

## **The Economic Impacts of Bird and Rodent Damage to California Crops: Preliminary Results**

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**ABSTRACT** California is the nation's greatest agricultural producer. In 2007, California's gross value of agriculture production was more than \$38.9 billion, almost double the value of production for the second most important state, Texas. The agricultural sector is a fundamental segment of any economy because it not only contributes substantially to the general production and employment of the region; it additionally provides a source of inputs to nearly all other sectors in the economy (e.g., manufacturing, retail trade, and accommodation and food service). Damage to crops by birds and rodents can reduce total crop yield and increase pest control costs, which ultimately reduces the potential production output of the agricultural sector and all other linked sectors. To quantify the economic impact of bird and rodent damage to 20 selected crops, this study included two distinct methodological analyses. First, using partial equilibrium analysis the direct economic impact of bird and rodent damage to California producers and consumers was compared to the estimated agricultural output if there was no damage in individual agricultural markets. These individual effects were then aggregated to estimate the direct economic impact of damage to California as a whole. Second, using input-output modeling techniques the total economic impacts to 10 important agriculture counties in California were projected. Total economic impacts were estimated using the direct damage estimates to quantify the additional indirect and induced losses in other sectors in the economy using an input-output model. Preliminary results indicate that in these 10 counties, depending on the level of bird and rodent damage, damage-caused losses in grower revenue range between \$200 and \$500 million annually. Additionally, job losses stemming from damage were estimated to be between 2,500 and 7,500 jobs throughout these counties. Monterey County experienced the largest estimated losses in grower revenue representing approximately 25% of total aggregated loss whereas Napa County had more than 20% of estimated aggregated job loss, the most of any county included. The cost of pest control was also considered in the study. Incorporation of pest control expenditures into the input-output models can be modeled as a gain or as a loss to the regional economy. On one hand, pest control expenditures generate jobs in the county which could be considered a gain in the regional economy. Conversely, pest control was conducted to prevent crop loss and these costs were incurred to prevent a loss to the economy. In addition to the incorporation of pest control costs, we will examine the impact of crop losses on the prices of the affected crops. Final results from this study will be submitted to the California Department of Agriculture Vertebrate Pest Control Research Advisory Committee in spring 2010 and full study details will follow shortly thereafter.