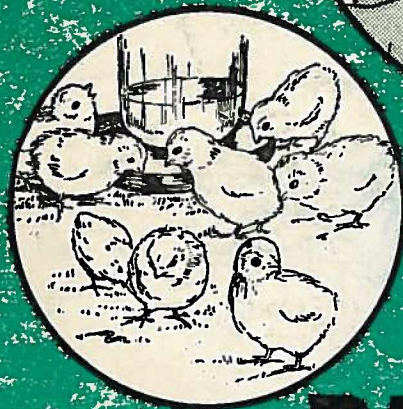


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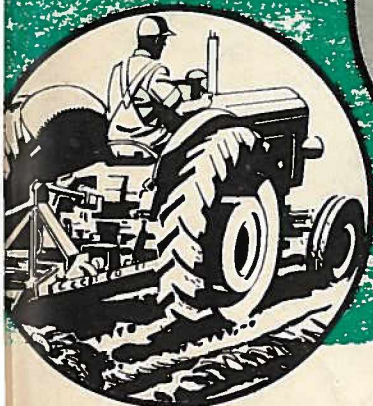
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AGRICULTURAL RESEARCH SERVES COLORADO

73rd
1959—60
ANNUAL REPORT



Agricultural Experiment Station, Colorado State University, Fort Collins

**Letter of Transmittal
Seventy-Third Annual Report
Colorado Agricultural Experiment Station**

Honorable Stephen L. R. McNichols
Governor of Colorado
Denver, Colorado

Sir:

In compliance with the act of Congress, approved March 2, 1887, entitled, "An act to establish Agricultural Experiment Station, in connection with the colleges established in several states under the provisions of an act approved July 2, 1862, and under the acts supplementary thereto," I herewith present the Seventy-third Annual Report of the Colorado Agricultural Experiment Station for the fiscal year of July 1, 1959 to June 30, 1960.

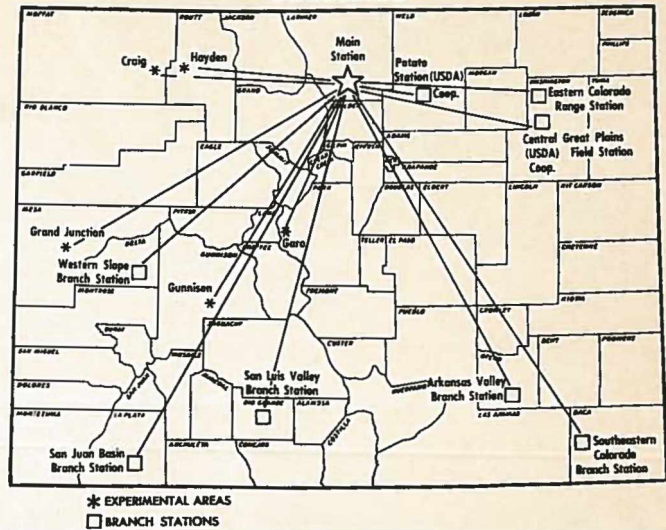
Fort Collins, Colorado
July 1, 1960



S. S. Wheeler
Director

Agricultural Research Serves Colorado

Branch Stations and Experimental Areas COLORADO



73rd Annual Report

Colorado Agricultural Experiment Station

At the main agricultural experiment station at Fort Collins, at branch experiment stations throughout the state and in various experimental areas, Colorado Agricultural Experiment Station scientists conduct research important to all segments of Colorado's people.

New crop varieties, new farm and ranch management techniques, new approaches to marketing, more effective ways to utilize water resources—these are but a few examples of problems which inquiring minds are considering in upwards of 200 projects.

Benefits from Colorado research obviously

accrue to those who provide the food and fiber to feed and clothe our people. Not so obvious, but perhaps exceeding in magnitude the benefits derived by our agricultural producers, are the advantages ultimately enjoyed by the consumer. The research project which provides information that permits the grower to produce a better product at lower cost inevitably must also benefit the consumer in terms of a higher standard of living.

A report of this nature obviously cannot cover in detail all aspects of a large number of research projects. The aim here is to provide only a brief picture of the vital work being done.

