

TOXICITY OF DDT TO FISH. By Joseph M. Ginsburg, New Jersey Agricultural Experiment Station, New Brunswick. Author's abstract of a paper read at the Entomological Society meetings in New York City, December 13-15, 1944.

Observations in the course of field experiments with mosquito larvicides containing DDT have shown this chemical to be toxic to black bass, catfish and salt water minnows. Laboratory experiments, conducted during the summer of 1944, with various concentrations of DDT in the form of (1) colloidal solutions, (2) oil emulsions, and (3) dusts, have brought out its rather high toxicity to goldfish. It appears from these experiments that DDT is most toxic to goldfish when in colloidal solution, less toxic in the form of oil emulsion applied on the surface, and least toxic when applied on the surface in the form of dust. In each case, however, the toxicity is sufficiently high to caution against unrestricted use of DDT on mosquito breeding waters where fish, worth preserving, prevail.

Author's Abstract.

DDT RESIDUAL HOUSE SPRAYING IN RURAL AREAS—COSTS AND EFFECTIVENESS. By Frederick L. Knowles and Clinton S. Smith. Abstract of a paper read at the Entomological Society meetings in New York City, December 13-15, 1944.

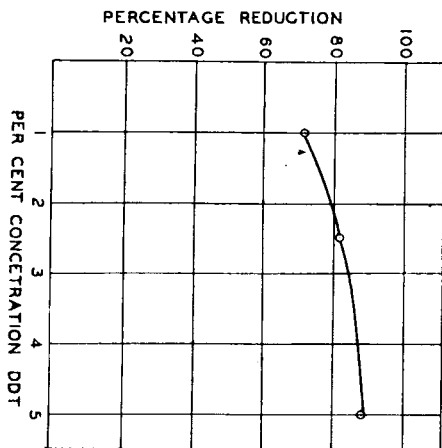


Fig. 1. Percentage reduction of resting female *A. quadrimaculatus* adults in sprayed houses compared to unsprayed houses plotted against DDT concentration of spray (a 5% DDT spray produces a deposition of 64 mgs. of DDT per sq. ft.)

To determine the effectiveness as well as the cost of DDT residual house spraying as a possible practical method of malaria control in rural areas, the Office of Malaria Investigations, during the summer of 1944, sprayed 513 tenant houses in a rural area, approximately 36 square miles in extent, near Helena, Arkansas.

Detailed records were kept of the time required for each operation and the quantity of materials used. For a two-month period following the spraying operations, the sprayed houses as well as unsprayed houses were carefully searched for resting adult *A. quadrimaculatus* mosquitoes.

The operations data show that an average of 2,400 square feet in each of 20 houses were sprayed per day; that the average amount of spray material per house was 0.82 gallons and that the total time per house was 21.8 minutes, approximately half of which was traveling time. Two operators were employed, so that in terms of man-hours and cost each house required 0.73 man-hours at a cost of 35 cents, and 0.82 gallons of spray is estimated at 39 cents, so that labor and material costs for each house were 74 cents.

Inspection of 166 unsprayed houses and 174 sprayed houses for resting adult *A. quadrimaculatus* showed for the two-month period following spraying a reduction of the mosquito population in the sprayed houses of 94, 81, and 66 per cent for the 5, 2½, and 1 per cent DDT concentration spray, respectively.

Author's Abstract.

TOXICITY OF DDT FOR MAMMALS. By Herbert O. Calvery, Chief, Division of Pharmacology, Food and Drug Administration, Federal Security Agency, Washington, D. C. Abstract of a paper read at the Entomological Society meetings in New York City, December 13-15, 1944.

This presentation consists of a brief resume of our toxicological studies of DDT along the following lines:

1. Acute and subacute application to the skin of rabbits, rats, guinea pigs and dogs.
2. Acute and subacute feeding to rats, mice, guinea pigs, chicks, rabbits, dog, sheep, horse, cow.
3. Chronic feeding to rats and dogs.
4. Skin irritation and sensitization.
5. Pharmacological investigations as to the site and mode of action.
6. Gross and microscopic pathology and blood studies of poisoned animals.

