative investigations*).—Adjoining the Piedmont Branch Station, 1½ miles northwest of Statesville (Southern Ry.). Com-

municate with J. W. Hendricks, superintendent, regarding transportation.

*Cotton and Other Fiber Crops and Diseases.*—Cotton breeding and improvement investigations. J. W. HENDRICKS, agent.

### Waynesville

*Mountain Experiment Station (cooperative investigations).*—About 1 mile east of Waynesville. Can be reached by Southern Railway by way of Asheville.

*Tobacco, Medicinal, and Special Crops.*—Burley and aromatic tobacco investigations, including fertilizer requirements, methods of curing, handling, and disease control, with reference to the development and testing of improved disease-resistant strains of burley tobacco. Improvement and standardization of varieties of burley tobacco (cooperation with North Carolina Department of Agriculture and State Agricultural Experiment Station). LUTHER SHAW, agronomist.

### Willard

*Coastal Plain Branch Station, State Department of Agriculture, and State Agricultural Experiment Station (cooperative investigations).*—One and one-half miles north of Atlantic Coast Line Railroad station.

*Fruit and Nut Crops and Diseases.*—Muscadine breeding and production investigations. Directed by C. F. WILLIAMS, agent, State Agricultural Experiment Station, Raleigh, N. C.

Strawberry breeding and production investigations. Directed by E. B. MORROW, State Agricultural Experiment Station, Raleigh, N. C.

## NORTH DAKOTA

### Fargo

*State Agricultural Experiment Station (cooperative investigations).*—About 1½ miles northwest of city. Take bus marked "Agricultural College."

*Cereal Crops and Diseases.*—Investigations on the diseases of flax, including rust, wilt, two kinds of canker, browning, and pasmo disease. H. H. FLOR, pathologist.

Wheat improvement investigations, durum wheat in particular, principally breeding and testing for disease resistance, improved quality, shorter and stronger straw, and earlier maturity. Breeding hard red spring and durum wheats resistant to sawfly. R. M. HEERMANN, agronomist.

*Forage Crops and Diseases.*—Soybean investigations. T. E. STOA, collaborator.

*Soil Survey.*—Subheadquarters, Great Plains States. See Nebraska, Lincoln: Soil Survey Office. J. E. McCLELLAND, agent (soil scientist). In Soils Department.

*Vegetable Crops and Diseases.*—Potato breeding investigations. Directed from Beltsville, Md.; local supervision by W. G. HOYMAN, agent.

*Weed Investigations.*—To develop methods of control of weeds in sugar beets and flax. D. E. KRATOCHVIL, agent. In Department of Botany.

### Langdon

*Langdon Substation, State Agricultural Experiment Station (cooperative investigations).*—About 1 mile east of Langdon (Great Northern Ry.). Communicate with VICTOR STURLAUGSON, superintendent, regarding transportation arrangements.

*Cereal Crops and Diseases.*—Investigations in the improvement of wheat, dealing principally with production and testing varieties for improved disease resistance, field characters, and quality. R. M. HEERMANN, agronomist.

Wheat diseases. Investigations on stem rust of wheat. E. A. SCHWINGHAMER, agent.

### Mandan

**United States Northern Great Plains Field Station.**—One and one-half miles southwest of Mandan (Northern Pacific Ry.). Transportation arrangements can be made by communicating with E. J. GEORGE, superintendent.

*Forage Crops and Diseases.*—Grass breeding, forage production, pasture, and range investigations (cooperation with State Agricultural Experiment Station and Soil Conservation Service). G. A. ROGLER, agronomist.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under irrigation. Soil management and crop production under dry-land conditions. H. J. HAAS, soil scientist.

*Soil Survey.*—Subheadquarters, Great Plains States. See Nebraska, Lincoln: Soil Survey Office. J. S. ALLEN, soil scientist.

*Vegetable Crops and Diseases.*—Farm windbreak investigations and cooperative tests in the northern Great Plains. E. J. GEORGE, silviculturist.

Horticultural crop investigations, including testing, breeding, and cultural investigations with fruits, vegetables, and ornamentals for adaptability in the northern Great Plains. W. P. BAIRD, horticulturist.

## OHIO

### Columbus

*State College of Agriculture (cooperative investigations).*—About 3 miles from railroad station at Columbus. Can be reached by streetcar or bus.

*Forage Crops and Diseases.*—Physiological studies on red clover as related to seed production. C. J. WILLARD, collaborator.

Soybean investigations. L. C. SABOE, collaborator.

*Soil Survey.*—Subheadquarters, Northern States. See Maryland, Beltsville: Soil Survey Office. J. H. PETRO, soil scientist. H and F Building, Ohio State University.

*United States Forest Pathology Field Laboratory (cooperation with State Agricultural Experiment Station and U. S. Bureau of Entomology and Plant Quarantine).*—5076 North High Street. Can be reached by bus from railroad and bus station.

*Forest Pathology.*—Investigations of control measures for Dutch elm disease, phloem necrosis, and other elm diseases, and certain forest-tree diseases. R. U. SWINGLE, pathologist.

## Toledo

*Pest and Plant Disease Control Machinery Laboratory.*—3620 River Road. Can be reached by bus marked "Maumee" of the Maumee Valley Transportation Co.

*Farm Machinery.*—Investigations to improve the effectiveness of present equipment and methods and to develop new equipment or devices for efficiently controlling the economically important insect pests and plant diseases (cooperation with State Agricultural Experiment Station and U. S. Bureau of Entomology and Plant Quarantine). FRANK IRONS, agricultural engineer.

## Wooster

*State Agricultural Experiment Station (cooperative investigations).*—About 1 mile south of Wooster (Baltimore & Ohio R. R. and Pennsylvania R. R.).

*Cereal Crops and Diseases.*—Effect of weather and nutrition on the growth, development, and quality of corn, including mineral nutrition of corn, seed storage, seed conditioning, radioactive isotopes, and spectrographic analysis of plant tissues. J. D. SAYRE, physiologist.

Corn production; breeding, disease, and quality investigations; breeding corn for the Corn Belt; performance trials of corn hybrids; development of improved methods of breeding corn; and the effect of date and method of planting corn and of fertilizers on corn quality and yield. G. H. STRINGFIELD, agronomist.

Quality evaluation of wheat varieties produced in the breeding programs of the Eastern and Southern States, including development of simple methods for evaluating small samples of different varieties and classes of wheat; development of baking techniques for evaluating the quality of different varieties and classes of wheat; the effect of environment on the inorganic elements of wheat varieties and their relation to milling procedures and nutritive values; determination of the inorganic composition of the different parts of the wheat kernel. Located in Soft Wheat Quality Laboratory. C. E. BODE, technologist.

*Fertilizer and Agricultural Lime.*—Studies of liming materials and their evaluation. C. J. SCHOLLENBERGER, agent (chemist).

## OKLAHOMA

## Chickasha

*Cotton Research Station, State Agricultural Experiment Station (cooperative investigations).*—Within 2 miles of railroad station (St. Louis-San Francisco Ry. and Chicago, Rock Island & Pacific R. R.).

*Cotton and Other Fiber Crops and Diseases.*—Cotton breeding investigations (cooperation with the Oklahoma Agricultural Experiment Station and the State extension service). Directed from Stillwater; local supervision by J. W. SIMMONS, agent.

*Farm Machinery.*—Investigations to develop and improve methods and equipment for the production and harvesting of cotton. E. M. SMITH, agent (agricultural engineer).

*Mechanical Processing of Farm Products.*—Adaptation of new and improved cotton ginning equipment and practices to semiarid cotton-production areas (cooperation with the State Agricultural Experiment Station). Under general supervision of United States Cotton Ginning Laboratory, Stoneville, Miss. J. A. LUSCOMBE, agricultural engineer.

## Stillwater

*State Agricultural Experiment Station (cooperative investigations).*—About  $\frac{3}{4}$  mile from bus station and 1 mile from railroad station (Atchison, Topeka & Santa Fe Ry.). Can be reached by taxi.

*Cereal Crops and Diseases.*—Breeding sorghum for improved adaptation, including resistance to diseases and insects. J. B. SIEGLINGER, agronomist.

Breeding wheat, oats, and barley for improved quality and adaptation, including resistance to diseases, insects, winter hardiness, and drought. A. M. SCHLEHUBER, agronomist.

*Cotton and Other Fiber Crops and Diseases.*—Investigations in cotton breeding, genetics, and improvement. J. M. GREEN, agent.

Cotton disease investigations. L. A. BRINKERHOFF, pathologist.

*Farm Machinery.*—Investigations of machinery for the production, harvesting, hulling, and handling of castorbeans. L. G. SCHOENLEBER, agricultural engineer. In Agricultural Engineering Laboratory Building.

