Dead birds collected on the area were shipped to Patuxent for chemical analysis on July 9, 1958.*

Whitehall Plantation had approximately 900 geese on the area being used in conjunction with its cotton farming operation. At the time of the application, all the geese were in the fields. On the morning of June 29, some geese appeared sick and on the afternoon of the same day, 11 geese were found dead and approximately 60 geese appeared sick. Immediately the manager of the plantation removed his geese from the fields and put them in enclosures. Geese died at the rate of 2 to 29 per day until July 6 for a total kill of 95.

One nestling dove and 2 young mocking birds were found dead along the fence row on the fourth day after spraying. There has been a decrease in the total number of adult doves observed along each row.

Night censuses on Whitehall Plantation showed very few animals.

Estimated bird population for the control area, before and after spraying, show that before spraying an average of 41.9 birds per mile were observed along the 3 mile census route, while after spraying the average increased to 49.4 birds per mile. This is not considered significant as the population normally increases during the summer.

A COMMENTARY ON THE FIRE ANT PROBLEM

(Based largely on reports by Messrs. Rosene, Allen, Lay, Baker and Glasgow at the 12th Annual Conference of the Southeastern Section of the Wildlife Society and the Southeast Wildlife Conference.)

By CLARENCE COTTAM, *Director*
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Ladies and gentlemen of the convention:

We have listened to five well prepared and thoroughly documented reports by mature and experienced wildlife research workers who have, in a relatively short period of time, attempted objectively to determine the immediate effects of the Federally directed fire ant "eradication" program upon wildlife in our Southern States. It is to be noted that in the course of their studies these workers (and their assistants) represented the Federal Fish and Wildlife Service, two great Universities (Louisiana State University and Alabama Polytechnic Institute) and two prominent State Game and Fish Commissions (Texas and Alabama). It is also significant that these men have worked largely independent of each other in different states and in varying biological habitats yet their results and conclusions show an amazing degree of similarity. Their unanimous conclusion is that very serious and widespread damage is resulting from the present program as it is being directed by our Federal Government's Plant Pest Control Division.

From my twenty-five years as an official of the Federal Wildlife Service, I am fairly well acquainted with the Gulf Coast States where this ambitious program is being applied, and I have devoted a little time to a field study of this control program as applied in East Texas. Also, I have read almost everything that I have been able to obtain pertaining to the fire ant and to the effects of the control program. Over the years I have had experience and contact with various other control programs.

* From a sample of three geese and fourteen songbirds, all except one of the songbirds showed the presence of heptachlor epoxide in sufficient quantity to attribute death to the insecticide.

* Contribution No. 26, Series A.

SERIOUS CONSEQUENCES OF FIRE ANT CONTROL ON WILDLIFE

I am not opposed to legitimate and wisely directed control operations where all factors and benefits are properly considered and evaluated and where control is applied to meet a proved public need. Based on most of the facts that I have thus far seen, I am forced to conclude that the fire ant program as presently directed is a good example of how not to proceed. It seems to me the present operation is immature and irresponsible and, perhaps, it may be doing more public harm than good—even without considering the millions of dollars of Federal, State and local funds (mostly tax dollars) being used in the process. It appears that the control procedure is so drastic and destructive that it is analogous to scalping the patient to cure dandruff! The cure seems to be far worse than the disease.

The five main reports of this session leave no doubt that damage is widespread and serious to animal life in areas treated with aerial application of the poisons. We are told that these are made at the rate of twenty pounds of 10% granular form of heptachlor or dieldrin per acre. This, of course, is equivalent to two pounds of technical material per acre. The records indicate that these highly toxic chlorinated hydrocarbons are from ten to twenty times more deadly than is DDT which has been used most commonly in insect control operations since the war years. Experience has shown that if the granulated materials are evenly applied at this standard rate by air it leaves a residue of seven to twelve granules per square inch of land treated. It is obviously quite impossible for a ground bird or other terrestrial animal to cross treated areas without contacting poisons at every step. The seriousness of this is apparent when it is realized that each of these potent poisons is extremely toxic either a contact poison or when taken internally.

