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March 1976

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James T. Hallett

*California Polytechnic State University, San Luis Obispo, California*

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## THE ROLE OF THE PEST CONTROL ADVISOR IN VERTEBRATE PEST CONTROL

JAMES T. HALLETT, Associate Professor, Crop Science Department, California Polytechnic State University, San Luis Obispo, California 93401

ABSTRACT: California State legislation as passed in 1971 established the Agricultural Pest Control Advisors Licensing program with the intent of providing agriculture with competent and professional personnel who make pest control recommendations. Today, nearly 4,000 advisors are licensed in California and approximately 1350 are licensed vertebrate pest control advisors. Recent amendments to the Federal Insecticide, Fungicide and Rodenticide Act will add new responsibilities to the advisor by requiring certification of both private and commercial applicators throughout the U.S. beginning in 1977. More than one-half of the vertebrate pest control advisors are employed in agrichemical sales while the remainder are employed by government agencies or are self-employed as consultants. Today, about one-third of the licensed vertebrate pest control advisors are not actively using the license and of the remaining licensed two-thirds, 94% are infrequently engaged in making vertebrate pest control recommendations. Control recommendations are most often made for rodent and bird pest problems. The majority of advisors feel that additional training, education and upgrading of the industry is important for all advisors.

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In 1971, the California Legislature passed an unusual piece of legislation which has since altered the responsibilities of those persons involved with protecting California's agriculture. Specifically, the legislation is known as Senate Bill 1021, which for the first time in the United States created an effective licensing program for all persons offering agricultural pest control recommendations to producers of agricultural commodities.

Agricultural pest control advisors licensing has added many new dimensions to pest control activity and has had an enormous influence in California and now in other states as they too establish similar advisory programs.

The basic intent of SB 1021 is to provide California agriculture with pest control advisors who are competent, aware of environmental impact as a result of control recommendations, and who provide for the proper, safe and efficient use of pesticides for agricultural production.

The law established that all persons making pest control recommendations must be licensed to do so. Additionally, the law established an 11 member Advisory Committee appointed by the Director of Food and Agriculture whose function is to make recommendations to the Director concerning three primary areas: Education, training and qualifications of agricultural pest control advisors. The Advisory Committee meets regularly to discuss and recommend proposed changes within these three areas.

One section of SB 1021 requires that all persons be licensed by written examination in seven pest control categories. Today, California has approximately 3,850 licensed agricultural pest control advisors and this number continues to expand by several hundred annually. Many advisors are obtaining their licenses in all seven license categories and approximately 1350 are licensed in the vertebrate pest control category, which comparatively is the smallest number of advisors in any category. However, 9 out of every 10 persons licensed in vertebrate pest control are also licensed in the remaining 6 categories, including insect control, weed control, plant pathology, plant nematology, defoliation and plant growth regulators. Five percent of the vertebrate pest control advisors are also licensed in structural pest control, which is administered by the Department of Consumer Affairs. An interesting aspect is that the most active categories in which an advisor provides recommendations is in insect control, followed by weed control and plant pathology. Many advisors feel competent to offer their services in several of the pest control categories.

The advisory program began in 1972 by examining all persons who were interested in becoming licensed at that time. Today, however, changes are evolving with respect to the basic requirements for licensing. Minimum qualifications for licensing today require two years of college within either the agricultural sciences or biological sciences or one year college in the agricultural or biological sciences plus 24 months of technical experience in a related field as approved by the Director. After 1980, the basic academic requirements

will be a Bachelor's degree in the agricultural or biological sciences, or two years of college and 24 months of approved experience. The Advisory Committee has recently recommended to the Director that after January 1, 1984, the minimum qualifications shall consist of a Bachelor's degree in the agricultural or biological sciences or 120 semester units of college level curriculum in which certain specified courses within pest control will be required. Additionally, 6 months of approved experience would be required if this proposal is accepted by the Director. The obvious objective of these new requirements is to gradually upgrade all personnel who provide pest control recommendations thereby guaranteeing the highest calibre and most competent individual in the field of pest control. Our APCA in California has been receiving his license for a period of one year. However, recent legislation has altered the licensing period from a one year to a two year period.

