

The University's Role in the Control of Pests and Diseases Injurious to Agriculture and Public Health



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IT IS THE POLICY of the University of California, Division of Agricultural Sciences, to insure that recommendations for pesticidal chemicals are not released until they are reviewed and approved by the best scientific authorities available at the University.

This procedure assures: (1) that the information fully conforms to federal regulations of the U. S. Department of Agriculture and of the U. S. Department of Health, Education and Welfare, as well as the California State Departments of Agriculture and Public Health, and to the policies of the Division of Agricultural Sciences; and also (2) that the pesticidal chemical has been registered for the use intended by U.S.D.A. and the State Department of Agriculture.

University recommendations for use of pesticidal chemicals are based upon information obtained by the Division of Agricultural Sciences, under California conditions. Research results from other reliable sources are sometimes used to supplement University data but are not accepted without first being checked. In some cases this has delayed issuance of

the University's recommendations but in the public interest this rule must be observed.

Before newly developed chemicals are recommended for application in California, the Division of Agricultural Sciences secures its own information as to residues, pesticidal performance, toxicity to plants, flavor alterations and the effect on other organisms including beneficial predators and parasites, honeybees, fish and other wildlife.

The University is as much interested in avoiding the misuse of toxic chemicals as it is in advocating use of those which, upon approval, may be put to beneficial use in agriculture.

Through research, it seeks the most effective and economically feasible means of controlling insects, weeds, mites, nematodes, plant diseases, and other pests in order that adequate supplies of wholesome food can be produced for the needs of a rapidly growing state and nation.

In the light of present knowledge, we need chemicals to protect crops and livestock from the many species of pests and diseases that affect them. Through long experience and research, we have learned how to use chemical control methods with a high degree of safety. It is true that chemicals can be dangerous and also true that human error may lead to injury from them. The University strongly advocates that chemicals be used only as specifically recommended on labels or in the pest control programs developed by University personnel.

By acts of Congress and the California Legislature, the Division of Agricultural Sciences of the University of California has been given the vital responsibility of developing information to aid California agriculture in producing an abundant and wholesome supply of high quality food. The legislation imposes an added responsibility—to supply information on pest control materials and procedures which will result in agricultural products that conform to all laws and which will adequately safeguard the public health.

Since the early 1930's, and continuing to the present time, the study of chemical residues in foods has been carried out on the Berkeley, Riverside, and Davis campuses of the University. The University staff is always concerned with potential residue problems. In addition, a Pesticide Residue Research Laboratory was established on the Davis campus in 1955 to amplify the research begun earlier. The University is seeking additional funds to increase its research in this field.

Since World War II, thousands of chemicals have been tested by the University for possible agricultural use. Only a few of these have survived the rigorous testing and have been recommended for

Gas chromatograph with automatic recorder, used for analyses of chlorinated pesticides, can "see" amounts of chemical residue in crop samples down to microgram quantities, allowing normal detection of 1/100th of a part per million.





Infra-red spectrophotometer "fingerprints" an insecticide by making a graphic recording of a spectrum of a compound on punch cards for quick identification of future samples.

use under specified conditions. These facts indicate the thoroughness of University investigations to safeguard our food supply and public health. Methods of analysis of toxic compounds are now in use by which the most minute traces of a chemical can be detected—less than one part per billion in some instances.

Biological control

The University has taken a leading role in pointing out the value and importance of biological control of pests. It was the first university in the United States to have a Department of Biological Control. The Vedalia beetle was introduced many years ago in California to control the cottony cushion scale, a very damaging pest of citrus. More recently, the spotted alfalfa aphid was ultimately controlled by using native and imported insects as well as a pathogen to prey upon this very costly pest. Control of the Klamath weed by use of imported beetles was developed by U. C. and U. S. D. A. scientists just when it threatened to destroy northern California cattle ranges. Use of insect pathogens ("diseases of insects") for pest control was developed by U. C. researchers.

