It All Started Many Years Ago With the Eaves Trough and the Rain Barrel

HARVESTING WATER

Remember, years ago, the eaves trough which led rain water from the roof down to the "rain barrel" at a corner of the house? Mother used to count on that supply of "soft" water for doing the laundry, back in the day of yellow laundry soap and the copper bottom boiler of hot water, heated on the wood-burning kitchen stove.

Today that same concept has renewed but far wider application. How about saving the rain runoff from all the "roof" of Tucson's streets and paved parking lots? Or from an entire mountainside? The quantity of water thus "harvested" would be tremendous.

Martin Fogel, acting head of the Institute of Water Utilization in this college, discusses the possibilities.

By Martin Fogel

Water harvesting systems, a means for collecting and storing rainfall — and treatment, if necessary — is nothing new to many of the farmers and ranchers of the Great Plains and Midwestern areas of the United States. With the farmhouse roof as the catchment area and the cistern as a storage facility, many a farm family used this "harvested" water for washing and, to a lesser extent, for drinking. The "treatment" in these systems was a butterfly valve in the downspout which, after the first few minutes of a rainstorm, diverted the relatively clean water into the cistern.

Water harvesting systems are nothing new to Arizona. A few ranchers are using highways as catchment areas, while others are using butyl rubber catchments and storage bags. The fish and game people have used paved catchments and storage structures to provide water for wildlife. The Kitt Peak National Observatory uses a paved catchment area for its source of water.

New Methods and Materials

What is new then? For one, new materials and techniques are being constantly developed. Secondly, Arizonans must continue to demonstrate that they are doing everything possible to live within their own resources if they stand a chance of importing additional water, water which everyone agrees is urgently needed.

As is the case with other systems, it is necessary to look at the total operation rather than at each of the various components that make up the system. The systems approach appears to be the logical way to produce the most economical product, water in this instance. Minimizing the size of the components, and using the best combination of materials that is available, will be required to produce water that will compete with other alternatives. The size of these components, interrelated as they are, will depend on such factors as water requirement, unit cost and expected life of the materials, the amount and probability of rainfall and the efficiency with which the catchment sheds rainfall.

To the livestock rancher who has to haul water at a cost of several dollars per thousand gallons, the cost of water is secondary to survival. But hauling is by far the most expensive means for obtaining a necessary supply of water. Contrast this with the city-dweller, who has only to open his tap for a usually unending supply of clean water under pressure, for a very nominal charge of some 30 cents a thousand gallons.

The author is professor and acting head of the Institute of Water Utilization.

Costs Decreasing

Where are we now on the cost scale with water harvesting systems? Fortunately, we are in the area between what the rancher has to pay for hauling water and what the people living in cities have to pay. Thus, there is a place now for water harvesting systems based on currently-available materials and techniques.

In a cooperative effort with the U. S. Water Conservation Laboratory of the Agricultural Research Service and suppliers of materials, the Institute of Water Utilization has planned and will shortly install a water harvesting system consisting of a 1-acre catchment area and a 100,000 gallon below ground storage tank.

The basic materials for this system include pea gravel-covered plastic sheets for the catchment area and a plastic liner and butyl rubber cover for the storage tank. Butyl rubber, while the most expensive material in this system, does serve several important functions. It prevents water loss by evaporation, provides added catchment area through the use of valves which allow rainfall which falls directly on the cover to go into the tank and, lastly, it protects the inexpensive plastic liner from deterioration. Expected installation cost for such a system is approximately $2,500.

Assuming what is believed to be reasonable life expectancies for the above materials and a realistic runoff efficiency for the catchment, the cost per 1,000 gallons of water will be about $1.25 in 12-inch rainfall areas and around $1 in areas where normal annual precipitation is 16 inches. Where a storage facility is already provided, water could be produced at a cost of 40 to 50 cents per thousand gallons.

Expect Further Decreases

Since the largest single cost factor is for materials, the hope for obtaining water at a lower cost rests with the development of cheaper, longer lasting, more impervious materials.

The use of silicones for water-proofing areas is currently being investigated and so is common table salt. It has always been thought that salts are detrimental to agriculture. They are, to plant growth. However, at a penny a pound they also provide a possible inexpensive mechanism for sealing soils and thereby inducing runoff. Researchers at both the Colorado State University and The University of Arizona are pursuing this line of endeavor. Test plots aid in determining

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National Group Honors 3 Arizona County Agents

Underwood Sears Jones

Arizona County Extension agents received top attention at the annual convention of the National Association of County Agricultural Agents last fall in Pittsburgh.

County Agent John L. Sears, Safford (Graham County), is the 1966 NACAA national chairman of the association's Public Information Committee. Keith Jones, a Pinal County Agent at Casa Grande, is the 1966 regional vice-director for the Western Region.

The NACAA, with membership of 5,500 County Extension Agents from all 50 states, gave a 1965 distinguished service award to Amos H. Underwood, Navajo County Agent located at Holbrook, Ariz.

Arizona representatives on NACAA standing committees for 1966, in addition to Sears, include:

State's Relations — Garrett E. Blackwell, Tucson, Pima County;

Professional Training — William M. Brechan, Flagstaff, Coconino County;

Public Relations — Robert G. "Pat" Gray, Globe, Gila County;

Public Information — Robert L. Halvorson, Phoenix, Maricopa County;

Extension Programs — Paul E. Lineberry, Yuma, Yuma County;

4-H Committee — Eldon E. Moore, Phoenix, Maricopa County;

Recognition & Awards — Alvin Allen, Prescott, Yavapai County.

