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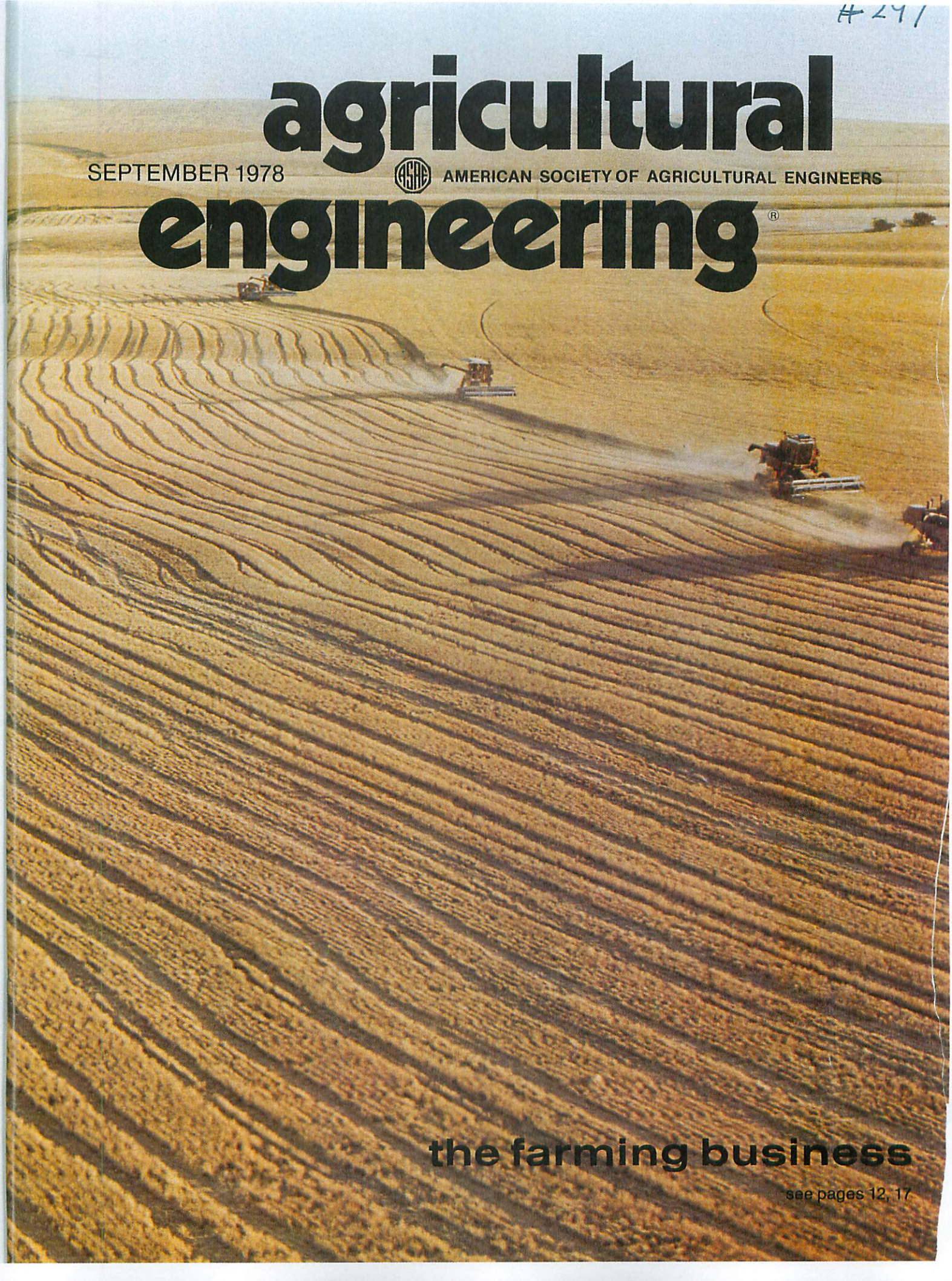

the farming business

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The Southwest Rangeland Watershed Research Center

