

## **PROJECT REPORT:**

**Project Title:** Estimating Job and Revenue Savings from Using a Variety of Pest Control Techniques to Protect Crops from Birds and Rodents.

**Research Agency:** National Wildlife Research Center

**Principal Investigator:** Stephanie Shwiff

**Budget:** \$78,210.00

### **Background:**

The goal of this project is to quantify job and revenue savings associated with using pest control measures to mitigate bird and rodent caused damage to selected crops in 10 important agricultural counties in California.

National estimates of total vertebrate pest damage to field crops and fruit/nut crops in 2001 were \$619 million and \$146 million respectively (NASS, 2002). In California, Clark (1976) estimated in 1974 that vertebrates caused \$12.75 million in damage to all crops. More recently, Marsh (1998) estimated the California ground squirrel alone caused between \$8 and \$12 million in damage to crops in California. These estimates indicate damage can be substantial and can cause widespread economic consequences through reducing revenue and decreasing employment in the affected counties.

To combat crop loss, many growers employ a variety of pest control techniques including rodenticides and avicides, trapping, exclusion, and chemical aversion (Sexton et al., 2007). The use of any given control measure is a function of the particular crop, region, grower preference, state regulations, and depredating species. In cases where pest damage is significant and affects multiple producers, losses can have broad economic significance.

A study was initiated in 2007 to quantify the impacts of bird and rodent damage in California. The objectives of that study were to: determine the magnitude of damage caused by rodents and birds to 22 major crops and commodities in 10 agriculturally important California counties using current control measures and to provide a critical review of this literature; develop scenario-based projections of the magnitude of these crop losses within the State; and conduct an input-output analysis of the job and revenue impacts these losses. Results from this study indicated the total estimated revenue lost annually in the 10 modeled counties due to bird and rodent damage to 22 selected crops ranged from \$168 million to \$504 million (in 2009 dollars), the total estimated number of jobs lost annually ranged from 2,100 to 6,300, and Monterey County reported the greatest estimated decreases in revenue and jobs with \$44 million to \$128 million in annual revenue losses and 515 to 1,514 jobs lost annually (Shwiff et al., 2009).

To complement the 2007 study, a second study was initiated in 2009 to estimate the number of jobs and the amount of revenue created by expenditures on pest control measures in the same study region. Results from this study indicated that pest control expenditures created \$38 million (in 2009 dollars) in total estimated revenue gained in the 10 counties annually and 692 total estimated number of jobs, San Joaquin County reported the greatest estimated increase in revenue from pest control expenditures (\$7.5 million annually), and Kern County reported the greatest estimated increase in employment from pest control expenditures (152 jobs created annually) (Shwiff et al., 2009).

Pest control expenditures provide a dual benefit to each county that uses these measures to protect crops. First, expenditures on pest control measures create jobs and revenue in the county. This was quantified in the 2009 study. Secondly, in the absence of pest control measures, crop loss would increase which would negatively impact the number of jobs and revenue in the county. The prevention of crop loss is arguably the most important contribution of pest control measures. Although several studies exist that determine the direct economic benefit of a new pest control measure (used in conjunction with existing measures) for a specific crop and region (see Salmon et al., 2000; Whisson et al., 2000; York et al., 2000; and Delwiche et al., 2007), a broad study encompassing multiple crops and counties to estimate the total economic benefit has not been initiated

Bird and rodent damage is a perennial problem faced by California's agricultural producers. Common bird and rodent pests to California agriculture include crows (*Corvus brachyrhynchos*), house sparrows (*Passer domesticus*), California ground squirrels (*Spermophilus beecheyi*), meadow voles (*Microtus pennsylvanicus*) and pocket gophers (*Thomomys* spp.). Damage is diverse, from crows consuming grapes and almonds to ground squirrels girdling trees and feeding on alfalfa (see Crase et al., 1976; Hueth et al., 1997; and Berge et al., 2007 for examples of bird and rodent damage in California). To combat crop loss, many growers employ a variety of pest control tools and techniques including rodenticides and avicides, trapping, exclusion, and chemical aversion (Sexton et al., 2007). Pest control is becoming increasingly limited in California as more legislation is passed eliminating control tools and techniques, in particular the impacts of the new labeling for many of the pesticides used in California. Estimating the benefits of pest control measures as a tool to increase crop yield in the presence of pest pressure will give legislators, growers, and stakeholders an understanding of how valuable these measures are in terms of saving regional jobs and revenues.

### **Objectives:**

- 1) Estimate the amount of crop savings related to pest control measures in specific counties for selected crops.
- 2) Quantify the number of jobs and the amount of revenue saved in each modeled county resulting from the pest control measure induced crop savings.

### **Progress To Date:**

**Last Updated:**

01/21/2011