The NACAA 1966 convention next fall will be in Hawaii.

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the feasibility of using newly-developed materials for catchment areas. Life expectancy and runoff efficiency of these new materials are learned from these test plots.

Up to now, little has been said about the treatment phase of the system. Fortunately, water for livestock requires little or no treatment with the types of water harvesting systems in existence or being planned. This may not be the case where water will be used for other purposes.

For City Use, Too

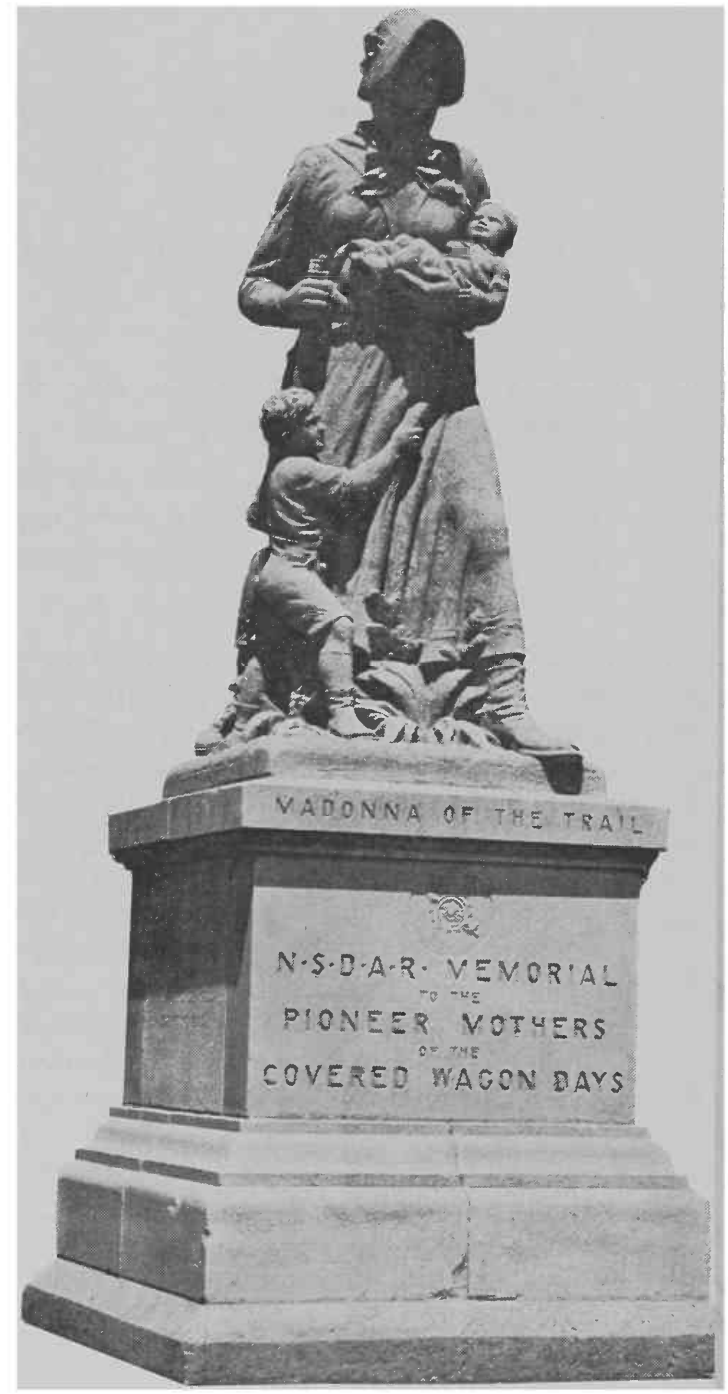
In the past, agriculture has been the prime mover in the development of water resources in the west. Agriculture once again may lead the way in development of water harvesting systems which may also be used to provide water for municipal and industrial, as well as for agricultural, purposes.

After all, if we could capture and store all the rainfall that annually falls on the impervious areas of a city such as Tucson, it would be possible to supply each person with up to 50 gallons of water per day.

UN MUNDO CURIOSO

Antes del triunfo reconocido de los antibióticos, la población blanca del delta del Mississipi sufría casi continuamente de anginas, mientras que la población negra de la misma región, aunque trabajaba laboriosamente, se protegía con eficacia contra este mal . . . por medio de amuletos. Cada negro llevaba colgado del cuello un saquito llena de "tierra mágica"; de vez en cuando estos negros echaban en su boca un bocadito de tierra y lo iban mascando "para alejar el mal espíritu". Pues bien, después se ha descubierto que aquella tierra mágica de los amuletos es muy rica en mohos, de la clase que se utiliza ahora para preparar los antibióticos.

OUR MYSTERY PICTURE



Our "Mystery Pictures" seem to be getting less mysterious all the time — but still they are interesting views of the state we love.

This statue, of course, is widely known by northern Arizonans. It stands at the juncture of two main highways, at a main business corner of the city of Springerville, in northeastern Arizona.

It is a wonderfully nice tribute to the pioneer mothers of covered wagon days, in those days when Indian raiding parties were more frequent than supermarkets, drought-borne hunger more often a companion than a self-defrosting refrigerator, and packaged foods came solely on the hoof.