7-1927

Circular No. 68 - Summary of Publications

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SUMMARY OF PUBLICATIONS

Circular No. 68 contains a summary of publications issued by the Utah Agricultural Experiment Station, thru its Publications Division, since September 1, 1926. The publications of this Station are no longer sent to a general mailing list (except in cases of libraries and state editors) but are sent only on request. Therefore, copies of any of the publications listed will be sent without charge to those requesting them as long as the supply is available. However, in the case of abstracts of scientific and technical papers the supply is very limited and the requests for these should be limited as far as possible to those only who are especially interested in this phase of experimentation.

Check those publications desired, FILL IN NAME AND ADDRESS in space provided above (write legibly), place this circular in a stamped envelope, and return to

Publications Division,
Utah Agricultural Experiment Station,
Logan, Utah, U. S. A.

Approved for publication by Director, June 23, 1927.
Bulletin 198—Report of Director for 18-month Period

WILLIAM PETERSON et al.

Approximately seventy-five different lines of investigation are included in this report which covers the 18-month period from January 1, 1925, to July 1, 1926. These investigations range from experiments in changes occurring in food during storage to investigations in underground-water and production costs in dairying. It contains many other problems of major importance. Included in the report will be found a brief tabulated summary of the ten farms operated by the Utah Experiment Station during this period. The general purpose of this report is to present a general review of the administrative, research, experimental, and other activities of the Station for the period designated.

Bulletin 199—Mutual Irrigation Companies in Utah

WELLS A. HUTCHINS

This publication covers the growth and activities of the mutual irrigation companies of Utah. The history of irrigation in the state from the earliest time of its settlement to the present operation and management of irrigation systems is clearly and concisely stated. The discussion of the adaptation of the mutual company to present conditions is both interesting and valuable. Directors of irrigation companies and watermasters will find unusual value in the activities of mutual companies, as herein reported.

Bulletin 200—Maintaining Potato Yields by Hill Selection

GEORGE STEWART AND D. C. TINGEY

For fifteen years the yields of Rural potatoes have been maintained at a level about double that of the state by rigorous hill selection. Check rows of unselected stock heavily infested with rugose mosaic and leaf roll have been grown interspersed thru the plat and immediately adjacent to hill-selected stocks. Another strain of Rural introduced from New York State has also been maintained for nine years. During the first year it yielded no more than unselected stock. Selection for foliage characters was found to be of no avail.

1Associate Irrigation Economist, Division of Agricultural Engineering, Bureau of Public Roads, U. S. Department of Agriculture.
SUMMARY OF PUBLICATIONS

Bulletin 201—Economic Insects in Some Streams of Northern Utah

J. G. NEEDHAM and R. O. CHRISTENSON

This bulletin should be of special popular interest because the insects described include the fishfood in the best trout streams of the state, altho most of the work was carried on in Logan River and other northern Utah streams. The life history of each insect is included, and the careful detail given to the economic position of each insect will be especially interesting. This means that some of the insects are of the highest value as fishfood, while others are a detriment in that they are predaceous and live on the other insects. The organisms can easily be identified and a measure made of their value as fishfood.

Bulletin 202—Some Observations on Winter Injury in Utah Peach Orchards, December, 1924

T. H. ABELL

The effect of low temperature in December, 1924, on Utah peach orchards is discussed in this publication. The various types of injury and manner of affecting the trees are described. This bulletin indicates that shortage of water, poor soil, frosty locations, peach tree borer, and improper pruning are some of the more important factors which favored winter injury. It is suggested that location of orchards on high bench lands, choice of fertile soils, maintenance of soil fertility and proper soil moisture, thinning the fruit in dry years, proper pruning of injured trees, and elimination of borers will aid in avoiding the maximum amount of winter injury in future years.

Circular 62—Summary of Publications

BLANCHE CONDIT-PITTMAN

This circular contains a summary of publications issued by the Utah Station from September 1, 1925, to September 1, 1926. In it the following bulletins and circulars are summarized: Bulletins Nos. 195, 196, and 197 and Circulars 57, 58, 59, 60, and 61. Five abstracts of technical papers appearing in three different scientific publications are also included in the circular.

2Dr. J. G. Needham is head of the Department of Animal Biology and Professor of Entomology and Limnology at Cornell University, Ithaca, New York. He was a special member of the National Summer School, U. A. C., 1926. Dr. Needham accumulated data for the writing of this bulletin during his summer stay in the state. He was assisted in this work by Reed O. Christenson, a graduate assistant in the Department of Zoology and Entomology in the Utah Experiment Station during the summer of 1926.
Circular 63—Tomato Culture in Utah
A. L. WILSON

The production of tomatoes for the cannery and for shipping is an important agricultural industry in this state. It was with this thought in mind that this circular was written. Among the various subjects discussed in this publication are the following: the hotbed—its preparation and maintenance for best results; preparation of the soil for planting tomato plants; proper time for irrigation; factors necessary for the production of tomatoes with the proper firmness, smoothness, and color; and the varieties which are best suited to Utah conditions.