University of Colorado at Boulder

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Crops and Soils



Crops and soils research was conducted in 28 separate projects. General areas of investigation included these:

- Winterhardiness and disease resistance of alfalfa
- Genetic and linkage relationships in barley
- Dryland crop improvement
- Inheritance studies of disease resistance of small grain
- Effect of alfalfa, plant nutrients and moisture level on irrigated crops
- Factors affecting productivity of exposed subsoils
- Improvement, management and classification of poorly-drained soils
- Breeding for disease resistance and improved seed
- Sorghum improvement
- High-altitude crop investigations
- Influence of irrigation on soil structure and plant growth
- Effect of fertilizers on yield and quality of dryland crops
- Corn improvement
- Longevity of farm seed
- Testing foreign bean introductions for resistance to root rots and other diseases
- Cooperative soils laboratory
- Foundation seed
- Behavior of natural and artificial phosphates in calcareous soils
- Secondary and trace element studies
- State soil survey and land classification
- Improvement of high-altitude irrigated meadows

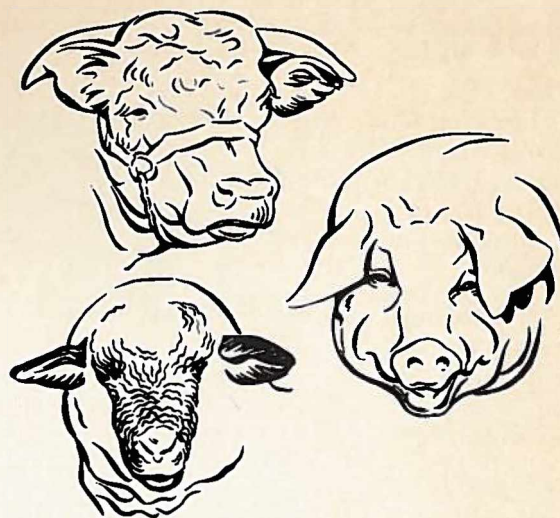
- Vascular tissue differentiation in alfalfa roots
- Soil fertility, salinity and moisture in relation to crop production

- Factors influencing nitrogen availability in soils
- Selection and improvement of strains of native and introduced forage grass and legume species
- Factors and mechanisms affecting role of organic matter in stabilizing aggregates in a hydrated environment
- Effects of soil moisture availability and related variables on seed germination and seedling development
- Movement of water in small capillaries and thin films
- Studies aimed at improving sorghum varieties were conducted under dryland conditions at Akron and near Springfield; similar studies under irrigated conditions were made at Rocky Ford.

Although grain sorghum hybrids were grown in Colorado for the first time in 1956, they occupied about half the planted Colorado acreage in 1959. This rapid switch from common to hybrid varieties was due in part to yield tests which made possible the selection of adapted hybrid varieties for a wide range of conditions in Eastern Colorado.

These tests have shown that adapted hybrids will produce from 10 to 20 percent more grain than the common varieties grown exclusively in the past. The best adapted common varieties, however, still outyield the non-adapted hybrids.

Livestock



Seventeen research projects involving such things as genetic improvement of livestock, development of better feeds and advances in feeding methods were in progress. The general areas of investigation:

- Nutritional evaluation of mountain meadow hays
- Value of fermentation products in ruminant nutrition
- Selection, inbreeding and crossing of inbred lines of Herefords
- New feeds in cattle rations
- Selecting for rapid gains in mammals
- Clean fleece weight production and shrinkage
- Fattening heavy, medium and light lambs
- Feeding methods and feed preparation for stocker steer calves
- Effect of hormones on rate of gain and reproductive performance of beef heifers
- Harvest dates in relation to feed response, mountain meadow hays
- Efficiency of lamb and wool production in Colorado
- Investigation of unidentified nutritional factors in alfalfa and range plants
- Effect of hormones, drugs and similar substances on feedlot performance

- Redd Ranch cooperative sheep project
- Selection criteria for genetic improvement of carcass merit in sheep
- Value of native and seeded range grasses in beef cattle nutrition
- Environmental stress on range cattle and sheep

A study was conducted at Gunnison on relation of mountain meadow hay harvest dates to feed response in cattle. The test showed that early-cut hay (cut July 10) was far superior to late-cut (Aug. 10) in terms of daily gain produced.

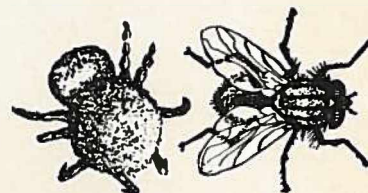
For early-cut hay, only 8.7 to 10.5 pounds of forage were required to produce a pound of gain; for late-cut hay, 29.8 pounds of forage were required per pound of gain.

These results indicate that a rancher can get as much from five acres of early-cut hay as from seven acres of late-cut. In addition, the rancher then has the added advantage of a high-quality aftermath growth, rather than a lower quality aftermath which follows late cutting.

