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Managing Risks in California Agriculture

by Steven C. Blank

The economic risk faced by agricultural producers is mostly captured by the variability of annual net income levels. This risk is a function of variability in output price, yield, input prices, and input quantities. Yet the financial tools available to manage some of this risk are under-utilized. For example, price risk tools (primarily forward cash contracting and hedging with futures or options) and yield risk tools (primarily crop insurance) are not widely used by producers in California. This raises the question, is the market failing to provide agricultural producers with effective risk management tools? If the answer to the question is "yes," it means that there are some attributes of the available risk management tools which conflict with the structure of agriculture and/or commodity markets within the state. This would be significant in light of the current trend toward placing responsibility for risk management on the producer and the market, rather than on government, as illustrated by recent changes in federal crop insurance aimed at eliminating disaster aid programs.

The question of market failure was evaluated by comparing producers' demand for price and yield risk management tools with the actual tools available in a sample of California commodity markets. This article summarizes the major results of several studies involving numerous groups in California agriculture.

Survey Results Regarding Risk Needs

Agricultural producers were surveyed concerning their risk needs in studies conducted from 1993 to 1997. Producers were asked to rank sources of risk in order of importance. The results of this ranking, presented in Table 1, reveal that production risk concerns are second to market risk among producers in California. Producers ranked output price and input costs as first and second,

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respectively, among their risk concerns. However, the significant number of responses received by each of the detailed types of risk listed in the table indicate the detail of producers' concerns; it is not just "price" or "yield" that worries individual producers. This, in turn, indicates a need for varied and detailed risk tools.

The concern for output and input price risk expressed in the surveys leads to expectations of high levels of use of price risk management tools. However, the data show that few producers use each of the risk management tools that directly affect price: 23% use forward contracting and 6% are hedging. Similarly, the rankings for the many sources of yield risk listed in Table 1 (disease, drought, etc.) make the low level of usage for crop insurance (24%) somewhat surprising. On the other hand, nearly half of all producers (48%) use the indirect risk management tool of diversification. These results indicate that the price and yield risk tools offered in the California market fail to meet the needs of most producers, so producers choose to "do it themselves" by using diversification. Diversification is a risk strategy that requires no use or knowledge of risk tools and their associated institutions (e.g., market brokers, insurance companies). Also, by definition, diversification is a risk strategy that involves actions on the part of individual producers that are tailored to their specific management needs.

Analysis of Risk Sources

To determine what producers' real risk management needs are, the first task is to establish the relative importance of price and yield risk. This was done by decomposing the variability of farm revenues to identify the percentages attributable to each primary source of variability. (Revenue, rather than net income, is used because data on input prices and use levels are not available.)

The revenue function is: R(P,Y,A) = Price x Yield x Acreage; where R = revenue, P = unit price for a particular commodity, Y = the yield per acre, and A = the number of acres planted in that crop (all for a given year or season). The variance of revenue may be viewed in terms of the three components of revenue. Analysis of these components focuses on their relative weight (contribution) to the overall variability of a grower's revenue. (Statewide acreages over time are evaluated making total acreage variation one source of systematic risk to individual growers.)

The values in Table 2 are estimates of the contributions of the three sources of variance as a percentage of the total revenue variance for the years 1972-91. The most notable result is the contribution of price variation to the total variation in revenue. For eight of the twelve crops analyzed it is clear that price variation is dominant over variation in yield or acreage

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Table 1. Sources of Risk

Sources of Risk	Rank (%) 1st	2nd	3rd	4th	5th	6th	7th	8th	Total Number of Observations
Disease	16.6	17.0	13.1	16.3	14.0	11.2	8.8	3.0	465
Drought	25.5	15.7	11.9	8.9	9.4	10.2	11.7	6.6	470
Floods	1.5	6.6	3.3	3.9	3.6	6.3	13.5	61.3	333
Freeze	19.9	16.8	8.9	7.6	7.8	11.2	14.8	13.0	447
Input price	12.5	21.3	21.1	13.6	14.9	9.7	4.6	2.2	445
Labor cost	8.9	12.4	13.5	13.1	15.7	16.9	11.3	8.2	451
Output price	32.0	25.9	14.6	11.1	7.1	4.4	2.9	1.9	478
Pests	12.4	17.9	20.4	14.3	17.2	8.8	5.9	3.2	476

Note: The first column lists a source of risk. The next eight columns list the percentage of respondents that ranked that source of risk as 1st most important, 2nd, etc. The percentages in each row are calculated on the total number of responses received listed in the last column.

