



UPDATE

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AgJOBS: New Solution or New Problem?

by

Philip Martin and Bert Mason

Over half of the workers employed on U.S. farms are not authorized to work in the U.S. A historic compromise between employer and worker advocates announced in September 2003 would legalize some currently unauthorized workers and make it easier for farmers to obtain guest workers, but may not fundamentally change the farm labor market.

The Agricultural Job Opportunity, Benefits and Security Act of 2003 (AgJOBS)(S 1645 and HR 3142), co-sponsored by U.S. Senators Edward Kennedy, D-MA and Larry Craig, R-ID, and U.S. Representatives Howard Berman, D-CA and Chris Cannon, R-UT, was introduced in September 2003 to legalize hired farm workers employed on U.S. farms. AgJOBS provides a path to legal status for some currently unauthorized farm workers, and makes it easier for farm employers to recruit additional workers, via the H-2A guest worker program, by changing key procedures and requirements.

The major goal of AgJOBS is to ensure that the workers employed on U.S. farms are legally authorized to work in the U.S. Worker advocates also hope that legal status will make farm workers more likely to join unions and press for wage increases, reversing the 1990s slide in wages and benefits. These goals are similar to those of the Special Agricultural Worker (SAW) program of 1987-88. The SAW program legalized many workers, but continued unauthorized migration led to a glut of workers, and the number of union contracts and wages fell despite legalization.

This article asks whether AgJOBS is likely to provide a new solution or cause new problems in the farm labor market.

As with the SAW program 15 years ago, the answer depends in part on how the program is implemented, how workers and employers respond and whether unauthorized entry and employment continue.

Long Road to AgJOBS

AgJOBS is the latest in a series of efforts since the early 1980s to trade “employer-friendly” changes in the H-2A program for an “earned legalization” path to immigrant status for unauthorized farm workers. The first major step was the SAW program, which was included in the Immigration Reform and Control Act (IRCA) of 1986. IRCA introduced sanctions on employers who knowingly hired illegal workers, an enforcement step aimed at reducing illegal entries and employment. Without unauthorized workers, farmers feared labor shortages, and the SAW legalization program allowed unauthorized foreigners who did at least 90 days of farm work in 1985-86 to become legal immigrants free to live and work anywhere in the U.S. If SAWs quickly left the farm labor market, leading to farm labor shortages, farmers could get guest workers via the H-2A program, which guaranteed workers to fill vacant jobs after the farmer tried to recruit U.S. workers under U.S. Department of Labor supervision, or via the

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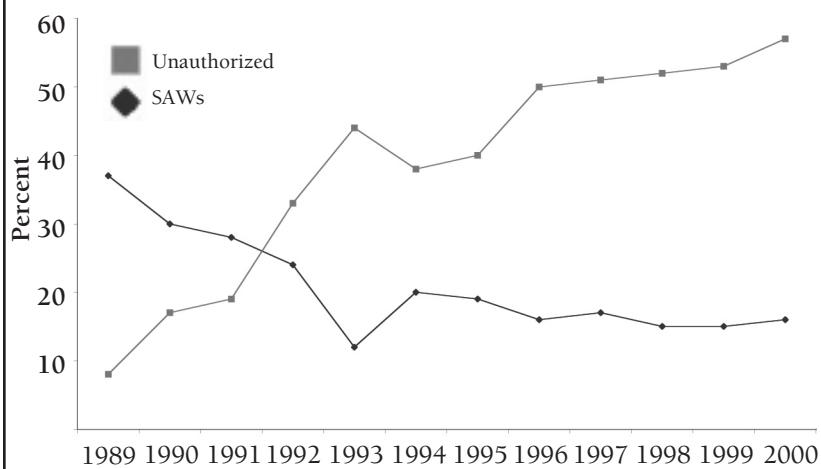
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*by
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**Figure 1. SAWs and Unauthorized Crop Workers: 1989-2000
(Percent of crop workers)**



Source: National Agricultural Workers Survey,
<http://www.dol.gov/asp/programs/agworker/naws.htm>

Replenishment Agricultural Worker (RAW) program, which admitted foreign workers who were free agents in the U.S. labor market.

The late 1980s and early 1990s were marked by the continued arrival of workers who used false documents to obtain jobs, prompting the U.S. Commission on Agricultural Workers (CAW) to conclude that, instead of the anticipated "stabilization of the labor supply," there was "a general oversupply of farm labor nationwide." Furthermore, "with fraudulent documents easily available," employer sanctions did not deter the entry or employment of unauthorized workers. The RAW program was not needed, and was allowed to expire in 1992, and farm labor contractors increased their share of placements in major farm labor markets such as California.

Surveys of crop workers in the late 1980s found that over a third were SAWs (Figure 1). SAWs quickly learned that they could obtain higher wages and more hours of work in the nonfarm labor market, and despite the recession of the early 1990s, many quickly exited the farm labor market, and were replaced by unauthorized workers. By 2001, the percentage of SAWs in the crop work force dropped below 15 percent, and the percentage of unauthorized workers topped 50 percent; the others were U.S. citizens and legal immigrants.

Farmers recognized that a growing dependence on unauthorized workers made them vulnerable to the enforcement of immigration laws, including stepped-up efforts to prevent entries over the Mexico-U.S. border. Farmers wanted a free agent program that

would admit a certain number of foreign workers who would be free to "float" from farm to farm seeking jobs, much as unauthorized workers did. Since these new guest workers would not be tied to a particular farm with a contract as H-2A workers were, U.S. farmers would not be responsible for their housing or their transportation costs.

