ARIZONA AGRICULTURAL EXPERIMENT STATION
1909-10.

The Arizona Agricultural Experiment Station, for the year ending June 30, 1910, has continued, for the most part, along established lines of agricultural experimentation. This work is prosecuted at such points within the Territory as possess conditions favoring the profitable study of the subjects upon which work is being done. According to this plan the offices, laboratories and greenhouses are located in the University buildings at Tucson; Miscellaneous cultural work and sheep breeding experiments are maintained upon the Station Farm near Phoenix; Date palms imported from the Old World are grown on the alkali soil so congenial to them at Tempe; An intensive garden for demonstration purposes is operated in the Colorado flood plain at Yuma; A large range reserve is under fence (in cooperation with the U. S. Department of Agriculture) near Tucson; and two dry-farms near Douglas and Snowflake, respectively, are now in operation. In this manner the Station reaches problems in agriculture incident to a diversity of conditions, embracing a variety of soils, climate, and water supply commensurate with the remarkably varied agricultural resources of the Territory.

The more important subjects now under investigation are ground-water supplies and their development; grazing ranges and their utilization; sheep breeding with particular reference to Southwestern conditions, horticultural specialties including the olive and the date palm; chemical studies of dates and of arid-region soils and waters, fungous diseases affecting crop plants, breeding improved strains

ARIZONA AGRICULTURAL EXPERIMENT STATION
1909-10.

The Arizona Agricultural Experiment Station, for the year ending June 30, 1910, has continued, for the most part, along established lines of agricultural experimentation. This work is prosecuted at such points within the Territory as possess conditions favoring the profitable study of the subjects upon which work is being done. According to this plan the offices, laboratories and greenhouses are located in the University buildings at Tucson; Miscellaneous cultural work and sheep breeding experiments are maintained upon the Station Farm near Phoenix; Date palms imported from the Old World are grown on the alkali soil so congenial to them at Tempe; An intensive garden for demonstration purposes is operated in the Colorado flood plain at Yuma; A large range reserve is under fence (in cooperation with the U. S. Department of Agriculture) near Tucson; and two dry-farms near Douglas and Snowflake, respectively, are now in operation. In this manner the Station reaches problems in agriculture incident to a diversity of conditions, embracing a variety of soils, climate, and water supply commensurate with the remarkably varied agricultural resources of the Territory.

The more important subjects now under investigation are ground-water supplies and their development; grazing ranges and their utilization; sheep breeding with particular reference to Southwestern conditions; horticultural specialties including the olive and the date palm; chemical studies of dates and of arid-region soils and waters; fusarium diseases affecting crop plants; breeding improved strains

of alfalfa, acclimatization of scale insects, and experiments in dry-farming. These general subjects, each with many included details, cover much of our field; yet many specialties remain which, however attractive, cannot with our present endowment be experimentally taken up in the manner desired by their patrons.

The results of Experiment Station work are desseminated both by means of publications and by farmers' institutes. Our publications, including both the longer bulletins on agricultural subjects and brief but carefully written "Timely Hints for Farmers," reach some four thousand farmers within the Territory. The following have been issued during the year:

Bulletins:

No. 61, Relation of Weather to Crops and Varieties Adapted to Arizona Conditions.
No. 62, Olive Culture and Oil Manufacture in the Arid Southwest.
No. 64, Groundwater Supply and Irrigation in the Rillito Valley.
Twentieth Annual Report.

Timely Hints for Farmers:

No. 81, Pruning of Ornamental Plants.
No. 82, Tomato Culture.
No. 83, Drought-Resistant Plants for the Arid Southwest.
No. 84, Sorghum as a Forage and Grain Rations for Sheep.

By means of institutes, members of the Station Staff have met and lectured to about 3000 farmers, on soils, plant diseases, dairying, fruit growing, spraying, floriculture, dry-farming and farmers' organizations. An extensive correspondence with intending settlers in the region is also maintained, many of whom know little of irrigation or of our agricultural conditions, and to whom, therefore, such correspondence is especially useful.

Agricultural affairs, with which the Experiment Station is thus concerned, at this time present an encouraging outlook. With the Salt and Colorado rivers under control through Reclamation Service

dry-farming. These general subjects, each with many included details, cover much of our field; yet many specialties remain which, however attractive, cannot with our present endowment be experimentally taken up in the manner desired by their patrons.

The results of Experiment Station work are desseminated both by means of publications and by farmers' institutes. Our publications, including both the longer bulletins on agricultural subjects and brief but carefully written "Timely Hints for Farmers," reach some four thousand farmers within the Territory. The following have been issued during the year:

Bulletins:

No. 61, Relation of Weather to Crops and Varieties Adapted to Arizona Conditions.
No. 62, Olive Culture and Oil Manufacture in the Arid Southwest.
No. 64, Groundwater Supply and Irrigation in the Rillito Valley.
Twentieth Annual Report.