Entomology

The long-established insect detection program was continued and provided regular weekly reports on the extent of infestations of principal economic insects. From these reports, producers were advised as to control measures necessary to protect their crops. In addition, research projects in these general areas were conducted:

- Relation of insect and mite populations to virus transmission in stone fruits



- Detection and control of insects transmitting potato viruses
- Influence of orchard management on insect and mite populations of pome fruits
- Persistence of pesticide residues under mountain climatic conditions
- Investigation of insect damage affecting marketability of canning tomatoes
- Control of rangeland grasshoppers

Horticulture

Many requests for new work on head lettuce and other fresh market crops were received. Grower interest in research was shown by their willingness, under marketing control boards, to assess and allocate more funds to research projects underway.

A problem is the increased demand for research and service in ornamental horticulture from city people. Horticulture interests almost every home owner and a more adequate program to meet such needs would be helpful.

Projects conducted include these:

- Improvement of canning tomatoes
- Effect of timing, method of application and source of nitrogen on Delicious apples
- Development of adapted onion varieties and hybrids
- Factors influencing quality of potatoes for processing
- Orchard management
- Floriculture investigations
- Potato tuberization and root growth factors
- Potato breeding and variety testing
- Horticulture farm
- Cucumber breeding and testing
- Turf grass research
- Propagation of drouth-resistant plants and revegetation of cut-over fills and banks



A study involving onion varieties showed that new hybrids developed in the Arkansas valley were highly resistant to pink root disease, stored better and matured slightly earlier than varieties previously available. The new hybrids also showed satisfactory yields.

Still another project concerned with growing carnations gave tentative indication that adding carbon dioxide to the greenhouse atmosphere improved growth rate of the flowers.

A new potato variety, Blanca, was introduced this year. From extensive field trials, it appears that Blanca may outperform the Navajo variety released a year earlier.

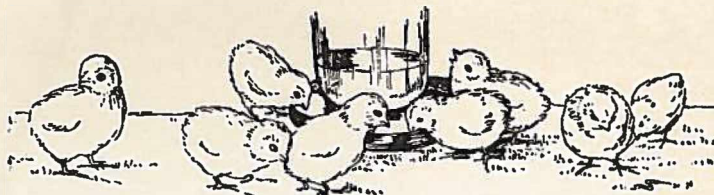
Poultry

Service to the public was extended through participation by poultry section staff members at various poultry meetings throughout the state. Disease control, improved marketing methods, and development of a new controlled-environment laying house were among many problems for which assistance was provided.

Contract research involved studies on possible use of Colorado granite for grit and the potential use of dried brewers' yeast in poultry rations.

Other research projects included these:

- Radioactive minerals and the role of vitamin D in intestinal absorption in the domestic fowl
- Nutritive requirements of laying hens
- Genetic adaptability to temperature stress and the development of the turkey embryo
- Interrelationship of genetic constitution and nutritional value of diet on utilization of nutrients
- Response of the avian embryo to X-ray irradiation
- Nutrient requirements in growing chickens
- Optimum management and housing practices for efficient turkey production
- Reproduction performance of caged and floor layers in a high-altitude environment



Influence of color and amount of carcass fat on market grades of dressed turkey

Factors influencing quality of eggs sold through the Denver market

Data useful to the state's turkey growers came out of a study relating floor and feeder space to growth and market grades under both pole house and dry-lot environments.

Toms gained slightly more weight in dry-lots than in pole houses. But when feeder space was doubled, the male bird gains in pole houses were significantly higher than in the dry-lot, where some increase in weight also occurred with doubled feeder space.

Hens on dry-lot grew at essentially the same rate as those in pole houses, with no response when feeder space was doubled.

Mortality for toms was greater in dry-lot than in the pole shed but no mortality difference was noted for hens.

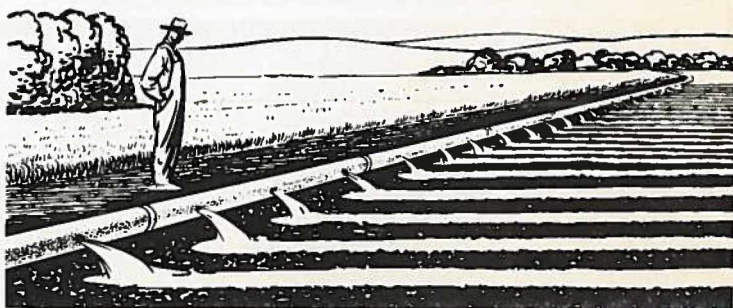
Carcass grades did not differ on the basis of type of confinement; however, in the pole house increased feeder space and more floor space were accompanied by a higher percentage of grade A carcasses for toms.

Agricultural Engineering

Among the more important farm management problems to which agricultural engineering can make significant contributions are those of mechanization to reduce labor costs and thus increase efficiency, and design of farm irrigation and drainage systems to conserve water and avoid loss of valuable land due to inadequate drainage.