*Forage Crops and Diseases.*—Grass and legume breeding and improvement investigations, and forage seed production studies. J. R. HARLAN, geneticist.

Soybean investigations. D. R. SWIFT, collaborator.

*Fruit and Nut Crops and Diseases.*—Investigations on the organisms causing pecan diseases and their control. R. H. CONVERSE, agent.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under dry-land and irrigated conditions, including studies of the effect of fertilizer application and fertilizer placement on wheat and sorghum yields, the effect of moisture supply on crop response to fertilizers, and the effect of physical condition of the soil on moisture movement and crop growth. J. A. HOBBS, agent (soil scientist).

*Soil Survey.*—Subheadquarters, Great Plains States. See Nebraska, Lincoln: Soil Survey Office. H. M. GALLOWAY, soil scientist.

*Tobacco, Medicinal, and Special Crops.*—Agronomic investigations of castorbeans, especially breeding for improved qualities and adaptation and for resistance to disease and for characteristics adaptable to machine harvesting. D. L. VAN HORN, agronomist.

*Vegetable Crops and Diseases.*—Breeding and testing improved vegetable strains and varieties for superior adaptation (cooperation with U. S. Regional Vegetable Breeding Laboratory at Charleston, S. C.). H. B. CORDNER, collaborator.

## Woodward

**United States Southern Great Plains Field Station.**—About 1 mile southwest of Woodward (Atchison, Topeka & Santa Fe Ry. and Missouri-Kansas-Texas R. R.). Transportation arrangements can be made by communicating with D. A. SAVAGE, superintendent.

*Cereal Crops and Diseases.*—Breeding sorghum for improved adaptation, including disease resistance and insect

damage (cooperation with State Agricultural Experiment Station). Directed from Stillwater by J. B. SIEGLINGER.

*Forage Crops and Diseases.*—Studies of methods of establishing and maintaining stands of native and introduced grasses (cooperative with the State Agricultural Experiment Station and U. S. Soil Conservation Service); the development of new improved grass strains through plant breeding methods (cooperative with the State Agricultural Experiment Station); and studies of the nutritive value of the range forage at various stages of growth; studies of sagebrush control and its relation to increased animal gains; studies of deferred and rotational systems of grazing in comparison with continuous grazing; and studies of the effect of intensity of grazing on the productivity of the pastures (cooperation with the State Agricultural Experiment Station and U. S. Bureau of Animal Industry). D. A. SAVAGE, agronomist.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under dry-land conditions. L. F. LOCKE, soil scientist.

*Vegetable Crops and Diseases.*—Farm windbreak investigations and cooperative tests of the adaptability of trees and shrubs in the southern Great Plains. [Vacancy], silviculturist.

Horticultural investigations, including testing, breeding, and cultural investigations with fruits, vegetables, and ornamentals for adaptability in the southern Great Plains. L. F. LOCKE, horticulturist.

*Weed Investigations.*—Studies of methods of controlling undesirable range plants. D. A. SAVAGE, agronomist.

## OREGON

### Corvallis

*State Agricultural Experiment Station (cooperative investigations).*—About 1 mile from Corvallis. Can be reached by taxi. Corvallis can be reached by West Coast Airlines, Greyhound bus, and by bus from Southern Pacific railroad at Albany.

*Cotton and Other Fiber Crops and Diseases.*—Experiments with fiber flax and other bast fiber plants; breeding, cultural,

and disease-resistance tests; soil-type and fertilizer tests in fields of flax growers; retting experiments, and spinning tests in spinning mill at Salem. D. W. FISHLER, agronomist.

*Forage Crops and Diseases.*—Agronomic investigations with forage crops, including vetches, clovers, grasses, alfalfa, and miscellaneous legumes. H. A. SCHOTH, agronomist.

Studies on breeding and production of forage crops. H. H. RAMPTON, agronomist.

Forage crop disease investigations. J. R. HARDISON, pathologist.

*Fruit and Nut Crops and Diseases.*—Walnut and filbert production investigations. J. H. PAINTER, horticulturist. In Agricultural Building.

Strawberry virus investigations. Walnut and filbert disease control investigations. P. W. MILLER, pathologist. In Agricultural Building.

Small-fruit breeding and production investigations. G. F. WALDO, horticulturist. In Agricultural Building.

Small-fruit disease investigations. P. W. MILLER, pathologist. In Agricultural Building.

*Mechanical Processing of Farm Products.*—Fiber-flax processing machinery investigations. J. E. HARMOND, agricultural engineer. In Agricultural Engineering Building.

*Ornamental-Plant Crops and Diseases.*—Investigations of diseases of ornamentals, especially narcissus, iris, lilies, and tulips. F. P. McWHORTER, agent.

*Rubber Plant Investigations.*—Breeding studies with kok-saghyz. R. W. HENDERSON, agent (geneticist).

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under irrigation, including laboratory studies and numerous widely scattered fertilizer experiments in farmers' fields for determination of effects of fertilizers on yields of sugar beets, potatoes, corn, grain alfalfa, onions, and other crops. A. S. HUNTER, soil scientist.

*Sugar Plant Investigations.*—Sugar beet seed production, including soil fertility studies. R. A. PENDLETON, agronomist.

*Tobacco, Medicinal, and Special Crops.*—Agronomic investigation of hops, especially by breeding for disease resistance;

studies on the distribution and control of downy mildew and other diseases of hops; investigation of the quality of hops as affected by various factors; and studies to improve quality of hops and cultural practices. K. R. KELLER, agronomist.

*Vegetable Crops and Diseases.*—Investigations on bean and table beet breeding for resistance to curly top and on nature of resistance. B. F. DANA, pathologist.

### Forest Grove

*United States Department of Agriculture Laboratory.*—2330 Elm Street. Eight blocks from Pacific Avenue and Main Street.

*Farm Machinery.*—Investigations to develop equipment that will deliver insecticides effectively from airplanes and ground equipment for the control of the pea aphid and other insects in low-growing crops (cooperative with State Agricultural Experiment Station and U. S. Bureau of Entomology and Plant Quarantine). V. D. YOUNG, agricultural engineer.

### Hermiston

*United States Umatilla Field Station.*—One and one-half miles south of Hermiston (Greyhound bus line); 2 miles from Hinkle (Union Pacific R. R.). Transportation arrangements can be made by communicating with C. A. LARSON, superintendent.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under irrigation; studies on fertilization and irrigation of field crops such as corn, alfalfa, potatoes, and pastures, vegetable crops, melons, and tree fruit crops such as apples, peaches, apricots, and prunes; research in turkey feeding (cooperative with State Agricultural Experiment Station). C. A. LARSON, agent (soil scientist).

*Vegetable Crops and Diseases.*—Field test plots for curly top resistance. Directed by B. F. DANA, Corvallis; local supervision by C. A. LARSON, superintendent.

## Hood River

*United States Fruit Disease Field Laboratory.*—Pythian Building, about 2 blocks from Union Pacific Railroad station.

*Fruit and Nut Crops and Diseases.*—Investigations of diseases of apples, pears, and stone fruits and testing new fungicides. J. R. KIENHOLZ, pathologist.

## Medford

*Medford Pear Investigation Laboratory (cooperation with State Agricultural Experiment Station).*—About 1½ miles south of city limits. Visitors will be met by automobile if advance arrangements are made.

*Fruit and Nut Crops and Diseases.*—Pear irrigation, nutrition, and breeding investigations. E. S. DEGMAN, agent.

## Moro

*Sherman Branch Experiment Station, State Agricultural Experiment Station (cooperative investigations).*—One-fourth mile south and east of Moro on U. S. No. 97. Moro can be reached by Greyhound bus, or transportation arrangements can be made from The Dalles or Biggs Junction (Union Pacific R. R.) by communicating with G. A. MITCHELL, superintendent.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under dry-land conditions; crop-residue studies (cooperation with Soil Conservation Service). G. A. MITCHELL, agent (agronomist).

## Pendleton

*Pendleton Branch Experiment Station, State Agricultural Experiment Station (cooperative investigations).*—Nine miles northeast of Pendleton (Union Pacific R. R.; United Air Lines). Transportation arrangements can be made by communicating with M. M. OVESON, superintendent.

*Cereal Crops and Diseases.*—Breeding wheat and other small grains for resistance to diseases, winter hardiness, yield, and quality. C. R. ROHDE, agronomist.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under dry-land conditions, including investigations on crop rotations, tillage, fertilizers, soil moisture, and soil nitrates. M. M. OVESON, agent (agronomist).

### Portland

*United States Forest Pathology Field Laboratory (cooperation with Forest Service).*—630 Post Office Building, Northwest Broadway and Glisan Streets. Three blocks from railroad station.

