

# Effect of Fluridone on *Trapa Natans* and *Phragmites communis*

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## INTRODUCTION

In Northern Greece, from W. Macedonia to Thrace, there is a substantial number of lakes with a total surface area of more than 500,000 ha. In the last decade, the fish production of these lakes is continuously decreasing because of the problem of pollution with domestic and agricultural wastes. Considerable effort is needed to control the flora, both micro and macro, to improve the fish production of these lakes. Therefore, the use of a herbicide like fluridone (1-methyl-3-phenyl-5-[3-(trifluoromethyl)]-4(1H)-pyridinone) for the control of water chestnut (*Trapa natans* L) and spire reed (*Phragmites communis* Trin.), which contribute significantly to the problems in most of these lakes was considered essential, as no other research has ever been done on the effect of this substance on these aquatic weeds (1, 2, 3). However, before extensive control programs for the control of the aquatic flora with fluridone are initiated it was decided to test the action of this substance, under natural conditions.

## MATERIALS AND METHODS

An experimental basin was constructed, alongside lake Mitrikou and a part of it, measuring 12x80 m and from 30 cm to 70 cm depth. The basin was separated from the lake by a barrier 80 m long. The basin was covered by two thirds with water chestnut and spire reed.

The pond was sprayed on July 19 with fluridone (4AS) at a rate of 1.0 kg/ha. To maintain the water level of the pond, water was supplied, when required, from the lake with a motor driver compressor pump. The temperature, pH, D.O. and conductivity of the pond was monitored daily with a MARTEK automatic recording analyser. Additional observations, as regards the flora and fauna of the pond and certain physicochemical water parameters were made on July 20, July 28, August 12, August 16 and September 2, 1983.

## RESULTS AND DISCUSSION

Nine days after fluridone application, a change in colour of water chestnut from dark green to yellow-orange was noted. In the subsequent period, the weeds were completely decomposed and settled into the pond 29 days after treatment. It is important that, in this period, although the weeds were settling, the effect of fluridone on the weeds was very effective, causing them to decay. The effect of

fluridone on spire reed was less pronounced and the weeds were controlled at a percentage of 50-60%. Another formulation or its application at a higher rate might have a better effect. After herbicide treatment and until the end of the experiment (September 2, 1983) the fish in the pond showed no gross lesions or other toxic symptoms. Noticeable effects were not observed in the rest of the pond fauna (small fishes, frogs, insect larvae, etc.). Changes in pond water quality following treatment compared to those of the lake could not be considered significant and/or likely to cause any problems to the water ecosystem. The most noticeable change observed after fluridone application was that of the oxygen concentration in the water. The levels of oxygen in pond water before treatment were from 6.2 to 6.8 mg/l and those of the lake 5.2 to 5.7 mg/l. One day post application, oxygen levels decreased to 5.4 mg/l and continued to decline until day 14 (4.0 mg/l). Thereafter, oxygen concentrations started to increase and resumed its normal levels on day 25 (6.0 mg/l).

In the same period, slight changes were also observed in the pH. While the pH was 6.2 before application (in the lake from 5.8 to 6.2) it was reduced in the pond to 5.5 on day 12 and reached almost prior application values (6.0) by day 29. The water conductivity was slightly altered in the post treatment period, but again normal values on day 46. Small changes were also observed in the concentration of sulphates (SO<sub>4</sub><sup>-2</sup>) and phosphates (PO<sub>4</sub><sup>-3</sup>) until day 29 post application. Contrary to the other parameters, pond water hardness showed an upward trend. From 105 mg/l CaCO<sub>3</sub> before treatment, to 125 mg/l CaCO<sub>3</sub> on day 9 and it reached a maximum of 135 mg/l CaCO<sub>3</sub> on day 46 post treatment.

The results of this experiment have demonstrated the direct and effective action of fluridone on water chestnut. Fluridone was less effective in controlling spire reed although its efficacy ranged from 50 to 60%. Toxicity effects which could be attributed to fluridone were not observed in *Cyprinidae*. Further the fauna of the pond was not adversely affected. Some, mostly insignificant changes of the water parameters were recorded, but returned to initial values by day 29 after fluridone application.

## LITERATURE CITED

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