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Demand for California Agricultural Commodities

by Richard D. Green

UC Research shows that demand for many California agricultural commodities is quite unresponsive to price changes.

Agricultural producers, policy makers and other decision makers can benefit from understanding the concepts of "demand" and being aware of the nature of demand for commodities. Studies of the demand for individual commodities are an important part of the research conducted in the Department of Agricultural and Resource Economics at UC Davis. This paper explains demand concepts and the economic implications of changes in demand. The focus of the paper is on policy analysis. Results are presented for selected commodities from applied demand studies by researchers from our department. These research findings illustrate the effects of changes in supply and demand on prices and revenues. Several commodities are mentioned but the paper focuses on two rather different commodities to illustrate some important demand concepts: a tree crop, almonds, and a field crop, lettuce. Almonds are a perennial crop that is storable, and lettuce is a perishable crop that must be refrigerated immediately after harvest.

First, consider the demand for almonds. The demand for California almonds depends upon their price, the price of substitutes for almonds (for example, filberts, pecans, walnuts, and imported almonds), per capita income of consumers, and many other demographic, social and economic factors. If the price of almonds increases, given all other factors remain the same, then the quantity demanded of almonds will decrease.

This result is known as the **law of demand**. Changes in the price of almonds result in movements up and down the demand curve. Changes in per capita income, advertising and promotional campaigns and prices of substitutes cause shifts in the demand function. If an effective advertising and promotional campaign for almonds is conducted domestically or if new foreign markets for almonds are created, then the demand curve for almonds will shift outward and,

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Agricultural Commodity Policy in an Historical Context
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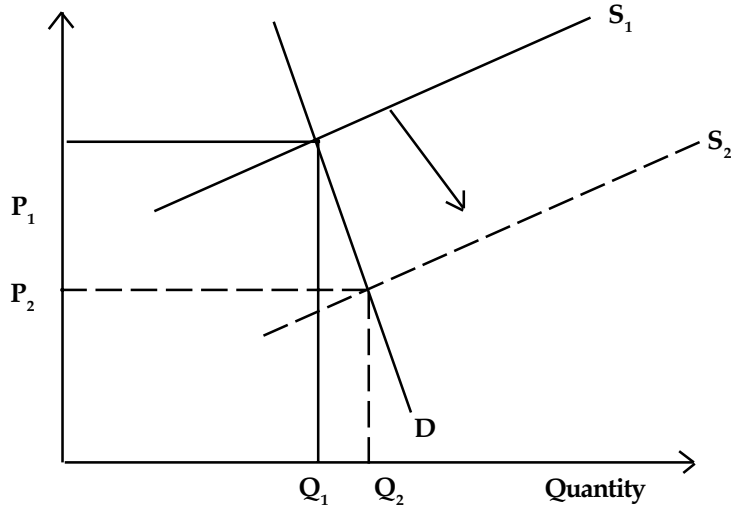
Figure 1. Effects of a Shift in Supply on Equilibrium Price Given an Inelastic Demand



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for a given supply, this means a higher equilibrium price and quantity for almonds in the short run. This benefits almond producers.

Researchers in the Department of ARE at UC Davis have estimated the own-price elasticity of demand for U.S. almonds to be approximately -0.83. An own-price elasticity is the percentage change in the quantity demanded of a commodity resulting from a one percent change in the price of the commodity. For example, if the price of almonds increases by 10 percent, then the quantity demanded of almonds would decrease by 8.3 percent. If the value of the own-price elasticity for a commodity is less than one in absolute value, then the demand curve associated with that commodity is said to be inelastic. What are the economic implications of an inelastic demand? Changes in the supply of almonds due to weather or other factors will have a significant effect on the price of almonds. An increase in the supply of almonds (from S_1 to S_2), given the inelastic or steep demand function (D) for almonds, will significantly decrease the price of almonds (Figure 1). Supply reductions will enhance the price of almonds. These short-run gains in supply restrictions dissipate in the long-run as increased prices will attract new producers of almonds, increasing supply, and thereby reducing the equilibrium price of almonds. With respect to revenues, an inelastic demand means that revenue rises (falls) as the quantity marketed falls (rises).

Since almonds can be stored, an inelastic demand has important reserve policy implications. Marketing strategies for California almonds may consist of diverting supply from the edible market in large-crop years, thereby increasing industry revenues.