Poverty Amid Prosperity

by

Philip L. Martin and J. Edward Taylor

Recently, about 40 people participated in a seminar at the Urban Institute in Washington, D.C. to discuss the policy implications of "Poverty Amid Prosperity." This seminar was a synthesis of a series of workshops held between 1995-97 that examined how immigration is affecting agricultural areas in California and the U.S. The three major findings of the study follow:

1. Seasonal farm jobs are the major magnet drawing foreign workers into rural and agricultural jobs. Most foreign workers remain in entry-level jobs for less than ten years, so that the seasonal farm labor market is best thought of as a revolving door that attracts 200,000 to 400,000 new foreigners each year.
2. Changes in rural Mexico and rural America are encouraging settlement in rural America, which makes the migrants "us" and leads to issues associated with providing public and private services to migrants and their children.
3. Possible policy responses can be framed by the extremes of stopping the immigration at one end of the spectrum, to focusing on the integration of immigrants and their children at the other. In between solutions involve both more controls and continued integration assistance and proposals to require employers whose hiring decisions attract immigrants to absorb some of the integration costs.

The theme running through the discussion was that the U.S. risks the creation of a new rural poverty, transferring poor Mexicans to U.S. agricultural areas where they have little prospect of upward mobility. In many respects, current policies tend to reinforce *vicious* rather than *virtuous* circles in the agricultural areas of the U.S.

First, the data available suggest that immigration into the nation's major agricultural area, the San Joaquin Valley, is producing a vicious circle of more farm jobs, more immigration, and more poverty rather than the virtuous circle that would result if the creation of more farm jobs reduced poverty. During the 1980s, for example, an analysis using the Urban Institute Underclass Database found that 100 additional farm jobs were associated with 136 more immigrants, 139 more poor residents, and 79 more welfare recipients.

The newly arrived immigrants did not get welfare, but their presence helped to hold down wages. Farmers often prefer newly arrived immigrants, and local residents eligible for welfare prefer benefits to seasonal work. In the San Joaquin Valley, about 50% of the immigrants who arrived between 1980 and 1990 were from Mexico (another 25% were from southeast Asia). A combination of low earnings from seasonal employment in agriculture and large households gave Mexican immigrants who entered the U.S. incomes of $3,700 per person in 1990, which was about the per capita income of Mexico. In other words, migration into the San Joaquin Valley might simply transfer rural Mexico poverty into rural America.

Second, federal and state policies are reinforcing the path toward the worst rather than the best outcomes. For example, U.S. border control operations have clearly raised the cost of entering the U.S. illegally, but so far they have not significantly reduced unauthorized entries. Instead of deterring entries, higher smuggling costs seem to have encouraged more unauthorized migrants to settle in the U.S. As they form or unify families in the U.S., migrants find it difficult to obtain legal status because of three and ten year bars due to illegal status, or because their incomes are too low to sponsor their families. The result is an increase in "mixed families" in which members have legal status ranging from U.S. citizen to unauthorized resident barred from legally re-entering the U.S.

It will be increasingly difficult to provide public services to such mixed families, which may limit the upward mobility of immigrants and their children. The net effect of continuing unauthorized immigration despite tougher border controls, ineffective interior enforcement and mixed families are likely to be a new rural poverty that will be costly and difficult to extirpate in the 21st century. Furthermore, many of the commodities and industries that today "need" a flexible migrant labor force will most likely be restructured as a result of changing trade, consumer taste and technology patterns.

The Clinton administration strongly opposes the solution offered by farmers: an easy-entry guest worker program that would prevent settlement in the U.S. by withholding 25 percent of each worker's wages. Workers would be encouraged to return, the argument goes, in order to claim these wages in person in their country of origin. Instead, the Clinton administration would like to see a serious debate over labor alternatives for the 21st century. There is a sharp contrast between the significant federal resources—$50 million—being offered to deal with the "shortage" of high-tech workers and the lack of new federal

POVERTY—*continued on page 4*

Poverty—*continued from page 3*

Photo courtesy of UC Statewide IPM Project

resources to deal with "shortages" of farm workers. Instead of debating alternatives, the farm guest worker debate risks becoming another in the century-long series of tests of political muscle between growers and farm worker advocates.