In addition to California's APCA licensing, EPA programs now being developed require certification of applicators and classification of pesticides that will directly involve many agricultural pest control advisors. The Federal Insecticide, Fungicide and Rodenticide Act as amended in 1972 by Congress requires by October 21, 1977, that persons supervising the use of a restricted pesticide be certified as being competent to do so. There will be no exemptions from this law; even public employees must be certified. In addition, all registered pesticides will be classified for either "general use" or "restricted use". General use materials is defined as one which ordinarily does not cause unreasonable, adverse effects on the environment when used according to label recommendations and these pesticides will generally be available to the public. The "restricted use" pesticides are those which may cause unreasonable adverse effects on the environment or injury to the applicator. After October, 1977, a "restricted use" pesticide can be used only by or under the supervision of a certified applicator. The EPA has not yet classified pesticides as either "restricted use" or "general use". The purpose of this new program is an attempt by the EPA to insure that applicators possess adequate knowledge regarding the potential hazards of pesticides to eliminate injury to humans or the environment. In the EPA regulations, two types of certified applicators are also indicated. They are, "private applicator", which is a certified applicator who uses or supervises the use of restricted pesticides in producing an agricultural commodity on his own property. The second category is the "commercial applicator", which is a certified applicator who uses or supervises the use of a restricted classified material on any property other than that as provided by the definition of "private applicator". Like the APCA program, the EPA calls for categories of written examinations representing various phases of pest control be given to commercial applicators. Responsibility for implementing the certification program is left to each state to develop and administer the various aspects of establishing standards of competence. California by way of the Department of Food and Agriculture is currently developing a program to meet EPA certification requirements and the University of California is working on plans for training programs for commercial applicators.

The APCA program began in 1972 with suspicion and even contempt by some who felt that government was infringing upon their territory. Some even rejected licensing all together. However, since the initial uncertainties, opinion has swung in strong favor of the advisory program. In fact, in a recent survey which I conducted, two-thirds of the vertebrate pest control advisors felt that licensing has been beneficial in their overall professional growth. So, the role of our pest control personnel in California is rapidly changing and these new laws and regulations are creating an entirely new class of professionals.

Now then, what is the role of the individual who is specifically licensed in vertebrate pest control in California? This is a difficult question to answer because there is little information regarding this new breed of specialist. In order to answer part of the question, I surveyed the 1350 licensed persons in the vertebrate pest control category, by using a questionnaire to assess their role with the objective of developing a characteristic profile of this group of individuals. Out of the 1350 surveyed, more than 50% responded by completing and returning the questionnaire. The results of the questionnaire are interesting, and I would like to share some of these results with you.

Our first interest was to determine the relative age range of the advisors. When all age groups were compared, the results showed that there are fewer advisors under 30 years of age than in any other age bracket, and more than one-half are over the age of 40.

Table 1. Age group of those licensed in vertebrate pest control.

<u>Age Group</u>	<u>Total Number Responding</u>	<u>Approximate Percent</u>
20 - 29	119	19
30 - 39	165	26
40 - 49	165	27
50 - 59	128	21
60 - over	<u>38</u>	6
Total Responding	615	

How much education do our vertebrate pest control advisors possess? The survey results show that approximately 62% possess a Bachelor's degree or an advanced degree either at the Master's or Ph.D. level (Table 2). Another twenty-six percent indicated they have 1 - 4 years of college, and 11% have a high school education. These figures do not reflect results obtained in a 1972 survey when 32% indicated they had attended or graduated from high school and only 37% had a Bachelor's or advanced academic degree.

Table 2. Education level of those licensed in vertebrate pest control.

	<u>Total Number Responding</u>	<u>Approximate %</u>
High School (did not complete)	9	1
High School (graduated)	62	10
College (1 - 2 years)	76	12
College (2 - 4 years, no degree)	86	14
B.A. or B.S. degree	321	52
M.S. degree	46	8
Ph.D. degree	<u>15</u>	2
Total Responding	615	

It is also interesting to note the diverse academic fields of study for those advisors with a Bachelor's degree. Table 3 illustrates the major fields of study for 321 advisors with a Bachelor's degree.

