

Preliminary study on eel breeding and vegetables production in an aquaponic system

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Abstract

Aquaponic is considered an innovative method for food production that reduces environmental impact and enhances sustainability. This system can be used also for different purposes, such as wildlife management and production of ornamental fish. In this perspective, the aim of the present project was raising eel for re-stocking purposes producing contemporaneously 'green' for human consumption. During the whole experimental period (December to April), two different vegetable crops, (sweet basil and lettuce) were grown (30 plant/m²) in a floating system. Forty-nine eels (body weight 133.4±68.4 g, body length 41.0±9.7 cm; mean± s.d.) were captured in the Orbetello's lagoon and reared in a 1 m³ freshwater tank. Eels were fed with commercial fishfood twice a day and water parameters (DO, pH, Conductivity, and Temperature) were daily monitored; ammonium, nitrites, and nitrates were monitored weekly. The tank run-off was recirculated through a sump, a biofilter, and the hydroponic unit. At the end of the four-month experimental period no fish growth was observed, due to their late sex maturation stage, together with rearing system constraints (i.e. tank shape, and biomass density). Aquaponic vegetable production was comparable to the hydroponic control unit: fresh-matter production was 132.5 and 135.4 g/plant, for sweet basil and 335.8 and 175.7 g/plant for lettuce. According to the above described results, eel requires specific adaptation of the system to its biology to be successfully reared in an aquaponic system, while vegetables can be effectively cultured without any adjustment.

Keywords: Aquaponic, eel, basil, lettuce, hydroponic floating system.

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