



**NEW DITCH SEALING** technique is most efficient with a three-man crew. One ← man jets the cracks, one sprays on the sealer and third drives the truck.

square inch), without the tack coat, was the most satisfactory method of preparing the cracks for sealing. It blasted the soil out of the cracks and removed all silt and algae around their edges. Fine silt-covered cracks that might otherwise have been missed were quickly and easily traced with the water jet, the scientists say.

#### **Holds Up Very Well**

Sealer sprayed directly on the clean, wet concrete at 1,500 pounds per square inch pressure produced a superior bond. After one year, there were no bonding failures and the sealer could not be scraped from the concrete with a knife.

For efficiency, the scientists say, three men are required for the new method of crack treating. One man jets the cracks, one sprays on the sealer, and one drives a truck laden with pumps, sealer, and water supply along the canal.

## **\$500 Scholarship In Range Management Announced by ASRM**

The Arizona Section of the American Society of Range Management has recently announced its participation in a national two-year scholarship program sponsored by the parent organization.

The ASRM's purpose in providing this scholarship is to encourage and assist an outstanding student in the pursuit of a professional recognized bachelor of science degree at a college or university of his choice.

Raymond Houseley, president of the Arizona Section, recently announced to high school principals throughout Arizona availability of the new \$500 per year scholarship. High school seniors who will graduate by June, 1967, from an accredited high school and who are interested in pursuing a professional education in range management or forestry, with a major in range management, are eligible to make application for the award.

# *Improved Ditch Sealing Saves Irrigation Water*

A way to save billions of gallons of valuable — and scarce — irrigation water has been developed by ARS water conservation scientists for use in western States.

It consists of an improved sealer and an efficient method of applying it to weather-cracked concrete irrigation canals. Using the new technique, three men can treat 800 feet of cracks, requiring about 10 gallons of sealer, in an hour's time.

#### **Huge Water Loss**

The need for a quick and effective sealer is illustrated in Arizona, where about 7,000 miles of concrete-lined canals lose an estimated 20 million acre-feet of water each year. Before a canal in Arizona's Salt River Project was repaired, it lost 2,800 acre-feet of water per mile each year, at a cost of about \$8,400 per mile of canal.

In 1963, soil scientist R. J. Reginato and director L. E. Myers of the U.S. Water Conservation Laboratory at Phoenix began developing and testing improved materials and methods for sealing cracks in concrete canals. At that time, commonly used repair methods were laborious and expensive, frequently requiring hand cleaning of cracks and troweling on mastic sealers.

Working in cooperation with The University of Arizona's Agricultural Experiment Station and the Salt River Project of Arizona, the researchers developed a sealer that can be sprayed on the cracks with high-pressure pumps and nozzles. The sealer is a mixture of asphalt, butyl latex, and asbestos fiber.

#### **Old Way Didn't Hold**

Previous asphalt-base sealers could be easily peeled from concrete, the scientists explain, because the bonds were mechanical. Concrete has a negative-charged surface, so the researchers added positive-charged agents to their formulation, forcing the sealer and concrete to form an electrochemical bond.

The ARS-developed sealer, and one that became available commercially during the test period, were compared with conventional mastic sealers on various concrete-lined canals. Also tested were several methods of pre-treating cracks before applying sealer. These pretreatments included wire brushing, sweeping with bristle brooms, or jetting with water. Some cracks were given a coat of cutback asphalt or kerosene; others were not.

Cleaning with the high-pressure water jet (400 to 500 pounds per