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BIRD CONTROL METHODS AND DEVICES--COMMENTS OF
THE NATIONAL PEST CONTROL ASSOCIATION

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The last speaker on any program as broad as this one has been usually finds that anything worthwhile he may have had in mind has already been said by one of the earlier speakers. My predicament is even more difficult because the topic for this period is "What's New from Research Laboratories," but I neither work in a laboratory, nor have I had an opportunity in recent months to visit laboratories concerned with bird control work.

It may be useful, however, to review some of the considerations that go into recommendations concerning bird management. Later I will make some comments concerning specific methods and devices being used in or promoted for bird control work regardless of whether or not they are new.

Members of the National Pest Control Association provide a variety of services, such as fumigation, termite control and general pest control which includes rodent control. There are eight such categories listed in our roster, but only one member in five provides every service listed.

Bird control is a rather recent development and is the newest category of service to be listed in the NPCA roster where it appeared for the first time in 1959. As of September 1, 1966, 45% of our members' offices indicated that they were prepared to offer bird control service. Less than 40% did so in 1964.

Why is it that more of our members do not declare themselves as ready to do bird control work? I believe the most common answer you would find is that bird control is not yet sufficiently established that they can provide a service comparable in quality to that which is provided against termites or cockroaches or rats. Our members simply do not want to jeopardize their reputation on methods that are not certain or are too complex. Others recognize the emotional reaction evidenced by much of the population concerning control of birds and do not want to become involved in work that might offend some of their clientele. Still others simply do not agree that birds are their responsibility.

There has been no complaint from the membership concerning the Association's activity in providing information on bird control, either as a technical service to the membership or as a public relations effort in the Industry's behalf. There seems to be general agreement that control of pest birds in and around structures, where people congregate, or where they conduct and do their business is all part of pest control. It is the opinion of the staff of NPCA that members have an obligation to provide service or useful information and advice to anyone troubled by pest birds under any of the above-mentioned circumstances.

The Association through its staff and its Bird Management Committee provides advice to members concerning bird control methods, materials and devices. The public is also free to call on us for advice, and almost weekly we have contacts from some firm or individual interested in the development, sale or promotion of a material or a device for pest control. To those who come to us in good faith, we try to give the best possible advice concerning what pest control operators should expect to find in a bird control method or device.

The Good Practice Statement of the NPCA Bird Management Committee, among other things, requires that bird management procedures be consistent with federal, state and local laws. The present Good Practice Statement may give too much weight to the need for a federally registered label to cover any proposed use of a toxic agent. Certainly it is desirable to have such a label, as it gives the user the manufacturer's recommendations plus assurance of thorough review by experts.

A PCO who follows directions on a registered label thus has powerful assurance that his work will not only be effective but that it will also be safe for humans, protected wildlife, domesticated animals and property. Unlabeled methods and materials may be necessary until bird control is better established. But if required for effectiveness, whatever method is used commercially should be well recognized, recommended by an informed and responsible agency and supported by a good experience record for a reasonable period of time.

The requirements for federal registration of labels for economic poisons used in bird control have been described in detail by Spencer (1964). Labeling which has met such requirements gives us a sound basis for advice to our members and to the public. Devices, on the other hand, do not require registration but may be found to be mis-branded if anything substantially misleading is found in their labeling or accompanying literature. This lack of registration of labeling for devices has been subject to some criticism. For the present, however, we believe it to be a correct position. The application of registration requirements to devices would open a Pandora's box of items ranging from fly swatters to bear traps to phonograph records. Most devices used in pest control have well recognized applications and are not subject to extravagant promotion or to misuse. Only a few devices offer serious hazard to pets. One basis for the renewed interest in

registration of labeling for devices has been the promotion of electronic gadgetry for the control of birds and other vertebrate pests. Most of these devices are the basis for many claims for performance that fail to materialize in practice. It appears that the lack of action by regulatory authorities against some of these devices is due to the ease with which the ownership of the sponsoring firm changes hands and because the models of the devices themselves are easily changed requiring new seizures and larger accumulations of red tape.