Exports of almonds accounted for about 60 percent of California industry's sales during the 1991/92 crop year. Exports have exceeded domestic sales for almonds annually since the 1973/74 crop year. The own-price elasticity of the total demand for almonds is a weighted average of domestic and foreign demand elasticities. Some export markets for almonds have elastic demands; however, the overall demand for almonds is still inelastic.

A second example of demand analysis includes a farm price determination model for produce commodities developed by Sexton and Zhang, agricultural economists at the University of California, Davis. Their results yield an estimate of the elasticity of demand for California iceberg lettuce of about -0.16, which is consistent with previous estimates of between -0.14 and -0.54. Given the highly inelastic demand and perishable nature of produce commodities, what are the economic implications for these products? First, there are dramatic swings in the price of these commodities given a variable supply. Second, since fresh produce is perishable, there does not exist the potential for reserve marketing strategies such as those for storable commodities like grains and tree nuts. Marketing efforts must be directed toward expanding demand and opening new markets. For example, ready-to-eat salads have emerged as an important "processing" market outlet for lettuce, with upwards of 25 percent of the crop now used in processing.

Most agricultural commodities have inelastic demands; see Table 1 for examples from selected commodities. All of the estimated own-price elasticities for the commodities are inelastic. Some of the economic implications for inelastic demands of agricultural commodities have already been discussed. Efforts to promote domestic or expand export markets can result in increases in both prices and output. When short run supply is inelastic, demand shifts can be effective in raising prices. Changes on the supply side can reap large benefits, especially in the short run. The long-run effects are less dramatic because of competition.

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The Role Of Crop Insurance In California

by Hyunok Lee

Analysis shows that traditional crop insurance leaves many California farm risks to be managed in other ways.

Uncertainty has been always an important part of farming. Uncertainty in farming arises from every step of the production and marketing processes. Unpredictable weather, inability to secure timely inputs (labor or operating capital), complying with regulations, fluctuating market prices, or product quality issues—they all add to uncertainty. However, whatever the source of uncertainty is, its major downside relates to an economic consequence—the risk of not maintaining steady income. Various tools are available to farmers to manage risk. This article focuses on federal crop insurance programs, as such crop insurance is now the only major federal program that provides regular assistance to farmers experiencing crop losses due to natural disasters. This article briefly reviews the change recently made in crop insurance, examines the current status of crop insurance in California and highlights some of the features of crop insurance that are particularly relevant to California farmers.

Photo courtesy of Jack Kelly Clark

Expanded Federal Crop Insurance

The federal government uses two approaches to assisting crop farmers in the event of a natural disaster, ad hoc disaster assistance and crop insurance. Although these were both intended to help farmers in the event of a natural disaster, there is a significant difference between the two. With ad hoc disaster programs, congress votes after the occurrence of a disaster to provide aid at no cost to farmers. Crop insurance is a permanent program made available to farmers at subsidized premiums contracted before the occurrence of a disaster.

A heavy budgetary burden of the two programs during the previous decades prompted the passage of the 1994 Crop Insurance Reform Act. The act put ad hoc disaster assistance "on line" in the budget, requiring an offset in other federal programs in the event of passage of future disaster assistance, and expanded the existing crop insurance program. The main purpose of this change was to reduce the probability of future ad hoc disaster aid legislation. While making little change in the existing crop insurance program, two newly created programs, Catastrophic Yield Insurance Coverage (CAT) and Non-insured Assistance Program (NAP), were added. These programs are intended to fill the role of previous disaster assistance, with CAT offered for insurable crops at a small processing fee and NAP offered for non-insurable crops at no fee. CAT crops include mainly field crops and tree crops, while NAP crops are mostly vegetables, some tree crops and other specialty crops.

Additional coverage is provided only for the crops that are insurable by purchasing an insurance policy at a premium. Among a variety of federal insurance programs currently offered at a premium, the most widely available is the Multi-Peril Crop Insurance (MPCI) program that provides coverage against yield shortfall caused by most natural disasters. Private insurance in agriculture has long been available based on a single peril, such as hail, fire, freeze (citrus) or rain (cherries and raisins) but has not been available for multiple perils. The most common form of MPCI offers participants various quantity and price guarantee options for choosing their level of coverage. A standard insurance policy indemnifies loss of production below a guaranteed level at the elected price. The enrollment period for participation is generally set so that it closes at or just before normal planting dates for a crop in a specific region. Other programs, including crop revenue coverage, group risk

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protection, income protection, and revenue assurance, are available only on a limited or trial basis.