Circular 64—Onion Growing in Utah
A. L. WILSON

Onion growing is now one of the leading agricultural industries in certain sections of the state. In this circular the author has indicated the varieties best adapted to Utah’s conditions, proper time of planting, soil and seedbed requirements, cultural and irrigation practices, proper harvesting methods, grading, packing, the growing of onion seed, and the selection of mother bulbs.

Circular 65—The Beet Leafhopper and the Curly-top Situation in Utah
GEORGE F. KNOWLTON

Curly-top is a beet disease that causes great losses to the farmers and sugar manufacturers in Utah. This disease is spread only thru the feeding of one insect, the beet leafhopper, or so-called “white fly”. This insect is present quite generally thruout the state. Wherever it occurs it may cause the disease, provided it has previously fed upon a curly-top beet or other plant harboring this disease. Curly-top overwinters in the hibernating leafhoppers, as well as in plants, but it does not persist in the soil or in beet seed. It seems possible that a variety of beets may be developed which will be resistant to curly-top.

Circular 66—Physical Curd Character of Milk and Its Probable Relation to Infant Nutrition
R. L. HILL

Since one of the greatest difficulties in the feeding of infants is the proper substitute for breast milk, it is highly important
that the food supplied be properly assimilated by the infant. This difficulty may be largely overcome by feeding a milk with a soft curd. The manner of determining whether a milk is hard- or soft-curded is described in this circular. The directions are so simple that one without special technical or scientific training can easily apply them.

Circular No. 67—Rules and Regulations for the Fourth Utah Intermountain Egg-Laying Contest

BYRON ALDER

This circular contains necessary information for entering the fourth egg-laying contest conducted by the Utah Experiment Station. This contest will begin November 1, 1927, and will end October 23, 1928.

ABSTRACTS OF SCIENTIFIC AND TECHNICAL PAPERS

80. Black-leaf of Peas Caused by Fusicladium pisicola N. Sp. —By Maurice B. Linford. In PHYTOPATHOLOGY, Vol. 16 (August, 1926), pp. 549-558. Black-leaf of peas is a newly described disease found on peas in the valleys of northern Utah and in the seed-pea producing area of the Snake River Valley, Idaho. The disease is favored by abundant humidity, and under this condition may become serious. The early symptoms of the disease are caused by a new species, Fusicladium pisicola. Pycnidium of Phyllosticta and sclerotia, similar in appearance, both evidently produced by the same fungus, are found associated with the Fusicladium form in the older lesions. The relationship between these two forms has not been established.

81. Effect of Color of Seed, of Scarification, and of Dry Heat on the Germination of Alfalfa Seed and of Some of Its Impurities. By George Stewart. In JOURNAL AMERICAN SOCIETY OF AGRONOMY, Vol. 18 (September, 1926), pp. 743-760. The experimental treatment of impervious seeds by dry heat is a new departure in agricultural botany. Alfalfa seeds and the weed seeds that commonly occur in Utah alfalfa seed were found to lose the quality of imperviousness when heated at 60° C. for from one to four hours.

Dodder and certain other weed seeds could be largely eliminated at temperatures which would not injure the alfalfa seed. Seeds of wild mustard and the foxtail grasses resisted more

3 The supply of scientific and technical reprints is very limited, and it may not be possible in all cases to supply the requests made.

4 Graduate student, Department of Botany and Plant Pathology.
heat than did alfalfa seeds. Scarifying the seeds rendered them permeable, but was less beneficial than some advocates of the practice think.

82. Relation of Light to Soil Moisture Phenomena. By Leon B. Linford. In SOIL SCIENCE, Vol. 22 (September, 1926), pp. 232-252. In previous work at the Utah Experiment Station an unexpected drying of moist soils was noted in desiccators containing water and submerged in a constant temperature bath. The paper reports experiments to explain this seeming anomaly.

Apparatus was built so that various moisture contents of soil samples could be obtained without interfering with the progress of absorption. In the dark, soils absorbed water in excess of twice the so-called hygroscopic coefficient in a limited time. When light was allowed in the desiccator the soils in all dried and the moisture content was dependent upon the light intensity.

With a thermocouple the differences in temperature between the soils and water in the submerged desiccator were determined. Difference of 0.5° C. with a 300-c.p. light 50 cm. away, 0.16° C. in laboratory daylight and less than 0.01° C. at night were noted. This showed the necessity of the exclusion of light from transparent apparatus in constant temperature experiments.

