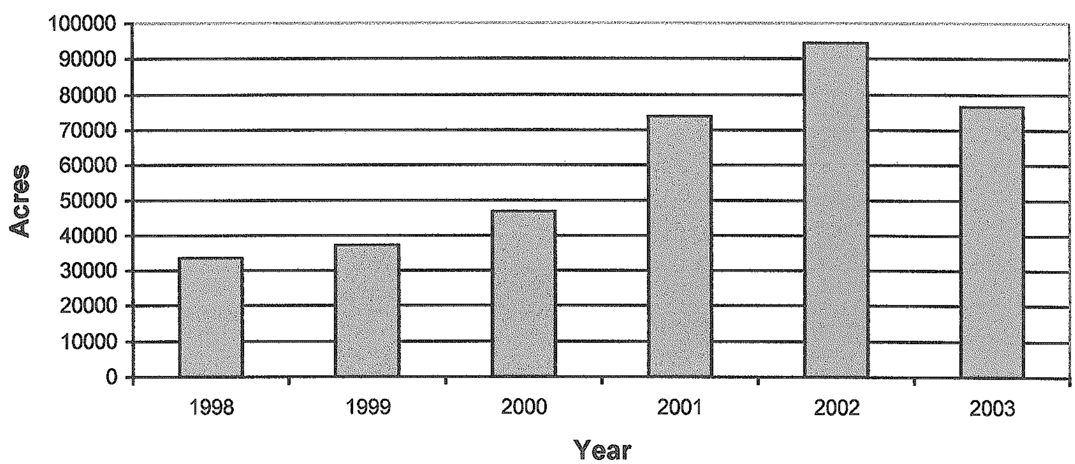
Testimony of Don Villarejo, Ph.D., October 5, 2004

The questions that need to be addressed in this hearing are simple and can be directly examined. First, has there been an increase in fallowed land in recent years in the Westlands Water District? Second, have there been changes in crop production during the same period of time? Third, have there been changes in farm operations and employment that are associated with land fallowing and/or changed patterns of crop production? Finally, how can policy address the issues that are associated with these findings?

To determine whether there has been an increase in land fallowing in the Westlands Water District in recent years, the annual crop report published by the district itself provides reliable data. From 1998 through 2002, there was a steady increase in the amount of fallowed land, followed by a decrease in 2003. These data are shown in Figure 1.

Figure 1. Fallowed Acres, Westlands Water District, 1998-2003
Source: WWD Annual Crop Report



Since land fallowing normally fluctuates from year to year, owing to variations in water availability, market conditions, and other factors, it is usual to compute multi-year averages in analyzing crop data. Multi-year averaging tends to reduce the influence of such annual fluctuations.

The three-year average of fallowed acreage in the WWD for 1998-2000 equals 39,145 acres. This figure can be compared with the corresponding figure for the three-year period 2001-2003, which equals 81,671 acres, which is about 14.6% of WWD's irrigable land area. The difference in these two figures is the first finding of this study, namely, using three-year averaging, **the average amount of annually fallowed acreage in the WWD has increased by 42,526 acres since 1998-2000**.

Of course, the three-year averaging process is somewhat arbitrary. One could take the average fallowed acreage for the most recent two-year period, namely, for 2002-2003, which equals 85,606 acres. In that event, the imputed increase in the average amount of annually fallowed acreage would equal 46,460 acres since 1998-2000, which is about 9% larger than the finding based on the three-year average.

Examination of decreases in reported WWD harvested acreage correspond closely with the increases in fallowed acreage. For the three-year period 1998-2000, the average annual harvested acreage equals 534,538 acres. And for the three-year period 2001-2003, the corresponding average equals 493,486 acres. Thus, the decline in average annual harvested acreage equals 41,052 acres.