*Forest Pathology.*—Investigations of diseases that affect timber stands, reduce lumber production, and influence logging operations; and fungus decay and degrade of lumber and other forest products. J. L. BEDWELL, pathologist.

## PENNSYLVANIA

### Landisville

*Southeastern Field Research Laboratory (State).*—Approximately 7 miles from Lancaster on U. S. No. 230. Landisville is located about  $\frac{1}{4}$  mile south of this highway.

*Tobacco, Medicinal, and Special Crops.*—Tobacco seedbed and fertilizer experiments, crop rotation experiments with tobacco as principal crop; breeding improved strains of cigar-filler tobacco varieties. E. O. SCHNEIDER, agronomist.

### State College

**United States Regional Pasture Research Laboratory** (*cooperation with agricultural experiment stations of 12 Northeastern States*).—Thirty miles from Lewistown, where local bus meets train. Can be reached by Greyhound and Lakes to Sea bus lines.

*Forage Crops and Diseases.*—Research on important pasture grasses and legumes in the Northeastern States (Maine, Vermont, New Hampshire, Rhode Island, Connecticut, Massachusetts, Delaware, New Jersey, New York, Pennsylvania, Maryland, and West Virginia), involving cytogenetics and breeding; physiology and chemical composition; pathology; and establishment and management of pastures and meadows. R. J. GARBER, director.

*Soil Management and Irrigation Agriculture.*—Soil, water, and fertility factors affecting persistence and growth of legumes and grasses in the Northeast. R. R. ROBINSON, agronomist.

## PUERTO RICO

### Mayaguez

*Federal Experiment Station in Puerto Rico (cooperative investigations).*—About 2 miles from Mayaguez; can be reached by taxi.

*Rubber Plant Investigations.*—Plant breeding and cytogenetical investigations of hevea. H. E. WARMKE, geneticist.

Investigation of biosynthesis of rubber in hevea. D. M. ENY, physiologist.

### Rio Piedras

*Insular Experiment Station (cooperative investigations).*—About 12 miles from San Juan and  $\frac{3}{4}$  mile from campus of University of Puerto Rico at Rio Piedras. Can be reached by bus from San Juan to the University and thence by taxi to experiment station or by taxi from San Juan.

*Soil Management and Irrigation Agriculture.*—Soil management requirements for erosion control and production of crops adaptable to Puerto Rico soil and climatic conditions (cooperative with Soil Conservation Service, University of Puerto Rico Agricultural Experiment Station, and Federal Experiment Station at Mayaguez). JOSE VICENTE-CHANDLER, acting project supervisor.

## RHODE ISLAND

### Kingston

*State Agricultural Experiment Station (cooperative investigations).*—About 3 miles north of New York, New Haven & Hartford Railroad station.

*Vegetable Crops and Diseases.*—Potato breeding investigations. Directed from Beltsville, Md.; local supervision by C. R. SKOGLEY, collaborator.

## SOUTH CAROLINA

### Blackville

*Edisto Experiment Station (cooperative investigations).*—

Three miles west of Blackville on U. S. No. 78. Nearest bus terminal: Blackville, S. C. Nearest train terminals: Southern Railway at Blackville; Seaboard Air Line Railroad at Denmark.

*Farm Machinery.*—Investigations to develop and improve methods and equipment for the production and harvesting of cotton. A. H. BENNETT, agent (agricultural engineer).

*Vegetable Crops and Diseases.*—Sweetpotato breeding, selection, variety testing, and cultural investigations. M. B. HUGHES, collaborator.

### Charleston

**United States Regional Vegetable Breeding Laboratory.**—About 7 miles west of Charleston on U. S. No. 17. Can be reached by bus from Charleston.

*Vegetable Crops and Diseases.*—This regional laboratory and station was planned to serve primarily the territory embraced in 13 Southern States. Basic studies are conducted in the genetics, pathology, structure, and physiology of vegetable crop plants for the orderly development of varieties of high quality, increased nutritive value and disease resistance, and improved adaptation to the Southern States (cooperation with Agricultural Experiment Stations of Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Arkansas, Oklahoma, Texas). S. H. YARNELL, director.

Breeding sweet corn and cabbage for disease resistance and adaptability to the South. S. H. YARNELL, geneticist.

Breeding snap beans and peas for disease resistance and adaptability to the South. J. C. HOFFMAN, horticulturist.

Breeding tomatoes and watermelons for disease resistance and adaptability to the South. C. F. ANDRUS, horticulturist.

## Clemson

*State Agricultural Experiment Station (cooperative investigations).*—About 1½ miles from Southern Railway station at Clemson. Can be reached by bus.

*Cotton and Other Fiber Crops and Diseases (cooperation with Clemson Agricultural College, U. S. Production and Marketing Administration, and South Carolina Extension Service).*—Investigations in cotton plant physiology and diseases. G. M. ARMSTRONG, collaborator.

Cotton fiber and spinning investigations (cooperation with Production and Marketing Administration). J. M. COOK, collaborator.

Cotton quality investigations. N. L. PEARSON, technologist.

*Farm Machinery.*—Investigations to develop and improve equipment for harvesting forage and legume seed. J. K. PARK, agricultural engineer. In Agricultural Engineering Department.

*Forage Crops and Diseases.*—Soybean investigations. W. R. PADEN, collaborator.

*Fruit and Nut Crops and Diseases.*—Cooperative studies on control of tree-fruit diseases, primarily peach. D. H. PETERSEN, pathologist.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under humid conditions; fertilizer requirements and placement for forage and pasture crops; effect of crop and soil management on soil properties and productivity. E. H. STEWART, soil scientist.

*Vegetable Crops and Diseases.*—Breeding and testing improved vegetable strains and varieties for superior adaptation (cooperation with U. S. Regional Vegetable Breeding Laboratory at Charleston). A. M. MUSSER, collaborator.

## Florence

*Pee Dee Experiment Station, State Agricultural Experiment Station (cooperative investigations).*—About 3 miles north of railroad station (Atlantic Coast Line R. R. and Seaboard Air Line R. R.) and 2½ miles from center of

town on Darlington Road. Transportation arrangements can be made in advance.

*Cotton and Other Fiber Crops and Diseases.*—Investigations in cotton breeding and improvement, genetics, and cytogenetics. W. H. JENKINS, agronomist.

*Tobacco, Medicinal, and Special Crops.*—Agronomic investigations on flue-cured tobacco, including kinds of soil best suited to these types of tobacco; fertilizer requirements of the crop; tobacco variety tests; cropping systems of tobacco; and improvements in tobacco plant bed management. J. F. BULLOCK, agronomist.

Studies on blue mold and nematode diseases of tobacco and their control. T. W. GRAHAM, pathologist.

## Union

*United States Forest Pathology Field Laboratory (cooperation with Forest Service).*—Calhoun Experimental Forest of the Southeastern Forest Experiment Station. Can be reached only by automobile, by county road. Seven miles east of Union.

*Forest Pathology.*—Investigations of soils in relation to occurrence of little leaf disease of pine. O. L. COPELAND, JR., soil scientist.

## SOUTH DAKOTA

### Brookings

*State Agricultural Experiment Station (cooperative investigations).*—About 1 mile northeast of Brookings (Chicago & North Western Ry. and Western Air Lines). Can be reached by bus from railroad and bus stations.

*Cereal Crops and Diseases.*—Investigations of foot rot diseases of wheat and barley, including identification of the organisms responsible for foot rot diseases and the control of these diseases. G. W. BRUEHL, pathologist.

*Forage Crops and Diseases.*—Soybean investigations. M. W. ADAMS, collaborator.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under irrigation, including

studies of fertility, moisture requirements, cultural practices, quality of irrigation water, and soil chemical and physical properties affecting crop production under irrigation. Field experiments are conducted on development farms at various locations in South Dakota, including the Shadehill development farm near Lemmon (cooperative with Soil Conservation Service). L. O. FINE, agent (soil scientist).

*Soil Survey*.—Subheadquarters, Great Plains States. See Nebraska, Lincoln: Soil Survey Office. A. J. KLINGELHOETS, agent (soil scientist). In Agronomy Department.

### Newell

*Newell Irrigation and Dry Land Field Station (cooperation with State Agricultural Experiment Station)*.—One mile west and  $\frac{3}{4}$  mile north of Newell (Chicago & North Western Ry.). Transportation arrangements can be made by communicating with H. E. WEAKLY, superintendent.

*Soil Management and Irrigation Agriculture*.—Soil management and crop production under irrigation, including soil fertility, fertilization, and soil moisture studies. B. L. BAIRD, soil scientist.

Soil management and crop production under dry-land conditions, including crop rotation, soil fertility, and small-grain and grass variety testing. ALBERT OSENBRUG, agronomist.

Livestock investigations, including pasturing and winter feeding experiments (cooperative with State Agricultural Experiment Station). H. E. WEAKLY, agronomist.

