TOXICITY OF THREE PHOSPHORUS INSECTICIDES TO COLD WATER GAME FISH

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Recent experimental work by Gahan and Mulhern (1955) and by Gahan and Noe (1955) on the control of mosquito larvae in irrigated pastures or rice fields has demonstrated considerable promise for solubilized toxicants introduced by the drip method (Gahan *et al.*, 1955). Tests of this technique with three phosphorus insecticides were planned for pastures at Fort Klamath in central Oregon for June 1956. However, as the tail waters of irrigation are returned to the streams and the canals themselves often contain substantial populations of trout, it was deemed advisable to do preliminary toxicity tests with fish. For this purpose the Oregon Game Commission Trout Hatchery at Klamath Agency, Oregon, provided all facilities and fish.

Hatchery troughs 31 feet long, 14½ inches wide, and 7¾ inches deep were provided for the tests. Spring water at 46° F. entered the troughs from a pipe so as to cause a turbulence assuring thorough mixing, and midway of the trough a spillway dropped the water about 8 inches to remix and aerate the flow. Flow was regulated to a constant 10 g.p.m.

Continuous application of the insecticides was accomplished with the automatic drip dispenser. Parathion was introduced as a solubilized formulation containing 20 percent of technical parathion and 80 percent of Triton X-100. Dipterex and Phosdrin were introduced as aqueous solutions.

Five fingerlings and three 8- to 10-inch legal-size Rainbow and/or Eastern Brook trout were used in each experiment. The trout were confined in wire fry baskets approximately 25 feet from the point of introduction of the insecticide.

PARATHION caused no mortality of fish when dispensed at rates of 0.05, 0.1, 0.5, and 1.0 p.p.m. over periods of 14, 14, 28, and 28 hours, respectively. Excessive foaming of the formulation made higher concentrations impossible, but these results indicate that mortality of trout is unlikely at the low concentrations (0.01 p.p.m.) needed to kill mosquito larvae.

DIPTEREX also appeared not to affect fish held in water treated with 1 and 10 p.p.m. for 72 and 24 hours. In all cases the fish were held for at least 48 hours after the toxicant was discontinued, for observation of possible delayed effects. Dipterex is effective against mosquito larvae at 0.2 p.p.m.

PHOSDRIN was indicated to be highly toxic to trout in these tests. Complete kill of fish resulted at rates of 0.05, 0.1, 0.5, 1.0 and 10 p.p.m. introduced over periods of 72 and 4 hours, 80, 30, and 15 minutes, respectively. Fish exposed for 180 hours at 0.01 p.p.m. showed symptoms of poisoning but were not killed. One of 10 Eastern Brook fingerlings exposed to 0.025 p.p.m. for 156 hours died.

Poisoning could be arrested by removing the fish to uncontaminated water. Fish so handled appeared to recover completely within a few hours. Age or species did not exhibit any marked influence on the susceptibility to the insecticide. Mosquito larvae confined to the treated troughs were not killed at rates of 1 p.p.m. or less, and thus were less susceptible than the fish.

References Cited

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