

ABSTRACT

Global, regional and national production of Nile Tilapia (*Oreochromis niloticus*) has faced challenges of low yields and lack of crucial culture information. Farmers in Teso North Sub County recorded lower yields than expected in 2009 despite having been provided with inputs. Factors responsible for the low production had not been established and water quality was suspected to be among them. The purpose of this study was to assess the effects of water quality on the growth of Nile Tilapia in ponds under semi-intensive culture system. The specific objectives were to: assess the levels of physico-chemical parameters (dissolved oxygen, temperature, pH, ammonia and conductivity) in the ponds, examine the growth rates of Nile Tilapia and determine the relationship between the growth rates and the physico-chemical parameters. The study was longitudinal in nature with pond water and fish being the units of analysis. Systematic sampling was used to select 5 ponds and a control pond selected based on previous harvest. Four of the ponds were surface flow and two underground fed ponds. The fertilized ponds were each stocked with 900 fry of averagely 1.4g and 4.4cm total length. The fish fed on a supplementary diet of 26% crude protein at 10 00 hrs and 16 00 hrs daily. Physico-chemical parameters were measured *in situ* using a multi-parameter probe. Sixty fish were randomly sampled per pond fortnightly for four months using a 10 mm mesh size non selective net. The fish were measured, weighed and returned into the ponds after each sampling exercise. The overall mean range of physico-chemical parameters were: DO 4.86-10.53 mg/l, temperature 24 - 26°C, pH 6.1-8.3, conductivity 35-87 µS/cm and ammonia 0.01-0.3 mg/l. Temperature ($F_{(5,53)} = 3.31, p = 0.012$) and conductivity ($F_{(5,53)} = 6.31, p = 0.0001$) levels varied significantly between ponds. The overall SGR ranged from 1.8 % (0.1692 g/day) to 3.8 % (1.9 g/day). Dissolved oxygen, ammonia and pH in the ponds were within the levels required for optimum growth of Nile Tilapia, while temperature and conductivity were below the optimal levels. The growth rate of Nile Tilapia was below the optimal. As temperature and dissolved oxygen increased, growth rate of Nile Tilapia increased but increases in conductivity, pH and ammonia caused a decrease in growth rate. Fish yields were dependable on water quality. Temperature and dissolved oxygen ranges of 27°C- 30°C and 5 mg/l – 23 mg/l respectively and SGR of 3.8 % and above are recommended for higher productivity.