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Evaluation of a grass field for reduction of sediment runoff from agricultural areas

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ABSTRACT

This study evaluates a centipede grass field for reduction of reddish fine sediment runoff from agricultural areas in Okinawa, Japan. Grass fields are expected to provide an additional countermeasure for the reduction of sediment runoff. However, the practical effectiveness of grass fields has not been examined under sediment runoff conditions in Okinawa. A numerical model simulating sediment transport in grass was used to analyze the effect of a centipede grass field on sediment runoff. The model was verified using data obtained from flume experiments. The analysis showed that the efficiency of sediment removal decreased with an increase in the inflow rate into the field. However, a grass field with a higher inflow rate removed more sediment and had a greater water treatment capacity under unsubmerged flow conditions. Therefore, the analysis showed that centipede grass fields with inflow control at a higher inflow rate under unsubmerged flow conditions are more effective as an additional countermeasure against reddish fine sediment runoff from agricultural areas.

Keywords: Grass field; Numerical model; Sediment removal efficiency

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