## TENNESSEE

### Crossville

*Plateau Experiment Station, State Agricultural Experiment Station (cooperative investigations)*.—Five miles west of Crossville. Can be reached by bus from Crossville.

*Vegetable Crops and Diseases*.—Potato breeding investigations. Directed by T. P. DYKSTRA, Baton Rouge, La.; local supervision by J. J. BIRD, State Agricultural Experiment Station.

### Greeneville

*Tobacco Experiment Station, State Agricultural Experiment Station (cooperative investigations).*—On R. F. D. 11, about 5 miles from Southern Railway station. Visitors will be met at Greeneville by experiment station bus. J. H. FELTS, superintendent.

*Tobacco, Medicinal, and Special Crops.*—Studies on improvement and standardization of burley tobacco varieties; control of black root rot, mosaic, and other diseases of tobacco. H. E. HEGGESTAD, agronomist.

Investigations on most effective systems of crop rotation, fertilization, and culture for burley tobacco. B. C. NICHOLS, agronomist.

### Knoxville

*State Agricultural Experiment Station (cooperative investigations).*—About 10 minutes' ride by streetcar from railroad station.

*Cereal Crops and Diseases.*—Breeding corn for the South and developing improved methods of breeding corn. F. D. RICHEY, agronomist and regional coordinator for corn improvement in the Southern States.

*Cotton and Other Fiber Crops and Diseases.*—Cotton breeding and improvement; genetics and cytogenetics. Office in Corn and Laboratory Building. D. M. SIMPSON, agronomist. Cotton quality investigations. P. R. EWALD, agent.

*Farm Electrification.*—Determination of the effects of electromagnetic energy on plants and animals and its possibilities for control of insect pests and plant diseases. O. A. BROWN, agricultural engineer.

Studies of the value of electric traps and radiation for the control of hornworms on tobacco (cooperation with Bureau of Entomology and Plant Quarantine). F. D. VAN AKEN, agent.

*Forage Crops and Diseases.*—Soybean investigations. L. N. SKOLD, collaborator.

*Tobacco, Medicinal, and Special Crops.*—Studies on chemical evaluation of burley tobacco. D. R. BOWMAN, physiologist.

*Soil Survey Office, Southern States.*—New Sprinkle Building, 508 Union Avenue.

*Soil Survey.*—Soil types are identified, defined, and classified on the basis of their characteristics, and county soil maps are prepared, showing their distribution. Soil survey reports are written, describing the soil types in terms of both their morphology and their crop adaptability and production under farm practices. (This work is carried on cooperatively with the Tennessee Valley Authority, State Agricultural Experiment Stations of the region, and in many counties with the Soil Conservation Service or other interested Federal agencies.) Soil maps and relevant soil data are used to guide regional programs of agricultural production, adjustment, and conservation and for the demonstration and extension of scientific and practical farm practices and rural land utilization. The work of the senior soil correlators, correlators, analyst, and other soil scientists is under the supervision of W. S. LIGON, soil scientist. *Subheadquarters:* Auburn, Ala.; Gainesville, Fla.; Baton Rouge, La.; and Blacksburg, Va.

### Springfield

*State Agricultural Experiment Station (cooperative investigations).*—About 30 miles north of Nashville and can be reached by the Louisville & Nashville Railroad.

*Farm Electrification.*—Investigations on improvement of facilities and equipment for curing dark-fired tobacco (cooperation with Forest Service). R. B. STONE, JR., agricultural engineer.

## TEXAS

### Beaumont

*Substation No. 4, Rice Pasture Experiment Station, State Agricultural Experiment Station (cooperative investigations).*—Twelve miles west of Beaumont on U. S. No. 90.

*Cereal Crops and Diseases.*—Agronomic investigations with rice, including varietal comparisons, genetic and breeding investigations, and cultural and irrigation studies. H. M. BEACHELL, agronomist.

Pathologic investigations of rice, including identification of disease-producing organisms, varietal resistance, and other phases of disease control. [Vacancy.]

*Forage Crops and Diseases.*—Studies on pasture establishment and management with rice; seed production of grasses and legumes; improvement and testing of forage species adapted to riceland agriculture. R. M. WEIHING, agronomist.

### Beeville

*Substation No. 1, Texas Agricultural Experiment Station (cooperative investigations).*—On U. S. No. 181. Daily bus service from Beeville (Southern Pacific R. R. from Houston or San Antonio; Trans-Texas Airways).

*Farm Buildings and Rural Housing.*—Studies of grain sorghum drying and storage. Directed from Ames, Iowa; local supervision, G. L. KLINE, agricultural engineer.

### Big Spring

**United States Big Spring Field Station.**—One mile north of Big Spring (Texas & Pacific Ry.; Pioneer Air Lines). Transportation arrangements can be made by communicating with F. E. KEATING, superintendent.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under dry-land conditions; fertilizer tests; varietal tests with cotton, sorghums, and grapes; cattle feeding investigations (cooperation with Bureau of Animal Industry). (Cooperation with State Agricultural Experiment Station.) F. E. KEATING, agronomist.

### Brownwood

**United States Pecan Field Station.**—About  $\frac{1}{2}$  mile from center of Brownwood (St. Louis-San Francisco Ry. and Gulf, Colorado & Santa Fe Ry.).

*Fruit and Nut Crops and Diseases.*—Studies on phony and other virus diseases of peach, plum, and cherry. Directed by L. C. COCHRAN, pathologist, Riverside, Calif.

Pecan culture, irrigation, and breeding investigations. L. D. ROMBERG, horticulturist.

## Chillicothe

*Substation No. 12, State Agricultural Experiment Station (cooperative investigations).*—Four and one-half miles south and a little west, on the main highway from Chillicothe (Fort Worth & Denver Ry.). Communicate with J. R. QUINBY, superintendent, regarding transportation arrangements.

*Cereal Crops and Diseases.*—Agronomic investigations with sorghums, with special attention to breeding new sorghum varieties and the study of sorghum genetics. J. C. STEPHENS, agronomist.

*Forage Crops and Diseases.*—Sudan grass investigations. J. R. QUINBY, collaborator.

*Tobacco, Medicinal, and Special Crops.*—Studies on castorbean diseases and their control; breeding for improved quality characteristics and adaptation. D. D. POOLE, agent (pathologist).

## College Station

*State Agricultural Experiment Station (cooperative investigations).*—On Texas A. & M. campus at College Station (Southern Pacific R. R. and Missouri Pacific R. R.; Pioneer Air Lines). Can be reached by taxi or bus. Field plantings at Milano, 40 miles northwest of College Station. Communicate with G. A. RUSSELL regarding transportation arrangements.

*Cereal Crops and Diseases.*—Breeding of improved adapted varieties of wheat, oats, barley, and flax, particularly disease-resistant varieties. E. S. McFADDEN, agronomist.

Stem rust of wheat. Investigations on stem rust of wheat. [Vacancy.]

*Cotton and Other Fiber Crops and Diseases.*—Investigations in cotton diseases and methods of control. L. S. BIRD, collaborator.

Investigations in cotton plant physiology. F. M. EATON, physiologist.

Investigations in cotton breeding, genetics, and improvement. T. R. RICHMOND, agronomist.

Cotton improvement in standardized one-variety communities. F. C. ELLIOTT, agent.

*Farm Electrification.*—Investigations on determination of requirements and developments of plans and specifications for facilities for freezing and storing perishable foods on farms for marketing and home consumption (cooperation with Bureau of Human Nutrition and Home Economics, and State Agricultural Experiment Stations of Washington and Maryland). General supervision by H. L. GARVER, Beltsville, Md.; local supervision by P. T. MONTFORT.

*Forage Crops and Diseases.*—Seed-production studies of grasses and legumes. R. C. POTTS, collaborator.

Soybean investigations. CLARK HARVEY, collaborator.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under both irrigated and dry-land conditions. E. R. LEMON, agent (soil scientist).

*Soil Survey.*—Subheadquarters, Great Plains States. See Nebraska, Lincoln: Soil Survey Office. E. H. TEMPLIN, soil scientist.

*Tobacco, Medicinal, and Special Crops.*—Investigations in developing *Tephrosia virginiana* (devils-shoestring) as a field crop in the Gulf Coastal States for a domestic source of rotenone (insecticide). Agronomic investigations on sesame, safflower, and castorbeans, especially breeding for better varieties for crop handling. M. L. KINMAN, agronomist.

*Vegetable Crops and Diseases.*—Breeding and testing improved vegetable strains and varieties for superior adaptation (cooperation with U. S. Regional Vegetable Breeding Laboratory at Charleston, S. C.). H. C. MOHR, collaborator.

*Weed Investigations.*—Investigations on the control of woody species on rangelands. [Vacancy.]