Easy-entry guest workers would leave the revolving-door farm labor market intact and past experience suggests that at least some of the guest workers will settle in the U.S. The other extreme is to worry less about the number and characteristics of new arrivals and to worry more about their upward mobility in the U.S. It is important to remember that the industries attracting rural Mexican immigrants are often the core industries of their communities. Thus, there is local reluctance to accept drastic labor policy changes that might threaten the economic viability of agriculture.

A new vision and new immigration and immigrant policies are needed in rural America—not only to acknowledge the importance of agriculture and food processing to local economies but also to recognize that immigrants filling jobs in these local core industries will likely to settle and that they and their children will expect to climb the U.S. job ladder. It has proven very difficult to develop policies that lead to gradual changes in the farm labor market. Immigration and integration in the agricultural areas of the U.S. typically goes through four phases.

- Phase one is the entry of solo males for seasonal farm jobs, with workers living 10 or 12 to an apartment or mobile home for three to six months, aiming to maximize remittances, and returning frequently to their homes abroad.
- Phase two is the shift from seasonal to year-round and usually nonfarm work in food processing, construction and services.
- Phase three is the settlement of spouses and children. This is the phase in which the communities notice the migration, in the sense that community concerns shift to bilingual education and public services, and there is discussion of the responsibility of the local employer for coping with the demographic changes in the community that result from recruitment and hiring strategies.
- Phase four is integration and political activism by the settled immigrants. In California's San Joaquin Valley, this phase was marked by the election of Hispanics to school boards, disputes about district versus at-large voting for city councils, and the shift in emphasis as Hispanics gain political power from, e.g., lowering taxes on farm land to economic development that creates good jobs.

The Commission on Immigration Reform in 1997 laid out the case for federal assistance for rural communities that experience rapid demographic changes due to immigration. This included urging the creation of systems that would, for example, warn school systems that they were about to get large numbers of non-English speaking children and tying reimbursement for educational services to outcomes, not methods of instruction. The CIR also emphasized that U.S. businesses, the primary beneficiaries of immigration, need to shoulder more of the cost and responsibility for integrating immigrants and their children.

Many cities and towns levy impact fees on newly built housing to raise funds for the cost of the additional school children and infrastructure that will be needed by new residents. And U.S. farmers pay fees to trust funds to do research on improving production and to promote their commodity in the U.S. and abroad. If the businesses attracting migrants into rural America do not voluntarily take more responsibility for integrating their migrant workers, a similar impact fee-assessment system could be developed to provide some of the needed integration funds.

Reference: Taylor, J. Edward, Philip Martin, and Michael Fix. 1997. *Poverty Amid Prosperity: Immigration and the Changing Face of Rural California.* Washington, DC. Urban Institute Press.

ARE Professor Philip Martin has interests in farm labor, immigration, and agricultural policy. Professor J. Edward Taylor specializes in economic development, population and resources, technology adoption, and applied econometrics. Their report is included in Rural Migration News, which is available on the following Web site: http://migration.ucdavis.edu Or contact the authors directly at: martin@ primal.ucdavis.edu (530-752-1530) or taylor@ primal.ucdavis.edu (530-752-0213).

A Cost/Benefit Analysis of the Ash Whitefly Biological Control Program in California

by

Karen Jetter, Dr. Karen Klonsky, and Dr. Charles H. Pickett

Previous research has shown that healthy street trees significantly contribute to the aesthetic beauty of our urban areas. Not surprisingly, people will demand pest control to protect the aesthetic beauty of street trees with levels of defoliation as small as 5%. Therefore, the preservation of a tree's aesthetic beauty by controlling pest infestations can result in substantial benefits to the community. In addition, healthy trees contribute significantly to property values, whereas defoliated trees cause property values to decrease.

The ash whitefly, *Siphoninus phillyreae*, was first identified in Los Angeles County during the summer of 1988. By 1990, it had spread throughout much of California and caused severe defoliation to its primary hosts, ash (*Fraxinus species*) and ornamental pear (*Pyrus species*) trees. Feeding by whitefly nymphs and adults resulted in chlorosis, or yellowing, of leaves. Also, a honeydew excreted by the whitefly caused sooty black mold to form on the leaves. The chlorosis and sooty black mold together led to substantial defoliation of the host trees although in general, the infestation had not led to tree mortality. Chemical insecticides were not a cost effective control of this pest because the whitefly multiplies rapidly during warm summer months.

