

Casa Grande Valley Has a New Look

Plowing 18 Inches Deep
Improved Soil Texture



▲ This giant moldboard plow (above) is used to plow soils up to depths of 30 inches.

By H. V. SMITH

The Casa Grande Valley has taken on a "new look" since 1936. Alkali and slick spots are rapidly giving way to fields of cotton, grains, sorghums and alfalfa of uniformly high yields. The reason? Deep tillage and intelligent soil management.

It all started when a cooperative soil survey of the area was made by the University of Arizona and the Division of Soil Survey of the U. S. Department of Agriculture. The soil-survey report pointed out certain soils which might be benefited by deep tillage. These soils were alkaline and salty and had fairly heavy surface soils over relatively light textured subsoils.

Deep plowing mixed the heavy and light textured soils, making the whole one of medium texture. This new soil mixture takes water well and therefore can be easily reclaimed by leaching out the harmful salt and alkali.

Cotton Yields Improved

Probably the first farmer in the Casa Grande Valley to use deep tillage was Diwan Singh who plowed 14 to 18 inches deep with a disc plow. As a result of deep tillage, cotton yields were increased several fold.

Encouraged by these yield increases, farmers introduced the subsoil plows which had been used in California to plow under gravelly flood deposits and to bring the buried soil back to the surface. This plow was capable of plowing 30 inches deep and was well suited to the con-

ditions found in the Casa Grande soils where the sandy layers are usually found about 18 inches below the surface.

Prem Mirchandani, a graduate student in the Department of Agricultural Chemistry and Soils, earned his Doctor's Degree studying the effects of deep plowing on the reclamation of the alkaline soils on the Gilbert Brothers' ranch at Casa Grande. Using virgin soil as a check he studied the chemical and physical properties of soils which had been deep plowed and had been cropped 2, 3, 9, and 12 years since deep plowing.

Salts Reduced by Leaching

His studies show good reclamation can be achieved in two years after the initial deep plowing. During this time, salts and alkali are reduced to a safe level by leaching and yields of $1\frac{1}{2}$ to $2\frac{1}{4}$ bales of cotton per acre are common. Attempts to farm these soils without ripping or deep plowing would have resulted in cotton yields of 100 to 200 pounds per acre.

Deep plowing should be used only in special cases if permanent benefits are expected. A soil which is of heavy texture through the entire plowed zone will not be permanently benefited, because the soil probably will run together again within a short time.

Two-Way Plow Better

Both one-way and two-way plows have been used in the Casa Grande Valley. It is claimed that the two-way plow leaves a smaller dead furrow and leveling costs after plowing are less than with the one-way plow.

According to K. K. Hennessey, county agricultural agent at Casa Grande, the cost of plowing and releveling the soil in Arizona averages about \$20.00 per acre. If the proper soil has been plowed the benefits derived soon repay this cost.

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The subsoil plow leaves the surface of the soil very rough (below). It must be re-leveled before planting. ▼