In our evaluation of bird control methods and devices at NPCA, we have observed a great lack in useful data on the probable safety and effectiveness of a method and the equipment to be used. Testimonial letters are of little or no value. What is required is documented facts about the values, limitations and safety of the product. Usually data should originate both in the laboratory under controlled conditions and in the field under more or less practical conditions. Furthermore, the data and observations need to be developed by qualified investigators. It should be obvious that since we are talking about control of biological organisms, the services of a biologist are required.

The research findings and evaluations which support registration of an economic poison are not required to be published. But there must be some suspicion about, and hesitancy to accept, any product which lacks a file of published scientific papers from recognized agencies. Publication of research permits other scientists to question results, to evaluate and to compare results of their tests under the same or varied conditions and to come to their own independent conclusions.

As the discussion at this meeting has indicated, bird control is much more than the application of materials, methods and devices. Usually, these are only adjuncts to proper utilization of detailed knowledge of ecology and sanitation. Common sense is required too. For example, one of our members was asked what he could do about a blue jay which "dive bombed" the family's pet cat every time it was let out the back door. By consultation with an agent of the Fish and Wildlife Service, our member learned that since it was nesting season and the mother jay was temporarily especially sensitive about the welfare of her offspring, the problem would be relieved in a few weeks. Instead of requiring pesticides or the destruction of the blue jay, the problem was solved by letting the cat out the front door. It would be nice if each of the bird control methods I am about to discuss could be applied so easily, so effectively and so safely.

Fumigation

Fumigation, using calcium cyanide or hydrogen sulfide, is recommended by the Fish and Wildlife Service for killing large numbers of birds caught in traps (Anon. 1965a). There may be a few instances where other uses of fumigants in bird control may be justified. Birds

roosting in barns or other structures are quickly and easily destroyed. For empty storages and warehouses, Monro (1961) has suggested the following doses per 1,000 cu. ft. at temperatures of 4°C. (39°F.) or higher: 2-4 oz. HCN for 6 hours, 4 oz. methyl bromide for 5 hours or 8 oz. of chloropicrin for 8 to 12 hours. So far as I know, there is no registration which specifically refers to the use of fumigants against birds, but the broad statements of pests controlled by these products probably can be interpreted as encompassing birds.

Recently, attention has been directed to anhydrous ammonia, which is an inexpensive familiar chemical in most rural areas. Either through knowledge of the properties of the gas, or by serendipity, several workers have learned that it will kill birds in confined spaces (Hockenyos, 1963) (Devore et al., 1966). While it may be that individual farmers and institutions may want to use ammonia in eliminating pest birds in barns and other enclosures, there are limitations that are likely to restrict its acceptance by commercial pest control operators.

Reference to usual sources of information on industrial chemicals indicates the need for recognizing certain precautions in handling ammonia. For example, the Chemical Safety Data Sheet of the Manufacturing Chemists Association (1960, reveals that anhydrous ammonia in liquid or gaseous state is corrosive to copper, copper alloys, aluminum alloys and galvanized surfaces, that the gas is explosive between 16 and 25 per cent by volume in air, and that "Although fire and explosion hazards are not great, the gas is flammable in high concentrations, particularly in presence of combustible materials or oxygen and oil."

The use of ammonia or any other gas in pest control is fumigation. The use of any fumigant introduces many special hazards related to inhalation and explosion as well as the need to comply with additional laws which pertain to fumigation. It is a procedure best left to experienced fumigators.

Avitrols

Phillips Petroleum Company of Bartlesville, Oklahoma has two registered bird control products--Avitrol 100 and Avitrol 200. It is my understanding that the Avitrols have been rather successful against pigeons and English sparrows but less so against birds like starlings, blackbirds and gulls which are difficult to get to accept baits with regularity.

The Association staff has made no special effort to keep in close contact with the development of these products because the Phillips' compounds are not generally available to all of our members. They are only available to licensees who may or may not wish to sell to others.