Projects aimed at solving some of these problems included these:

- Development of vegetable harvesting machinery
- Pneumatic conveyance of livestock feeds
- Drainage criteria for irrigated land
- Sugar beet planting investigations
- Hydraulics of surface irrigation
- A study to determine drainage criteria for



irrigated land showed that construction of "community" drains—using a common conduit to carry drainage water from a number of farms—will become increasingly necessary. Farm-by-farm drainage systems, dependent upon nearby ponds or slough areas for disposal of water, appear in many cases to have reached their capacity. Thus farmers may find it increasingly necessary to approach the problem from a community standpoint.

The study showed that yield of a fairly large drainage area can be predicted with reasonable accuracy and that drainage systems based on those predictions can be designed.

The study cited was supported almost entirely by the Soil Conservation Service.

Civil Engineering

Of some 30 research projects in progress this year, 16 involved contract research grants administered through the Colorado State University Research Foundation. While contract research permits significant contributions to engineering, there is some question as to whether a research program should be so heavily dependent on non-experiment station funds. At present, this section obtains over 80 percent of its financial support from non-experiment station sources. This is a high percentage which should be reduced to not more than 50 percent—an objective which cannot be achieved without additional experiment station funding.

The following projects were in progress during the year:

- Laboratory and field study of the vortex tube sand trap
- Meteorological observations
- Effects of cloud seeding on snowfall
- Ground water fluctuations and their relation to pumping
- Development and improvement of water measuring devices
- Hydraulics laboratory
- Sealing irrigation canals with colloidal clays
- Snow course measurements and forecast analyses
- Calibration of current meters in rating flume
- Proper irrigation well construction and maintenance
- Natural and artificial recharge of ground water
- Gravel filter design for irrigation wells
- Evaporation from soil surfaces
- Economic effects of controlling water use



CSURF Projects

- Investigations of contracted openings in an open channel
- Mechanics of flow in alluvial channel
- Distribution and concentration of radioactive waste in alluvial streams
- Water and sediment measuring equipment for ephemeral streams
- Calibration of a turbinemeter for Martin Company
- Spur dikes
- Model study of Dillon dam spillway
- Bhumiphol outlet works tunnel
- Martin Company evaluation
- Pitot tube calibrations
- Magnitude and frequency of floods in arid and semi-arid areas
- Wind tunnel modeling of atmospheric diffusion
- Development of a dual-channel stream monitor sponsor
- Climatology of upper Colorado river basin
- Fundamental study of a submerged and non-submerged three-dimensional jet
- Evaluation of orifice plates for measuring feedwater flow in atomic reactors for ships

In the project aimed at developing and improving water measuring devices, a number of types and sizes of trapezoidal measuring flumes were studied and calibrated. These range from small V-notch flumes, intended primarily for furrow measurement, to one designed for streams with flows up to 400 cubic feet per second. Most of these flumes were also studied and calibrated under submerged conditions.

The study has indicated a number of advantages in using flumes with sloping sidewalls in contrast to the rectangular types.

Forestry and Range Management

Maintenance, improvement and more efficient utilization of Colorado's forest and range resources were studied in a variety of projects. Included were these:

- Effect of fertilizers on native and reseeded forage plants
- Improving sagebrush lands for range livestock production
- Induced vegetation of depleted range and abandoned croplands
- Shelterbelts
- Colorado cooperative gopher project
- Investigations in more efficient use of native wood
- Marketing forest products in Colorado
- Use and management of seeded range units
- Forage production and species composition of sand sagebrush range
- Value of native and seeded range grasses for beef cattle nutrition
- Selection and improvement of native and introduced species of grasses and legumes
- Forest products marketing practices and problems at the initial processor level
- Aspects of interspecific competition between pocket gopher species
- Effect of asphalt emulsions on range seeding
- Effectiveness of ground-line maintenance treatments of utility poles

A study on the dimensional variation of lumber manufactured in Colorado was completed.



This aspect of the quality of locally-produced lumber is a factor in prejudice against the product encountered in Colorado markets.

The study showed that dimensional quality of Colorado lumber is not correlated with the size of the producing sawmill—a finding which refutes a commonly held viewpoint that dimensional variations are a “small sawmill problem”. It thus appears that the attitude of the sawmill operator is more important in determining dimensional quality of lumber than the size of his operation.

Operators of 41 Colorado sawmills were surveyed regarding the possible formation of a co-operative trade association to improve quality of Colorado lumber. In general, reaction was favorable, but inertia and indifference were indicated as major organizational difficulties facing such a venture.

Home Economics



Research projects listed for this section reflect continued attention to such areas as nutrition, clothing, and housing. One area of research which has not received sufficient attention and for which additional support is needed is the economics aspect of home management.