The relationship between the vapor-pressure and pressure potential of the soil water was derived, which showed the enormous internal stresses, caused by the drying effect of light. The conclusion—that soil at the “hygroscopic coefficient” is not in isothermal equilibrium with water—was checked by a theoretical analysis, assuming ideal conditions.

83. Effect of Alternate Freezing and Thawing on the Impermeability of Alfalfa and Dodder Seeds. By A. R. Midgley. In JOURNAL AMERICAN SOCIETY OF AGRONOMY, Vol. 18 (December, 1926), pp. 1087-1098. Temperatures below the freezing point were found to overcome the effect of impervious seed coat in alfalfa seed. Repeated freezings and thawings brought a more rapid effect than one freezing, but in the end the total result was the same. Several months of storage in a laboratory at about 20° C. produced a nearly similar effect. Dark-colored alfalfa seeds were injured by freezing at higher temperatures than were bright-colored seeds. Dodder germination was hastened by freezing.


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5 Graduate Student, Department of Physics.
6 Graduate Student, Department of Agronomy.
of the difficulties in breeding sugar-beets has been to prevent the loss of desirable strains by the free cross-pollination with ordinary or undesirable types. This paper shows how ordinary bagging with proper precautions can be made to produce self-fertilized seeds. There was considerable variation between individual plants in self-fertility.

85. Causes of Increased Yields of Sugar-beets following Applications of Barnyard Manure. By D. W. Pittman and John F. Fonder. In JOURNAL AMERICAN SOCIETY OF AGRONOMY, Vol. 19 (February, 1927), pp. 167-170. Manure has been shown to be highly essential for the production of sugar-beets on the soil of the Experiment Farm at North Logan, and it was the object of this experiment to determine what was the effect of the manure on the soil that seemed to be most responsible for this result. There are plats on the farm that have received different quantities of manure varying from none to 40 tons per acre per year for several years. The yields of sugar-beets on these plats vary from 2.8 tons to 30.5 tons per acre. Laboratory tests were made to determine what soil properties were most closely correlated with these yields. The soil of the plats was tested for apparent specific gravity (tilth), organic content, total nitrogen content, nitric (available) nitrogen content at various times during the growing season, and nitrifying power. The nitric nitrogen in June and the total nitrogen content of the soil were most closely correlated to the yield of sugar-beets.

86. Correlated Inheritance in Wheat. By George Stewart. In JOURNAL AGRICULTURAL RESEARCH, Vol. 33, No. 12 (December, 1926), pp. 1163-1192. In a varietal cross between Sevier and Dicklow wheats where strains were isolated they gave high acre-yields and three forms highly resistant to black stem rust of wheat. In pureline crosses of Sevier x Federation wheat there were found to be two linked factors (about 35 per cent crossing over) for the expression of awns. In head density, pure-breeding strains were isolated that were much more compact than either parent and others much more lax than either parent. There was segregation also for height of plant. The degree of squareheadedness was greatly affected by environment. There was also strong evidence of a correlation between head density and length of awn.

87. The Microflora and the Productivity of Leached and Non-Leached Alkali Soil. By J. E. Greaves. In SOIL SCIENCE, Vol. 23 (April, 1927), pp. 271-302. The number and activity of microorganisms in alkali soil vary with the kind and concentration of the alkali salt. They were lowest in the soil contain-
ing carbonate and highest in the soil containing sulfate. Leaching increased the number and activity, but in many cases the soil required reinoculation in order to establish a normal microflora. This was successfully accomplished either by the use of barnyard manure or small quantities of a productive soil. The productivity of the alkali soils was low; this was increased by leaching and in some cases made what may be considered a normal productive soil by the use of barnyard manure. Certain combinations of the alkali salts very appreciably increased the nitrogen content of the soil due to an increased activity of the nitrogen-fixing microorganisms of the soil. The results clearly indicate that barnyard manure is not only beneficial but essential in the reclaiming of alkali soil.

88. Notes on a Few Amphorophora (Aphididae) of Utah. By George F. Knowlton. *In* PAN-PACIFIC ENTOMOLOGIST, Vol. 3 (April, 1927), pp. 185-186. Two new aphids of the genus Amphorophora are described and field notes on two other forms are given.

89. A New Willow Aphid from Utah. By George F. Knowlton. *In* PAN-PACIFIC ENTOMOLOGIST, Vol. 3 (April, 1927), p. 199. A new species of aphid of the genus *Neothomasia* is described and a few ecological notes are included.

Blanche Condit-Pittman,
In Charge, Division of Publications.

(College Series No. 236)