University of Zabol

Postgraduate administrator

Faculty of Natural resources

Department of fisheries

The Thesis submitted for the degree of MSc. (in field of Fisheries science)

Effects of stocking density on growth performance, immunity and stress of Oncorhynchus mykiss ittalic in reservoir ponds (rectangular, round and octagonal) in Sistan area

Supervisors:

Ali Arshadi (Ph.D)

Advisor:

Abdoll Ali Rahdarie (Ph.D)

By:

Mahmood reza sargolzaie

September, 2020

Abstract:

Due to severe limitations on water resources in Sistan region, ponds construction for both water storage and agriculture purposes is necessary in order to optimal use of small water resources, which are in fact the real sources of white protein, and can promote job creation and sustainability in rural development. The present study was conducted to investigate the effect of density (10, 15, 20 fish/m^2) and pond shape (rectangular, round, and octagonal) on growth performance, nonspecific immunity and stress of rainbow trout during 5 months. The water physical and chemical parameters were measured during experiment. Feeding rate was determined every 15 days according to fish biometry. At the end of the experiment, growth indices, nutrition parameters and blood factors were measured. The results showed physico-chemical factors of octagonal ponds had significant different with others ($p \geq 0.05$). The hematological parameters including RBC, hemoglobin, hematocrit, MCHC and eosinophils showed no significant difference($p > 0.05$). The highest levels of white blood cells (6600 ± 1452.58), neutrophils (%16.33 ± 1.53), monocytes (%4.67 ± 0.58), cortisol (13.6 ± 0.96 mg/L) were observed in 4000 density and the highest mean concentrations of hemoglobin (69.23 ± 1.41 pg), lymphocytes (%84 ± 2.64), and lysosomes (51 ± 57.5 U/mL) were recorded in 2000 density which showed significant differences with other treatments ($p \leq 0.05$). The results of growth parameters showed that the maximum increase in final length and weight, production rate, and weight (24.5 ± 0.87 cm, 606.33 ± 5.51 g, 2300 ± 50 and 593 ± 31.58 g, respectively) were observed in octagonal pools with a density of 4000. Finally, the maximum and minimum feed conversion ratios were observed in round ponds with 3000 density (1.19 ± 0.09) and octagonal ponds with a density of 3000 (0.887 ± 0.148), respectively. The results of the present study indicated that octagonal ponds with a density of 4000 in Sistan region have higher production rates than other shapes and they could be promoted among farmers for more economical production.

Keywords: Rainbow trout, Growth performance, Nonspecific safety, Stress, Dual-purpose pools