The Avitrols are used on baits in such a way as to affect a few or more of the birds in a flock. The affected birds are so disoriented that in most cases they frighten away the remainder of the flock. I think that

it is accepted that successful use frequently results in the killing of at least a small percentage of the flock. The labels of these products as furnished by Phillips contain statements such as "Avitrol 100 has lethal effect when consumed in quantity" and "Avitrol 200 grain is lethal to most birds that ingest enough to cause flock frightening symptoms."

Improper use of the material may endanger domesticated animals or protected wildlife and consequently, it should be used by experienced, well-trained applicators usually under the supervision of trained biologists and with the knowledge and approval of Fish and Wildlife authorities. Reports of accidents involving desirable birds and animals cannot be properly evaluated in the absence of published data on the toxicology of the active ingredients.

Sterilization

Efforts to sterilize pigeons and other urban pest birds have had a magical appeal to a number of individuals and organizations who wish to have their birds and at the same time placate those who are injured by the pest species. Chemosterilization of pest populations is a popular concept, one that has been the subject of much publicity and, perhaps, of misplaced optimism. It may be that sterilization will be a practical way of reducing certain problems like those presented by blackbirds and even rural starling populations. But there is no reason to believe that a population of birds made static by sterilization will produce droppings that are acceptable to Food and Drug authorities, to the matron with a "decorated" hat, to the operators of a variety of devices which malfunction if contaminated by birds, or to health authorities responsible for prevention of diseases such as histoplasmosis and cryptococcosis.

Hopefully, practical applications will be found for the sterilization technique, but it appears quite unlikely the method can provide relief for more than a few of the many pest bird problems that are encountered by PCO's.

Protection of Water

A combination of stretched wires and water sprays has been used in Tacoma, Washington to protect open water reservoirs. The wires are strung about 3 feet from the high water level and in a grid with spacings about 40 feet apart. The sprinkler system must cover at least 50 percent of the water surface with spray; permit flexible cyclic operation, and protect the edges of the reservoir, as well as the water, under most wind conditions (Emigh, 1962).

Lights

Revolving lights are moderately priced devices which seem to be easily sold to managers of warehouses, hangers and other structures in

which birds roost. According to advertising and other promotion literature, it would appear that the installation of constantly rotating amber or yellow lights actually frightens pest birds away permanently. On the other hand, there are reports of investigations by U.S. Fish and Wildlife personnel, which indicate, for example, that "Sparrows and pigeons were startled at first, but soon became accustomed to light. Several hundred dollars have been spent on revolving lights but to no avail."

The Fish and Wildlife Service recently commented upon such lights as follows: "The equipment we have had the opportunity to see shows little or no value in bird management."

In the 1965 Survey of our Bird Management Committee, only eight members reported any experience in the use of flashing lights as a bird control device. Of the eight, only one said that they were currently used, and seven no longer used them. By way of evaluation, one member reported that he felt they were useful for special problems.

A year ago I wrote to 17 firms mentioned in the sponsors literature as satisfied users of one of the rotating flashing lights. I inquired from the firms as to the success that they had had with the lights. Of the 5 replies I received, only 1 indicated that they had satisfactory results; and in this case the bird involved was the sparrow.

I presume that such lights create a favorable impression upon un-informed people who are moved by good intentions, but all our information seems to indicate that such lights have very little value in moving birds away from indoor places where they really want to be.

Sound

That birds react to sound and are usually alarmed by foreign noises, is a well recognized fact of life. Fireworks, acetylene exploders, bells, horns and other noisemakers have been utilized in bird control. Each has some application, but there are problems of fire hazard and habituation which limit the situations to which they are applicable. I have chosen two methods for more detailed discussion. They are distress calls and ultrasonics.

Distress Calls

Recorded distress cries have numerous demonstrated or potential uses in the management of pest birds. Specialized equipment is needed to produce the required volume and fidelity of sound under a variety of field conditions. But not only is special and expensive equipment required, but the sounds produced must be chosen and utilized with considerable knowledge of bird identification, populations, habits and habitats. It appears that a well financed and coordinated team effort is required before the potential value of this system can be successfully applied.