## Denton

*Substation No. 6, State Agricultural Experiment Station (cooperative investigations).*—Five miles northwest of Denton, one-half mile north of Denton-Decatur Highway, State Route 24. Communicate with I. M. ATKINS regarding transportation arrangements.

*Cereal Crops and Diseases.*—Breeding wheat, barley, flax, and oats for adaptation, including disease and insect resistance. I. M. ATKINS, agronomist.

## Greenville

**United States Cotton Field Station.**—Three and one-half miles southwest of Greenville (Southern Pacific R. R., Missouri-Kansas-Texas R. R., and St. Louis Southwestern Ry.) on U. S. No. 67 (Bankhead Highway). Communicate with D. D. PORTER regarding transportation arrangements.

*Cotton and Other Fiber Crops and Diseases (cooperation with Greenville Chamber of Agriculture, Commerce and Industry, State Agricultural Experiment Station, and State Extension Service).*—Investigations on cotton improvement, genetics, botany, morphology, and plant physiology and culture, and on cotton disease control. D. D. PORTER, agronomist.

## Harlingen

**United States Horticultural Field Laboratory.**—Fairgrounds.

*Handling, Transportation, and Storage of Horticultural Crops.*—Investigations in handling, storage, and transportation of citrus fruits, vegetables, and other horticultural crops. H. B. JOHNSON, pathologist.

## Lubbock

**Substation No. 8, State Agricultural Experiment Station (cooperative investigations).**—About 4 miles east of Lubbock. City bus within  $\frac{1}{4}$  mile of station.

*Farm Machinery.*—Investigations to develop and improve methods and equipment for the production and harvesting of cotton. E. G. HUDSPETH, JR., agricultural engineer.

*Tobacco, Medicinal, and Special Crops.*—Agronomic investigations on canaigre as a tannin crop; studies on sesame, safflower, and castorbeans as oil-yielding crops. G. H. ABEL, JR., agronomist.

## Pearsall

**United States Rubber Plant Field Headquarters (cooperation with Texas Agricultural Experiment Station).**—Field plantings near Pearsall and Dilley. Office on

second floor of Pearsall City Hall. Communicate with B. F. BARNES, P. O. Box 566.

*Rubber Plant Investigations.*—Field comparisons of guayule strains and hybrids; field tests of kok-, krim-, and tau-saghyz; field studies of guayule shrub production. B. F. BARNES, agronomist.

### Weslaco

*Substation No. 15, State Agricultural Experiment Station (cooperative investigations).*—About 1½ miles south of Weslaco (Missouri Pacific R. R.).

*Fruit and Nut Crops and Diseases.*—Tests of citrus stocks for adaptation and disease resistance. W. C. COOPER, physiologist.

### Winter Haven

*Substation No. 19, State Agricultural Experiment Station (cooperative investigations).*—About 5 miles from Crystal City and 7 miles from Carrizo Springs (International-Great Northern R. R.). Communicate with C. H. McDOWELL, superintendent, regarding transportation.

*Rubber Plant Investigations.*—Field comparisons of guayule strains and hybrids; yield tests of kok- and krim-saghyz. F. A. FRANK, agent (agronomist).

*Vegetable Crops and Diseases.*—Investigations on onion culture, breeding, and diseases. Directed from Beltsville, Md.; local supervision by B. A. PERRY, collaborator.

### Ysleta

*Substation No. 17, State Agricultural Experiment Station (cooperative investigations).*—Thirteen miles south of El Paso (Southern Pacific R. R.). Transportation arrangements should be made in advance by contacting P. J. LYERLY.

*Cotton and Other Fiber Crops and Diseases.*—Cotton breeding, variety testing, and related investigations. P. J. LYERLY, agent.

## UTAH

## Logan

*State Agricultural Experiment Station (cooperative investigations).*—About 1 mile east of the Union Pacific Railroad station. Can be reached by bus.

*Cereal Crops and Diseases.*—Cereal improvement, with major interests in wheat and barley breeding and testing. Special interests include dwarf bunt studies and barley genetics. Oat and corn varieties are tested for their adaptation to the State. Varietal testing is done at such representative areas as Nephi and Cedar City, official college stations. R. W. WOODWARD, agronomist.

*Forage Crops and Diseases.*—Alfalfa seed production investigations. J. W. CARLSON, agronomist.

Alfalfa breeding and evaluation studies. M. W. PEDERSEN, agronomist.

Grass breeding, improvement, and pasture and range investigations. WESLEY KELLER, geneticist.

*Forest Pathology.*—Investigations of rusts and other tree diseases that affect timber stands, reduce lumber production, and influence logging operations; rate of deterioration of insect-killed timber; and diseases of trees in national parks. J. L. MIELKE, pathologist.

*Fruit and Nut Crops and Diseases.*—Investigations on virus diseases of stone fruits (at various points in the State). B. N. WADLEY, pathologist.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under irrigation. J. L. HADDOCK, soil scientist.

*Soil Survey.*—Subheadquarters, Far Western States. See California, Berkeley: Soil Survey Office. V. K. HUGIE, soil scientist.

*Vegetable Crops and Diseases.*—Breeding tomatoes for resistance to curly top and verticillium wilt; investigations of bacterial canker, mosaic, and other diseases of tomatoes. O. S. CANNON, pathologist.

Investigations of cultural practices affecting yield and quality of vegetable seed crops. L. R. HAWTHORN, horticulturist.

Investigations on onion culture, breeding, and diseases. L. H. POLLARD, collaborator.

*Weed Investigations.*—Investigations on the control of aquatic weeds and weeds in horticultural and field crops. Serves as coordinator for Bureau weed program in Western States. F. L. TIMMONS, agronomist. In Department of Agronomy.

### Salt Lake City

*United States Nematology Field Laboratory.*—Located in Post Office Building. Can be reached by streetcar from railroad station.

*Nematology Investigations.*—General problems related to nematode diseases of plants in the Rocky Mountain region and California; sugar beet, alfalfa, and clover nematode investigations; potato rot nematode investigations; soil fumigation work. GERALD THORNE, nematologist. The potato rot nematode work is in cooperation with the Idaho Agricultural Experiment Station at Aberdeen.

*United States Sugar Plant Field Laboratory.*—Office and laboratory, 1810 South Main Street.

*Sugar Plant Investigations.*—Studies on sugar beet breeding, genetics, physiology, and seed production, with special reference to curly top resistance (cooperation with Curly Top Resistance Breeding Committee). F. V. OWEN, geneticist.

## VIRGINIA

### Blacksburg

*State Agricultural Experiment Station (cooperative investigations).*—Take train (Norfolk & Western Ry.) to Christiansburg and taxi from Christiansburg to Blacksburg.

*Farm Electrification.*—Drying of forage crops, particularly peanuts and peanut vines (cooperation with Bureau of Dairy Industry, Production and Marketing Administra-

tion, and Division of Forage Crops and Diseases) ; and brooding chicks with infrared lamps (cooperation with Purdue Agricultural Experiment Station, Lafayette, Ind., U. S. Bureau of Animal Industry, and Division of Farm Buildings and Rural Housing). J. M. STANLEY, agricultural engineer.

*Forage Crops and Diseases.*—Soybean investigations. T. J. SMITH, collaborator.

*Soil Survey.*—Subheadquarters, Southern States. See Tennessee, Knoxville: Soil Survey Office. H. C. PORTER, agent (soil scientist).

### Holland .

*Tidewater Field Station of the Virginia Agricultural Experiment Station (cooperative investigations).*—Twelve miles west of Suffolk on U. S. No. 58. Bus service available.

*Farm Buildings and Rural Housing.*—Drying and storage of corn, other grains, and seeds. Directed from Beltsville, Md.; local supervision, [vacancy].

### Norfolk

*Virginia Truck Experiment Station (cooperative investigations).*—Seven miles east of Norfolk at Diamond Springs. Can be reached by Virginia Beach and Deep Creek Ferry roads.

*Vegetable Crops and Diseases.*—Breeding and testing improved vegetable strains and varieties for superior adaptation (cooperation with U. S. Regional Vegetable Breeding Laboratory at Charleston, S. C.). F. T. McLEAN, collaborator.

## WASHINGTON

### Mount Vernon

*Northwest Washington Agricultural Laboratory (cooperative investigations).*—About 2½ miles from town, and can be reached by private transportation.

*Vegetable Crops and Diseases.*—Investigations of diseases and cultural practices influencing yield and quality of seed

of vegetable crops (cooperation with State Agricultural Experiment Station). D. M. McLEAN, pathologist.

### Prosser

*Irrigation Experiment Station, State Agricultural Experiment Station (cooperative investigations).*—Five miles northeast of Prosser (Northern Pacific Ry.). Transportation from station may be arranged by calling H. P. SINGLETON, superintendent.

