

## Will Dryland Farming Be Feasible In The Avra Valley?

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The increasing cost of water and legal restrictions on its use have caused farmland to be taken out of production in Pima County. In the early 1970's, approximately 50,000 acres of farmland were being irrigated in Pima County. This is projected to drop to less than 20,000 acres by 2000 and to virtually zero by 2020 (9).

The City of Tucson is the largest owner of retired farmland in the county. The city purchased Avra Valley farmland, retired it from production, and is now exporting the water for municipal use. Little natural revegetation has occurred in the 10 to 11 years since most of the city's land was retired from farm production.

The land remains as a huge management problem. Weed control problems have resulted in a large expenditure of the city's funds. The land must be mowed periodically to keep tumbleweeds from growing and being blown to adjacent agricultural fields, homesites, and roads.

The retired farmland has no permanent tenants, thus problems persist with vandalism, theft, trash dumping, and overgrazing. As of 1981, the City of Tucson was spending about \$75,000 per year to manage and maintain its Avra Valley holdings with no offsetting returns (4).

Jojoba, guayule, buffalo gourd, and tumbleweed biomass production have been studied for their feasibility on retired farmland. None of those crops are economically feasible (9); all require some irrigation. However, the 1980 Groundwater Law prohibits any irrigation on much of this retired farmland (4).

The USDA-Agricultural Research Service conducted a study on establishing rangelasses on retired farmland on the San Xavier Indian Reservation. The plantings were irrigated to establish the stands, but all of the grass eventually died without supplemental water (1). Another study is under way in Three Points area, but the greatest obstacle to the survival of perennial plants is the hot and dry period from May to early July.

Dryland farming may be feasible on these retired farmlands. Annual precipitation is 10-12 inches in the area, with about 60% coming with the mid-July to mid-September monsoon rains and 40% in the gentle winter rains. Farming according to this rainfall distribution avoids the annual May-June drought.

The plant breeding programs of Drs. Ramage, Thompson, and Voigt have produced barley, wheat, and milo breeding lines, respectively, that show promise for dryland farming. The City of Tucson and some local farmers acquired barley and wheat seed that was discarded from the Ramage and Thompson breeding programs and grew them without irrigation in the Avra Valley with encouraging results. Dr. Voigt's milos have not yet been tested under purely dryland conditions (8).

The most remarkable example of dryland farming was between 200 B.C. and 630 A.D in the Negev desert of Israel. The Israelites captured rainwater and channeled it to their cultivated areas, and thus maintained a flourishing civilization on a meager 3 to 4 inches of annual rainfall (2). Dryland farming exists today in Texas and California (5,7), and is expected to increase due to declining water tables.

The Arizona Cooperative Extension Service will be conducting field experiments with farmers to explore the potential of dryland farming in the Avra Valley. Techniques of capturing rainwater will be evaluated (3,6), along with various cropping rotations and cultural practices.

New drought-tolerant wheat, barley, and milo breeding lines will be field tested in close corroboration with the plant breeders who developed them. These on-the-farm experiments will show whether dryland farming is economically feasible, and if so, how it can be done.

If dryland farming is feasible, farmers will be able to shift over to it rather than simply going out of business when the land can no longer be irrigated. The City of Tucson may be able to share or cash lease its Avra Valley land to farmers rather than continue making maintenance expenditures with no offsetting returns. Farming techniques that capture rainwater would help mitigate soil erosion and flooding. Other benefits would include the aesthetics of farming versus desertification, and the benefits to wildlife from the production of forage and grain.

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