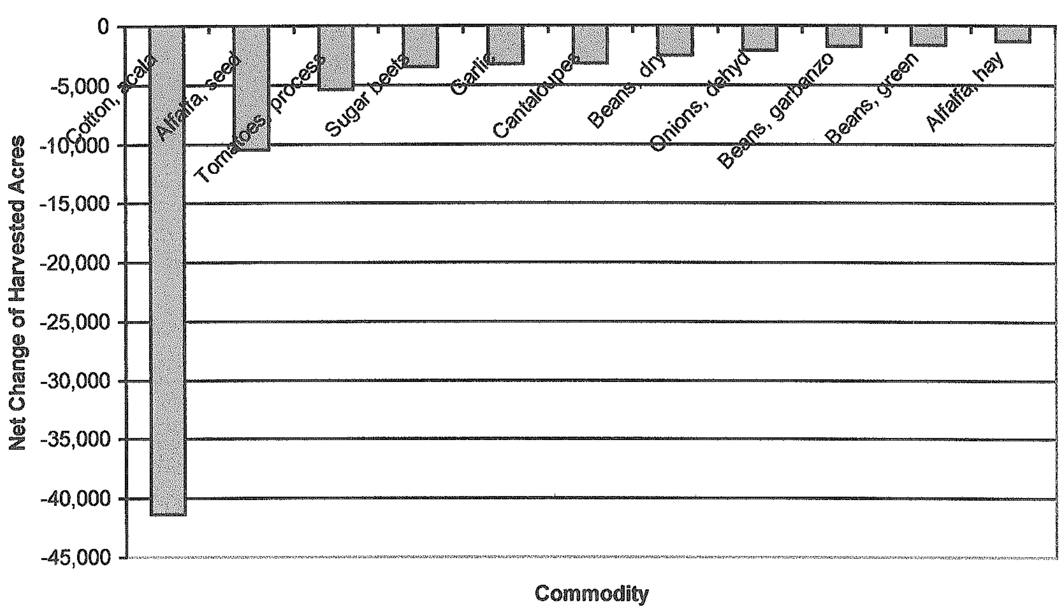
The changes in annual average fallowed and harvested acreage are summarized in Table I.

Table I
Fallowed and Harvested Acres, Westlands Water District

	Harvested acres	*Fallowed acres*
Average, 1998-2000	534,538	39,145
Average, 2001-2003	493,486	81,671
Difference	-41,052	+42,526

Changes in crop patterns are examined next. For this, the Annual Crop Report of the Westlands Water District provided sufficient detail to determine which crops experienced decreased harvested acreage, again comparing annual averages for 1998-2000 with those for 2001-2003. Figure 2 shows the findings for the eleven crops that had decreases in harvested acreage exceeding 1,000 acres.

Figure 2. Net Reductions in Harvested Crop Acres, Westlands Water District, 1998/2000 vs. 2001/2003, WWD Annual Reports