Timely Hints for Farmers:

No. 81, Pruning of Ornamental Plants.
No. 82, Tomato Culture.
No. 83, Drought-Resistant Plants for the Arid Southwest.
No. 84, Sorghum as a Forage and Grain Rations for Sheep.

By means of institutes, members of the Station Staff have met and lectured to about 3000 farmers, on soils, plant diseases, dairying, fruit growing, spraying, floriculture, dry-farming and farmers' organizations. An extensive correspondence with intending settlers in the region is also maintained, many of whom know little of irrigation or of our agricultural conditions, and to whom, therefore, such correspondence is especially useful.

Agricultural affairs, with which the Experiment Station is thus concerned, at this time present an encouraging outlook. With the Salt and Colorado rivers under control through Reclamation Service

operations, with numerous smaller sources of water supply under development, and with increasing knowledge of Southwestern conditions, crops and methods of farming, our farmers are becoming established in prosperity.

The final measure of this development is hard to foresee but may be roughly judged by our potential (though as yet only partly developed) water supply. This may be approximated as follows:

	Acre-feet annually
The Colorado River, sufficient water to irrigate 350,000 acres of adjacent bottom and mesa lands	2,000,000
The Little Colorado River and tributaries, with storage	300,000
The Salt River with storage	840,000
The Gila River without storage	160,000
Miscellaneous small streams and wells	143,000
Seepage or return waters, estimated at ten to thirty percent of original river waters and not included in above estimates	200,000
Underflow in the large river valleys of Arizona	750,000
Approximate total of both ascertained and estimated water supplies	4,393,000

At this time, therefore, estimating our privileges in the Colorado, conservatively, reckoning on storage along the Salt and Little Colorado rivers, estimating seepage waters conservatively, and reckoning on a moderate development of underflow, the gross water supply reasonably within expectation in Arizona amounts to between four and five million acre-feet annually. This amount of water, under average conditions, economically applied, is sufficient to irrigate about one million acres of land.

In addition to possible development of irrigation above outlined, we may include small numbered water supplies, dry-farming at higher elevations, and the [illegible] adjacent to large irrigated districts with an aggregate of 30,000 acres actually irrigated

t ons, crops and methods of farming, our farmers are becoming established in prosperity.

The final measure of this development is hard to foresee but may be roughly judged by our potential (though as yet only partly developed) water supply. This may be approximated as follows:

	Acre-feet, annually
The Colorado River, sufficient water to irrigate 750,000 acres of adjacent bottom and mesa lands	2,000,000
The Little Colorado River and tributaries, with storage	300,000
The Salt River with storage	840,000
The Gila River without storage	160,000
Miscellaneous small streams and wells	143,000
Seepage or return waters, estimated at ten to thirty percent of original river waters and not included in above estimates	200,000
Underflow in the large river valleys of Arizona	750,000
Approximate total of both ascertained and estimated water supplies	4,393,000

At this time, therefore, estimating our privileges in the Colorado, conservatively, reckoning on storage along the Salt and Little Colorado rivers, estimating seepage waters conservatively, and reckoning on a moderate development of underflow, the gross water supply reasonably within expectation in Arizona amounts to between four and five million acre-feet annually. This amount of water, under average conditions, economically applied, is sufficient to irrigate about one million acres of land.

In addition to possible developments of irrigation above outlined, we may include small pumped water supplies, dry-farming at higher elevations, and the major industries with improved range conditions. With an area of about 330,000 acres actually irrigated at the present time and with 1,000,000 acres possible, it is reason-

able to suppose that with improved and intensified methods of farming, four or five times our present area of highly productive land will ~~easily~~ several times multiply the present importance of our agricultural industry.

Financial

The Station is mainly supported by the Federal Hatch and Adams appropriations. It is to a lesser extent supported by the Territory. From time to time, also, the S. P. and E. P. & S. W. railroads have made grants for special purposes, particularly underflow and [illegible] of water supply [illegible]. Following is a statement of the receipts for the fiscal year ending June 30, 1910:

Hatch Fund		$15,000.00
Adams Fund		13,000.00
Farm Sales, Station Farm	$600.54	
Produce, Yuma Date Orchard	11.40	
Misc. sales, refunds, fees, etc.	733.39	1,345.33
Southern Pacific Fund		262.36
El Paso & Southwestern Fund		870.91
Institute Work, Laws of 1909		994.81
Dry-Farming Work, Laws of 1909		937.03
Date Orchards, Laws of 1909		2,182.15
Publications, Laws of 1909		1,442.26
Overdraft to 1910-11	$104.67	
Overdraft at beginning of year	88.49	193.32
		$ 35,529.17

Respectfully submitted,

Director.

SRP0290