Projects conducted this year include:

- Effects of atmospheric conditions on specified cotton fabrics
- Baking flour mixtures at high altitudes
- Effects of microwave energy on quality of fruits and vegetables cooked at high altitudes

- Baking and boiling quality of Colorado potatoes
- Factors affecting consumer purchase and use of fruits and vegetables
- Amino acid utilization as affected by dietary factors
- Role of diet and environmental factors in cholesterol metabolism
- Nutritional status of selected population groups in Colorado
- Housing project

A project involving the use of microwave energy in cooking fruits and vegetables was slanted toward determining the effect of microwave energy on palatability of fruits cooked in an electronic range.

Excellent products resulted from microwave cookery of fresh fruits such as apples, peaches, pears and plums when following procedures used at sea level. Cookery of fresh fruits with microwave energy apparently differs little, if any, with variation in altitude. With dried fruits, however, the product was more satisfactory when cooking times recommended for sea level were increased. Tests were conducted at an altitude of 5,000 feet.

Botany and Plant Pathology

Plant diseases and unwanted weeds take a heavy toll each year in terms of reduced crop yields for Colorado farmers. Research projects in the botany and plant pathology section, many of them of a fundamental or basic nature, are conducted to reduce these losses.

Studies conducted this year were these:

- Breeding disease-resistant crops
- Floricultural studies (plant pathological phase)
- Chemical and biological investigations of plant growth regulators
- Weeds detrimental to agricultural and other interests of the state
- Diseases of sugar beets
- Testing foreign bean introductions for resistance to root rot and other diseases
- Diseases of onions
- Soil fungi
- Cereal disease investigations
- Miscellaneous truck crops



- Alfalfa diseases
- Melting-out disease of turf
- Importance and influence of crop residues on microorganisms in soil
- Effect of light on plant response to herbicides
- Causes of variation in the rust disease syndrome

In just one phase of potato disease research conducted by this section, studies revealed there are Virus X strain differences within the best foundation seed lots of Red McClures grown in Colorado. Prior to this study, it was thought that all Red McClures carried the virulent strain only.

This year's tests have shown that both moderate and severe strains are present and there is some indication of a weak strain or freedom from the X virus. The progeny of these lots will be further tested. There is a strong possibility that such weaker strains of virus X can be utilized by introducing them to virus-free lines as a cross-protection agent.

Seed Laboratory

The seed laboratory is operated primarily as a service agency with limited funding through state appropriations, supplemented by testing fees.

The number of seed samples sent in for testing increased about 25 percent over the previous year. Receipts were up about 80 percent, due primarily to an increase in the number of more difficult and time-consuming tests run.

The laboratory is involved in two research projects:

- Facilitating seed marketing through improved testing procedures
- Improvement of laboratory techniques in germination of seed



Scarification is known to be effective in overcoming dormancy due to hard seed coats in certain seeds. The laboratory has made progress in the more difficult applications of this principle to certain grass seeds. In one instance, the germination period was reduced from the normal 8 to 10 weeks to 3 to 6 days.

Effects on seed germination of red light, infra-red, and low energy irradiation in vacuum are being investigated, as is treating with gibberellic acid, hydrogen peroxide and other compounds.

The laboratory continues to cooperate fully with the state department of agriculture in conducting the state seed inspection program.

Chemistry and Endocrine Research

Research conducted within the two groups making up the chemistry section included these projects:

Chemistry group

Disease resistance of cercospora leaf spot in sugar beets
Antianemic growth factors related to amino acid utilization in chicks
Chemical composition and processing characteristics of peaches and apples
Polyphenols in plants
Water analysis

Endocrine group

Effect of natural and synthetic hormones on metabolism and reproduction in farm animals
Effect of hormones on fattening and feedlot performance of cattle
Metabolism of steroids in the bovine male and female
Characteristics of the metabolic pathways of diethylstilbestrol and its products in poultry
Effect of hormones on growth and finish of poultry
Effect of hormones, drugs and similar substances on livestock nutrition
Chemical and biological characterization of anti-fertility factors
Evaluation of Hg-cholesterol as a therapeutic agent in veterinary medicine

Relation of protein, amino acid and carbohydrate constituents of bull semen to testi-accessory-sex-organ function

Causes and treatment of testis failure in sub-fertile bulls

The chemistry group has developed an uncooked dried apple sauce which rehydrates instantly with the addition of cold water. The product retains the fresh apple flavor. This development is still in preliminary stages and more work is needed to increase the stability of the apple powder and to improve the method of drying, however.

In commercial beef herds, more and more artificial insemination is being used. One of the chief problems has been the lack of a method by which beef cows can be brought into heat and bred at shorter intervals than heretofore possible. In a field test conducted with 68 heifers and young cows, the endocrine group found that treating the animals with certain compounds rendered the estrous cycle dormant for a short period of time. Thereafter, normal estrous cycle was resumed without any adverse influence on the cycle itself. This work, which has very real significance for the cattle industry, will be repeated next year.