*Soil Management and Irrigation Agriculture.*—Soil management and crop production under irrigation in the Columbia River basin (cooperative with Bureau of Reclamation and Soil Conservation Service); fertilization, irrigation practices and methods, soil physics and soil moisture, crop adaptation, investigations of cereals, legumes, grasses, and new crops as related to soil management and fertility problems, and plant disease control. H. P. SINGLETON, agent (agronomist).

*Tobacco, Medicinal, and Special Crops.*—Agronomic investigations on hop production, breeding, and quality improvement. A. I. Dow, agronomist.

*Vegetable Crops and Diseases.*—Toxicity of and accumulation of agricultural chemicals. W. J. CLORE, collaborator.

*Weed Investigations.*—Investigations of aquatic weed problems in irrigation systems and of weeds on adjacent farm lands. V. F. BRUNS, agronomist.

### Pullman

*State Agricultural Experiment Station (cooperative investigations).*—About 11¼ miles from Northern Pacific Railway and Union Pacific Railroad stations. Can also be reached by bus from Spokane.

*Cereal Crops and Diseases.*—Agronomic and disease investigations of wheat, including improvement, varietal testing, and genetic studies, especially for quality and resistance to bunt. O. A. VOGEL, agronomist and coordinator for western wheat region.

Investigations on cereal diseases in the Pacific Northwest, including bunt and flag smut, snow mold, and foot rots of wheat and the smuts of oats, including physiologic specialization, seed treatment, and determination of varietal resistance. C. S. HOLTON, pathologist.

Investigations on the quality of wheat varieties, including milling, baking, chemical, physical, and other properties. M. A. BARMORE, chemist.

*Farm Electrification.*—Determination of requirements and developments of plans and specifications for facilities for freezing and storing perishable foods on farms for marketing and home consumption (cooperation with Bureau of Human Nutrition and Home Economics, Texas and Maryland Agricultural Experiment Stations). General supervision by H. L. GARVER, Beltsville, Md.; local supervision by M. C. AHRENS, agricultural engineer.

*Forage Crops and Diseases.*—Grass diseases (cooperation with Soil Conservation Service). G. W. FISCHER, collaborator.

*Plant Exploration and Introduction.*—Headquarters for cooperative investigations in the western region covering the propagation, testing, and distribution of rare and valuable economic and ornamental plants from foreign countries and United States possessions. L. A. MULLEN, agriculturist.

## Puyallup

*Western Washington Agricultural Experiment Station (co-operative investigations).*—About 2 miles west of Puyallup (Northern Pacific Ry., Great Northern Ry., Union Pacific R. R., and Chicago, Milwaukee, St. Paul & Pacific R. R.).

*Nematology Investigations.*—General problems related to plant diseases caused by nematodes in Washington and Oregon; particularly, investigations on nematode diseases of grass seeds and of ornamental bulbs, such as narcissus, iris, and Easter lilies; transfer studies as related to crop rotation; and soil fumigation for nematode control. W. D. COURTNEY, nematologist.

## Spokane

*United States Forest Pathology Field Laboratory (cooperation with Forest Service).*—Located at Northern Rocky Mountain Forest and Range Experiment Station, 157 South Howard Street. Within 6 blocks of railroad and bus stations.

*Forest Pathology.*—Investigations of forest-tree diseases, including pole blight of western white pine. D. P. GRAHAM, forester.

## Wenatchee

*United States Horticultural Field Laboratory.*—Post Office Annex, Mission and Yakima Streets, 3 blocks from Great Northern Railway station and 4 blocks from (bus) depot. Bus service also from Seattle and Spokane.

*Farm Buildings and Rural Housing.*—Investigations of building design, construction, and equipment for fruit storage. Directed from Ames, Iowa; local supervision, G. F. SAINSBURY, agricultural engineer.

*Fruit and Nut Crops and Diseases.*—Investigations of factors affecting fruit production; including studies on nutritional diseases of fruit trees, of fruit thinning, of hormone sprays, and on soil management. L. P. BATJER, physiologist.

Virus diseases of stone fruits; their symptoms, transmission, and control. E. L. REEVES, pathologist.

*Handling, Transportation, and Storage of Horticultural Crops.*—Investigations in handling, transportation, storage and post-harvest diseases of fruits, vegetables, and other horticultural crops. H. A. SCHOMER, physiologist.

## WISCONSIN

### Madison

*State Agricultural Experiment Station (cooperative investigations).*—About 2½ miles west of Chicago & North Western Railway station. Take cars marked "Nakoma" or "Wingra Park" that go out University Avenue within 1 block of Horticultural and New Agronomy Buildings.

*Cereal Crops and Diseases.*—Investigations of pathologic diseases of small grains and corn, including scab, helmin-

thosporium diseases, rusts, mildew, smuts, foot rots, and other diseases. J. G. DICKSON, agent.

Barley and wheat breeding for improved adaptation, yield, disease-resistance, and quality, including species crosses in the case of wheat. R. G. SHANDS, agronomist.

Corn disease investigations, with particular reference to stalk rot and seedling blight. P. E. HOPPE, pathologist.

Malting quality investigations for all barley-growing areas, including basic research on quality and the evaluation of currently grown varieties and hybrid selections from State and Federal barley breeders throughout the United States. A. D. DICKSON, chemist. Located in Barley and Malt Laboratory, 501 North Walnut.

*Farm Electrification.*—Investigations on the application of electrical heating of beehives for overwintering of bees, raising queens, and spring brood rearing; and comparing methods of electric heating to develop functional requirements for electrical equipment necessary to heat beehives under various conditions. (Cooperation with Bureau of Entomology and Plant Quarantine.) G. P. BARRINGTON, agricultural engineer.

*Forage Crops and Diseases.*—Alfalfa and sweetclover breeding, production, and disease investigations. W. K. SMITH, agent.

Clover breeding and disease investigations. E. W. HANSON, agent.

Grass breeding investigations. E. L. NIELSEN, agronomist.

Soybean investigations. J. H. TORRIE, collaborator.

*Soil Survey.*—Subheadquarters, Northern States. See Maryland, Beltsville: Soil Survey Office. G. B. LEE, agent (soil scientist). In Soils Department.

*Tobacco, Medicinal, and Special Crops.*—Studies on improvement and standardization of cigar-binder tobacco varieties, including laboratory and field investigations on control of root rot, mosaic, and other diseases of cigar tobaccos. JAMES JOHNSON, collaborator.

*Vegetable Crops and Diseases.*—Cabbage disease investigations, including breeding for resistance to yellows, mosaic, and clubroot. J. C. WALKER, collaborator, and R. H. LARSON, pathologist.

Investigations on diseases of onions and their control. Directed from Beltsville, Md.; local supervision by J. C. WALKER, collaborator.

*United States Forest Pathology Field Laboratory (cooperation with University of Wisconsin and U. S. Forest Service).*—Located at Forest Products Laboratory. Can be reached by bus from railroad and bus stations.

*Forest Pathology.*—Investigations of decays and disease defects of lumber and other forest products, including sap stains. R. M. LINDGREN, pathologist.

### Sturgeon Bay

*Wisconsin Agricultural Branch Experiment Station (cooperative investigations).*—The Sturgeon Bay Branch Experiment Station is located on State Route 42, 4 miles north of Sturgeon Bay. Travel to the station is provided by daily bus service from Green Bay.

*Fruit and Nut Crops and Diseases.*—Virus diseases of stone fruits. Directed by J. D. MOORE, collaborator, Pathology Department, Madison.

*Plant Exploration and Introduction.*—Serves the United States for the propagation, testing, distribution and maintenance of introduced potato stocks from all parts of the world. R. W. HOU GAS, agent.

## WYOMING

### Cheyenne

**Cheyenne Horticultural Field Station.**—Six and one-half miles northwest of Cheyenne. No bus transportation beyond Fort Francis E. Warren, which is 2½ miles from the station. Transportation arrangements can be made by communicating with the station office.

*Vegetable Crops and Diseases.*—Breeding, testing, and evaluating tree and bush fruits for adaptation in the central Great Plains; breeding strawberries and raspberries for hardiness and quality; adaptation studies with peas and other vegetables; breeding and genetics of tomatoes and cucurbits; cooperative farm windbreak tests; studies on adaptation of

tree and shrub species for farm windbreak use. A. C. HIL-  
DRETH, pathologist and superintendent.

### Laramie

*State Agricultural Experiment Station (cooperative investi-  
gations).*—On campus of University of Wyoming at  
Laramie (Union Pacific R. R., Frontier Airlines, and  
bus). Can be reached by taxi or bus.