There was widespread opposition to the farmers' proposal for a new guest worker program. President Clinton issued a statement on June 23, 1995 that read: "I oppose efforts in this Congress to institute a new guestworker or 'bracero' program that seeks to bring thousands of foreign workers into the

United States to provide temporary farm labor." Congress agreed with Clinton, and rejected proposals for a new large-scale guest worker program in 1996 and a scaled-down pilot version in 1997-98. The U.S. Senate approved a free-agent guest worker proposal in July 1998, but Clinton threatened to veto it and the House did not consider it.

Farmers did not give up on an alternative guest worker program. The election of Vicente Fox as president of Mexico in July 2000, and of George Bush as U.S. president in November 2000, prompted employer and worker advocates to agree on a compromise version of AgJOBS in December 2000 that introduced a new concept—earned legalization. The compromise offered temporary legal status to unauthorized workers who had done at least 100 days of farm work during the previous year, and allowed them to earn immigrant visas if they did at least 360 more days of farm work in the next six years. Earned legalization satisfied employers, who received assurance that newly legalized farm workers would not immediately leave for non-farm jobs, and worker advocates, who wanted farm workers to eventually have the same rights as U.S. workers. However, Republicans who opposed "rewarding lawbreakers" with legal status blocked the AgJOBS compromise in December 2000.

During the spring and summer of 2001, there were Mexico-U.S. meetings on migration, the top foreign policy priority of Mexico, and a variety of proposals were introduced in Congress to legalize farm and other workers. The debate centered largely on whether currently unauthorized workers should be granted

only a guest-worker status, an immigrant status or a temporary status that would enable workers to "earn" an immigrant status. The September 11, 2001 terrorism stopped legislative momentum for these proposals.

AgJOBS 2003

AgJOBS 2003 would allow unauthorized foreigners who did at least 575 hours or 100 days of farm work (one hour or more constitutes a day of work), which ever is less, in a 12-consecutive month period between March 1, 2002 and August 31, 2003 to receive a six-year Temporary Resident Status (TRS) that gives them the right to live and work in the U.S. The application period would begin six months after enactment, and last 18 months; applications could be filed within the U.S. or at U.S. ports of entry with Mexico. To avoid dealing directly with the Department of Homeland Security, workers could file applications with Qualified Designated Entities, and farm worker unions and employer associations would be favored to receive applications.

TRS workers could earn a permanent immigration status by doing at least 2,060 hours or 360 days of farm work in the next six years, including at least 1,380 hours or 240 work days during the first three years following adjustment, and at least 430 hours or 75 work days during each of three 12-month periods in the six years following adjustment. Spouses and minor children of TRS workers would not be deportable (but would not be allowed to work), and could receive permanent immigrant status when the farm worker received an immigrant visa. There is no cap on the number of unauthorized foreigners who could qualify for TRS.

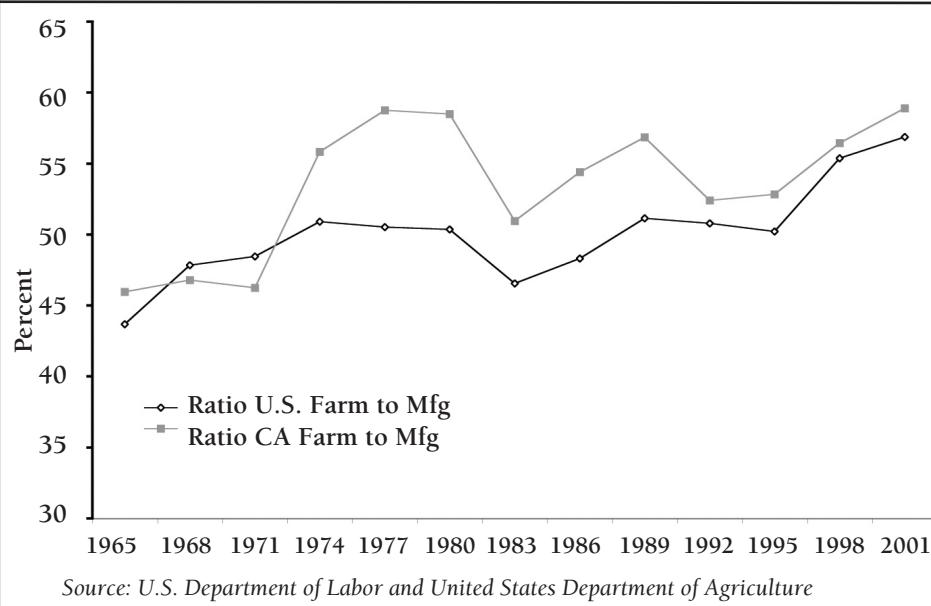
For employers, the H-2A program would be made more "employer-friendly" by allowing employers to "attest" to their need for foreign workers. By law, the U.S. Department of Labor would have to approve employer requests for H-2A workers if their job offers were filed at least 28 days before workers were needed at local Employment Service offices

and employers advertised jobs in local media at least 14 days before the need date. If local workers did not appear, the employer would be authorized to have guest workers admitted.