During 1989 scientists with the California Department of Food and Agriculture (CDFA) and researchers at the University of California, Riverside (UCR) obtained a small stingless parasitic wasp, *Encarsia inaron (=partenopea)* from researchers in Israel and Italy. The wasp was reared in CDFA and UCR greenhouses and released throughout neighborhoods in California starting in 1990. Two years after the parasite was released, ash whitefly densities were reduced to numbers difficult to detect even with rigorous monitoring efforts. Since 1992, no further releases of the parasitic wasp have been made and ash whitefly populations remain at undetectable levels. The control of the ash whitefly resulted in the preservation of the aesthetic beauty of ash and ornamental pear trees in urban landscapes. This article estimates the economic benefits and costs of preserving the aesthetic beauty of urban street trees from the ash whitefly biological control program.

Photo courtesy of UC Statewide IPM Project

Ash Whitefly (Siphoninus phillyreae) *adult and nymphs, feeding on leaf surface.*

The Program

The primary benefit from the ash whitefly biological control program was in the preservation of the aesthetic beauty of the urban forest. The estimation of the tree's appraised value was based on the Trunk Formula Method, a widely used tree appraisal technique, developed by the Council of Landscape and Tree Appraisers, used when appraising landscape trees too large to be replaced with nursery stock. The formula calculates the value per square inch of the cross-section of the largest available transplantable tree at a height of one foot, and then multiplies this value times the trunk area of the tree being appraised. This maximum value was then adjusted by factors for the tree species, location within the landscape (street, yard, park, etc.) and the condition of the tree. For this analysis, the only difference between the appraised values of damaged and undamaged trees of the same species was the condition factor. Pear trees have a much smaller cross-section area than ash trees and a higher species factor. The average benefit per host tree was equal to its change in appraised value (CAV) due to ash whitefly damage.

This change was equal to the difference in the hosts' average appraised value as a healthy tree less the average appraised value after ash whitefly defoliation. This benefit was calculated as a onetime change at the

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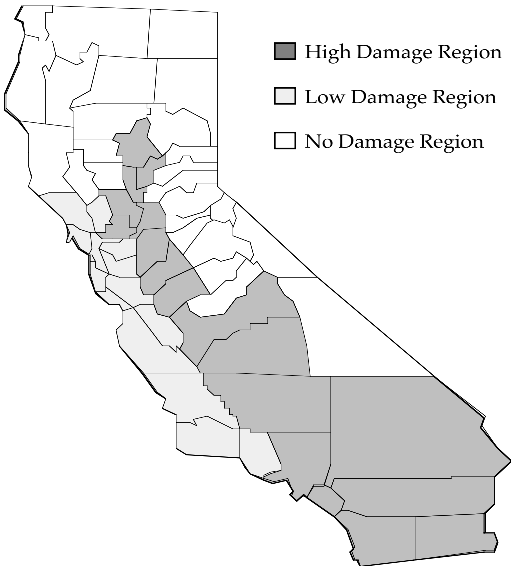

level of defoliation that occurred when the ash whitefly populations were at their greatest.

The extent of urban tree damage caused by ash whitefly infestations varied geographically. Consequently, the state was divided into three regions for the analysis: high damage, low damage and no damage (see map on following page). The high damage region included counties in California with relatively cool winters and hot summers.

Defoliation of ash and ornamental pear trees in the high damage region reached 70% - 90% during peak infestations. Counties in the low damage region had lower temperature variations, with milder winters and cooler summers than in the high damage region. The ash whitefly caused 40-50% defoliation of susceptible trees in this region. The remaining counties in California had climates too cold to support the ash whitefly and consequently suffered no damage. The total benefits were equal to the average benefit per host tree, times the number of host trees in both the high and low damage regions.

The change in aesthetic values (CAV) is:

$$CAV_{ijp} = \text{Appraised Value without defoliation} - \text{Appraised Value with defoliation}$$

where:

i is equal to the geographical region
j is equal to ash or ornamental pear tree
p is equal to the wholesale price or retail price of the respective replacement tree.

Benefits were calculated at both wholesale and retail prices because cities could pay either price depending on the number of trees purchased and source of the trees. The wholesale cost represents a lower bound to the estimated benefits and the retail costs are an upper bound.