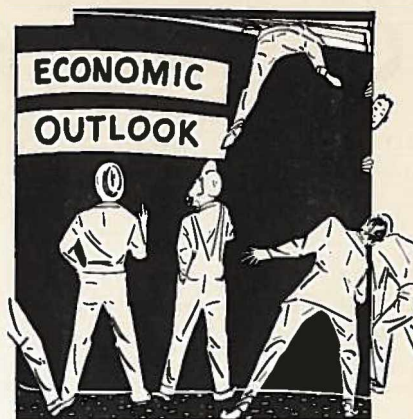
Economics and Sociology

Financing farm housing, rural population shifts, changing market patterns for agricultural products and evaluation of resources were among subjects studied in this section.

The complete list of research projects:

- Financing of farm housing
- Impact of population change and migration in Sedgwick county
- Determining benefits from irrigation water
- Marketing Colorado wool
- Adjusting farming to prospective markets
- Improving retailer acceptance of Colorado carnations
- Economic effect of ground-water law on ground-water use in the lower Bijou basin
- Factors affecting increases in sale of dairy products
- Adjustments of Colorado agricultural marketing co-operatives to the changing market structure
- Alternative marketing channels for Colorado cattle and calves
- Effects of buying practices of food retailers on suppliers of selected agricultural products

Completed this year was a study which compared two methods of selecting and packing cut carnations. The study resulted in the selection



of more efficient packing techniques—in one plant alone, facilities that were crowded three years ago now are handling double the quantity of flowers they once did. The study also uncovered several undesirable pre-treatments which now have been discontinued.

Several promising innovations such as perforated film have been tested and seem ready for acceptance. Other innovations such as the automatic set-up box have been tested and are now being used in the industry.

Animal Diseases

In conducting its research programs, the animal disease section has enjoyed excellent cooperation from livestock producers, veterinarians, and producers of veterinary medicines and supplies.

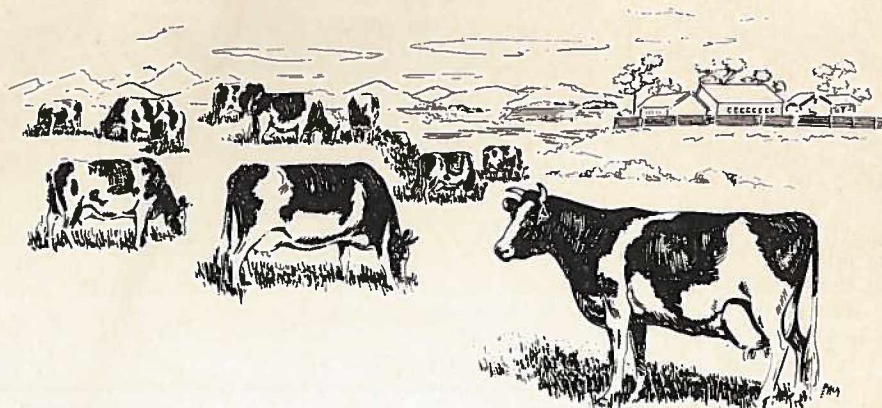
Research was conducted in these fields:

- Shipping fever
- High mountain disease
- Viral ulcerative dermatosis of sheep
- Infectious bovine rhinotracheitis
- Comparative placental pathology
- Urinary calculi of beef cattle
- Foot rot of cattle
- Vibriosis in range cattle
- The mechanism of vibriosis in sheep



- Enterotoxemia
- Chemotherapeutic control of lungworm infections of cattle
- Role of animal fecal flora in stream pollution

In addition to conducting the above studies, this section operated a diagnostic laboratory which in 1959 received 2,219 consignments of animals or tissues for diagnosis. Of this number, 874 were in support of clinical investigations at the veterinary hospital. Most consignments consisted of multiple animals or multiple specimens of tissues. Although all species of domestic animals were included, bovine specimens predominated and poultry specimens were second in frequency.



Dairy

Significant studies have been conducted in such fields as dairy cattle nutrition, raising dairy replacements and forage harvesting and feeding methods. Research areas needing greater attention include mastitis and marketing.

The following research projects were carried on in 1959-60:

- Forage production and harvesting methods for economical milk production on irrigated land
- Intermediary metabolism of the ruminant as influenced by various feeds

Feeding at high levels to reduce dairy replacement rearing time

- Investigation of inhibitory substances in milk
- Hormone implants for replacement dairy cattle
- Relation of solids-not-fat to yield of cottage cheese curd
- Milk marketing and distribution practices in Colorado

The study concerned with the influence of various feeds on the intermediary metabolism of the ruminant has produced data on which changed feeding recommendations are now being made. Primarily, this involves an increase in the energy content of concentrate rations.