Employers must provide housing to H-2A workers or "a monetary housing allowance" if the governor certifies there is sufficient housing for workers to find their own. The allowance would be a quarter of the Section 8 housing allowance for a region, or \$100 to \$150 a month per worker in states such as California, assuming that four workers share a two-bedroom apartment. Employers would have to reimburse inbound and return transportation costs for satisfactory workers and guarantee work for at least three quarters of the period of employment. For the first time, H-2A workers would be able to sue in federal rather than state courts to enforce their contracts. Housing and other provisions could be modified by a collective bargaining agreement, if there is one.

Average hourly farm earnings fell relative to manufacturing earnings after the SAW legalization program. Under AgJOBS, farmers would have to pay to H-2A workers, but not to U.S. citizens and immigrants, newly legalized TRS workers and unauthorized workers, the higher of the federal or state minimum wage, the prevailing wage in the occupation and area of intended employment, or the Adverse Effect Wage Rate (AEWR). The 2002 AEWRs would apply until 2006, while farm wages are studied, and are \$8.02 an hour in California, \$7.69 in Florida, \$7.53 in North

**Figure 2. Ratio of Manufacturing Worker Hourly Earnings
1965-2001**



Carolina, \$7.28 in Texas and \$8.60 in Washington. If most workers are H-2A workers, the ratio of farm to manufacturing hourly earnings may continue to rise; if they are not, it could turn down as in the past.

AgJOBS' Effects

If AgJOBS is approved, there is likely to be renewed interest in the farm labor market. As organizations are created to legalize farm workers (legalization will be funded by worker application fees), a new system would be established to monitor days of farm work, and a database on TRS workers would record days of farm work as well as data on dependents, taxes paid and crime. A new adjudication system would be established to give TRS workers credit for days not worked in agriculture because of on-the-job injuries or if they were fired without "just cause."

A key issue will be verifying the data in worker applications. During the Special Agricultural Worker program, there was widespread fraud, as foreigners who did not do sufficient farm work submitted letters (affidavits) from especially contractors saying they did, and the U.S. government was unable to meet its burden of proof to show that the applicant's information was wrong. AgJOBS puts the burden on the applicant to demonstrate "by a preponderance of the evidence," that the claimed work was performed. There may also be less fraud because of the required continuing farm work. On the other hand, the market share of workers brought to farms by contractors has risen significantly, to almost half of all farm work days in California, and employment records may be less reliable now than 15 years ago.

Based on the SAWs experience, most currently unauthorized workers may soon be legal workers. Many are likely to be tempted to satisfy their farm work obligation as soon as possible which, combined with easier admissions via the H-2A program and continued illegal migration, could increase the farm labor supply. This would place downward pressure on wages and benefits, make it difficult for labor unions to organize farm workers, and perhaps speed up the rate at which workers who can find nonfarm jobs leave the farm labor market. In the absence of effective border and interior enforcement, rural Mexicans are likely to continue to migrate to the U.S.

Many things will not change with AgJOBS. Most workers will continue to be young immigrant men from rural Mexico; however, for at least a few years, the work authorization documents they present to

employers may be valid. Second, there may continue to be controversy over H-2A admissions, with the focus shifting from suits against employers for inadequate housing to political pressure on governors to certify that there is sufficient housing available, so that farmers can pay housing allowances rather than provide housing. Many states apply for federal housing grants citing the lack of housing for farm workers, which may make such certification a political issue. Farm employers applying for H-2A workers for the first time may learn costs are higher than they have been paying, since the minimum H-2A wage is \$8.02 an hour in California rather than the state's \$6.75 minimum.

AgJOBS continues to send mixed signals about the future availability and cost of farm workers. On the one hand, AgJOBS expresses a desire for a legal farm work force, which advocates assume will also be a higher-wage work force. However, an easing of admissions under the H-2A program combined with a three-year AEWR freeze signals the ready availability of workers at a predictable cost. There is also a high probability that unauthorized workers will continue to arrive and present false documents to employers in the hope of another legalization, so the combined effect may be no fundamental changes in the farm labor market.

For additional information on this topic, the author recommends the following reading:

Martin, Philip. 2003. *Promise Unfulfilled: Unions, Immigration, and Farm Workers*. Ithaca. Cornell University Press.

Martin, Philip, Wallace Huffman, Robert Emerson, J. Edward Taylor, and Refugio Rochin. Eds. 1995. *Immigration Reform and U.S. Agriculture*. Berkeley, CA: Division of Agriculture and Natural Resources Publication 3358.

Thilmany, Dawn and Ed Taylor. 1993. Worker Turnover, Farm Labor Contractors and IRCA's Impact on the California Farm Labor Market. *American Journal of Agricultural Economics*, 75. May. 350-360.

U.S. Commission on Agricultural Workers. 1992. Final Report. Washington DC. Government Printing Office.

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Urban Farmers: A Profile of the California Nursery and Floral Industry

by
Hoy Carman

While the overall number of commercial nursery and floral producers within California appears to be decreasing, total sales are on the rise. With \$3.30 billion in receipts last year, California's nursery and floral industry is clearly a very important part of the state's agricultural economy.

The California nursery and floral industry is the largest in the United States, accounting for 22.2 percent of total 2002 U.S. receipts for nursery and floral production. The total value of California nursery and floral products grew from \$1.90 billion in 1992 to \$3.31 billion in 2002 (an overall increase of 74 percent). During the same time period, total California agricultural output grew from \$21.77 billion to \$30.64 billion (an overall increase of 40.7 percent). As a result, the nursery and floral share of California agricultural production grew from 8.7 to 10.8 percent while many other commodities remained stable or decreased. Within the state, total 2002 production of nursery products placed the nursery industry in third place (\$2.57 billion) and the floral industry in 11th place (almost \$730 million) among all California agricultural industries. When combined, the floral and nursery industry (\$3.30 billion), ranked second among all California agricultural products. This followed the dairy industry, which ranked first with \$3.79 billion sales in 2002 but ranked ahead of the third place value of all grapes at \$3.16 billion.