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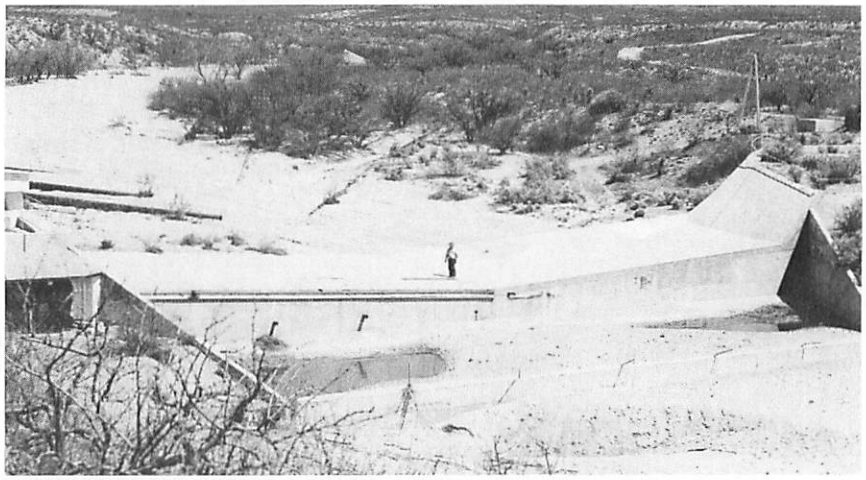
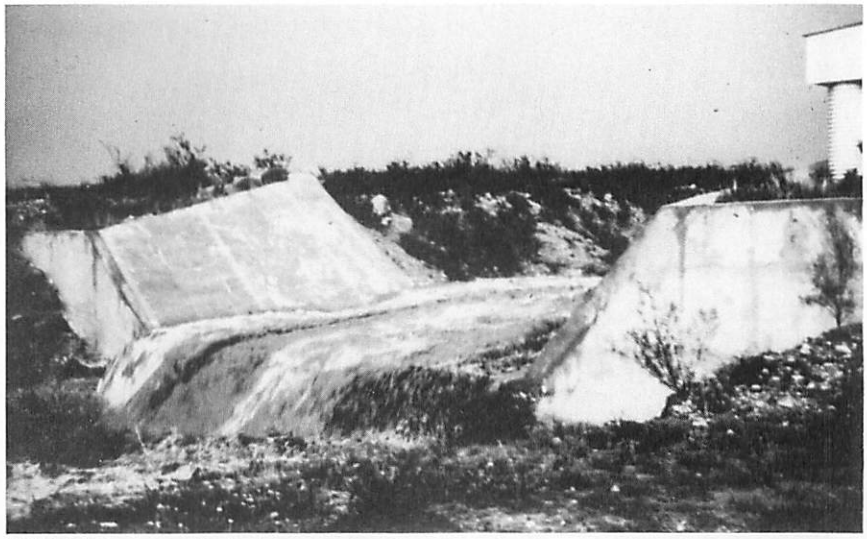
RECENT non-point pollution legislation (PL 92-500 and PL 95-192) has added an important new dimension to rangeland research—development of best management practices to preserve the natural resources and protect the environment.

Using data from experimental areas in Arizona and New Mexico, scientists at the Center study the quality and quantity of water from Southwestern rangelands. This information aids in determining water-resource potentials; in establishing soil, water and grazing management systems for increasing and stabilizing forage production; in providing design concepts and criteria for flash flood and sedimentation control; and in monitoring the movement of non-point source pollutants.

Extensive studies based on records from dense recording raingage networks show variability in both time and space of thunderstorm rainfall in the Southwest. This extreme rainfall variability over relatively short distances indicates that grazing units should be much smaller than those customarily used in much of the Southwest. Small units, like small herds within ranches, would allow more efficient use of the