Results

The costs of the ash whitefly biological control program were provided by CDFA and UCR. The costs included salaries of employees hired for the ash whitefly project as well as costs for permanent employees of both institutions who worked on the project, travel expenses to collect and import the parasitic wasp, materials to rear the wasp in greenhouses, and travel expenses to release the wasp at selected sites and monitor its spread (Table 1).

The appraised value of an ash tree with no ash whitefly damage was between $1,279 dollars at wholesale prices and $1,607 at retail prices, and $922 and $1,238, respectively, for an ornamental pear.

In the high damage region, the appraised value of an ash tree decreased by $261 at wholesale prices and $328 at retail prices due to ash whitefly defoliation. The appraised value of pear trees decreased by about $75 less than for ash trees, due to the lower base value of the pear trees. As expected, in the low damage region the decrease in the appraised value of the susceptible hosts was much lower than in the high damage region.

The change in appraised value per tree per region was multiplied by the number of trees to estimate the total benefits of the ash whitefly biological control program. The total benefits from the biological control program from preserving the aesthetic value of street trees were between $255 million at wholesale and $320 million at retail prices for ash trees, and between $50 million and $66 million for ornamental pear trees in the high damage region (Table 2). In the low damage region, the total benefits ranged from $13 million to

Table 1: Ash Whitefly Biological Control Program Costs

Item	Costs ($)
Salary	772,492
Collection/Importation of Parasite	4,000
Rearing and Monitoring Costs	457,850
Total Costs	**1,224,352**

Table 2: Summary of Benefits

		Average CAV per Tree ($)		Total Benefits in Dollars[a]	
	No. of Trees	Wholesale	Retail	Wholesale	Retail
High Damage Region					
Ash Trees	974,848	261	328	254,541,345	319,994,833
Pear Trees	262,894	188	253	49,511,617	66,487,029
Total Trees	1,237,742	246	312	304,052,962	386,481,862
Low Damage Region					
Ash Trees	101,914	126	158	12,846,573	16,149,978
Pear Trees	79,987	91	122	7,272,353	9,765,732
Total Trees	181,901	111	142	20,118,926	25,915,709
Total Regions					
Ash Trees	1,076,762	248	312	267,387,918	336,144,811
Pear Trees	342,881	166	222	56,783,971	76,252,760
Total Trees	1,419,643	228	290	324,171,888	412,397,571

[a] *Sum of regions may not equal total due to rounding.*

$16 million for ash trees and $7 million to $10 million for ornamental pear trees.

As stated earlier, these benefits represented a one-time change in the aesthetic beauty of the host trees that was achieved when the ash whitefly populations were at their greatest in early fall. Defoliation levels might have been lower during earlier parts of the year. Also, this did not reflect that over time the defoliation could have led to tree death and the need to remove and replant new trees. If the long-term effects were also included, the estimated benefits would have been greater.

The direct costs of the ash whitefly biological control program totaled $1,224,324. The net benefits (total benefits less total costs) were thus $322,947,536 at wholesale values and $411,173,219 at retail values. The rate of return for each dollar spent to import, rear, release and monitor the parasitic wasp was between $265 and $337. If the overhead costs of the biological control program and the long-term research costs were also included, total costs would be higher and the rate of return would be lower.

Photo courtesy of UC Statewide IPM Project

*Wasp parasite (*Encarsia inaron = partenopea*)*

Conclusions

Successful introduction of a natural enemy, *Encarsia inaron (= partenopea)*, resulted in permanent control of the ash whitefly and protection of the aesthetic beauty of urban trees. The economic benefits from avoiding aesthetic damage to ash and ornamental pear trees planted as street trees in urban areas of California were between $323 million and $411 million. The respective benefit to cost ratios were 265:1 and 337:1. It should be emphasized that these benefits are for street trees only. Due to data limitations, aesthetic benefits for trees on other public areas (golf courses, parks, freeways, etc.) and private property were not included. Consequently, the economic benefits presented here may be regarded as minimum values that would increase with inclusion of additional trees.

This analysis demonstrated that significant economic benefits can be realized from successful biological control programs aimed at preserving the aesthetic beauty of the urban forest. Perhaps more important, the ash whitefly biological pest control program is permanently preserving the aesthetic beauty of these valuable host trees.

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(as a percentage of total direct variation). Growers in California who produce any of these crops are experiencing price risk disproportionate to the other sources of risk in their revenue. This result indicates that growers should be using price risk tools like hedging or forward contracting.