Nursery and flower producers are rather unique among California farmers in that a large number continue to be located in the most urbanized areas of the state. Good reasons exist for remaining in urban areas, despite the pressures from development. Location near one's customers is typically a good strategy to minimize shipping and distribution costs and to provide fresh and high quality product. Many nurseries distribute their product directly to retailers and some are also integrated into retailing. In addition, the climatic conditions favorable for nursery production are also very attractive to many people and, as a result, population and housing growth have been high in areas where nurseries have traditionally located. While much of California's nursery and flower production sells locally, significant amounts are shipped to distant markets. California ships an estimated 40 percent of flower production and approximately 20 percent of nursery production to other states. California exports

an estimated one percent of its total nursery and flower production to other countries.

Location of Production

California produces nursery products and/or flowers and foliage in 54 of its 58 counties, but production tends to be concentrated in the Central and South Coast. Eight of the 11 counties that produced over \$100 million in nursery, flowers and foliage in 2002 are coastal counties. As shown in Table 1, San Diego County dominates the industry with 26.5 percent of total production. The next four counties, Orange, Monterey, Ventura and Riverside combine for 25.6 percent of total California production. The remaining six counties account for 25 percent of production. As shown, the 11 counties with production over \$100 million, accounted for almost \$2.55 billion (77.1 percent) of California's 2002 nursery, flower and foliage production. Note

**Table 1. Top Producing CA Counties of
Nursery, Flowers and Foliage: Value and Share
of Production and Population, 2002**

| County | Value of Production (\$1,000) | Share of CA Value (%) | Population | Share of CA Pop (%) |
|---------------|-------------------------------------|-----------------------------|------------|---------------------------|
| San Diego | 877,481 | 26.5 | 2,935,100 | 8.3 |
| Orange | 231,706 | 7.0 | 2,954,500 | 8.4 |
| Monterey | 218,650 | 6.6 | 412,000 | 1.2 |
| Ventura | 214,018 | 6.5 | 785,700 | 2.2 |
| Riverside | 182,977 | 5.5 | 1,677,100 | 4.8 |
| Los Angeles | 177,083 | 5.4 | 9,902,700 | 28.1 |
| Santa Barbara | 149,263 | 4.5 | 407,800 | 1.2 |
| San Mateo | 143,661 | 4.3 | 713,800 | 2.0 |
| Santa Clara | 122,106 | 3.7 | 1,718,500 | 4.9 |
| San Joaquin | 119,072 | 3.6 | 605,500 | 1.7 |
| Kern | 115,383 | 3.5 | 697,100 | 2.0 |
| TOTAL | 2,551,400 | 77.1 | 22,809,800 | 64.8 |

Source: California Agricultural Statistics Service,
Summary of County Agricultural Commissioners' Reports, 2002

that San Joaquin and Kern are the only Central Valley counties with production of more than \$100 million. Four counties support nursery, flower and foliage production in the range of \$50 to \$100 million. These four counties, San Luis Obispo, Santa Cruz, Stanislaus and Tulare, accounted for 9.5 percent of total 2002 production. Overall, 15 counties produced 86.6 percent of California's total 2002 nursery, flower and foliage crops. Among these top 15 counties, these crops ranked number one in value of production in San Diego, Orange, Los Angeles, Santa Clara and San Mateo Counties. Nursery, flower and foliage crops are very important agricultural products for several California counties that are not among the 15 largest value producers discussed above. For example, nursery crops are listed as the number one commodity in terms of gross value of production for seven counties that are not included in the top 15. These counties include Alameda (\$14.2 mil), Contra Costa (\$29.1 mil), Del Norte (\$12.9 mil), Humboldt (\$35.3 mil), Inyo (\$3.8 mil), San Benito (\$29.0 mil) and Solano (\$38.8 mil).

California's three most populous counties, Los Angeles, San Diego and Orange, are also among the six top nursery and flower producers. As shown in Table 1, the top 11 counties account for 64.8 percent of California's 2002 population.

Crops Produced

California nursery, flower and foliage producers market a tremendous variety of plant materials ranging from cut flowers, potted plants, flower seeds, bedding and garden plants, bulbs, and ornamentals to fruit and nut trees and strawberry plants. Buyers include consumers, landscape contractors, institutions and agricultural producers. The most recent data available indicate that the gross value of plant materials produced by the

California nursery, flower and foliage industry in 2002 totaled over \$3.3 billion. Table 2 illustrates the various categories of nursery products and their values.

The California nursery industry supplies critical inputs to fruit, vine and nut crop producers in the form of seedlings, nonbearing trees and plants. Included in the category of nursery stock other than ornamentals, are products that accounted for 19.2 percent of total value of nursery products in 2002. Thus, the majority of California nursery production consists of flowering plants and ornamentals sold to households rather than inputs sold to agriculture.