Dr. Hubert Frings, who was involved in the early utilization of the

distress call to repel birds (Frings and Jumber, 1954) has had much experience and long interest in the subject. As late as 1964, he stated: "Any pest bird can be controlled by sound." At the same time, he indicated that much time and research might be required and the ultimate results could be of doubtful, economical practicality (Frings, 1964). The use of distress calls is one of several methods being explored for the control of starlings by the joint efforts of researchers in California. After three years' experience and development (Siebe, C. Ed, 1965), they are able to report that:

"This method can prevent starling damage to ripening grapes and figs. A 1-minute broadcast repeated at 10-minute intervals appears adequate to repel starlings, but other species of birds are not affected by the starling distress call. In order to obtain maximum benefit from a distress call system, it is desirable to begin broadcasting prior to buildup of starling numbers. The speakers should be mounted on poles to project the sound effectively over the vegetation and located to take advantage of the prevailing winds. Irregular-shaped fields, interfering trees, strong crosswinds or other detracting influences may reduce the effect range of the sound unit. Where electrical power is not available, a portable unit operating from an automobile storage battery can be used. These units can be mounted on a pickup or temporarily placed at strategic spots within the field as needed. Portable units require more time and attention, but are smaller and less expensive to construct."

Elliott (1964) found that starlings could be frightened from holly groves with the amplified distress call in combination with either acetylene exploders or patrols of men making noise and firing occasional cracker shells,

Seubert (1964) has reported that the English have had limited success with broadcast starling distress calls in orchards and in woodland roosts. It is an important element in the protection of crops in France. Also in France, there is some evidence that the distress call can be used against nesting carrion crows to interrupt incubation of eggs. Distress calls have been used in Holland to move starling roosts and the practice has been successful even without reinforcement by other scare devices. German vineyards and orchards are also protected from starlings by broadcast distress calls, but effectiveness is limited by trees or hedges surrounding vineyards or by wind. Application of the distress call in cherry orchards is made from several speakers all faced in the same direction and controlled by an operator on continuous duty.

Workers in Great Britain report, however, that some pest birds, notably the wood pigeon, seem to lack any call associated with danger (Anon., 1965b). Similarly, vertebrate pest specialists of the California

Department of Agriculture report that band-tailed pigeons can be made to produce no more than a grunting and that requires a pressing down of the thoracic cavity (Anon., 1966). Obviously, distress calls will be useless against such birds.

Ultrasonic Devices

Ultrasonic devices accompanied by claims for repelling or controlling birds have come and gone during the past few years. Because some are still with us, and we shall probably see others, a review of current knowledge is in order.

The hearing range of man is between 20 and 20,000 cycles per second. Vibrations above that range are not heard by man and are called ultrasonic.

Some limitations of ultrasonic sounds are:

1. At higher frequencies sound travels more like light and leaves "shadows." Thus, a mill, food processing plant, warehouse or store would require many loudspeakers if all areas were to be flooded with sound.
2. Such sounds diminish in air more rapidly than do ordinary sounds. Consequently, a great amount of energy would be needed to develop the required coverage of ultrasonic sound.
3. Not all pest animals cooperate by being able to hear ultrasonic sounds. Rodents and some insects can; birds generally cannot. See Table.

Frings and Cook (1964) have reported on additional tests with adult European starlings captured in Pennsylvania. The birds were conditioned to sound by shock avoidance techniques and soon learned to respond to sounds of known pressures and frequencies between 7,000 to 14,000 cycles per second. Then the birds were tested at 14,000 to 35,000 cps for more than a year. During July through September of the first year many of the birds responded to sound frequencies from 17,000 to 28,000 cps. Response to frequencies above 20,000 cps stopped at the end of September and after May 6 there was none above 16,000 cps, although the tests continued to August 4. This shift in ultrasonic limit has not been explained. These authors concluded, however, that the most probable stable ultrasonic limit is about 16,000 cps.

