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Sustainable Aquaculture for a Secure Future

Title: Bottom Soil Quality in Tilapia Ponds of Different Age in Thailand

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Abstract: Bottom soil samples were collected from 35 ponds in the vicinity of Samutprakarn, Thailand. Ponds ranged in age from 3 to 39 years and had been used continuously for production of tilapia. Liming materials had been applied in large amounts, and bottom soils of all ponds had pH above 7, low exchange acidity, and free carbonate. Pond soils often contained between 1% and 2% total sulphur, suggesting that they were potential acid-sulphate soils. However, acidity from sulphide oxidation was not expressed because carbonate in the soil neutralized it. Concentrations of total carbon seldom exceeded 4% and the average for organic carbon was 1.90%. The correlations between pond age and both total carbon and organic carbon concentration were weak (r = 0.34 and 0.36 respectively). Concentrations of nitrogen in bottom soils did not differ with pond age and ranged from 0.1% to 0.3% with an average of 0.19%. The average ratio of concentrations of carbon and nitrogen was 11. Acid-extractable phosphorus concentrations averaged 217 mg kg^{-1}, but the phosphorus adsorption capacity averaged 768 mg kg^{-1} suggesting that soils still have considerable reserve capacity to adsorb phosphorus. Ponds can be used annually for semi-intensive production of tilapia, and presumably other species, for many years without serious deterioration of bottom soil quality.

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