While cut flowers continue to be an important nursery product, they have faced and continue to face competitive pressure from imports. Latin American countries, especially Columbia and Ecuador, dominate the U.S. fresh cut flower market due to their lower costs of production and improved transportation systems. The United States now imports over three-fourths of the cut flowers consumed in the country. Thus, California cut flower production has remained rather steady over the past few years with most of the

growth in nursery production coming from the other nursery products shown in Table 2.

In addition to imports, the California nursery industry faces many of the same problems facing other California agricultural firms. These include the availability and increasing costs for major inputs, (labor, energy, water and chemicals), the high cost of workman's compensation insurance and other government programs, low product prices and increasing market power of their major customers.

Number and Types of Firms

According to the 1997 Census of Agriculture, 4,988 California farms grew nursery and floriculture crops, which was a significant increase from the 3,263 farms

Table 2. Wholesale Value of California Nursery Products by Major Categories

| Floral Products | 2002 Value in dollars |
|--|-----------------------|
| Cut Flowers & Cut Greens | 365,944,700 |
| Flower Seeds | 4,775,700 |
| Christmas Trees | 9,636,300 |
| Floral Products Total | 380,356,700 |
| Nursery Products | |
| Potted Plants & Flowering Foliage | 628,212,900 |
| Bulbs, Corm, Roots & Tubers | 38,961,600 |
| Flowering Propagative Materials | 71,976,600 |
| Bedding Plants | 509,310,000 |
| Rose Plants | 61,047,000 |
| Woody, Deciduous & Evergreen Ornamentals | 941,488,700 |
| Herbaceous Perennials | 39,134,900 |
| Turf & Sod | 74,853,100 |
| Nursery Stock Other Than Ornamentals | 561,484,100 |
| Nursery Products Total | 2,926,468,900 |
| Grand Total | 3,306,825,600 |

Source: CASS, County Agricultural Commissioners' Reports.

counted in 1982. The pattern of production was similar to many other sectors with a relatively small number of large firms accounting for the majority of output. In 1997, 2,892 farms (58 percent of the total) produced nursery and flower crops with sales less than \$50,000 annually, and these farms accounted for only 1.3 percent of industry sales. At the other end of the scale, 411 California farms had nursery sales over \$1 million in 1997. This 8.2 percent of nursery farms, by number, accounted for 81.3 percent of total nursery sales.

While averages have many shortcomings, they do help to characterize California nursery operations. California nursery farms are comparatively compact and high value in comparison to other farms. In 1997, there were 74,126 California farms with an average size of 374 acres. Nursery farms were 5.8 percent of total California farms in 1997, but with an average of 45 acres of land, they accounted for only 0.7 percent of California land in farms. Overall, the average California farm had an average value of land and buildings totaling \$941,170 per farm (\$2,605 per acre). The average farm growing nursery crops had an average value of land and buildings of \$624,267 or \$12,017 per acre.

The legal structure of California nursery operations has changed over time. The 1982 distribution of nursery farms was comprised of 61 percent sole proprietors, 13 percent partnerships and 26 percent corporations. In 1997, this had changed to 69 percent sole proprietors, 11 percent partnerships and 19 percent corporations. In the corporate category, the relative importance of family corporations tended to decrease over time. Even though the share of farms organized as corporations has decreased over time, nursery farms had a higher share of corporations than any other sector in California agriculture. Note that the corporate share of all California farms was about 7.1 percent in 1997.

While the structure of California agriculture has been changing since 1997, the extent of the changes will be difficult to determine before the 2002 agricultural census is published. It appears that the number of nursery and floral producers has decreased. The 1997 census listed 4,988 California farms producing nursery and floral products. As noted above, 2,892 of these farms had sales less than \$40,000 and accounted for only 1.3 percent of industry sales. The California Agricultural Statistics Service (CASS) reported that "The number of floriculture producers in the state has been declining rapidly, and California now (2001) has 895 growers, compared to 973 in 2000, with sales greater than \$10,000." The 2002 Directory of Nurserymen and

Others Licensed to Sell Nursery Stock in California, which defines a commercial producer as someone who grows and sells a total of \$1,000 or more of nursery stock in one year, lists 2,999 producers for 2002.

There are a large number of California firms involved in production and distribution of nursery and floral products. The 2002 Directory of Nurserymen provides a listing of producers and retailers by county. At the high end of the scale, there are 551 producers in San Diego County, 375 in Los Angeles County and 207 in Riverside County. At the other end of the range, no registered producers exist in three counties (Alpine, Mono and Sierra). Moving forward in the channel of distribution, there are 3,756 retailers whose primary products are nursery and floral products. These include 263 integrated producer/retailer operations (producers who also retail nursery and floral products). Also, 3,465 incidental retailers are registered in California. These retailers are outlets with multiple product lines, including nursery and floral products. Retail stores in the incidental classification include many of the largest nursery retailers (warehouse club stores, chain stores and mass merchandisers such as Home Depot, Lowes, Wal-Mart, K-Mart, Target and the supermarket chains). Many producers sell directly to large-scale retailers, performing the functions usually associated with wholesalers and brokers. There are also 853 wholesalers and 476 jobber/broker/commission merchants dealing in nursery and floral products in California.

Total California retail sales of florists, independent farm and garden stores, the floral departments of large scale retailers, and the lawn and garden departments of hardware, big box and chain stores are very large and growing over time. A *Nursery Retailer* article estimated that 2002 California lawn and garden sales totaled \$8.96 billion out of the U.S. total of \$94.9 billion (March/April, 2003). This estimate did not include sales of retail florists, which the California State Board of Equalization reported at \$988 million in 2001. Thus, total retail sales for nursery and floral retailers are estimated at close to \$9.95 billion in 2002. The California nursery and floral industry is clearly a very important economic sector.