There are two crops (peaches and wheat) which exhibit a dominant contribution from yield variability to total revenue variation, and another crop (oranges) which has significant yield variation. Growers of these crops may have a strong preference for a yield risk management tool such as crop insurance.

Only one crop exhibits a majority contribution from acreage variation, although a second crop has significant acreage variation. The acreage variation for processed tomatoes is high enough to allow neither price variation nor yield variation to dominate the total variation, although price variation appears to be more important. Rice acreage variation is also important as a possible indirect effect on price. These industries tend to be volatile in size, thus growers of crops like these may need varied pricing tools.

As a group, these results indicate that producers' needs for risk management tools vary across commodities. Neither price nor yield risk is always dominant and differences in the degree of importance between price and yield can be large (e.g., alfalfa has a wide difference versus oranges, which do not).

Table 2. Estimated Revenue Variance Decomposition Percentages

Crop	Price Variance %	Yield Variance %	Acreage Variance %
Alfalfa Hay	85.7	3.8	10.5
Almond	56.5	42.2	1.3
Cotton	85.5	4.4	10.1
Lemons	56.8	40.2	2.9
Lettuce	69.2	17.2	13.6
Oranges	50.9	48.6	0.5
Peaches	32.2	51.9	15.8
Pears	72.7	13.6	13.6
Proc. Tomato	38.3	8.7	53.0
Rice	56.1	3.1	40.8
Table Grapes	59.1	35.4	5.5
Wheat	10.6	65.1	24.3

Note: The percentages in each row total 100, except for rounding.

Risk Tools In Commodity Markets

A market can fail producers who wish to manage risks in either of two ways. First, a market is missing if no tool is available for managing a producer's primary source of risk. California producers face missing markets for both price and yield risk management tools, as shown in Table 3. By comparing the results in Tables 2 and 3, it is apparent that half of the crop markets (alfalfa hay, almonds, table grapes, lemons, lettuce, and pears) are missing a tool for the primary source of risk faced. In general, there are relatively few price risk management tools available even though price is the primary source of risk facing most producers in California.

The second type of failure is when markets are incomplete in the coverage available. It is expected that producers would use a tool to manage their most important source of risk if such a tool was available and reasonably priced. However, if usage levels for that tool are low, it indicates that the tool is ineffective. For example, based on producers' risk needs shown in Table 2, crop insurance should be used by growers of oranges, peaches and wheat to manage their yield risk, but the survey data show that most of those growers are not insured (27, 4 and 17% are insured, respectively). This means that despite the government subsidy that reduces the price of federal crop insurance to growers, a majority of market participants believe the tool does not reduce their risk exposure sufficiently to justify purchasing it.

The survey data on use of insurance were aggregated into two categories of commodities: (1) tree and vine crops versus (2) vegetable and field crops. Totaling the responses from producers of these crop categories gives:

Crop	Number of Growers	Number Insured	Percent Insured
Tree & vine	462	112	24.2
Vegetable & Field	337	30	8.9

These summary results indicate that tree and vine crop producers are nearly three times more likely to insure than are vegetable and field crop growers. To explain this result one needs only to recognize that perennial crops requiring multi-year investments are

Table 3. Price and Yield Risk Management Situation for Selected Commodities in California Agriculture

Commodity	Futures Contracts Available?	Forward Contracts Available?	Crop Insurance Available
Alfalfa Hay	indirectly	no	yes
Almonds	no	some	yes
Cotton	yes	some	yes
Lemons	no	no	yes
Lettuce	no	rare	no
Oranges	indirectly	no	yes
Peaches (fresh)	no	rare	yes
Pears (fresh)	no	no	yes
Processing Tomatoes	no	yes	yes
Rice	yes	no	yes
Table Grapes	no	no	yes
Wheat	yes	rare	yes
Feeder cattle	yes	no	no
Fed cattle	yes	no	no

being insured more often than are annual crops. Obviously, a larger investment is required for a perennial and that investment is "at risk" over a much longer period, meaning that there is a higher probability of suffering a significant loss with a perennial.

It is the low probability of suffering a yield loss large enough to trigger an insurance indemnity payment that makes federal crop insurance ineffective for most growers in California. Therefore, the markets for tools to manage yield risk of many commodities are incomplete because a significant number of growers find the tools unsuitable, as designed currently, and will not use them.

