

Irrigation in Arizona

# *Irrigating in Arizona*



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UNIVERSITY OF ARIZONA, TUCSON

CIRCULAR 123

# University of Arizona

College of Agriculture, Agricultural Extension Service  
Chas. U. Pickrell, Director

Co-operative extension work in agriculture and home economics, the University of Arizona College of Agriculture and the United States Department of Agriculture co-operating. Distributed in furtherance of the acts of Congress of May 8 and June 30, 1914.

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*Dedicated to the man with the shovel*

#### FOREWORD

The purpose of irrigation is to make the soil a more favorable feeding place for plant roots. Good irrigation practice, therefore, must take into account the needs of plants, the parts played by roots in supplying those needs, and the soil conditions necessary to enable the roots to feed to the best advantage.

In the following pages the authors will not attempt to present new information, but only to bring together and organize accepted facts, that these may be in more convenient form for field use.

APPENDIX

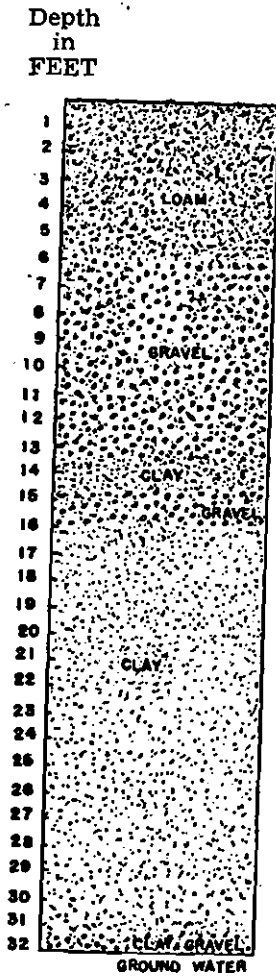


Figure 20.—A 32-foot soil profile.

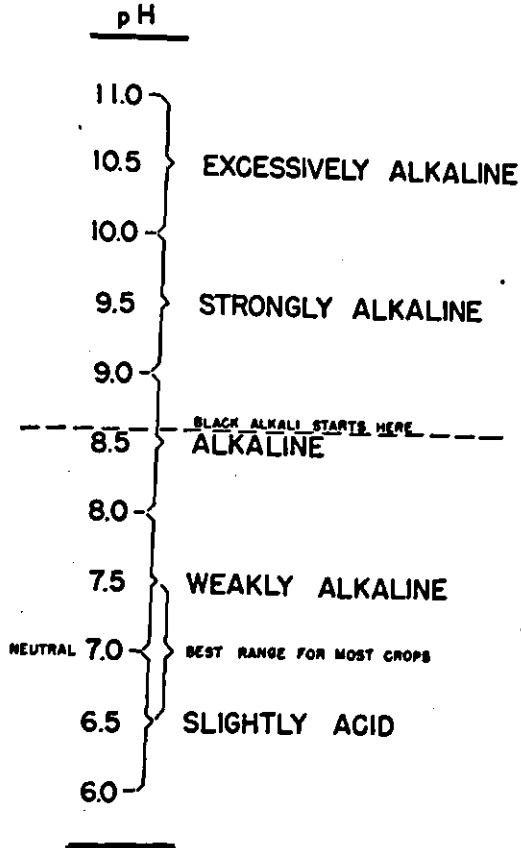


Figure 21.

Figure 20 illustrates a rather common soil profile. It is from an actual drawing of conditions shown by excavation on the old date farm near Alhambra, once owned by the University. The drawings were made by Alfred J. McClatchie and are carried in *University of Arizona Bulletin 37*.

Figure 21 is a chart showing pH readings as determined in the laboratory and the relation of these readings to the conditions of acidity or alkalinity which actually exist in the soil tested. The chart is copied from *Extension Circular 108*.

NOTE.—The drawings on page 34 are presented through the courtesy of Karl Harris (6).

In section 89, page 33, read "Figures 12 and 13."

### A SUMMARY

This publication is, in itself, a summary of the principles of irrigation practice, and the facts are further summarized in the bold-faced section headings. The reader will find that these headings, read consecutively, form a connected story of the subject.

### ACKNOWLEDGEMENTS

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Of these last, they wish especially to mention Ernest Douglas, Editor, *Arizona Farmer*; E. Ray Cowden, farmer, Phoenix; M. E. Bemis, Agricultural Secretary, Phoenix Chamber of Commerce; and members of the College Staff.

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\*A partial list of University of Arizona publications relating directly or indirectly to irrigation practices.



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†Out of print.

## UNITS OF WATER MEASUREMENT AND DEFINITIONS

The following units of measurement and definitions are of interest to all water users.

### UNITS OF VOLUME

1 acre land = 43,560 square feet

1 acre-foot = the quantity of water required to cover 1 acre of land 1 foot deep

1 acre-foot = 43,560 cubic feet of water

1 acre-foot = 325,850 gallons

1 acre-inch = the quantity of water required to cover 1 acre of land 1 inch deep

### RATES OF FLOW

1 cubic foot of water per second = 1 second-foot

1 second-foot = 450\* gallons per minute

1 second-foot = 40 miner's inches (statutory law in Arizona)

1 second-foot = 7.5\* gallons per second

1 miner's inch = 11.2 gallons per minute

### MISCELLANEOUS

1 second-foot flowing 12 hours = 1 acre-foot\*

1 second-foot flowing 1 hour = 1 acre-inch\*

450 gallons per minute for 1 hour = 1 acre-inch

40 miner's inches for 1 hour = 1 acre-inch

1 acre-foot provides:

a 3-inch irrigation for 4 acres

a 4-inch irrigation for 3 acres

a 6-inch irrigation for 2 acres

To convert second-feet to acre-feet per day, multiply by 1.984.

To convert acre-feet to gallons, multiply by 43,560 and then by 7.5.

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\*Approximate amounts for convenience of conversion.