*Soil Management and Irrigation Agriculture.*—Soil man-  
agement and crop production under irrigated conditions, in-  
cluding fertility requirements of mountain meadow forage  
production (cooperative with Soil Conservation Service and  
State Agricultural Experiment Station). R. D. LEWIS, soil  
scientist.

### Sheridan

*United States Sheridan Field Station.*—Eight miles north-  
east of Sheridan (Chicago, Burlington & Quincy R. R.;  
Western Air Lines, and bus). Transportation arrange-  
ment can be made by communicating with superin-  
tendent.

*Soil Management and Irrigation Agriculture.*—Soil man-  
agement and crop production under dry-land conditions;  
shelterbelt investigations; garden and fruit investigations;  
variety tests of cereal and forage crops; and testing of  
grasses and legumes for forage production. (Cooperation  
with State Agricultural Experiment Station and the Uni-  
versity of Wyoming.) Directed from Fort Collins, Colo.  
OSCAR BARNES, acting superintendent.

## FOREIGN STATIONS

The Bureau of Plant Industry, Soils, and Agricultural  
Engineering, through its Division of Rubber Plant Investi-  
gations, conducts a cooperative research and technical guid-  
ance program for encouragement of cultivated rubber produc-  
tion in the Western Hemisphere. This program is carried  
on under an allotment from the Mutual Security Act.

Cooperative investigations are conducted at 3 regional field  
stations, supported mainly by the United States, and at Fed-  
eral stations or rubber-development centers of 11 tropical  
American countries. The experiments are carried out on

lands furnished by the cooperating agency. Research is conducted on farm practices, including soil cover and intercrops, suited to the growing and production of improved strains of the hevea rubber tree obtained by jungle selection and breeding. Initial supplies of budded stumps or budwood of superior strains are furnished cooperating countries for local propagation and distribution. Technical assistance is provided local agencies engaged in developing rubber-production programs.

Through the Division of Cotton and Other Fiber Crops, the Bureau conducts investigations on abaca production in Costa Rica and elsewhere in Latin America. It also conducts studies on accelerating breeding and genetic investigations by growing an extra generation of cotton during the winter season in Mexico.

## Bolivia

### BENI

#### Riberalta

*United States Rubber Plant Field Headquarters (cooperation with Ministerio de Agricultura y Colonizacion).—* Can be reached by air from La Paz. Arrangements should be made in advance by writing PAUL TOBLER, Casilla 8, Riberalta, Beni, Bolivia.

*Rubber Plant Investigations.*—Technical assistance on plantation and small-farm rubber production. PAUL TOBLER, agriculturist.

## Brazil

### BAHIA

#### Una

*Instituto Agronomico do L' Este (cooperation with Ministerio de Agricultura).—* Located about 1 mile from Una. Arrangements for visiting should be made in advance by writing to R. L. FOWLER, Instituto Agronomico do L' Este, or to the American Consul, Salvador, Bahia, Brazil.

*Rubber Plant Investigations.*—Technical assistance for propagation; distribution of nursery stock; clone tests. R. L. FOWLER, agriculturist.

**PARA****Belem**

*Instituto Agronomico do Norte (cooperation with Ministerio da Agricultura).*—Located about 3½ miles from Belem, Para, and can be reached by bus.

*Rubber Plant Investigations.*—Research and technical assistance on hevea disease control. A. M. GORENZ, pathologist.

Plantation management advisory services. LOCKE CRAIG, agriculturist.

**Belterra**

*Plantacoes Ford (cooperation with Ministerio da Agricultura).*—Located on the Tapajos River about 600 miles up the Amazon River from Belem. Can be reached by air from Belem to Santarem and by boat from there to Belterra. Advance arrangements should be made by writing to C. H. T. TOWNSEND, JR., Plantacoes Ford, Belterra, Para, Brazil.

*Rubber Plant Investigations.*—Studies on plant breeding, including wild hevea species and strains, disease resistance, hevea yield tests, and technical guidance on rubber planting. C. H. T. TOWNSEND, JR., agriculturist.

**Colombia****ANTIOQUIA****Villa Arteaga**

*Campo Experimental de la Villa Arteaga (cooperation with Ministerio de la Economia Nacional).*—About 175 miles by highway from Medellin. Visitors should make advance arrangements through R. E. STADELMAN, in care of American Consulate, Medellin, Colombia.

*Rubber Plant Investigations.*—Technical guidance on plantation and small-farm rubber production. R. E. STADELMAN, agriculturist.

Jungle exploration and collection of promising new breeding material. R. E. SCHULTES, botanist.

## Costa Rica

### Guapiles

*Los Diamantes Experiment Farm (cooperation with Secretaria de Agricultura y Industria).*—Reached by rail from San Jose or Port Limon on the Northern Railway via Siquirres and “Old Line” branch to Los Diamantes. Visitors should make advance arrangements through E. P. IMLE, U. S. D. A. Cooperative Rubber Plant Field Station, Turrialba, Costa Rica, or Agricultural Attaché, American Embassy, San Jose, Costa Rica.

*Rubber Plant Investigations.*—Field studies of hevea cultivation; breeding; testing of selected clones; and the multiplication and distribution of plant material. W. E. MANIS, agriculturist.

### San Jose

*Field Regional Headquarters.*—Advance arrangements should be made through the American Embassy, San Jose.

*Rubber Plant Investigations.*—Regional headquarters for pathological investigations and disease control. M. H. LANGFORD, pathologist.

Regional headquarters for plantation management advisory services. H. C. HAINES, agriculturist.

### Turrialba

*Inter-American Institute of Agricultural Sciences (cooperation with the Reconstruction Finance Corporation and the United Fruit Co.).*—About 3 hours by rail or highway from San Jose. Advance arrangements should be made with W. Q. LOEGERING, Inter-American Institute of Agricultural Sciences, Turrialba, or through the Agricultural Attaché, American Embassy, San Jose, Costa Rica.

*Cotton and Other Fiber Crops and Diseases.*—Investigations on the production of abaca in Central America. These studies include determining the nature and causes of abaca

diseases, insect damage, nutritional problems, varietal responses, and related agronomic studies. W. Q. LOEGERING, pathologist.

*Rubber Plant Investigations.*—Regional experiment station for investigations of leaf blight and for the development of superior disease-resistant clones of hevea; breeding investigations; research on field practices and production techniques. E. P. IMLE, agriculturist.

## Dominican Republic

### Piedra Blanca

*Campo Experimental del Caucho (cooperation with Secretaría de Estado, Agricultura, Industria y Trabajo).*—Located near Piedra Blanca on the Duarte Highway about 50 miles from Ciudad Trujillo. Visitors should make advance arrangements through D. D. ALBERT, care of American Embassy, Ciudad Trujillo, Dominican Republic.

*Rubber Plant Investigations.*—Technical assistance on plantation and small-farm rubber production. D. D. ALBERT, agriculturist.

## Guatemala

### Cuyotenango

*U. S. D. A. Cooperative Rubber Plant Propagation Center (Finca Trapiche Grande) (cooperation with Ministerio de Agricultura, Instituto Agropecuario Nacional, and U. S. Office of Foreign Agricultural Relations).*—About 112 miles from Guatemala City by railway or highway. Trapiche Grande is 3 miles from Cuyotenango by highway. Visitors should make advance arrangements with J. F. O'DONNAL, U. S. D. A. Rubber Plant Field Station, Cuyotenango, Suchitepeque, Guatemala.

*Rubber Plant Investigations.*—Regional breeding station; clone testing; technical assistance on plantation and small-farm rubber production. J. F. O'DONNAL, agronomist.

## Haiti

### Marfranc (Jerémie)

*U. S. D. A. Cooperative Rubber Plant Field Station (cooperation with Secrétaire d'Etat de l'Instruction Publique et l'Agriculture).*—Jerémie can be reached by phone from Port-au-Prince or by automobile, the distance being 210 miles. Marfranc and the station are 12 miles southeast of Jerémie and can be reached by automobile. Advance arrangements should be made through G. C. VAN DEN BERGHE.

*Rubber Plant Investigations.*—Regional breeding station; technical assistance on plantation and small-farm rubber production. G. C. VAN DEN BERGHE, rubber technologist.

## Honduras

### Tela

*San Alejo Experimental Plantation (cooperation with Ministerio de Agricultura, Tela Railroad Co., and United Fruit Co.).*—Arrangements for visiting should be made in advance through V. C. DUNLAP, Research Department, United Fruit Co., La Lima, Honduras.

*Rubber Plant Investigations.*—Field comparisons of hevea clones; technical assistance on plantation and small-farm rubber production. Assistance from J. F. O'DONNAL, agronomist, Cuyotenango, Guatemala.

## Mexico

### DISTRITO FEDERAL

#### Mexico

*Field Headquarters.*—Montes Escandinavos 305, Mexico 10, Distrito Federal, Mexico. Visitors should write in advance to T. D. MALLERY at the above address.