Eligibility

Not all crops are eligible for MPCI. Since the inception of crop insurance for wheat in 1938, federal crop insurance rapidly expanded to cover all other major field crops, such as corn, soybeans and cotton. The major expansion of crop insurance to non-field crops, however, is recent. The coverage for tree crops substantially increased during the 1980s. By the end of the 1980s, most tree crops were eligible for crop insurance. However, most vegetables and some tree crops are still excluded from the coverage options. As shown in the table at right, tomatoes are the only vegetable for which crop insurance is available in California.

While CAT and NAP both intend to fill the role of disaster assistance, different criteria are applied to receive the payment. CAT requires only individual loss to qualify for payment. NAP uses a two-tiered trigger, first "area" eligibility and then "individual" eligibility. Under NAP, an "area" must incur a loss of at least 35 percent for any given crop. Once this area trigger is met, to receive a payment the individual's loss must exceed 50 percent of his or her normal yield. When both conditions are met, farmers are paid for individual crop losses in excess of 50 percent at 60 percent of a price announced by USDA. The NAP regulation provides three options that may be used in defining an "area": 1) a county; 2) a geographic area containing at least 320,000 acres; or 3) a geographic area with a minimum average annual value of at least $80 million for all crops produced.

These rules imply that disaster aid for CAP-crops changes little, but aid for NAP-crops may change significantly relative to the ad hoc disaster programs of the 1980s and early 1990s. The non-insured crops covered by NAP are an important part of agriculture in California. Lee et al. investigated what this new program means to California farmers compared to the previous ad hoc disaster assistance. They found that NAP is very likely to reduce payments to producers in California on the order of 90 percent compared to ad hoc disaster payments. The major factor limiting NAP payments is the "area trigger".

The Status of Crop Insurance in California

Historically, crop insurance has not been a widely used tool in California. Given that California is the nation's largest producer of vegetables, the coverage exclusion for most vegetables obviously limits the role of crop insurance in California. However, even when eligibility is not an issue, participation rates are low (Table 1). Statewide, the participation rate was only 12 percent (in acres) in 1998, below the national average.

Table 1. Federal Crop Insurance Participation Rates in California (percent of acres in crop)

Annual Crops	*%*
Tomatoes (fresh & canning)	35
Sugarbeets	26
Sweet Potatoes (pilot program - Merced only)	16
Wheat (only Durum)	14
Rice	13
Cotton (Upland)	12
Els Cotton (Extra Long Staple-Pima)	11
Total Annual Crops	**10**
Perennial Crops	
Raisins (Industry estimates)	80
Prunes	45
Apricot (fresh & processed)	35
Almonds	34
Figs	27
Navels & Valencia Oranges	26
Tangelo (Total)	22
Peaches (Cling)	14
Lemons	11
Plums	11
Grapefruit	10
Total Perennial Crops	**16**
Total Annual & Perennial Crops	**12**

Crops with participation rates below 10 percent are not reported. Those include: for annual crops: barley (6%), dry beans (3%), corn (2%), oats (1%), safflower (1%), and potatoes (0%); and, for perennial crops: pears (8%), grapes for wine and raisins (7%), nectarines (7%), freestone peaches (5%), table grapes (4%), walnuts (4%), apples (4%), avocados (2%), mandarins (0%).

The low participation rate may be due to several factors. California's mild climate and controlled irrigation reduce the exposure to yield risk, compared to other parts of the country. Crop disasters in California have been less common compared to other parts of the nation. During 1988 through 1993, the federal government spent $7.8 billion on ad hoc

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Household Willingness to Pay for Biological and Chemical Public Pest Control Programs

by Karen M. Jetter, James A. Chalfant and Karen M. Klonsky

How much are Californians willing to pay to control newly discovered urban pests? UC study provides some answers.

Every year new pests enter the urban landscape from other areas. When a pest is new to an area, there may be no natural enemies there that can control it. In California, one or two of the new pests that enter it each year will become a nuisance and damage or kill trees in the urban landscape. Consequently, people in charge of the care of urban trees in public areas will need to undertake some type of public pest control program in order to manage the infestation. One way economists ascertain the extent of public support for taking some action is by determining the public's willingness to pay for control. This monetary measure can be thought of as the answer to the familiar question, "Would you pay $X for this good?" A greater willingness to pay corresponds to a higher level of net benefits to residents affected by an infestation. Similarly, alternative pest controls may be ranked, according to desirability, by these monetary measures.