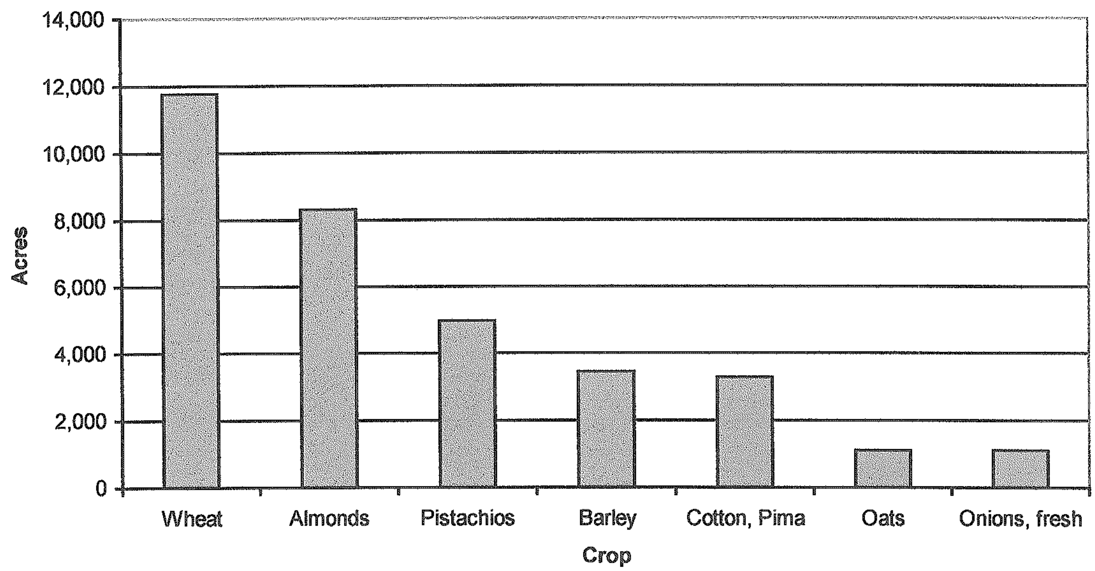


By far, the largest decrease was in acala cotton, which was followed in importance of decreased acreage by alfalfa seed, processing tomatoes, sugar beets, garlic and cantaloupes.

It is important to realize that changes in annual crop patterns are normal in agriculture, and respond to a wide range of factors, such as market conditions, crop pests and water availability. Weak prices for acala cotton are a major factor for its decline in importance in recent years. Similarly, competition from imported Chinese garlic was likely a factor in the reduction of garlic acreage. And the collapse of Tri-Valley Growers in 2000 adversely impacted some processing tomato growers.

There were some crops that experienced increases in harvested acreage during the period of interest. Figure 3 shows the findings of this study for the seven crops that each had an annual average increase of at least 1,000 harvested acres since 1998-2000.

Figure 3. Net Increases in Annual Harvested Crop Acres, Westlands Water District
1998/2000 vs 2001/2003, WWD Annual Reports



Wheat, almonds, pistachios and barley each had significant increases in harvested acreage during the period of interest. Of the seven crops listed, only fresh onions has a substantial annual harvest labor requirement. This is in contrast with the findings for those crops that had a substantial decrease in harvested acreage: garlic, cantaloupe and green beans all have significant harvest labor requirements.

The effect of these changes in fallowed and harvested crop acreage on farmers and farm laborers was examined in several ways. First, Fresno County Agricultural Commissioner records for those WWD crop fields fallowed in 2003 were compared against similar records for earlier years. It was found that **18 farms which were active in 2000, and which had farmed exclusively on land that has been subsequently fallowed, are no longer farming in the district**. An additional forty-five farms active in 2000 are operating on land that may be fallowed in the future.

Second, the Annual Crop and Livestock Report of the Fresno County Agricultural Commissioner was consulted for the years 2001-2003 to determine the annual average countywide revenue per acre for each crop. For each crop in WWD, the change in annual average harvested acreage was multiplied by the annual average revenue per acre to obtain the change in crop revenue. This is illustrated in Table II.

Table II
Change in Annual Almond Crop Revenue, Westlands Water District
1998-2000 vs. 2001-2003

Change in Annual Average Almond Harvest Acres = +8,294 acres

Annual Average Almond Crop Revenue per Acre = $2,517.67

Change in Annual Almond Crop Revenue = +$20,881,527.33

Source for crop revenue per acre: Fresno County Agricultural Commissioner, Annual Crop and Livestock Report, 2001, 2002, 2003

The grand total for all crops in WWD yields the finding that the changes in annual harvested crop acreage reported above corresponds to a **decline in annual crop revenue in WWD of an estimated $58.7 million since 1998-2000**.

An additional source of farm income is payments received by eligible producers under USDA support programs. For the 18 farm operators who conducted agricultural operations exclusively on land in 2000 that has been subsequently fallowed, it was found that USDA payments in the five-year period 1998-2002 totaled $6.7 million, or an average of $1.3 million per year. Thus, the total **decline of annual farm revenue that can be attributed to land fallowing in WWD subsequent to 1998-2000 is approximately $60 million**.

Third, harvest labor requirements for each crop, in hours per acre, were determined from reports by Fresno County Cooperative Extension and other sources in the agricultural and economics literature. This 'labor coefficient' was utilized to determine the change in overall labor demand associated with land fallowing.

