

COMPLETED PROJECT REPORT

Project Title: Electronic systems for bird control in orchards and vineyards.

Research Agency: University of California - Davis

Principal Investigator: Delwiche

Budget: \$24,860.00

Background:

The objectives of this study are:

1. Design sensor systems to detect birds entering an orchard or vineyard.
2. Develop remotely activated sound devices to broadcast distress calls and scare sounds.
3. Integrate the detectors with the sound devices and develop more effective strategies for bird control.

January - May 2001

1. The field tests of the optical detection unit to determine an optimal configuration of camera lens and filter have been delayed until the late spring when the almond trees have leaves.
2. A sound recognition circuit to detect crows by their calls was designed and constructed. A voice recognition module was interfaced to a microcontroller board similar to the one used with the optical detection unit. The voice module was trained to recognize several common greeting calls, which would cause the microcontroller to activate a sound circuit with the hazing call. One problem with the present system is that the microcontroller must initiate a sound recognition cycle. The circuit is now being redesigned to operate in a continuous listening mode. This technology may be more appropriate for preventing birds from roosting in urban areas.
3. The optical sensor system described above is currently under active research and it may take some time before these concepts reach the stage of commercial development. Therefore, we have begun the design of a simple and inexpensive call unit, which could be readily built and used by growers. This will also have to include non copyrighted hazing sounds. Our goal is to have this design completed and tested and an operational plan available to growers before the end of this project in June.

Summary:

November 2001 - The final report was submitted. A summary is provided below.

Research was conducted on the design of electronic hazing systems for improved control of birds in orchards and vineyards. The original concept was to develop a sensor-based unit to detect when birds entered an area and activate the hazing sounds only when they were present. In this way, habituation would be minimized, thus prolonging the effectiveness of control in the field. Several different detection strategies were evaluated, including optical, sonic, and motion sensors. An optical system was designed and constructed in which a small digital camera was interfaced to a high-speed embedded controller. The controller was programmed to recognize changes in the camera field of view, such as a bird flying by, and to activate pre-recorded distress calls when the change exceeded a threshold. The sensor-based system performed well in the lab, but some problems were encountered outside with light variations causing the camera to saturate.

Due to the complexity and potential cost of the sensor-based system, a simplified non-sensor unit was subsequently designed with the intention of large scale field use by growers. Four different distress calls could be recorded on the simplified unit and a different call was automatically activated every 12 minutes. A high power audio amplifier and horn loudspeaker were used to cover large field areas. The circuitry was designed to minimize its power requirements during the day when not calling and to shut off at night. Initial field tests showed the unit could operate more than a month with a small lead/acid storage battery. We intend to use this basic design in a new research project to develop a protocol for controlling crows in large almond orchards with multiple calling units and non copyrighted hazing sounds.

Last Updated:

02/23/09