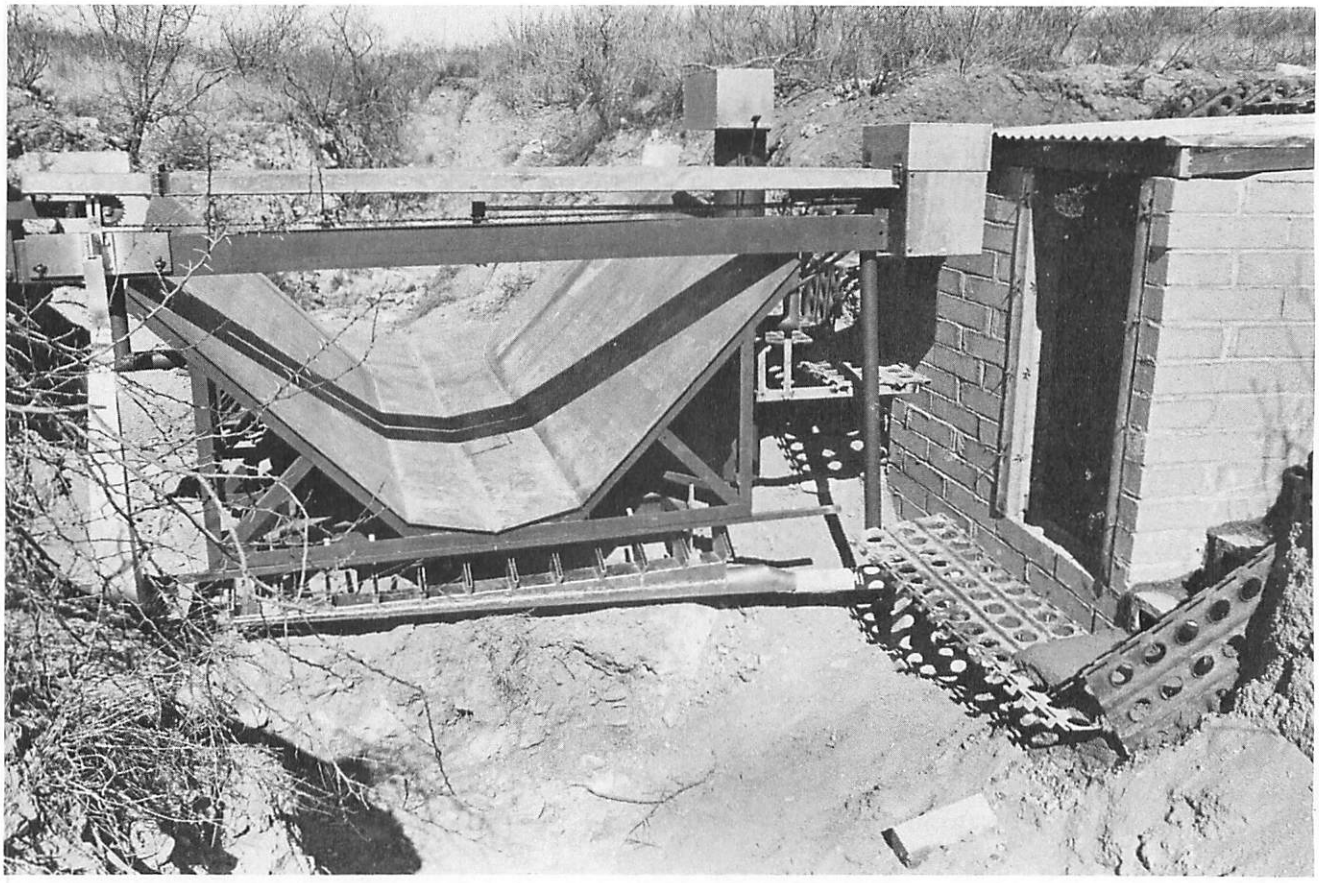


THIS FLUME, with a maximum measuring capacity of 1050 m^3/sec (22,000 cfs), measures streamflow at the outlet of the 150 km^2 experimental area

