AIR VIEW OF Salt River Valley farmlands, typical of the Alluvial soils in Arizona river valleys. Note encroachment of urban buildings which gradually are eating away at this farming area.

IRRIGATED ALLUVIAL SOILS IN ARIZONA

S. W. Buol

Most of Arizona's irrigated agriculture is in the river valleys, namely those of the Salt, Gila, Santa Cruz, Colorado and several smaller river valleys. Most of the soils in these valley bottoms are recent and undeveloped alluvial deposits. This means that, for the most part, the soils consist of material that is relatively unaltered once it is deposited by the flood waters that occasionally cover the areas.

The valley-bottom soils are usually more desirable for irrigated agriculture than the older developed soils on the adjacent slopes for two reasons: (1) they are lower and more nearly level, thus making them easier to irrigate; and (2) they are usually much deeper and do not have restricting layers of caliche or bedrock in the subsoil.

Color Denotes Parentage

Alluvial soils vary mainly in their texture and color. Color serves to indicate the type of parent material and amount of organic matter present. Texture, which is the relative distribution of the various sized mineral particles, varies from the loose coarse sands to the heavy clay soils.

Since it is important to know the texture of the subsoil in the management of soils for irrigated agriculture, texture is used as the criterion for grouping similar soils into what is known as a soil series. Soil series are given common names, usually that of a city or town near where the group of soils was first studied.

Series names associated with Arizona cities include Gila, Pima, Glendale, Heber, Gadsden, and several others too numerous to mention. We often find that Arizona soils have series named for cities in other states where the particular soils were first studied, since classification and naming of series is nationwide. For example, in the Alluvial soils these include Imperial (from California) and Anthony (from New Mexico).

Topsoil Named, Too

It is also important to know the characteristics of the surface or topsoil. Surface texture is added to the series name to describe a soil type; *i.e.*, Gila sandy loam is an Alluvial soil with a medium textured subsoil and a sandy loam textured topsoil whereas a Gila clay loam has a medium textured subsoil and a clay loam textured topsoil.

The color of the topsoil is also a criterion for separating soil series. In general, the darker the color, the more organic matter present.

A listing of the Alluvial series names

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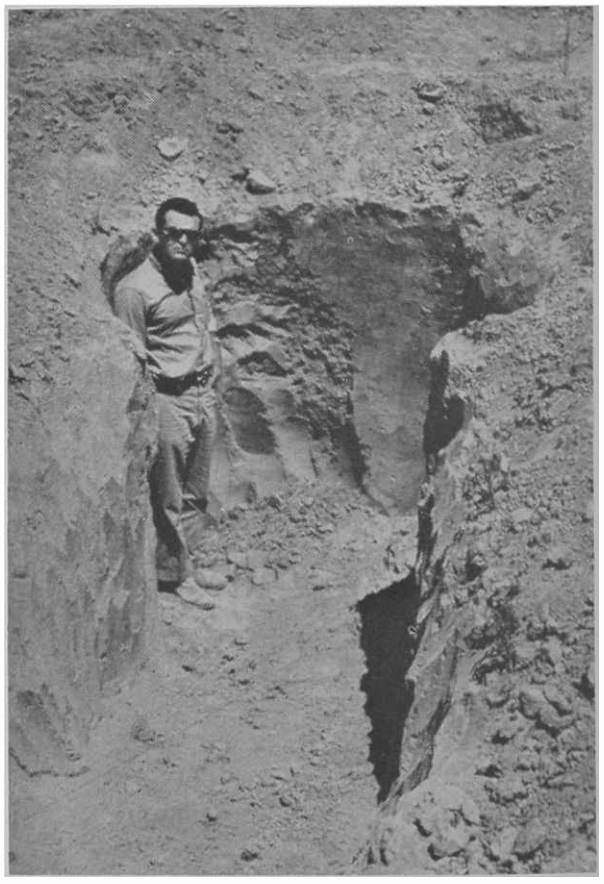
BELOW, WE SEE a profile of Gila Loam, a medium-textured, light-colored Alluvial soil typical of Arizona.