In a wide range of settings, the willingness-to-pay concept has been applied by economists to place monetary values on public goods such as cleaner air or the preservation of a particular wilderness area. Our study looks at the household willingness to pay for alternative public pest control methods to reduce newly discovered pests in urban neighborhoods. The results provide information concerning both the overall level of support for pest control and the public's willingness to pay for environmentally benign methods.

When trees are lost or damaged due to insects or disease, aesthetic quality decreases drastically and public pressure develops for more active street tree management. In a study of insect damage on street trees in Norfolk, VA during 1988, 50 percent of the requests for public pesticide applications were for trees with less than 5 percent defoliation. In a series of studies a general pattern emerged, indicating that the majority of people perceive a reduction in the aesthetic beauty of trees at less than 10 percent defoliation, and start engaging in activities to prevent that damage.

Over the past few decades, however, there has been increasing awareness of the negative impacts to the environment and the potential harmful health effects due to pesticide pollution of water and soils. As knowledge about the negative impacts of pesticides grows, private citizens and environmental groups are actively seeking to limit the use of pesticides in urban areas. Another disadvantage to chemical pesticides is that they do not control pest infestations permanently. As a result, they must be reapplied in order to prevent defoliation or tree death in urban environments. The problem is thus how to prevent pesticide pollution, while at the same time maintaining a tree's aesthetic beauty, when faced with a newly discovered pest infestation.

Biological methods are one alternative to chemical controls. These methods have little or no environmental impacts. Biological methods include the use of bacterial sprays, pheromone traps, and the introduction of a natural enemy that will attack the pest. Bacterial sprays and pheromone traps provide immediate control of pests with little environmental impacts. The drawback is that bacterial sprays must be reapplied, and pheromone traps replaced periodically, if a pest infestation is to be managed successfully.

The process of introducing a natural enemy into a landscape is known as a classical biological control program. The natural enemy becomes a permanent part of the ecosystem and will result in the permanent reduction of pest populations, so that no further pest management actions will need to be undertaken. The problem is that it takes time to identify, import, rear

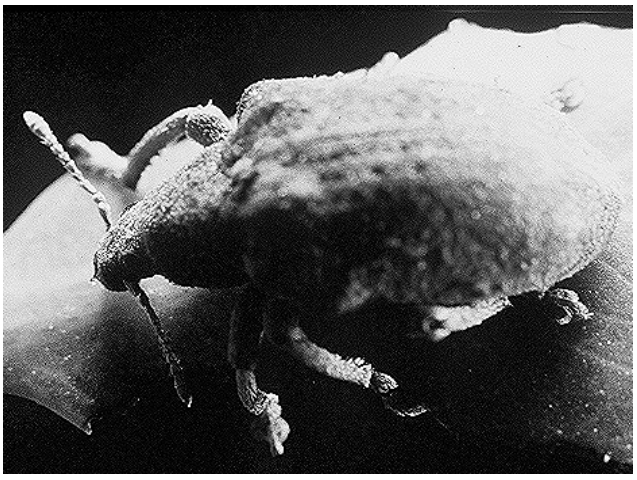

Photo courtesy of Larry Hanks

Eucalyptus Snout Beetle, defoliating pest of eucalyptus trees.

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Pest Control—*continued from page 5*

and release the natural enemy. It also takes time for the natural enemy to spread completely throughout the landscape and achieve effective control.

Because the control of newly introduced pests is usually completed by public agencies, there are no market prices that can be used to measure the demand for the alternative methods. However, non-market valuation techniques have been developed to estimate the demand, or willingness to pay, for public goods. Two techniques are the contingent valuation method and the contingent ranking method. The contingent valuation method (CVM) asks people if they would be willing to pay at least a hypothetical cost that is presented to them by a researcher. The yes/no responses to that question may be used to estimate household willingness to pay for different pest control techniques.

With the contingent ranking method, a scenario describing the public good's individual attributes is presented. The attributes include changes in the quality of the good and the price for receiving the entire bundle of attributes. The attributes are varied in different scenarios to respondents. Respondents are then asked to rank their preferences for each scenario. The responses allow researchers to estimate the value placed on, or marginal willingness to pay for, each attribute by the respondents.

A phone survey asking households in Southern California both contingent valuation and contingent ranking questions was used to evaluate three alternative public pest control programs to manage a newly discovered pest, the eucalyptus snout beetle. Discovered in Ventura County in March 1994, the eucalyptus snout beetle, *Gonipterus scutellatus*, feeds on the leaves and tender shoots of susceptible eucalyptus species, especially manna gum and blue gum species. Since 1994, it has been identified in Los Angeles County and is expected to spread to other areas. Feeding by the snout beetle and its larvae damages a tree by causing defoliation, stunting, and, over time, tree death.