The literature on the subject which has been reviewed does not provide us with a logical explanation for the claimed value of ultrasonic methods of bird control. We can hope that research will continue in this area as it would be very useful to be able to apply some type of radiant energy that would effectively repel birds without harm to property, humans or the birds themselves. For the present, however, we cannot believe in "magic" and must await a convincing demonstration of what force is at work and how it can be used in a practical way.

Table - Hearing Ranges for Several Species of Birds
(Adapted from Frings and Slocum, 1958, except as noted)

Common	Name		Limit in Cycles per Second	
	Scientific	Lower	Upper	
Canvasback	<u>Aythya valisineria</u>	190	5,200	
Ring-Necked Pheasant	<u>Phasianus colchicus</u>	250	10,500	
Feral Pigeon	<u>Columba livia</u>	200	750	
Horned Owl	<u>Bubo virginianus</u>	300	8,000	
Horned Lark	<u>Otocoris alpestris</u>	350	7,600	
European Starling	<u>Sturnus vulgaris</u>	700	15,000	
			16,000	(Frings & Cook 1964)
Canary	<u>Serinus canarius</u>	1,100	10,000	
Snow Bunting	<u>Plectrophenax nivalis</u>	400	7,200	
Hairy Woodpecker	<u>Dendrocopos villosus</u>	30	18,500	(Ramp, 1965)
English Sparrow	<u>Passer domesticus</u>	675	11,500	

A concise summary of what is required in order to utilize the potential value of acoustical methods in bird control is given in the following paragraph from the review article in Sound by Frings and Frings (1963):

"Regardless of what acoustical method is used to attract or repel birds, it is obvious that mere sounds are not enough. Under any circumstances, it is necessary to know the habits of the birds and to study their behavior carefully. Management of populations is of prime importance. Practical use of acoustical methods will necessitate long and careful studies upon the life histories, environmental relations, behavior, even genetics of the birds if they are to be successful."

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DISCUSSION

DR. GILTZ: You suggest a question to me, "What's the next step?" I've run into the next step so often. Now, I think that it's up to the

manufacturer to develop some of these sound-producing devices to eliminate the pitfalls, to train people to use them, on a specific crop or in a specific situation. Just the decoy trap, or the baiting experiment, it takes trained people to do it. The biologist is not going to go very much farther than uncovering these things and establishing the use of them in the literature. The man who controls the animals isn't going to go much farther. It takes a manufacturer here to pick it up and go. In scaring birds, one of our problems is feedback we get from the neighbors. There are some ways to eliminate this, if sounds do affect birds in corn (although, again, it takes a trained operator to do it), maybe there's a way that we can apply this. In 1958, it appeared that we had an alarm cry that scared birds out of corn in the fall of the year. We suggested that this might be broadcast in one community from one radio station to all of the fields in the area. We didn't think then but what we'd broadcast it on big loudspeakers, it would shoot out over the whole field. Since 1958, little pocket-sized transistor radios have been developed which are just a few dollars apiece. Instead of placing a couple of big speakers in the fields, why not put a lot of little ones throughout the field. This call could be broadcast from the farmhouse whenever the need arises. Though we don't have any electronics engineers in the audience, this appears to me to be a step in the right direction.

J. STECKEL: We mentioned this morning something about the inclusion of calcium cyanide in a water spray, and this was something we just played with. We don't know anything about it from a technical standpoint. Then Phil begins to talk about fumigation, and calcium cyanide came up. Phil, can you give any knowledge—is this a possibility? What are the hazards?

DR. SPEAR: Since you broached the subject this morning, I haven't had a chance to analyze the situation, nor gather any information. I'm no help to you, Jim.

J. STECKEL: I thought you carried it all in your head.

DR. SPEAR: Thank you.

L. QUATTROCHI: I'm going to add some more problems. Did I understand you correctly, Phil, that you were pointing out that we do have a recommendation as a possible agent for control, recommending that these birds can be killed with a fumigant? Then when we look into the next column, we find that there is no labeled usage for the product in that area. This again falls into the same sequence. The recommendation without label coverage is more or less useless.