Hoy Carman is a professor in the Department of Agricultural and Resource Economics at UC Davis. His interests include agricultural marketing and the impacts of taxes on agriculture. Hoy can be contacted by telephone at (530)752-1525 or by e-mail at carman@primal.ucdavis.edu.

Faculty Profile

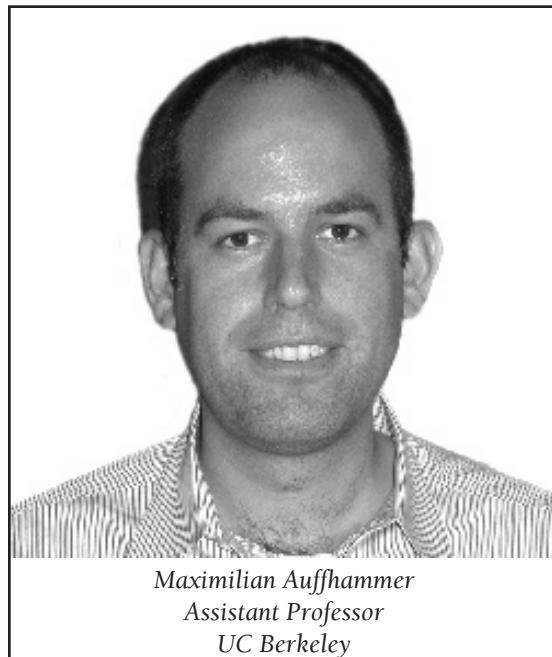
Maximilian Auffhammer is an assistant professor with a joint appointment in the Department of Agricultural and Resource Economics and the International Area Studies Program at UC Berkeley. Max received his Ph.D. in economics from the University of California, San Diego in June 2003.

Max's recent research in environmental and resource economics has focused on the role of air pollutants and climate change in the developing country context. His dissertation research on climate change provides the first forecasting model of China's greenhouse gas emissions, based on province-level data. Any meaningful agreement regulating global climate change has to include the top two emitters of greenhouse gases: the U.S. and China, which are jointly responsible for 41 percent of aggregate CO₂ emissions.

The U.S. has repeatedly based its participation in such an agreement on cutbacks by China. China has argued that any cutbacks should be specified relative to the level of emissions that would be projected to occur normally as it industrializes further. This makes emission forecasts a crucial component of a potential successor to the Kyoto Protocol. Exploring the provincial heterogeneity of China's technology, income as well as the changing level and distribution of population, suggests that changes in population and technology are driving variation in China's emissions forecasts.

In related work, Professor Auffhammer is interested in developing empirical methods to measure strategic production behavior prior to international environmental agreements. In a forthcoming paper, Stranlund, Morzuch and Auffhammer suggest that producers of chlorofluorocarbons anticipated the Montreal Protocol (which regulated the production of ozone depleting CFCs) asymmetrically, in order to obtain a favorable bargaining position resulting in a net increase in pre-treaty production.

In current work, he is interested in estimating the current and future market potential for privately owned cars across China's provinces. The double-digit growth rates of car adoption are likely to have a major impact on the long-run emissions of greenhouse gases. Growth has largely been fueled by rising incomes in the coastal provinces and the emergence of private credit markets. The limiting factors are the scarcity of China's national petroleum reserves combined with issues of fuel quality and refinery capacity. Max discusses these issues in the next issue of *ARE Update*.



*Maximilian Auffhammer
Assistant Professor
UC Berkeley*

In other research, Professor Auffhammer is one of three economists on a team of scientists from the Scripps Institute of Oceanography and the UC Institute on Global Conflict and Cooperation. They are working on estimating the impact of the recently discovered Atmospheric Brown Cloud, which is a layer of air pollution covering much of Southeast Asia, on agricultural production and climate change.

Before dedicating himself to the study of environmental economics, Max worked for a large consulting firm specializing in financial institutions and brokerage. He also coordinated the program for the Second World Congress of Environmental and Resource Economists in Monterey, sponsored by the Giannini Foundation.

Max and Lori-Anne, an up-and-coming painter, live in San Francisco and are slowly getting used to climbing hills. They enjoy movies, hiking and cooking. Having lived in Southern California for the past five years, they are thrilled about the cultural offerings in the Bay Area. Max learned to ski before he learned to walk and cannot wait for the Tahoe experience. While in snow-challenged San Diego, he learned how to surf and sail.

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Making Room for the Environment in California Water Policy: Ten Years of the Central Valley Project Improvement Act

by

David L. Sunding

Ten years have passed since President Bush signed the Central Valley Project Improvement Act, which made major changes to California's water system. A recent conference examined the accomplishments and shortcomings of the Act and its continued influence on the state's water scene.

Authorized in 1935, the Central Valley Project (CVP) is a vast public works project built over the course of three decades. The system is owned and operated by the U.S. Bureau of Reclamation, a subdivision of the Department of the Interior. The Bureau provides water captured in its reservoirs on a subsidized basis to agricultural and urban water districts under contract. These districts then provide water to individual farms, businesses and households.

A decade ago, the CVP was operated to provide cities and farms with water, with relatively little consideration given to the environmental impacts of storing and diverting water. Today, environmental interests have a seat at the table as a result of landmark reform legislation passed in 1992 called the Central Valley Project Improvement Act (CVPIA).