Prior to the phone interview a booklet describing three alternative public pest management programs was sent to each participating household. The three programs were to spray with a chemical insecticide, Carbaryl, spray with a bacterial insecticide, *Bacillus thuringiensis var. tenebrionis* (*Btt*), or to import and release a natural enemy, *Anaphes nitens*, a stingless wasp. The booklet described what the pest problem was, what would happen if no pest control took place, how the different pest control programs worked to control the snout beetle, and the environmental impacts of each program. For simplicity, it was stated that the use of any of the programs would result in the same aesthetic benefits. An information sheet was provided in the booklet that summarized the program characteristics and the cost of each program. The program characteristics and cost were varied over 48 different versions.

The primary difference between the chemical and bacterial spray programs is in the environmental impacts. The primary difference between the bacterial spray program and the classical introductory biological control program is in the long-run effectiveness of the method used to control the snout beetle. As a result, the marginal willingness to pay for the pest control programs can be related not only to the environmental characteristics, but also to the effectiveness of each program.

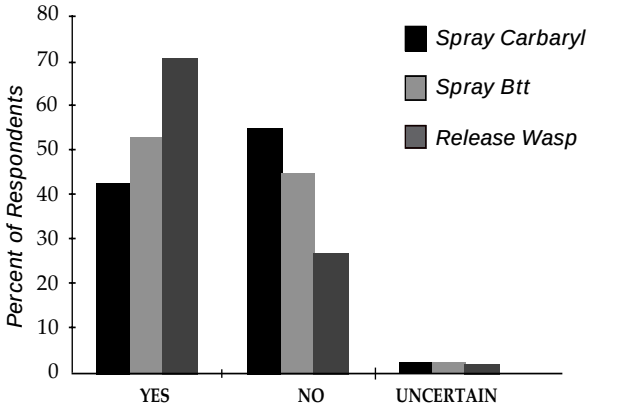
Each respondent was asked to rank the alternatives based on how long it would take to control the pest, the environmental impact of the pest control input used, the effectiveness of the program (was it permanent or were reapplications necessary) and the cost of the program. Finally, respondents were asked if they would support the implementation of that program if they had to pay the cost specified for it.

Contingent Valuation Responses

The responses to the contingent valuation questions show the most support for the biological alternatives, even at the relatively higher prices. A majority of respondents, 71 percent, would support the release of parasitic wasps at the price stated in the survey (Figure 1).

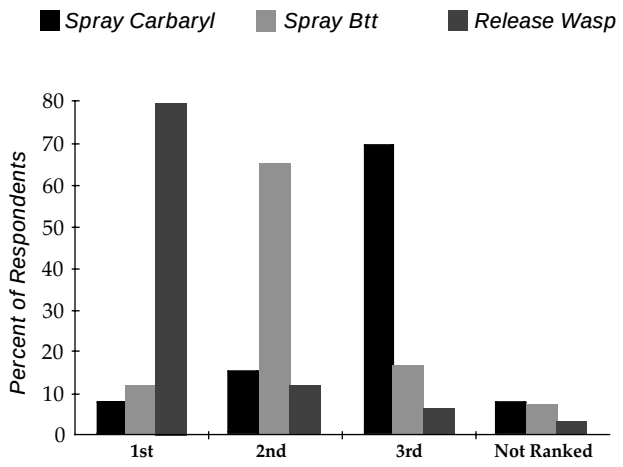
Slightly more than half of respondents, 55 percent, said that they would not vote to support the program

Figure 1. Support for Each Pest Control Program



Pest Control—*continued from page 6*

Figure 2. Program Rankings



to spray Carbaryl and 43 percent would vote to support it. More than half of the respondents, 53 percent, stated that they would support the program to spray *Btt*, given the characteristics and costs of the program on the information sheets they received. The remaining respondents were either uncertain about whether they would support the program, or did not answer the ranking question and so were not asked the support question.

The attributes that were significant in determining whether someone would be willing to pay the stated price of a program were the environmental characteristics of the program, how often Carbaryl and *Btt* needed to be reapplied every year, if there were eucalyptus trees in the neighborhood, and household income. Interestingly, how long it took before the wasp was able to effectively control the snout beetle was not important. Based on the responses to the support questions, median annual household willingness to pay was $27 for the option to spray Carbaryl, $135 for the option to spray Btt, and $490 for the wasp release program.