Some Alluvial Soils in Mixed Acid Igneous Parent Materials (neutral to moderately alkaline pH values)

Sub-soil texture	*Light-colored topsoil*	*Dark-colored topsoil*
Coarse (sands)	Carrizo	Heber
Mod. Coarse (sandy loam)	Anthony	Comoro
Medium (loams)	Gila	Grabe
Moderately Fine (clay loam)	Glendale	Pima
Fine (clays)	Imperial	Gadsden

This is the first article in a series which will be written by Dr. Buol, a member of the Department of Agricultural Chemistry and Soils. Dr. Buol is now a member of an inter-agency team which is classifying Arizona soils, a large scale project which lends authenticity to his writing.

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now used in Arizona is in the table on Page 20. As we continue to learn more about soils, and thus are better able to classify them, these names may change with time. Also, before a final name is determined, information is exchanged with other states and it is often discovered that they have the same type of soil called by another series name. At that time, one state has to change the series name. Although confusing to people working with the soil, this presents no major problem since the soil actually remains the same.

By grouping similar soils into series, scientists are better able to plan research, and extension people are better able to explain the results of the research in terms of the conditions on individual farms. The fact that series are understood in other states makes possible the exchange of information and experimental results as well as extrapolation of other management practices across state lines.

The program to map and classify soils is carried on under what is known as the "national cooperative soil survey" and involves the cooperation of the Soil Conservation Service, Forest Service, Bureau of Indian Affairs and the University of Arizona Agricultural Experiment Station in Arizona at the present time.

Irrigation Water Use In Arizona Analyzed

During the 1962 water year (spring, 1962-spring, 1963), total water use in Arizona was 7.34 million acre-feet, about a third of a million acre-feet more than in 1961 but about the same that had been used in 1959 and 1960. Surface flow diversions were up by more than a half million acre-feet to 2.84 million, of which about 750,000 acre-feet returned to the Colorado River or diverted across the international boundary to Mexico.

Pumped water volume was down 200,000 acre-feet to 4.5 million. In direct contrast to 1961, surface diversions in 1962 were higher, resulting in a saving of ground-water supplies, although total use was increased by 340,000 acre-feet.

Total pumpage of ground water continues at the relatively stable rate that has prevailed since 1953 — about 4.5 million acre-feet. As heretofore, about 2.0 million acre-feet of this pumpage occurred in the Salt River Valley, about 1.05 million in the lower Santa Cruz, and the balance — about 1.45 million acre-feet — in the rest of the state.

Surface water diversions were divided between the Colorado River (1.7 million acre-feet) and the Gila River system (1.17 million acre-feet). The return flow-international diversions amounting to 750,000 acre-feet occurred in the Colorado River drainage and resulted in a "net usage" of 950,000 acre-feet of surface flow in that drainage.

Vegetable Income Up

The Arizona vegetable industry shipped a total of 58,239 cars of vegetables and melons during the 1962-63 crop year. The total value of production was $86.2 million compared to $81.3 million in 1961-62. Approximately 75 percent of the income from vegetables and melons is derived from the sale of lettuce and cantaloups. The acreage of lettuce increased from 55,473 acres in 1962 to 56,919 acres in 1963. Yields were down, however.

First UA Judging Team Has Reunion

The group above — too old to be students and too prosperous looking to be professors — is the livestock judging team which Prof. E. B. Stanley coached back in 1925 — the first livestock judging team in the history of this College of Agriculture.

This first reunion, nearly 40 years after the group first worked together on the fine points of steers, barrows and horses, was in the same building where the group had attended Prof. Stanley's classes 40 years earlier. In fact the picture, taken in front of that building, was set up where the judging team first was photographed four decades earlier.

In the group, left to right, are Prof. Stanley; Merle Mundhenke of Lewis, Kansas; Dr. J. W. McInnes, Tucson; Orval Knox, Chandler; Forrest Manley of Holtsville, Calif., and Hiram Shouse, Mesa.

The group made quite an occasion of the reunion, being welcomed by Pres. Richard A. Harvill, Vice Pres. Marvin "Swede" Johnson and Agriculture Dean Harold E. Myers. A tour of the new Agriculture Building and Science Library evinced approval that "there've been some great changes made since we were around."

This 1925 team participated in intercollegiate livestock judging both at the American Royal Livestock Show at Kansas City and the big International Livestock Exposition in Chicago.