"It is hard to think of any other system of government that is more conservative, more resistant to change, than water policy, even when there is an obvious need for change," said former Sen. Bill Bradley at a conference, held September 12, 2003, examining the success of the law and its implications for future water policy in the state. Bradley was the keynote speaker at the daylong conference in San Francisco hosted by UC Berkeley's College of Natural Resources and Boalt Hall School of Law. The conference was sponsored by the Giannini Foundation of Agricultural Economics, along with several other groups. The conference brought together over 200 experts in water policy, many of whom participated in the creation of the act, along with students, lawyers, scientists and representatives from agriculture, fisheries, cities and environmental groups.

Beyond listing environmental restoration as an objective of water project operation, the CVPIA

reallocated water supplies to the environment, mandated a doubling of wild salmon populations in the state, and changed the way long-term federal water contracts are designed and implemented in California.

Bradley Played a Key Role in Federal Water Policy Reform

Sen. Bradley, along with Bay Area Rep. George Miller, co-sponsored the Central Valley Project Improvement Act (CVPIA) when he was chair of the Senate Committee on Energy and Natural Resources, in an effort to change the way the Interior Department managed water in California.

UC Berkeley Dean Paul Ludden presented Bradley with a Chancellor's Distinguished Honor Award for his commitment to California, and a graduate prize for water policy research has been established in his honor. The prize will be awarded to a UC Berkeley graduate student focusing on water economics and policy analysis. Congressman Miller also was recognized for his efforts on water policy.

Moving Water from Agriculture to the Environment

An unusual feature of the CVPIA is that it is so specific. The act gave very detailed instructions to the Department of the Interior about how federal water projects were to be operated in California, including how much water was to be set aside for the environment. Congress usually leaves such technical decisions up to agencies, but in this case the legislative history of the act suggests that Congress simply did not trust the Department of the Interior to faithfully implement its wishes.

In normal years, the CVPIA mandates that 800,000 acre-feet of water should be taken from agricultural and urban uses in California and be left instream to improve the health of rivers in the Central Valley and the Delta estuary. This amount of water is sufficient to meet the needs of roughly four million residential customers in cities, or irrigate roughly 250,000 acres of a typical crop.

While the amount of reallocation seems large, 800,000 acre-feet is only 10 percent of total deliveries made by the Central Valley Project in a normal year. Further, it is an even smaller share of all water diversions that occur in the Central Valley. In an unimpaired state, about 27 million acre-feet of water flowed out of the Central Valley, through the Delta and into the San Francisco Bay in a normal year. Diversions from the CVP, the State Water Project and numerous other local projects, such as San Francisco's Hetch Hetchy system, together reduce inflows to the Bay by 40 percent (or about 16 million acre-feet) in a normal year. Viewed in this way, the 800,000 acre feet reallocated by the CVPIA seems quite modest.

Urban Support for the Act Gained by Streamlining Water Transfers

Other provisions of the CVPIA have also affected the way that federal water supplies are managed in California. To gain the support of urban water agencies, most importantly the Metropolitan Water District of Southern California, the authors of the act inserted provisions streamlining the sale of water from agriculture to cities. Because urban water agencies would also be subjected to some level of cutback under CVPIA, these agencies felt that it was important to have access to water markets in order to make up the difference.

Economic research has underscored the importance of expanding water markets to alleviate the

cost of reduced diversions of surface water to cities and farms. There is a wide disparity, even within agriculture, in terms of the economic value produced per unit of water applied. Farms in some regions are highly capitalized and operate on high-quality soils, thus producing very high levels of net income per acre. Agriculture in other regions is less productive due to unfavorable growing conditions or other factors. One important benefit of water trading is that

it ultimately allocates the burden of a water supply reduction on those growers who can conserve water at the lowest cost.

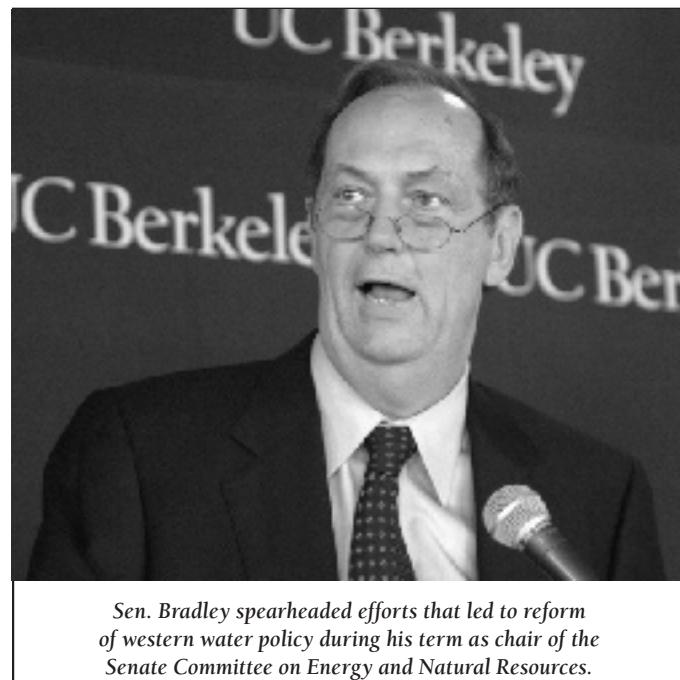
It is important to note that without markets, water supply cuts are apportioned by the seniority of water rights. Unfortunately, it has been documented that the growers in California with the most senior rights are not usually those with the highest water productivity. The implication, then, is that if seniority of water rights is used to allocate a supply cut, then the

economic impacts of the cut will be larger than necessary. The resulting losses from environmental restoration will be borne by farmers, farm laborers, input dealers and many others in rural California.