DR. SPEAR: This point I tried to make is that HCN or methyl bromide to take two common fumigants have a broad application, and it is understood that their use results in the elimination of all animal life in the enclosure. I think that this is a somewhat different situation than that in which something like DRC-1339 is being considered for the management of bird populations where some are expected to be protected and some are expected to be removed. I do think that USDA might interpret that the broad usage of a fumigant would be expected to result in the killing of everything in the enclosure. That when you enclose it, it's at that time when you determine whether everything is to be killed. Fish and wildlife men working in this area might differ.

DR. BALSER: Some of the things that we've tried in years past, like chlorine gas, have been found extremely difficult to control under field conditions like roosts and tree roosts. Everyone who has worked with this technique is a little leery about being able to predict what the results will be.

DR. SPEAR: I'm glad you brought that point up, because I am thinking about only those operations inside structures and had no intention of suggesting the use of anything outside of a structure. I'm talking only about birds in an enclosed structure, and the birds are destroyed within the building.

K. BORTZ: What is the attitude of NPCA toward those companies which trap birds then introduce a fumigant into the trap to kill the birds?

DR. SPEAR: I'll repeat the question as: What is my attitude toward pest control companies who trap birds and destroy them by fumigation? If the fumigant is one which is appropriate for this use and will cause prompt death of birds that are not protected, I'd say this is a fine way to do it, if you can do it safely.

DR. JACKSON: Don Lieb of Huron, Ohio, had something to say about a couple of gadgets.

D. LIEB: A year ago I stuck my neck out for bird control because it looked real easy, along with our other pest control work. The first job I had was a three-story bank building with a flat roof. We prebaited the roof area, then baited with Avitrol cracked corn. We wanted to do this work on the flat roof so there would be no displays at street level. But I only got 80% of the birds. These 12 remaining birds were resting on a ledge about 15 feet below the top of the roof. The problem was to get the bait to that ledge.

My company also works a factory which makes flexible metal tubing. I took some of this tubing and partly crimped the bottom end. Then

from the roof I could swing this tubing, and place the end on the ledge about three inches from where I wanted my bait without any danger of wind blowing it or moving it. You take a small cup with bait and pour this through the top and it goes down the tubing, and into place on the ledge. It works. You can buy this kind of tubing in any electrical store; it isn't expensive and it coils up and can be carried on the truck at all times.

Another gadget which developed from working for an aluminum awning company which processed 3/4 inch and 5/8 inch tubing. We do spider jobs where people ask us to remove webs. In bird control we also remove bird nests from high places. We also can remove wasps nests. Put a bolt through the midline of the 3/4 inch tubing about three inches from the bottom; slot the other tube (5/8 inch) so that when it is placed into the bolted end of the larger tube, the slot connects with the bolt and holds steadily. By carrying two pieces of tubing on your truck (about four to five feet each) you can do some of these jobs with your combined eight or ten foot reach without having a ladder. This is fine for taking down bird nests.

We also discovered that we can attach the bottom end to a cyanide foot gun and with just a couple of puffs, can force the gas out of the top under a wasps nest. I just thought someone could benefit with this gimmick. It's not patented, and you can pick up the materials anywhere, and it's simple to make.

DR. JACKSON: Those of us in Ohio are fortunate to have Don around; he sends out the Newsletter of the Ohio Pest Control Association. We get these gems of wisdom coming periodically. I'm glad to see him in action. Thank you, Don.

Just a word of final appreciation first to the speakers who have done a tremendous job of bringing in a diverse field of views. Also thanks to the 100 of you who have gathered here for two days and some for three days. A word of thanks to Dave Schneider who has borne the burden of administrative detail all summer long while I've had a chance to enjoy the South Seas. Also, thanks to my other grad students who have been involved in the background in unsung roles of driving to the airport and back, carrying things from here to there, this sort of thing. This brings us to the formal conclusion, though there will be informal aspects continuing.

R. SMITH: I think that we owe you a word of thanks for organizing this.