General Recommendations For Establishing A Permanent Vegetative Cover On Retired Farmland

Gary W. Thacker and Jerry R. Cox

Abstract

A permanent vegetative cover should be established on farmland before retirement. After four years of research, we recommend:

1. Work with the farmer while he is still on the land; 2. Furrow the land into 38 or 40-inch beds; 3. Plant adapted species; and 4. Apply establishment irrigations.

Water Resources Are Being Reallocated In Arizona

In many areas of Arizona, the water beneath the farmland is more valuable than the crops that can be grown on the surface. Cities, developers, and speculators have purchased "water farms" to secure municipal water supplies (2). In Pima County, the City of Tucson has purchased and retired one-half of the farmland.

Arizona's 1980 Groundwater Management Act (GMA) will probably cause more farmland to be retired. The GMA dictates that by the year 2025, the Tucson, Phoenix, and Prescott Active Management Areas will reach "Safe Yield". Safe Yield means that no more water may be pumped from the aquifer than is recharged into it. In order to meet safe yield, the GMA authorizes the State of Arizona to buy and retire farmland. A pump tax is now accumulating funds for farmland purchases.

If A Farm Is Retired Without A Vegetative Cover, Blowing Dust And Tumbleweeds Will Characterize The Land For 5 - 10 Years

Rural residents will have to endure the problems until the land begins to stabilize. In Pinal and Cochise Counties, dust storms from abandoned farms have caused fatal accidents on Interstate 10. A messy process called secondary succession will eventually revegetate and stabilize the land (1). However, where the annual rainfall is below 8-inches and the soils are clay to clay loams, natural revegetation will take 30 or more years.

A Permanent Vegetative Cover Will Prevent The Problems

Over the last four years, we have developed successful revegetation techniques that provide a permanent vegetative cover in one year. We believe that vegetative cover should be established before retirement. The cost is about $100. per acre.

General Recommendations:

1. Work with the farmer while he or she is still on the land.

The farmer has an intimate knowledge of the land: how to run the irrigation system, weed problems, and soil types. Taking advantage of this knowledge makes the job much easier. The new landowner may wish to pay the farmer to establish the vegetative cover.

Waiting until after the farmer is gone makes the job more difficult. Tumbleweeds quickly dominate the land, and the irrigation system begins to fall apart.

2. Furrow the land into 38 or 40-inch beds.

Research data in an accompanying article show that ordinary 40-inch beds perform as well as 80-inch wide water harvesting microcatchments or flat disked soil. Our reasons for recommending beds are:

--- In most years, some establishment irrigation will be needed. Farmland that has any slope is most efficiently irrigated with furrows.

--- Furrowing increases the roughness factor of the land, reducing the wind erosion potential.

When planting on beds, keep in mind that the best place for the plants to establish and persist will be on the sides of the beds, just above the bottom of the furrow. The tops of the beds will be the driest, saltiest, and least hospitable place for seedlings.

3. Plant adapted species.

Some of the accompanying articles identify some plant species that have worked well at our test site in the Avra Valley. We do not recommend planting monocultures, but rather a mixture of grasses, shrubs, and trees. This will provide the variation of cover that wildlife requires.

4. Apply establishment irrigations.

Seedlings can't establish unless the soil surface stays moist long enough for the plants to root in. The problem is that the rainfall in Arizona is erratic and unreliable. Often, the weather turns out to be too dry, or if it does rain, the timing is all wrong. Some of the accompanying articles show how a few establishment irrigations can make a big difference in the success of the project.

We recommend irrigating often enough to keep the top half-inch of soil wet until the seedlings are established. The amount of irrigation needed will vary with the weather conditions. A corollary to this recommendation is to plant when the weather conditions are most likely to be favorable, which is the monsoon season in southeastern Arizona.

In applying establishment irrigations on 40-inch beds, we have found that the plants tend to establish and persist on the sides of the beds, just above the bottom of the furrow. One does not have to keep the tops of the beds wet, because plants won't survive there anyway. Maintaining the optimal moisture condition on the sides of the beds requires a lot less water than it does to keep the entire bed wet.

Once the plants are established, the vegetative cover will persist without supplemental water.

ONCE A VEGETATIVE COVER IS ESTABLISHED, THE LAND IS A MAINTENANCE-FREE SITE.

Acknowledgments

This project would not have been possible without the support and cooperation of the City of Tucson, Tucson Water, Nick Buckelew, and funding from the Arizona Department of Environmental Quality's Air Quality Fund.

Literature Citations

1. Karpiscak, M.M. 1980. Secondary Succession of Abandoned Farmland Field Vegetation in Southern Arizona. Doctoral Dissertation, University of Arizona Department of General Biology, Tucson, AZ 85721.

2. Woodard, G.C., Elizabeth Checchio, G.W. Thacker, and B.G. Colby. 1988. The Water Transfer Process in Arizona: Analysis of Impacts and Legislative Options. Division of Business and Economic Research, College of Business and Public Administration, University of Arizona, Tucson, AZ 85721.