Contingent Ranking Responses

An overwhelming majority of the respondents preferred the release of the stingless wasp, *Anaphes nitens*, over the other two programs (Figure 2). The majority of respondents, 79 percent, ranked releasing the wasp as their most preferred program. Sixty-five percent ranked spraying *Btt* as their second most preferred program, and 69 percent ranked spraying Carbaryl as their least preferred program. The program to spray Carbaryl was ranked first by the smallest percent of respondents. Some respondents did not rank any programs, and some ranked only their most preferred program. If only one program was ranked, it tended to be the wasp program.

The attributes that were important in determining how the alternative programs were ranked were the environmental differences, the relative prices of the programs, if it was the wasp option, and the respondent's level of education. Both how long it took before the wasp program became effective, and the number of times Carbaryl and *Btt* needed to be reapplied each year, were not a factor in deciding how to rank the programs. Based on the responses to the contingent ranking question the willingness to pay for each attribute was $339 for being a biological control as opposed to a chemical control, $19 for the additional benefits of the wasp option, $0 for each additional application in the spray programs, and -$10 for each additional year the respondent waited before the wasp became effective. The results of the survey indicate that there is a preference for biological control methods, unless chemical methods are relatively cheaper. However, even at low prices, many people still do not support the use of chemical public pest control methods.

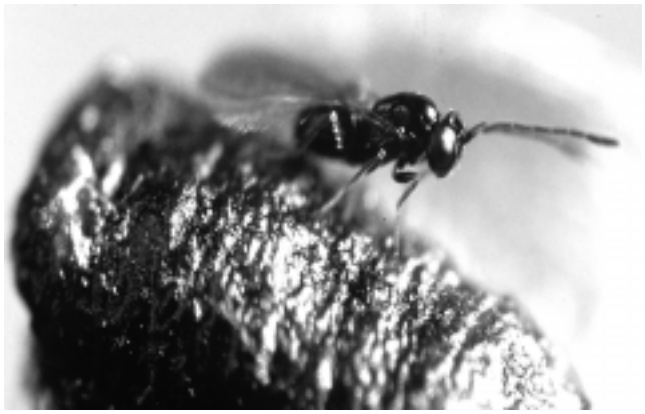


Photo courtesy of Larry Hanks

Anapheles nitens, *wasp parasite, laying eggs in Eucalyptus Snout Beetle egg case.*

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Photo courtesy of Steve Koike

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disaster payments to crop farmers. Of that amount, California received $171 million—2 percent of the national total—the 14th highest among the 50 states. Expressing the disaster payment as a share of the state's crop revenue, California's 0.2 percent ranked 47th out of the 50 states over the same period (this contrasts with Wisconsin's revenue share of 8.5 percent during this period).

Risk Not a Concern for California Farmers?

Risk is a natural part of agriculture. Almost all decisions in farming involve some level of risk and risk management. And, of course, farmers in California are as concerned about income risk as farmers in other states. Low participation in crop insurance does not indicate that farmers in California are not concerned about risk. Low participation indicates that crop insurance in its current form does not provide the risk management that is most needed by farmers in California.

The relative importance of various risks may differ across regions and crops. With widely used irrigation and the relatively mild climate in California, yield or production risk related to weather is less important. Farming in California may, however, be subject to different types of production risk. One example may be input related risk (or risk related to human resources). Production of specialty crops uses more hired labor per unit of output than traditional field crops. For example, for many vegetable crops, harvest labor costs amount to one third of total production costs. These farms may be exposed to more labor related risk than farms producing other crops.

To California farmers, marketing risk may be more of a concern than yield risk. Many California crops do not store well, meaning that prices fluctuate widely from week to week and season to season. However, crop insurance does not provide direct coverage against price risk. Furthermore, there is also risk associated with product quality. Specialty crops are often subject to quality specifications. When the products do not meet quality standards, they cannot be marketed at all, or, if marketed, only at a low price.

It is not surprising that crop insurance is used only selectively in California. The current crop insurance policies were initially designed for field crops, and they have been applied across regions with almost no variation. The importance of other crops and the climatic conditions here entail cultural practices and a marketing environment that are different from most of the country. Crop insurance in California requires research on the risk faced by California farmers and then adapting policies to deal with that type of risk.