In solid form DDT applied topically to the skin is nonirritating, nonsensitizing and not appreciably absorbed. In solution, either in oil or in organic solvent, it does readily penetrate the skin, is very mildly irritating and a very mild sensitizing agent.

In single and multiple dose administration (acute and subacute) there are wide individual as well as wide species variations.

In the prolonged feeding experiments (chronic toxicity) rats have been fed for about 18 months diets containing 100, 200, 400 and 800 p.p.m. Guinea pigs, dogs and monkeys have been studied for shorter periods.

The pharmacological manifestations of effect from DDT are principally loss of appetite, mild to severe tremors of central nervous system origin, convulsions and death. Tremors can be prevented or abolished by general anesthetics and narcotics.

Histopathologic examination of tissues of animals which have received DDT shows tissue damage, but it is neither striking nor characteristic for all species.

Author's Abstract.

A STUDY OF DINITRO-PHENOL COMPOUNDS AS MOSQUITO LARVICIDES. By H. I. Magy and W. M. Hoskins. Abstract of a paper read at the Entomology Society meetings in New York City, December 13-15, 1944.

Solutions of 3, 5 dinitro-*o*-cresol, 2, 4 dinitro-6-cyclohexyl phenol or dicyclohexylamine salt of 2, 4 dinitro-6-cyclohexyl phenol are toxic to larvae of the mosquito *Culiseta incidens* only at relatively high concentrations, but if only small amounts of suspended particles of the two latter compounds are present high mortality results within 24 to 48 hours or less. Hence they function as stomach rather than as contact poisons. Field trials with dusts applied in the weeds and reeds along an irrigating ditch gave high kill of *Anopheles maculipennis* larvae with dusts containing 10 per cent 2, 4 dinitro-6-cyclohexyl phenol or 40 per cent of the dicyclohexyl amine salt, each applied at rate of 50 pounds to the acre. Author's Abstract.

ECONOMIC ENTOMOLOGY AND APPLIED ECOLOGY. By Z. P. Metcalf. The interrelations between economic entomology and ecology are numerous and very close. In fact there is a science of economic entomology today because the early settlers on this continent disturbed the ecological climaxes that had developed here. A great deal of time, energy and money are devoted to the control of insect pests of farm, field, orchard, and garden. Much of this effort is wasted because the methods of control must be our chief reliance in dealing with the pests of orchards and gardens where a slight amount of damage detracts greatly from the use-

ability of the products. This is especially true in orchards where rotation and other similar practices cannot be followed. But for most of the field crops, where return per acre is so low that the application of insecticides is impractical, indirect methods of control based upon ecological principles must be used.

Author's Abstract.

THE RELATION BETWEEN THE TOXICITY OF DDT AND THE POSSESSION OF A CHITINOUS EXOSKELETON IN ANIMALS. By A. Glenn Richards, Jr., and Laurence K. Cutkomp.

Analyses of DDT toxicity through the series of animal phyla showed high toxicity only for those groups which possess a chitinous exoskeleton. The most critical data come from studies on closely related forms of Coelenterates with respectively complete, partial and no chitinous cuticle (perisarc). A negative temperature coefficient for DDT action under certain conditions favors the idea that the reaction involves adsorption phenomena, though clearly other phenomena are also involved. Direct tests with isolated chitinous cuticles and purified chitin show that DDT can be adsorbed by such exoskeletons. Tests with several standard cell systems show less, usually negative, results.

These data are consistent with the hypothesis that the arthropod cuticle is a system which selectively concentrates DDT by adsorption phenomena and somehow transmits it to its effective locus within the animal. This concentration phenomenon may be, in a sense, independent of the physiological action of DDT within the animal.

Authors' Abstract.

Editor's Note: There remains the question why, of equally chitinized and rather closely related insect species, some may be easily killed by DDT, while other are highly resistant.