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MONTANA STATE DEPARTMENT OF FISH AND GAME
FEDERAL AID IN FISH RESTORATION SECTION
HELENA, MONTANA

JOB COMPLETION REPORT
INVESTIGATIONS PROJECTS

State of Montana

Project No. F-21-R-3 Name Evaluation of DDT Spraying

Job No. III Title Bio-Assays on the Toxicity of DDT to Fish and Fishfood Organisms

Period May 1, 1958 - April 30, 1959

Abstract:

During the summer of 1958, thirty three experiments under controlled cold water conditions were conducted at the Ovando Hatchery to determine the effects of DDT on brown trout and rainbow trout.

Objectives:

Extensive studies have been and are being made on trout streams by a cooperative study of the Montana Fish and Game Department and the U. S.Forest Service. These extensive studies are being made to determine effects of forest spraying with DDT on fish and fishfood organisms. To better evaluate the extensive studies and the test stream study it is necessary to conduct laboratory investigation on the toxicity of DDT to fish and fish-food organisms under various conditions. It is the objective of this job to: (1) study the toxicity of various concentrations of DDT considering physical and chemical conditions, and time and type of exposure; (2) study the physiological effects on the fish.

Techniques Used:

During the 1958 testing program the same standard procedure was used as adopted during the 1957 testing program.

Thirty brown trout, 10 to 20 inches in length, were subjected to a concentration of one ppm DDT suspended in oil and held until fall to determine the effects of DDT on brown trout spawning. This phase of the testing program was a failure due to the escape of the test fish from the holding pond into a stream before the experiment was completed.

A statistical design was set up by the Mathematics Department at Montana State College to determine the effect of three environmental factors upon the rate of fish mortality caused by DDT. In this statistical block the DDT concentration and wild rainbow trout were used as constants. Temperature, total alkalinity and turbidity were used as the environmental variables each with a high and low range.

Four repetitions of eight environmental combinations were conducted.

Findings:

The data has not been analyzed to the point where positive conclusions may be drawn.

Recommendations:

That the bio-assays be continued for conducting experiments considering:

1. Feeding test fish with insects killed by DDT followed by a Starvation period.
2. Physiological condition factor in relation to mortality.
3. Relation of aquatic vegetation to toxicity.
4. Delayed mortality
5. The relation of DDT to spawning mortality in brown trout.
6. Bio-assays on other species of particular importance in Montana.

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Approved by George D. Holton

Date June 23, 1959