EFFECTS ON DOMESTIC ANIMALS

Not only do these aerial sprays decimate the wildlife and frequently leave an area almost a biological desert, but the damage is by no means confined to wildlife. On many areas that have been treated for fire ant eradication and where the results have been investigated by wildlife biologists, farmers have volunteered information concerning the loss of livestock following such treatment. These losses have included many kinds of domestic animals such as cats, dogs, cows, pigs, sheep, goats, horses, turkeys, geese and chickens. Losses have been diagnosed as being due to chlorinated hydrocarbon poisoning. It seems incredible that these losses should occur only on treated areas and yet merely be incidental to the control operation. Any information obtained on the effects of these poisons on domestic animals certainly is of help to the wildlife biologist.

In reporting a meeting at Bainbridge, Georgia, on July 28, 1958, the Alabama Department of Conservation, in its press release of July 30th said: "Farmers and ranchmen meeting here Monday with officials of the Georgia and U. S. Department of Agriculture complained bitterly that heavy losses of livestock, poultry, wildlife, songbirds and fish followed application of heptachlor and dieldrin for control of imported fire ants." They sought payment for their losses. Veterinarian O. L. Poitevint reported loss of about 100 head of cattle. He stated that reproduction failure occurred, which he attributed to these poisons, in 100 to 150 brood sows. He added that large numbers of chickens, turkeys, goats and sheep and other farm animals died as a result of fire ant control. There were no similar deaths or reproductive losses in surrounding untreated areas. He added that animals died suddenly with fits and convulsions characteristic of this type of insecticide poisoning. On one farm fifteen cows and calves died in one day. Chemical tests of one specimen reported to date revealed large quantities of the poison in the brain.

INDISCRIMINATE CONTROL

It is obvious that such dangerously toxic materials should be applied with caution and understanding of the probable consequences. Furthermore, they should be applied only where there is an overwhelming need and where less drastic and damaging controls cannot be successfully employed. Certainly, they should not be broadcast from the air to kill fire ants where there are few or

no fire ants on the ground! If my own observations are sound, as I believe they are, and if the information obtained from others is correct, hundreds, if not thousands, of acres have been sprayed where few or no colonies of ants could be found! Such disregard of other public resources is inexcusable and doubly so when directed by a Federal agency that should be the zealous champion of public interest. This, I believe, is a case of bureaucracy at its worst.

It would seem that the economics of aerial treatment would prevent use of this costly method of control except when and where the ants are rather widely distributed and reasonably abundant. When tax dollars are involved, the moral obligation of bureaucracy to use public funds with maturity of judgment sometimes seems to be sadly disregarded. Are we undermining our own democracy in such a procedure?

It is of interest to note that a number of our best authorities on the fire ant are far from enthusiastic about the program that is being followed and the type of information that is being put out by the sponsors of the program. The funds requested and appropriated by the Congress, I believe, were given on the basis of this being an "eradication" program. The approach, however, seems to be largely, if not entirely, one of operational control. Was this appropriation obtained under false pretenses and is the present approach ethical?

In his report to the Conservation Foundation of New York, Dr. John L. George accurately and succinctly summed up the situation when he said, "It is evident that although much is known about the fire ant and still more is alleged, there is considerable misinformation as well." Unfortunately, most of the observations made by the research entomologists of the U. S. Department of Agriculture have only recently been published.† Dr. F. S. Arant, an authority of recognized standing in entomology and head of the Department of Zoology and Entomology of the Alabama Polytechnic Institute writes under date of June 30, "There is much misunderstanding regarding the economic status of the imported fire ant. In Argentina, it is considered beneficial . . . Our research proves that it feeds to a large extent on insects and that damage to crops is of minor importance. The fire ant is not ruining our livestock program or agricultural production . . . Excellent control procedures have been developed by the Alabama Polytechnic Institute's Agricultural Experiment Station. When treatment is limited to individual fields and pastures where control is actually needed, the insecticides used as recommended cause no serious hazards to wildlife or domestic animals."