Concluding Comments

Market failure is readily apparent for tools to manage risks related to California commodities. The markets for tools to manage price risk associated with particular commodities produced in California are often missing. All of the pricing tools available are provided through private market mechanisms. Yield risk management tools, which are usually offered through public market mechanisms, are incomplete.

So, what should producers do to manage their income risk? Recommendations include: (1) develop a risk management plan, (2) evaluate all available risk tools, and (3) consider diversification. A risk management plan identifies all sources of risk faced and specifies how each risk is being managed. Multiple tools may be available for use in managing particular sources of risk, so producers should be familiar with each. Finally, diversification for economic, as well as agronomic, reasons is an effective tool for producers in California and can be used as part of any risk management plan.

Reference: Blank, S., C. Carter, and J. McDonald, "Is the Market Failing Agricultural Producers Who Wish to Manage Risks?" *Contemporary Economic Policy* 15(1997): 103-112.

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ARE Faculty Profile

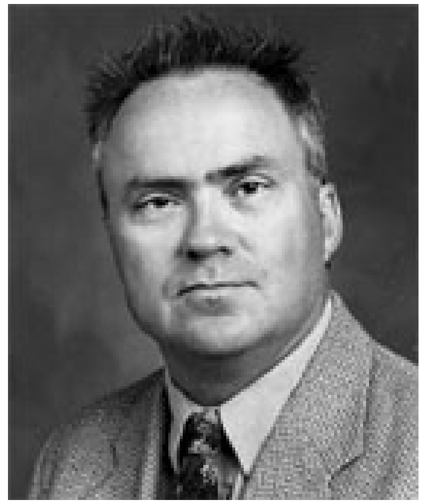
Professor Colin Carter has been selected to serve as the new chair of the Department of Agricultural and Resource Economics beginning July 1, 1998. On the ARE faculty at UC Davis since 1986, Dr. Carter was previously at the University of Manitoba. A native of Alberta, Canada, Colin was raised on a grain and oilseed farm. He received both his Master's in Economics and Ph.D. in Agricultural Economics (in 1980) from UC Berkeley.

Carter's research and teaching interests focus on commodity markets and international trade. He teaches an undergraduate course on futures and options markets and a graduate course on international agricultural trade. He has co-authored several books, including one on futures markets, two on China's agricultural markets, and one on U.S. agricultural policy. Throughout his academic career, Colin's research work has investigated problems related to agricultural markets and trade policy, with a focus on the Pacific Rim. He is a leading authority on global "state trading" in agriculture and a renowned expert on the agricultural economy of China. He has studied state trading behavior in Australia, Canada, and China and the consequences of state trading for international markets.

Colin's work on China began in the mid 1980s when he was awarded a three year fellowship in international food systems from the Kellogg Foundation. Carter has also received numerous research awards from professional associations for his published research. In 1994, the American Agricultural Economics Association presented him with their annual award for "Quality of Communication" for his co-authored book entitled *The Political Economy of U.S. Agriculture*.

Colin has been active in national and international professional societies and committee service on the UC Davis campus. He also serves as Associate Director (for international trade) of the UC Agricultural Issues Center.

When asked about his plans as the new ARE Chair, Colin responded, "I plan to ensure the department plays a key role in servicing the projected 25 percent growth in UCD student enrollment over the next decade." He added, "At the same time, the department's academic excellence must be upheld. High quality research and high quality teaching complement one another."



Colin A. Carter
New ARE Department Chair

The ARE department at UC Davis ranks in the top two or three Agricultural Economics departments nationwide, based on research output and student placement. As a top priority in his new role as chair, Colin intends to foster continued growth in the department's research productivity. At the minimum, he has to work to maintain this national ranking. "Even better," he states, "we can move into becoming clearly the number one Agricultural and Resource Economics department in the nation."

When he is not in his office, Colin is spending time with his wife Noreen, and their 7-year-old son, Dakota. The golf course also beckons about once a week and Colin hopes that service as department chair will not have negative consequences for his golf handicap.

Colin Carter is a professor of Agricultural and Resource Economics at UC Davis. His fields of interest include agricultural marketing and international trade. Dr. Carter can be contacted at (530) 752-6054 or you can visit his Web site at http://ccarter.ucdavis.edu

Selected Comments from the 1997-98 rBST Survey

by L. J. (Bees) Butler

We decided that many of the remarks made by dairy producers on their experiences with rBST add a different dimension to the often sterile and boring statistics that are usually reported. (See Winter, 1998 issue of *ARE Update*.)