Information and Publications

Reporting research results has been the joint responsibility of station scientists and editorial specialists within the Information Service. Highlights on research, with particular but by no means exclusive emphasis on findings which offer reasonable chance for immediate practical application, were handled through such mass media as farm magazines, newspapers and radio stations. More detailed information on results was included in progress reports, bulletins, circulars and other publications issued by the experiment station. In addition, station scientists summarized their findings in scientific series papers, prepared for publication in technical journals within their fields. The Information Service was responsible for processing the following such publications:

General Series Papers

<i>GSP Number</i>	<i>Title</i>
710	Soil Reclamation and Cropping Studies in the Grand Valley
711	Soil and Water Management Studies (Mosca-Hooper)
712	Animal Nutrition & Range Management at the Eastern Colorado Range Station

713	A Progress Report on Fruit Research at the Western Slope Branch Experiment Station
714	A Specific Gravity Survey of San Luis Valley Potatoes
715	Fruit Disease and Insect Control Recommendations for Colorado in 1960
716	Grain Sorghum Performance Test in Colo. in 1959
717	Snow Surveys in Colorado & New Mexico
718	Report on Herbicides
719	Feeders Day
720	Arkansas Valley Branch Station Progress Report—1959
721	Insect Control Recommendations Sec. 1
722	Insect Control Recommendations Sec. 2
723	Snow Survey—March
724	Snow Survey—April
725	Snow Survey—May
726	Performance Tests of Hybrid Corn Varieties—1959
727	Land Resource Areas in Colorado
728	Insect Control Recommendations—Sec. 7
729	Potato Variety Trials & Breeding Program 1959
730	Date of Picking Dark Red Jonathans in Relation to Storage Quality
731	Beef Cattle Improvement Day & Auction
732	Dryland Forage Nursery and Seeded-Pasture Studies at the Fort Collins Foothill Experimental Range
733	Southeastern Colorado Branch Experiment Station—Progress Report 1959
734	Western Slope Branch Station Progress Report
735	San Luis Valley Branch Station Report

Scientific Series Papers

- Aanes, W. A. "Pingue (*Hymenoxys richardsonii*) Poisoning in Sheep." *Amer. Jour. Vet. Res.* (Sci. Series 646).
- Adams, O. R. "Foot Rot in Cattle." *Jour. Amer. Vet. Med. Assoc.* (Sci. Series 627).
- Alexander, A. F., Will, D. H., Grover, R. F., and Reeves, J. T. "Pulmonary Hypertension in Cattle at High Altitude." *Amer. Jour. Vet. Research.* (Sci. Series 621).
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- Booth, N. H., Rankin, A. D. and Will, D. H. "Simplified Apparatus and Method for Administering Oxygen and Ether to the Dog." *Jour. Amer. Vet. Med. Assoc.* (Sci. Series 635).
- Bredeck, H. E. "Intraventricular Blood Pressures in the Chicken." *Amer. Jour. Phys.* (Sci. Series 624).
- Bredeck, H. E., Herin, R. A. and Booth, N. H. "Chemoceptor Reflexes in Swine." *Circ. Res.* (Sci. Series 658).
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- Enos, H. L., Moreng, R. E. and Whittet, W. A. "Factors Influencing Market Grade of Dressed Turkeys." *Poultry Science.* (Sci. Series 655).
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<i>Number</i>	<i>Title</i>	<i>Author</i>
66	Selections of Gravel Packs for Wells in Unconsolidated Aquifers	Gordon Kruse

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<i>Number</i>	<i>Title</i>	<i>Author</i>
499-S (Reprint)	Venison on the Menu	Dyar and Wagar

505-S	Colorado's Ground-Water Problems: Water and the Law	E. J. Farmer
506-S	Colorado's Ground-Water Problems: The Economic Picture	I. F. Davis, Jr.
507-S	Winter Wheat Production in Colorado	T. E. Haus, et al
508-S	Pocket Gophers in Colorado	R. M. Hansen, et al
4-S	Kenosha: A new Canning Tomato for Northern Colorado	R. L. Foskett