*Rubber Plant Investigations.*—Technical assistance to plantation and small-farm rubber production. T. D. MALLERY, agronomist.

**GUERRERO****Iguala**

*Campo Agrícola Experimental* (cooperation with the Mexican Ministry of Agriculture, The National Cotton Council of America, and private and institutional breeders).—About 125 miles south of Mexico City on highway to Acapulco. Advance arrangements should be made with L. R. LYTTON, Apartado 41, Taxco, Guerrero, Mexico, or through the Agricultural Attaché, American Embassy, Mexico City.

*Cotton and Other Fiber Crops and Diseases.*—Conducts studies on accelerating cotton breeding and genetic investigations by growing an extra generation during the winter season. These studies are designed to serve geneticists and cotton breeders in speeding up the program of developing improved cotton varieties. L. R. LYTTON, agent.

**TABASCO****Villahermosa**

*Field Headquarters* (cooperation with Secretario de Agricultura y Fomento).—Advance arrangements should be made through T. D. MALLERY, Montes Escandinavos 305, Mexico 10, Distrito Federal, or P. C. CONNER, Apartado Postal 130, Villahermosa, Tabasco.

*Rubber Plant Investigations.*—Technical assistance on plantation and small-farm rubber production. P. C. CONNER, agriculturist.

**VERACRUZ****Tezonapa**

*Campo Experimental de Hule "El Palmar"* (cooperation with Secretaria de Agricultura y Fomento).—About 10 miles from Tezonapa, Veracruz, and is reached by automobile from that place. Telephone, Cozolapa 15. The post office address is Apartado 19, Cozolapa, Oaxaca, Mexico. Visitors should make advance arrangements with R. H. BARTLETT, assistant agriculturist.

*Rubber Plant Investigations.*—Technical assistance on plantation and small-farm rubber production; assistance and

guidance of disease control and clone testing. R. H. BARTLETT, agriculturist.

## Panama

### Divisa

*Escuela Nacional de Agricultura (cooperation Ministerio de Agricultura y Comercio).*—Divisa is about 130 miles from Panama City on the highway passing through Agua Dulce. Visitors should contact the Ministry of Agriculture in Panama City.

*Rubber Plant Investigations.*—Clone comparisons; demonstration planting. Direction from Turrialba, Costa Rica. Local supervision by RAUL LUACES, horticulturist.

### Gatun, C. Z.

*Rubber Substation of the Inter-American Institute of Agricultural Sciences (cooperation with Ministerio de Agricultura y Comercio).*—Visitors should make advance arrangements through R. H. ALLEE, Inter-American Institute of Agricultural Sciences, Turrialba, Costa Rica.

*Rubber Plant Investigations.*—Seed production and distribution; clone comparisons. Directed from Turrialba, Costa Rica; local supervision, H. C. F. COOK, farm manager.

## Peru

### Tingo Maria

*Estación Central de Colonización en Tingo Maria (cooperation with Ministerio de Agricultura, Corporación Peruana del Amazonas, and U. S. Office of Foreign Agricultural Relations).*—Can be reached by plane or highway from Lima. Visitors should make advance arrangements through the Director, Estación Central de Colonización en Tingo Maria, Tingo Maria, Peru.

*Rubber Plant Investigations.*—Technical assistance on plantation and small-farm rubber production; comparison of jungle selections; seed collection and distribution. H. F. ALLARD, agronomist.

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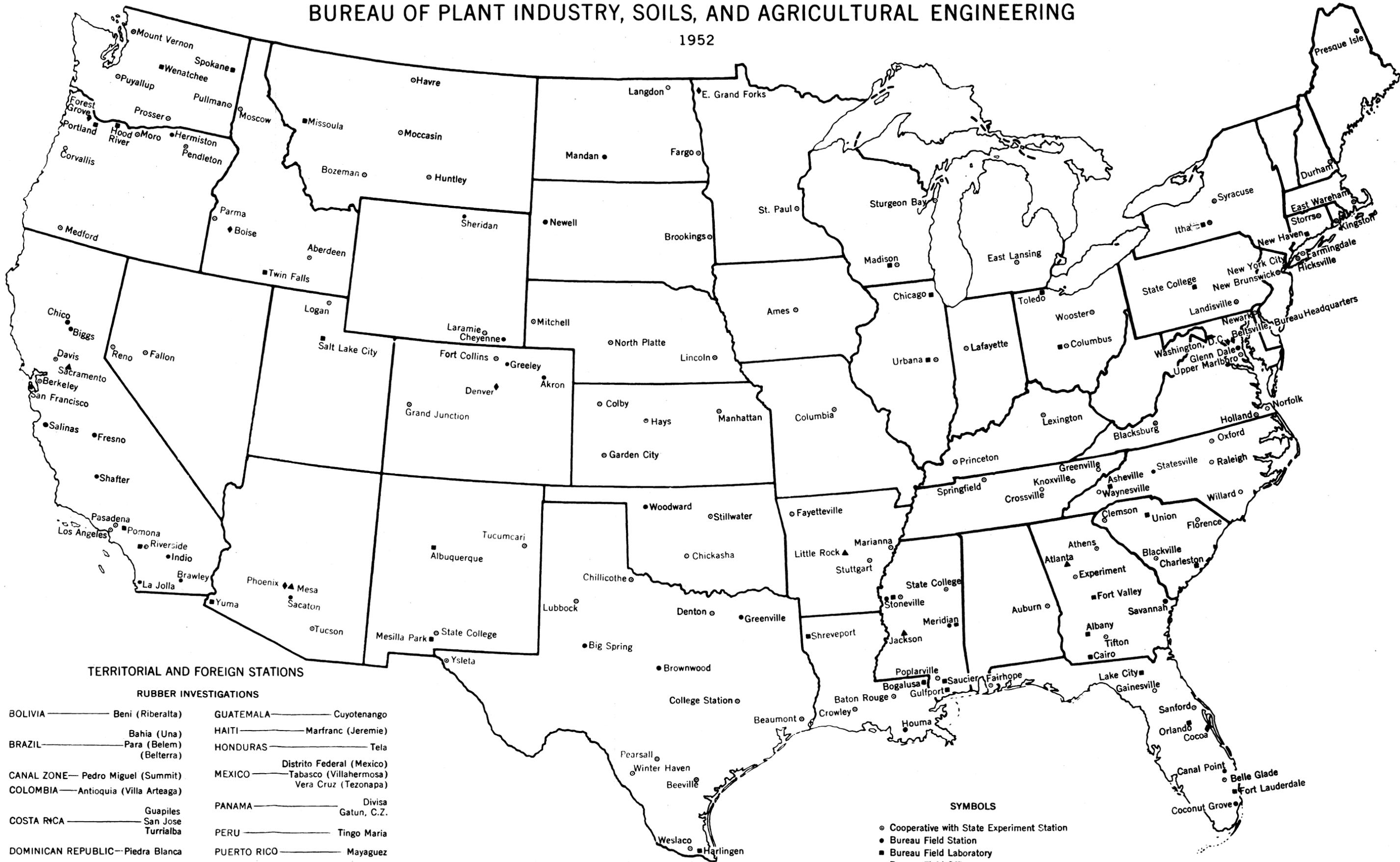
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# PRINCIPAL FIELD LOCATIONS

## BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

1952



### TERRITORIAL AND FOREIGN STATIONS

#### RUBBER INVESTIGATIONS

- |                                      |                                    |
|--------------------------------------|------------------------------------|
| BOLIVIA — Beni (Riberalta)           | GUATEMALA — Cuyotenango            |
| BRAZIL — Bahia (Una)                 | HAITI — Marfranc (Jeremie)         |
| Para (Belem)                         | HONDURAS — Tela                    |
| (Belterra)                           | MEXICO — Distrito Federal (Mexico) |
| CANAL ZONE — Pedro Miguel (Summit)   | Tabasco (Villahermosa)             |
| COLOMBIA — Antioquia (Villa Arteaga) | Vera Cruz (Tezonapa)               |
| COSTA RICA — Guapiles                | PANAMA — Divisa                    |
| San Jose                             | Gatun, C.Z.                        |
| Turrialba                            | PERU — Tingo Maria                 |
| DOMINICAN REPUBLIC — Piedra Blanca   | PUERTO RICO — Mayaguez             |

#### SOILS

PUERTO RICO — Rio Piedras

#### COTTON AND OTHER FIBER CROPS

COSTA RICA — Turrialba  
 MEXICO — Guerrero (Iguala)

### SYMBOLS

- Cooperative with State Experiment Station
- Bureau Field Station
- Bureau Field Laboratory
- ▲ Bureau Field Office
- ◆ Centers of Bureau work other than above