Table 3. Undergraduate majors of those with a Bachelor's degree.

<u>Major Field of Study</u>	<u>Number Responding</u>	<u>Approximate %</u>
General Agriculture or Animal Science	120	37
Agronomy or Soil Science	46	14
Entomology	34	10
Plant Pathology or Virology	31	10
Fruit Science	27	8
Horticulture or Botany	25	8
Crop Science or Plant Science	31	10
Forestry	11	3
Chemistry	<u>7</u>	2
Total Responding	321	

These results show a tremendous diversity of academic backgrounds and it raises an interesting question as to where or how did these individuals receive training in vertebrate pest control (Table 4). One-third indicated they received no formal training in vertebrate pest control. The remainder stated they received their training by either formal education or on-the-job training in government employment or private industry.

Table 4. Source of training obtained in vertebrate pest control.

	<u>% responding (based on 615)</u>
Have had no formal training or education in vertebrate pest control	33
Formal educational training	21
Private industry experience (or on-the-job training)	37
Government experience (Federal, State or County level)	9

Professional occupations of the advisors are also interesting to note. Over one-half of our vertebrate pest control advisors are employed in the field of agrichemical sales with major industrial firms (Table 5). Twenty-five percent are employed in either government pest control positions at the county, state or federal level or in education, forestry, crop production, agricultural research or horticultural pest control. The remaining are involved as independent agricultural consultants.

Table 5. General occupational categories of vertebrate pest control advisors.

<u>Occupational Group</u>	<u>Number Responding</u>	<u>Approximate %</u>
Chemical Sales	371	57.4
Independent Consultants	101	15.6
Agricultural Production	65	10.1
Agricultural Research	28	4.3
Pest Control Operators	28	4.3
Government Pest Control	23	3.5
Educators	15	2.3
Horticultural Pest Control	13	2.0
Forestry	<u>2</u>	1.0
Total Responding	646	

When asked what percent of the advisor's time was spent in dealing with actual vertebrate pest control problems, the answer was revealing: Ninety-four percent indicated they spend less than 10% of their time on vertebrate pest control problems and of that approximately one-third do not use their license (Table 6). Only 1% spend more than 50% of their time in the field. However, advisors that are actively engaged in vertebrate pest control services most often make recommendations for ground squirrels, rats and mice, rabbits, birds and gophers.

Table 6. Percent of total time spent on vertebrate pest problems by licensed vertebrate pest control advisors.

<u>% Time</u>	<u>Number Responding</u>	<u>Approximate %</u>
None	195	31
1 - 10%	389	63
10 - 25%	24	4
25 - 50%	8	1
25 - 50%	8	1
50 - 75%	0	0
75%- over	<u>5</u>	1
Total Responding	621	

The most prevalent pest situations that advisors encounter for which written recommendations are made are with rodents such as rats (Rattus norvegicus and Rattus rattus) and mice (Mus musculus) which invade stored grain and other stored commodities, and meadow mice (Microtus sp.) in crops such as, potatoes, sugar beets, artichokes, alfalfa, and deciduous tree crops. In addition, control recommendations are made for ground squirrels (Citellus sp.) which cause considerable damage in pastures, drainage or irrigation canals, tree crops, grain and other crops such as sugar beets and even garbanzo beans. Gophers (Geomysidae) are another particularly troublesome pest in a wide number of tree crops, row crops, grapes and pasture situations. Advisors are also called upon to advise on control of Jack Rabbits (Lepus californicus) which are a serious problem in several crop situations including alfalfa, and various vegetable crops.

Birds continue to gain in importance and have become a major problem in California especially Starlings (Sturnus vulgaris), Blackbirds (Agelaius phoeniceus), House finches (Carpodacus mexicanus) and Horned Larks (Otocoris alpestris). Bird pest problems where advisors are called upon for control recommendations are Starlings and Blackbirds in livestock feedlots, grapes and soft fruits, Horned Larks in row crops such as cantaloupes and vegetables, and Linnets in deciduous fruit trees and grapes. A few advisors occasionally handle less frequently occurring animal problems such as skunks, deer, fish or snakes. Currently no advisors are involved with predatory animal control.

