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Exotic pest research well worth the price

This special issue of *California Agriculture* vividly illustrates that exotic pests may impose huge potential losses on California agriculture and the statewide economy. It also defines some serious gaps in our scientific knowledge of these pests — knowledge needed to undergird effective prevention, eradication, and control programs for the lengthening list of exotic pests to which California agriculture is vulnerable.

The risk of major economic loss to these pests is magnified by increasingly stringent public regulation of pesticides, by genetic resistance of pests to the diminishing number of chemical controls still available, and, in some cases, by the absence of any effective controls for certain pests — illustrated by the devastating invasion of sweetpotato whitefly in Southern California.

If we are to address these risks in an effective, intelligent manner — rather than lurching from crisis to crisis using the most expedient means available — several actions are necessary. As indicated by Dowell and Krass, we need strong programs to prevent entry of exotic species. As Carey points out, "Sound exclusion policy for the future must be based on detailed and in-depth understanding of the nature of the introduction problem. . ."

To provide that in-depth understanding, a "Manhattan project" type research program supported by the state and federal governments and the agricultural industries is needed now. The program should be targeted to scientifically well-defined, mission-oriented objectives, multidisciplinary in nature, leading to integrated use of pest control technologies with emphasis on biological control. UC scientists, as well as the "blue ribbon" committee which I appointed in 1990 to address Mediterranean fruit fly problems, have described the framework for such a program.

A major constraint on the development of needed research is the inadequacy of research facilities at the University and throughout the western United States, as well as in other vulnerable states such as Florida and Texas, and at the Agricultural Research Service of the United States Department of Agriculture (USDA).

At the direction of the House and Senate Agricultural Appropriations Subcommittees in 1991 as well as the California Legislature in 1990, the University, in collaboration with the California Department of Food and Agriculture (CDFA) and USDA, has developed a facilities proposal which, if funded, would constitute a giant step forward in research to address pest management issues into the 21st century.

The research strategies upon which the facilities proposal is based are premised on the need for increased use of parasites, microorganisms, predators, and genetically engineered organisms such as disease-resistant plants or more potent microbial insecticides. Sophisticated biological pest control methods are now possible due to the recent development of recombinant DNA technology which allows the cloning of genes and stable insertion of such genes into insects, plants or microorganisms. To conduct the necessary research on exotic or genetically engineered biocontrol agents requires "state-of-the-science" quarantine and physical containment facilities to ensure safety before field releases are made. These facilities do not now exist at the University or anywhere else in the western U.S.

The proposal would provide such facilities on the Davis and Riverside campuses, expanding their current programs in biological control. It calls for three-way participation by the University, CDFA, and USDA. The facilities would be available for use by scientists from other states as well as state and federal research agencies. Cost of the facilities is estimated at $25 million to $35 million.

The proposal has been reviewed by a panel of five scientists appointed by the Cooperative State Research Service, USDA, in a site visit in mid-1991. The panel concluded "the benefits to agriculture are potentially very large. Biological controls will lessen the need for the use of synthetic chemical pesticides and this will help commercial agriculture to remain competitive at the international level. The intelligent use of recombinant organisms in a multitude of ways will benefit agriculture by enhancing the efficacy of some components of integrated pest management (IPM), providing greater options by identifying new products, and probably opening new markets."

Public investment in agricultural research has yielded large benefits to American agriculture and consumers, domestic and foreign, during the past century. Now the advancement of productivity and competitiveness in agriculture must be coupled with public goals of environmental protection. New investments in science are needed now to make these goals a reality in the 21st century. Investing in pest management research and extension is one of the most important commitments we can make for the benefit of agriculture and society as a whole.