This aspect of water trading has been examined and quantified by several economists at UC Berkeley and UC Davis, including Richard Howitt, David Zilberman and myself. One scenario we considered is the 800,000 acre-foot cut mandated by the CVPIA in normal rainfall years. The costs of this supply reduction are reduced by one-half if there is a water market south of the Delta as opposed to forcing junior rights holders such as Westlands Water District to bear all of the reduction.

Has the CVPIA Worked?

While the various parties agree that the act was a milestone in water law and policy, there is wide disagreement as to whether the law has been beneficial or effective. For example, a main goal of the CVPIA



Sen. Bradley spearheaded efforts that led to reform of western water policy during his term as chair of the Senate Committee on Energy and Natural Resources.

was to double wild salmon populations in the Central Valley watershed — a goal that has, for the most part, been unmet. Understanding why these environmental objectives have gone unfulfilled is important to the future success of the CVPIA, and also to other, similar aquatic restoration efforts in other parts of the country (e.g., the Everglades).

The CVPIA required the U.S. Fish & Wildlife Service to prepare a restoration plan detailing how fish populations were to be doubled as required by the act. The CVPIA also established a \$60 million restoration fund to pay for the restoration program; the fund was financed by surcharges on some water deliveries provided by the CVP. Implementation of these provisions has been slow — in fact, the FWS only released the fish doubling plan this year.

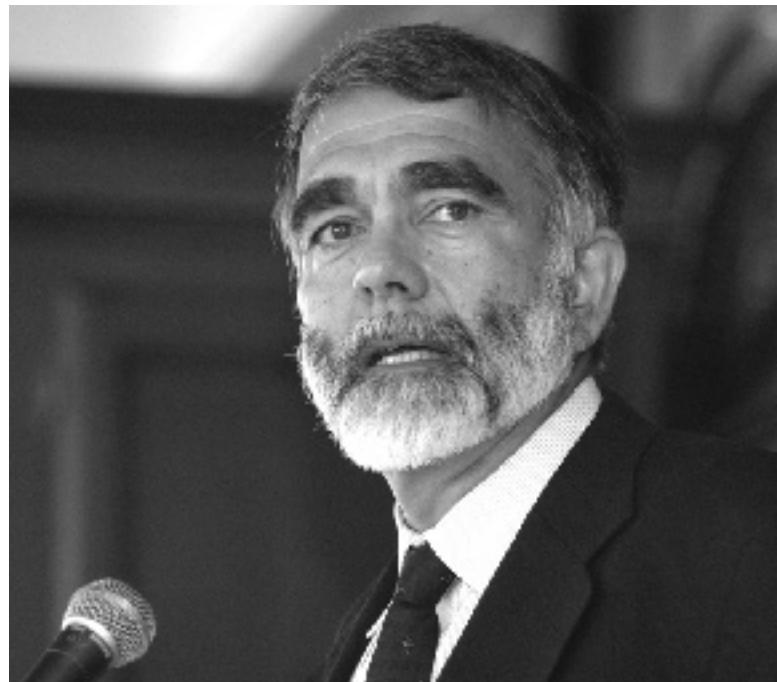
To date, the restoration fund has financed a variety of conservation measures, including some physical fixes to the CVP system that make it less damaging to fish. One problem encountered with restoration is how to use the water allocated to the environment to help salmon. Resource managers and biologists at the federal agencies charged with solving this problem point to a need for adaptive management and learning from past successes and mistakes. To date, however, it is questionable how much has been achieved.

Looking to the Future

Agricultural and environmental interests have waged multiple legal battles over interpretation and implementation of the act. A major point of contention, for example, is how to measure the amount of water that has been reallocated to the environment. In a dynamic and variable system like the CVP, it is difficult to know when 800,000 acre-feet of water have been reallocated, particularly since baseline conditions are continually changing.

The Cal-Fed Bay Delta Program, a subsequent effort with an even wider scope to balance water supplies among various users statewide, continues to struggle as well. Last month, a federal court decision in Fresno revived a major lawsuit by agricultural businesses against the Cal-Fed program.

Participants at the CVPIA conference agreed that the outcome of these decisions will be crucial to California's future. "After the energy debacle, water



Professor John Leshy was the Solicitor General of the Department of the Interior in the Clinton Administration.

He played a major role in implementing the CVPIA.

Photos by Jim Block

may well present the next big crisis in California," said Cynthia Koehler, a visiting scholar at College of Natural Resources' Center for Sustainable Resource Development. Groups on all sides of the debate will remain alert to see whether the changes in water policy introduced by the act will allow lawmakers and water managers to meet future challenges.

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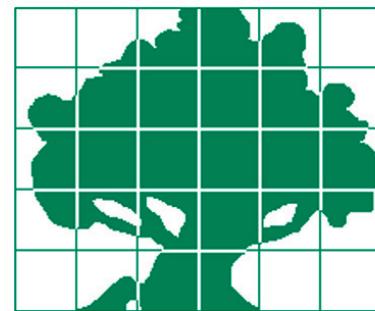
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