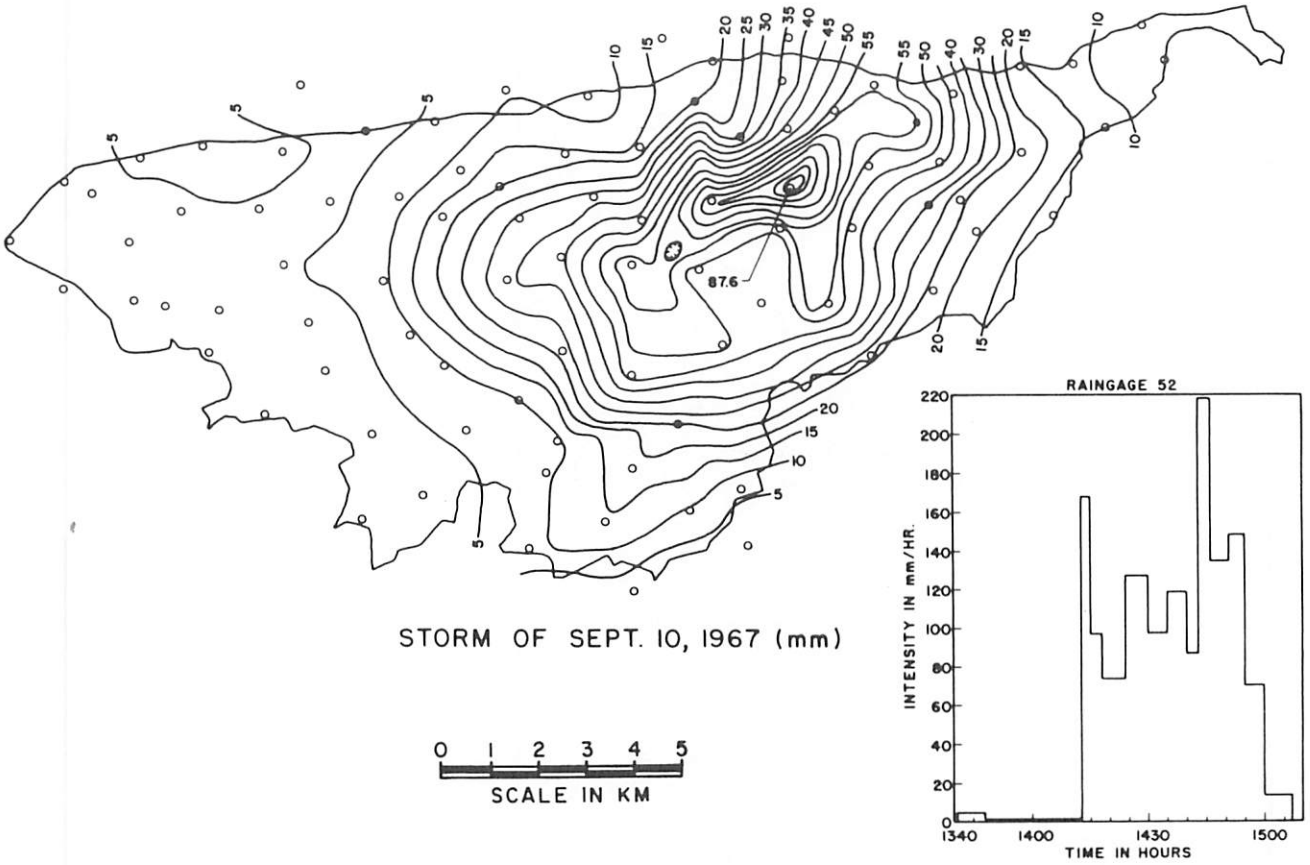


RUNOFF from the limited-extent thunderstorms is often measured several times within the watershed. Dry alluvium in the streambed absorbs much of the water

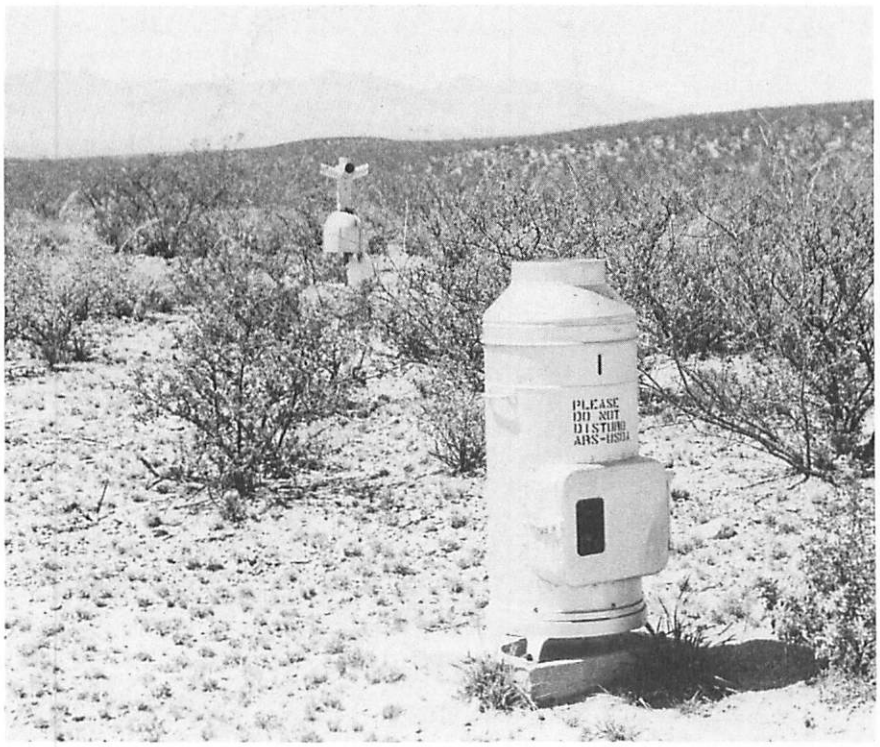
THIS LAND IMPRINTER, developed at the Center, is being used to prepare seedbeds which concentrate runoff from the right cylinder into the depressions of the left center, where the seed is placed



WITH THIS EQUIPMENT, water-sediment chemical samples are obtained at several locations. The system is powered by a solar panel which drives a moving slot, diverting an aliquot of the flow onto the stationary slots at the flume overfall



ISOHYETAL MAP of a typical summer thunderstorm on the 150 km^2 Walnut Gulch Experimental Watershed in southeast Arizona. Each circle represents a raingage location



THE VECTOPLUVIOMETER behind this raingage permits computing the precipitation vector in directions other than the vertical

available forage without degrading the land through overgrazing during periods of limited precipitation.

Southwest streams do not convey water to downstream points efficiently. While some water does reach the regional groundwater table, most is lost to evaporation and to transpiration from channel plants. Our researchers are working on solutions to these situations.

Other studies are focusing on developing densely growing vegetation to help reduce soil loss. The low vegetation density plus the steep land slopes and channels accelerate erosion of the shallow soils.

Our goal is to develop water-resource technology that can provide ranchers, land-use planners, and resource-planning engineering with sufficient knowledge of range management systems and available water supplies to manage livestock for maximum productivity of the range resource. Thus range production can be sustained while soil, plant and water resources are conserved and downstream pollution is minimized. ■