Table III
Labor Demand Based on Crop Acres and Labor Coefficient
Labor Demand = (Hours per acre) x (Acres)

Example: Lettuce, head; Labor coefficient = 118.7 hours per acre
2003 Head Lettuce Acres (estimated): 20,800 acres

Labor Demand (Lettuce, head) = 20,800 acres x 118.7 hours per acre
Equals: 2,468,960 hours

Source for Labor Coefficient: Larson, Office of Migrant Health, 2000

Labor coefficients for each crop in WWD were determined, and the corresponding change in labor demand was calculated, again using the annual average change in harvested acreage for each crop. The total change in labor demand was determined by simply adding the results for all crops. The principal finding of this report is that **the overall change of annual average labor demand in WWD subsequent to 1998-2000 equals –741,338 hours, a decline of about 5%.**

The average farm labor wage reported by the California Farm Bureau Federation's 2003 Wage and Benefit Survey (FELS) was $8.22 for general labor. This leads to the finding that **the decline of labor demand associated with land fallowing in the WWD since 1998-2000 has resulted in an annual loss of farm labor wages of about $6.1 million.**

The finding of the decline of labor demand can be combined with the finding of the Department of Labor's National Agricultural Worker Survey that the average number of annual weeks of agricultural work obtained by California's hired farm workers equals 24 weeks. In other words, the average number of hours of agricultural work per hired farm worker is roughly 1,000 hours. Hence, dividing the decline of the total number of hours of labor demand by the average number of hours per worker yields the finding that **approximately 750 jobs have been lost in the WWD as a result with land fallowing subsequent to 1998-2000.**

Farm supply and service businesses in the region may lose income as a result of declines in crop acreage. Table IV shows the 2002 Census of Agriculture reports of production expenses, both totals county-wide and per harvested acre.

Table IV
Selected Costs of Production, Combined Fresno and Kings Counties
Census of Agriculture, 2002

Type of Production Expense	*Expense per Harvested Acre*
Seeds, plants, etc	$44.74
Commercial fertilizer	$83.84
Agricultural chemicals	$140.81
Petroleum products	$64.27
Repair and maintenance	$132.27
Customwork and machine hire	$80.16

By taking account of the decline harvested acreage and these expenses per acre, this report finds that **the total annual lost revenue for purchases of seeds, commercial fertilizer, agricultural chemicals, petroleum products, repair and maintenance, and customwork and machine hire amounts to an estimated $23.2 million.** It is likely that a substantial share of this business activity would have accrued to local businesses.

In conclusion, I want to stress that these findings only pertain to land fallowing that has already occurred, and no predictions are presented as to future crop outcomes. It is also important to realize that lack of adequate irrigation water supplies along with severe land drainage problems are at the main cause of the land fallowing discussed in this report.

The 2001 Annual Report of the Westlands Water District includes the following quote, which is accurately attributed to me,

> "The failure of environmental policy to address the community impacts of irrigation water reductions is identified as a major short-coming of the new water ethic. As in the case of worker dislocations resulting from new forest or fishery management practices, programs need to be developed to address the effects of water reallocation."
>
> *Source: Westlands Water District Annual Report 2001, p. 3.*

Fourteen years ago, the prestigious National Academy of Sciences Committee on Western Water Management met in Fresno to discuss the impacts of water reallocation policies. I had the opportunity to participate in that discussion. The final report of the NAS contains the important conclusion,

> "No issue gave the committee more trouble than the question of how to characterize and evaluate the effects of water transfers on small communities… Retiring irrigated land can lead to losses of farm jobs, crop production, and farm income. These direct effects can be measured with a fair degree of accuracy. However, indirect impacts of water transfers, such as losses of off-farm jobs, income, and production in nonfarm businesses and households, are more difficult to estimate. Another type of economic impact, "induced impacts," includes changes in population, employment, and income in local businesses and activities not linked to agriculture but dependent on the vitality of the local economy in general. Retail stores, restaurants, and local services may be affected by a decline in agriculturally linked jobs and income (Charney and Woodard, 1990)."
>
> *Source: Water Transfers in the West: Efficiency, Equity and the Environment, National Academy of Sciences, Committee on Western Water Management, Water Science and Technology Board, Commission on Engineering and Technical Systems, National Academy Press, 1992, p. 45.*