It seems not unfair to say that leaders of the control movement have been guilty of broadcasting misinformation and half truths and perhaps withholding facts that the public should receive. They have repeatedly maintained that the control helps wildlife or at least it cannot cause any appreciable harm because the fire ants cause serious wildlife losses. It is significant to note that careful studies in areas of the densest fire ant population show quail, a ground nesting and ground inhabiting species, with some of the highest production and populations in the State of Alabama and probably higher in most of those areas than they were forty years ago when the Argentine fire ants arrived. Studies of population turnover reveal that quail production remains as favorable in these ant-infested areas as in any other sections of the state without fire ants.

It seems significant also that where dieldrin or heptachlor have been aerially sprayed over the total home ranges of quail and other wildlife, mortality of all species has been exceedingly heavy and surprisingly uniform regardless of soil type, soil moisture, rainfall, topography, slope, or vegetative cover.

INDIRECT AND LONG-TIME EFFECTS OF CONTROL

A major criticism of the control program involves the use of stable deadly poisons used at alarming concentrations with the expectation that the killing power will remain on the areas treated for several years (possibly three to five or even longer) and with little research on what effects such concentrations of poisons will have on other interests and resources. Almost nothing is known

† Observations on the Biology of the Imported Fire Ant. August, 1958. U.S.D.A., A.R.S. 33-49.

of the long-time and indirect effects of these poisons upon soil organisms, beneficial insects, wildlife, domestic stock or upon humanity itself.

It is of interest to note that the imported fire ant has been with us for forty years, yet apparently relatively little Federal concern or basic research has been undertaken until recently. Certainly, little or no preparation had been made in advance for this gigantic and drastic "eradication" program.

DeWitt ‡ has shown that we can expect that there may be serious indirect consequences. From laboratory experiments he found that these highly toxic chlorinated hydrocarbons not only are extremely lethal in minute quantities but that these poisons are accumulative and that young birds hatched from parents that had ingested minute sublethal doses of poison show a much higher mortality after hatching and that sterility or partial sterility often follows in those young that do survive. He found that one two-hundred-thousandth (1/200,000) of an ounce of dieldrin per day in the food of pheasants resulted in eggs of low hatchability and chicks subject to abnormally high death rates. Because of size difference there is every reason to conclude that the effects of similar dosages of the poison is even more damaging to quail.

There is no reason to expect that the indirect effects of these dangerous poisons will be any less damaging to man or his domestic livestock. One of America's foremost blood authorities has concluded that there is a close parallel between blood cancer and the application of poisonous chlorinated hydrocarbon sprays. The risks are too high for such foolhardy irresponsibility as we are witnessing in the present fire ant control program.

A total of approximately 700,000 acres was treated by September, 1958. This large-scale application of such lethal and relatively non-specific control methods that have been so inadequately investigated is indefensible. Until much more is known about the good and bad effects of the ant and the dangerously poisonous insecticides used in control, it would be in the public interest to halt the control program and especially the indiscriminate aerial applications. The remaining fire ant funds should be transferred to research.

‡ Dewitt, James B. 1955. Effects of Chlorinated Hydrocarbon and Insecticides Upon Quail and Pheasants. Agriculture and Food Chemistry. 3 (8):672-676.

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PROGRESS REPORT ON ALABAMA BOBWHITE QUAIL WING STUDY *

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and

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Sound game management is dependent upon accurate information about annual production. Data on production of bobwhite quail *(Colinus virginianus)* may be obtained from study of wings of birds bagged during the hunting season. A trained person can determine (1) whether the bird is an adult or a "bird of the year" and (2) the approximate date of the hatch, provided the bird isn't over 150 days old (Petrides and Nestler 1943, 1952). Such data may be useful in adjusting the length of the hunting season and for explaining changes in populations. Data obtained on chronology of the hatch may provide clues to reasons for failure or success of the hatch and should yield sound information