This survey also attempted to determine the relative importance of various pest control materials and devices in current use. A summary of this data shows that anticoagulants are by far the most often used material followed by lesser amounts of strychnine, gophacide, zinc phosphide and 1080, but also small amounts of avitrol and starlicide are used. Several fumigants are used including methyl bromide, carbon bisulfide and chloropicrin. Among mechanical or physical devices, traps are the most widely used along with av-alarms, cannon guns and other accoustical devices especially for bird control.

Because the advisor is often faced with a variety of vertebrate problems, the following question was asked: "Do you have difficulty in identifying vertebrate pests or assessing damage levels in the field?" Remarkably, one-half of those responding to these questions indicated they do have difficulty at least some of the time in identifying the pest in the field or identifying the cause of damage. This is further revealing because over one-half indicated they have difficulty in assessing the level of economic damage in the field, at least some of the time.

Perhaps the problem is compounded by the fact that actual thresholds of damage are either not established or are unknown by the advisor. Nevertheless, this places the advisor in an awkward and at times a difficult situation in prescribing reliable controls.

In California many agricultural vertebrate pest control programs are the responsibility of County Agricultural Commissioners. Recently many advisors have shown an interest in assuming an active role in some programs now handled by the Agricultural Commissioners. Listed most often as the pest problems in which the advisor indicated an interest are: Birds, ground squirrels, rabbits, rats and mice.

It is evident from this survey that training and education are an integral part of this field and undoubtedly if sound and reliable recommendations are to be made, then some form of on-going education and training must become available to all advisors. In fact, three-fourths of the advisors believe that some form of on-going training or educational programs are essential and about 40% of the advisors said their business would be expanded significantly providing they could better identify and assess vertebrate pest problems in the field. Eighty percent indicated they would take short courses in their geographic areas, provided such training courses were made available to them. The advisors identified several specific subjects as most important for inclusion in short courses including, general rodent identification and control, bird, rabbit and predator animal identification and control, ecology and integrated methods of vertebrate pest management.

Another problem frequently cited by advisors is the lack of adequate field study guides and quick references regarding vertebrate identification and controls. Many would like to see publications specifically oriented towards their needs in vertebrate pest control such as exist in other professional fields.

Today, few educational programs exist which deal specifically with vertebrate pest control. While other professional fields such as entomology, weed control or plant pathology are well covered in academic studies, the academic training in vertebrate pest control is lacking. Curriculum at the college and university level requires developing if the agricultural advisors are to maintain a high degree of professional competency in this field. There are two ways in which our vertebrate pest control advisors can be assisted in this regard: 1) Develop college and university curriculum designed for practical training and development of skills, which include vertebrate animal identification, animal ecology, field zoology, economics of control, integrated management systems, and agri-chemical safety. 2) Industry and university extension training programs should be developed which emphasize the practical and applied approaches to vertebrate pest management and stress problem solving situations. This could be accomplished using 1 or 2 day workshops, seminars or short courses.

Finally, I believe the Advisors program must go beyond the purely mechanical procedure of examination for the purpose of licensing. Further, I believe required upgrading programs should become an integral part of the Advisors development as is already required in several other professions. A survey of 2800 advisors conducted by the Agricultural Pest Control Advisory Committee in 1974 showed that 9 out of every 10 advisors wanted a program of upgrading. They positively identified further training as requisite to continued professional growth. In that same survey, the majority indicated a preference for required standards of upgrading be initiated, and that some minimum number of hours be set forth as the pre-requisite to continued licensing. To date, the Advisory Committee has not acted upon an up-grading program, however, such a program may be forthcoming by 1980.

In summary, the Advisor's licensing is an innovative and vital program in California agriculture which has generated many professional job opportunities. The future pest control advisor will most likely be required to demonstrate greater competency and proficiency in several fields which will enable him to deal more effectively with a broader variety of pest control situations, all complimentary to his overall objective to serve the agricultural community.