A survey of 1500 California dairy producers was carried out in the fall of 1997 and the winter of 1998. The following remarks have been heavily edited and reflect some comments from past and current users.

- *BST works well. As long as the price of milk and feed cost justify using it, taking into account labor and time.*
- *Sophomore slump. Seems many do not react as well the second time around. Does the cost of BST work on the $11.00 California milk price?*
- *Individual response varies. SCC is higher. Too much work with no lock-ups. Breeding efficiency is lower.*
- *BST was not a positive experience for us. Lots of milk but little profit. The second year we only got enough response to cover the cost of the product. We enjoy dairying much more without "the shots". Have no plans for future use, but will try to stay open-minded.*
- *Very pleased with the product. Unable to detect any adverse effects on livestock. Producers not using BST, in my opinion, have an economic disadvantage.*
- *I have used BST now for over four years. I really believe that when all is said and done, only Monsanto makes money on it. Many of my friends have quit using it and are happy they did. I am considering stopping its usage as well in my herd.*
- *I found that the use of BST required us to be more aggressive at challenge-feeding our cows. If they are underfed it takes much longer to get body scores back to acceptable levels. The use of BST has allowed us to keep breeding-problem cows in the herd that otherwise would have been culled for low production caused by extended lactations.*
- *We tried it and didn't get the results we should have. We lost a few udders on 2-year-olds. Overall we were disappointed with our results. We also used our feed consultant and veterinarian in our decision to stop. Milk production is higher today than when we were on it. Higher herd average and daily weights.*
- *When we use BST on our dairy in the summer we don't get the response that they say and in the winter I feel we get more than our fair share of mastitis, which I blame on BST. We are off of BST as of October '97 and through now [February '98]our hospital is less than 2%. The last few years we have had as high as 12% hospital and an average of 5% total. This year I will make more money off of BST than on it.*
- *Initially I was very much against it. Today I feel it is a management tool, but that very few dairies can use it successfully. It requires the highest level of management, i.e., nutrition and reproductive. Feed must be adequate and of highest quality.*
- *Experience: began by injecting 70% plus for one year in one herd and 0% in the other. Estimated response in injected cows at 8 lbs. Became concerned after one year with lengthened days open and calving interval. Production seemed to wane some. How much, I do not know. Second year we are injecting later DIM: will reevaluate after second year.*
- *I believe that when cows are in stressed condition, problems arise with BST—mastitis, etc. I have used it to keep problem breeders milking with success. When I tried to be more aggressive with it, I had too many cow health problems.*
- *BST is a great management tool. It isn't a cure-all for poor management, nutrition, breeding problems, etc. BST works well when all the other dairy parameters are under close watch and are working well. My experience still is not a very positive one. BST works better on some cows. I continue to use BST, but have quit 2x and restarted using it later on, just to make sure I'm not losing out on lost opportunities for increased production, but I'm still not overly pleased with the results.*
- *Don't like, but use to stay competitive.*
- *BST has had a positive economic impact on our herd on the whole. Our main concern is the effect it has on 2 yr. olds. They get old fast...I would just as soon not push our cows for all they're worth.*
- *BST should be used judiciously, only on healthy, heavy cows. Those who are on the borderline of being beefed but are otherwise healthy. It should not be used on the whole herd. Maybe one quarter of the herd. It should not be used in place of good management and a good feed program.*
- *BST doesn't work on all cows. Some cattle really respond, others so-so, others zero. Strange—isn't it?*

Once again, these opinions do not represent a majority of California dairy producers. In fact, the majority of California producers do not use rBST either because they are opposed to its use or do not find it economically feasible for their operations. These opinions most represent the 30-35 percent of California dairy producers who have used or currently use rBST.

A number of conclusions seem to emerge from these comments. First, it is clear that there is still a substantial amount of uncertainty about using this technology. Second, cow health problems are often associated with rBST use, but there does not seem to be any consistent pattern of occurrences. Finally, there is clearly still some concern about the profitability or cost effectiveness of rBST. All in all, one might conclude that rBST is still very much in its infancy. The question of whether or not it will mature is still unanswered.

To obtain more information about the rBST surveys in the California dairy industry, contact Dr. Butler by phone at (530) 752-3681 or visit his Web site at: http://www.agecon.ucdavis.edu/Faculty/Bees.B/Butler.html

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