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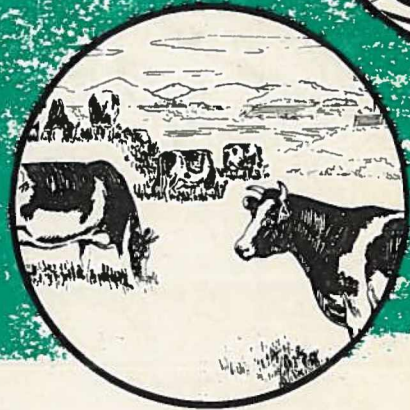
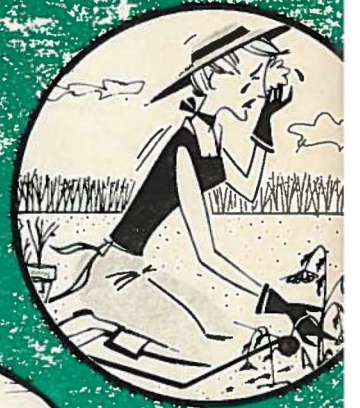
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Financial Report for Year Ending June 30, 1960

RECEIPTS 1959-1960					DISBURSEMENTS OF FUNDS BY CLASSIFICATION FOR THE FISCAL YEAR ENDED JUNE 30, 1960													
FUNDS	Balance 7/1/59	Receipts from U.S. Treasurer	Receipts Other Sources	Total Income	Personal Services	Travel	Trans- portation of things	Communi- cation Service	Rents and Utility Service	Printing and Binding	Other Con- tractual Services	Supplies and Materials	Equipment	Misc. and Others	Contributions to Retirement	Total Expenditures	Balance 6/30/60	Grand Total
Hatch	-----	312,306.00	-----	312,306.00	238,859.63	13,044.36	1,117.81	1,738.31	2,834.97	669.29	9,102.40	27,552.50	16,117.77	1,268.96	-----	312,306.00	-----	312,306.00
RRF	-----	149,885.00	-----	149,885.00	110,953.15	2,777.51	71.80	727.85	1,144.66	286.81	4,654.03	16,579.83	12,330.90	358.46	-----	149,885.00	-----	149,885.00
RRF Trust	-----	9,600.00	-----	9,600.00	164.79	6,679.18	-----	-----	-----	-----	2,736.20	19.83	-----	-----	-----	9,600.00	-----	9,600.00
Title II	-----	5,000.00	-----	5,000.00	1,119.51	47.14	-----	-----	-----	-----	-----	21.00	471.50	-----	-----	1,659.15	3,340.85	5,000.00
General Appropriation	-----	-----	704,800.00	704,800.00	486,948.33	8,154.90	3,243.67	7,550.73	25,236.24	10,248.18	17,795.55	52,371.34	51,217.23	5,617.07	36,416.76	704,800.00	-----	704,800.00
Ground Water Appropriation	-----	-----	47,324.00	47,324.00	20,277.56	1,327.56	1.00	45.13	1,585.67	11,121.67	9,835.20	1,206.18	1,547.53	-----	376.50	47,324.00	-----	47,324.00
Mill Levy Tax	9,921.93	-----	46,499.74	56,421.67	29,370.69	174.41	88.59	202.72	2,360.32	4,714.05	969.32	2,048.95	3,464.51	2,752.00	1,592.25	47,937.81	8,483.86	56,421.67
Vibrio Tax Fund	(3,771.16)	-----	22,882.73	19,111.57	13,519.45	-----	24.73	-----	-----	-----	1.90	23.07	7,287.00	-----	810.34	21,666.49	(2,554.92)	19,111.57
Station Special	(2.64)	-----	328,960.15	328,957.51	73,223.28	4,516.29	2,051.52	1,670.39	33,292.19	297.29	27,678.45	96,081.92	47,020.59	10,576.94	24.00	296,432.86	32,524.65	328,957.51
Hybrid Corn	10,399.41	-----	1,730.05	12,129.46	2,353.65	683.72	23.41	57.80	718.85	302.60	281.81	3,087.00	1,176.70	-----	-----	8,685.54	3,443.92	12,129.46
Sorghum Improvement	-----	-----	2,455.75	2,455.75	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	2,455.75	2,455.75
ARS Contracts	(5,398.64)	-----	40,668.63	35,269.99	27,646.90	1,358.60	4.00	143.83	3,017.05	-----	3,439.84	3,525.20	2,575.25	-----	795.52	42,509.19	(7,239.20)	35,269.99
Services— Revolving	-----	-----	7,780.60	7,780.60	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	7,780.60	7,780.60
Trust & Agency	-----	-----	4,217.50	4,217.50	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	4,217.50	4,217.50
TOTAL	11,148.90	476,791.00	1,207,319.15	1,695,259.05	1,004,436.94	38,763.67	6,626.53	12,136.76	70,392.95	27,639.89	76,494.70	202,516.82	143,208.98	20,573.43	40,015.37	1,642,806.04	52,453.01	1,695,259.05



AGRICULTURAL EXPERIMENT STATION
Colorado State University, Fort Collins, Colorado