Hyunok Lee is an associate researcher in the ARE department at UC Davis. Her current research interests include crop insurance, risk analysis of specialty crops, agricultural trade and economics of climate forecasts. To obtain additional information on this subject, Dr. Lee can be contacted by phone at (530) 752-3508 or by e-mail at hyunok@primal.ucdavis.edu. *Dr. Lee wishes to acknowledge James Otto and Bill Murphy from USDA Risk Management Agency in Sacramento for providing the crop insurance data.*

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Table 1. Estimates of Own – Price Elasticities for Selected Commodities

Commodity	Own - Price Elasticity
Food (in general)	–0.42
Almonds	–0.83
California Iceberg Lettuce	–0.16
California Table Grapes	–0.28
California Prunes	–0.44
Dried Fruits	
Figs	–0.23
Raisins	–0.67
Prunes	–0.35
California Avocados	–0.86
California Fresh Lemons	–0.34
Meats	
Beef	–0.84
Pork	–0.79
Poultry	–0.58
Fish	–0.57
California Residential Water	–0.16

Sources: All of these empirical estimates are reported in research publications by faculty of the Department of ARE at UC Davis. The exact references can be obtained by writing the author.

An important policy implication follows from an inelastic demand for a commodity. For example, the own-price elasticity for residential water in California was found to be about -0.16. Thus, consumers are not very responsive to changes in the price of water. In order to reduce the demand for water, new conservation policies may need to be implemented such as more efficient toilets that use less water. In fact, several measures are already being used in conjunction with pricing policies to reduce the demand for water.

Cross-price effects enter in the demand equation when analyzing the effects of changes of prices of substitutes on the quantities demanded of the commodity under consideration. If the price of, say, walnuts decreases relative to the price of almonds, then some consumers will switch from buying almonds to buying more walnuts. In addition, an analysis of advertising and promotion expenditures needs to take into account the effects of the promotion of substitutes of the commodity being investigated. For example, increasing the promotional expenditures for beef may not result in much change in beef prices and sales if the pork industry matches or spends more in promoting pork. On net, advertising and promotion in the meat industry over the long run may not increase sales overall, but advertising may cause significant changes in market shares of various meat products.

In conclusion, an understanding of demand concepts is essential in order to understand the economic implications of changes in agricultural markets. With most agricultural commodities characterized by inelastic demands, changes in supply can have large impacts on prices and revenues. These effects can be mitigated by restricting supply in certain years, expanding domestic and export markets, and responding to changes in consumers' preferences. One of the major policy implications from an inelastic demand combined with public research efforts enhancing production, is that consumers have been the primary beneficiaries of public research efforts in agriculture. Consumers have benefited tremendously from lower food prices and currently only about 14 percent of consumers' disposable income is devoted to food expenditures.

Richard D. Green is a professor of agricultural and resource economics at UC Davis. His current research focuses on econometrics, demand analysis, price analysis, advertising and promotion. To obtain additional information on this subject, contact Dr. Green at (530) 752-1534 or send an e-mail to green@primal.ucdavis.edu. *Visit Dr. Green's Web page at* http://www.agecon.ucdavis.edu/Faculty/Richard.G/Green.html.

ARE Faculty Profile

Leslie J. (Bees) Butler is a Cooperative Extension specialist and lecturer in the Agricultural and Resource Economics department at UC Davis. He was raised in New Zealand on a sheep farm and earned his B.S. in Agricultural Sciences and Economics at Lincoln College at the University of Canterbury in New Zealand. Bees then went on to England to receive his M.S. degree in Agricultural Economics at the University of Reading in Berkshire. He traveled to Australia to work as a senior research economist for the Bureau of Agricultural Economics in Canberra from 1970-1975.

Dr. Butler came to the US in 1976 to continue his studies in agricultural economics at Michigan State University. He wrote his dissertation on price instability in agriculture and received his Ph.D. in 1979. While in graduate school, Bees also earned his pilot's license, which began his lifelong enjoyment of flying.

After graduate school, Bees worked as a Senior Research Associate in the Department of Agricultural Economics at the University of Wisconsin, focusing on intellectual property rights in the seed industry and biotechnology. He joined the UC Davis ARE department in 1987 as an extension economist.

Dr. Butler's areas of interest include dairy and lamb production and marketing, biotechnology, technology transfer, intellectual property rights and public policy issues. The focus of his research is in dairy marketing and policy issues. He was involved in policy issues affecting the dairy industry in both the 1990 and 1995 Farm Bills. For the past fifteen years, Dr. Butler has intensively tracked the research and implementation of rBST in dairy production.

Dr. Butler travels extensively throughout the state giving seminars on issues affecting dairy producers and processors. He has served on several dairy industry committees, including the Producer Relations Committee of the Dairy Industry of California and the Federal Milk Marketing Order Committee of the Western United Dairymen.