Biological control is recommended to every extent possible to help solve our pest control problems. We recognize that the use of chemicals has aggravated some of our problems by causing, in certain instances, the upsurge of a new pest, development of resistance to chemicals, and pesticide residues on some of our food crops. In developing our pest control recommendations, we make every effort possible to utilize biological control. Although the use of chemicals in many cases is still very necessary to produce marketable crops, it is University policy, long in force, that all possibilities for better pest control be investigated and to adopt only those which have been proven, by exhaustive tests, to be safe as well as effective.

At present, departments at Riverside, Berkeley, and Davis work on problems of "integrated" pest control. This concept of combining chemical and biological

methods was developed by members of the Agricultural Experiment Station and is used successfully against several important crop pests.

Chemicals important

Chemicals are an integral part of American agriculture. Actually, some chemicals have been used since Biblical times to control pests. The newer pesticides have made it possible for this nation to produce an adequate quantity of food for our increasing population. It appears that they will continue to be even more important in food production in the future.

The American public itself has made this decision. Consumers expect the variety and quality of foods that can only be produced in commercial quantities through the use of positive pest control measures. They refuse to accept the poor quality produced in orchards and fields where such measures are not taken—and the farmer who fails to use chemical pest controls cannot survive long economically.

The fact that United States consumers spend a smaller percentage of their disposable income for food than do people of other nations may be traced in large part to the abundance of food we enjoy.

Recognized authorities agree that this abundance of wholesome food at reasonable cost is possible only if we protect our crops and livestock against the pests that, in nature, would take a severe toll. Estimates of the damage caused annually by agricultural pests range from eight to fifteen billion dollars—despite our considerable knowledge of how to control them.

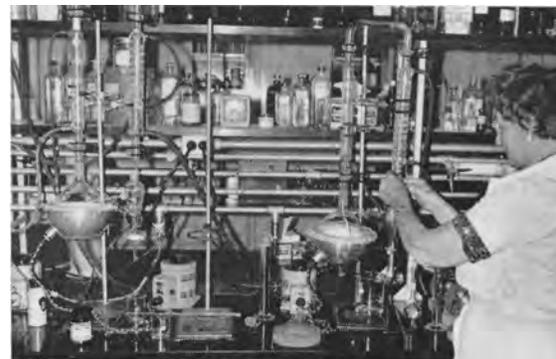
Discovering the most effective and economical methods of pest control, while at the same time safeguarding the health of consumers, is a major activity of the Division of Agricultural Sciences. All scientists admit that there are gaps in the

Radioactivity counter, with freezer to maintain stability of samples, represents an \$8,000 investment at the University's Pesticide Residue Research Laboratory, Davis. It is used for detection of extremely small quantities of tracer isotopes in plant material.



information on many important questions concerning the agricultural use of chemicals. In the absence of this information, every precaution is taken by federal, state and county governments, as well as by the University, to avoid making recommendations which might be dangerous.

The University also carries out research on pests of public health importance. Studies are underway of flies that may carry intestinal diseases, mosquitoes which can transmit encephalitis, gnats which are implicated in infective conjunctivitis (pink eye), and arthropods



Use of this hydrolysis apparatus in the colorimetric analysis of herbicides, is one of many painstaking laboratory procedures conducted in departments at all campuses to produce scientifically exact information on the safe use of agricultural chemicals.

which may transmit bubonic plague. The constant search for possible vectors of other human diseases is still another responsibility of the research workers of the University.

Control studies in this field commence only after a thorough investigation of the insect vector and its relationship to man and the surrounding environment. Because treatment of large areas often may be required to suppress these vector species, it is a responsibility of the research workers to evaluate the effect of control measures on all of the exposed flora and fauna—and to develop methods that will adequately control the pest but not seriously disrupt the rest of the environment. If chemicals are to be used, special studies are made upon the effect of these materials on beneficial insects, fish, amphibians and other wildlife in the area. Biological and cultural control procedures are also investigated, and frequently the final method to be selected is a composite of the best of all of these.

Much more research is needed in all of these fields. Public support of such scientific work is the most direct and beneficial method of securing the answers to these questions which are so important to California and the nation.