In addition to his extension duties and research activities, Bees teaches a popular upper-division course in agricultural markets at UC Davis and is an active participant in many professional associations.

Dr. Butler is a world-traveler, having recently returned from trips to South America, Europe and Russia. He has consulted with the Italian Cheese Industry and was selected by the U.S. Information Agency to advise on the agricultural transition in both Kazakhstan and Russia. He also was supported by Winrock International to help establish dairy marketing systems in various regions of Russia.

L. J. (Bees) Butler
Extension Economist

Bees' fondest interest is in wine tasting. He is also a wine expert, possessing a great knowledge of wines produced throughout the world. In his spare time, Bees enjoys golf and skiing.

L. J. (Bees) Butler is a UC Cooperative Extension economist with interests in dairy and lamb marketing, food and agricultural policy, market structure and technological change, and intellectual property rights. For additional information on these issues, you can contact Dr. Butler at (530) 752-3681. Or visit his Web page at http://www.agecon.ucdavis.edu/Faculty/Bees.B/Butler.html.

California Agriculture: Outlook '99

Editors' Introduction

California agriculture continues to adjust to the scenario of increasing limits on its use of resources and uncertainty in its foreign markets. The industry's success in doing so led to gross sales of $26 billion in 1997 and is expected to have produced similar sales in 1998, although El Niño adversely effected quality and quantity of some commodities. The prospects for 1999, in general, are for approximately the same level of success, despite continued changes in the competitive environment faced by the industry.

Below is a brief summary of the outlook for California agriculture. The information is from a presentation made in December 1998 by Jerome Siebert, Extension Economist from UC Berkeley, during a conference organized by the UC Agricultural Issues Center. For more information from the conference, readers can contact the AIC at 530-752-2320.

General Outlook

California produces a widely diverse group of commodities and, overall, is expected to see revenues and profits at levels in 1999 that are similar to those of the past few years. However, the prospects for specific products or groups of commodities are going to vary widely as production and market conditions change. For example, acreage continues to shift to higher-value crops as increased population, urban and environmental pressures increase the cost of water, land and other inputs. Added to these pressures has been the Asian financial crisis that has introduced increased uncertainty into lucrative export markets.

The gross value of production per acre for vegetables has been much higher than the value of fruits and nuts and field crops over the past decade. In 1988, vegetable revenues averaged $2,960 per acre, but increased to $4,700 by 1997. Fruit and nut crops averaged $3,640 per acre in 1997, while field crops generated only $810 per acre. Increasing costs pressure producers to shift into higher value crops to maintain return-on-investment levels adequate to justify continued use of land in agriculture rather than the expanding options for nonagricultural use made possible by the urbanization of the state.

Agricultural exports from California remained steady in recent years, totaling $6.7 billion in 1997. However, exports of bulk commodities were down 12 percent while high value product exports increased 5 percent. Leading export commodities during 1997 were cotton ($825 million), almonds ($818 million) and oranges ($307 million). Continued growth in exports depends on a number of factors; the two primary ones being the value of the dollar and economic growth in the rest of the world.

Outlook by California Commodity Groups

The fruit, nut and vegetable sectors all are expected to have continued growth in acreage and sales revenues in 1999. The abilities of markets to handle the gradual expansion of production in upcoming years will directly affect price levels during the harvest season. In general, demand for these products remains strong.

In 1997 the livestock and poultry sector reversed the decline in which markets had been mired since 1990. The $3.6 billion dairy industry is primarily responsible for this trend. Milk production is expected to have increased in 1998 in response to higher prices, yet prices in 1999 may be stable or slightly higher. This will benefit alfalfa producers as strong demand from dairies should continue. Cattle and calves are responsible for the decline in livestock revenues during the 1990s. Although revenues have increased since 1996, the beef sector is still adjusting production to better match demand levels.

Field crops cover 60 percent of California's harvested acreage, but economic pressures are squeezing this sector. In 1998 weak international markets impacted prices of field crops and prompted the federal government to substantially increase appropriations for farm supports. In the future such support is less likely, so field crop markets will be variable and reflect international market situations. With relatively low and increasingly variable revenues, these crops are becoming much less attractive to producers, hence the shift in acreage to higher value commodities.

*Readers interested in seeing detailed information about California agriculture can visit the web pages of the California Department of Food Statistics Service (*www.cdfa.ca.gov*) and the California Agricultural Statistics Service (*www.nass.usda.gov\ca*).*

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