

SUMMARY

Greywater combined with tap water and raw greywater from laundry, bath and washbasin was studied to evaluate effect of the irrigation water factors on the total dry mass yield of ryegrass and soil. The greywater was treated in lab-scale set-up constructed out of lamella settler and filters. The full factorial experiment with two levels (low level 5 mm/week, and high level 15 mm/week) for three factors of irrigation water was designed. After preliminary tests (stage I), the experiment was carried out for two cases: without fertilizer supply (stage II) and with fertilizer supply (stage III) lasting 186 days each. Ryegrass was harvested 6 times during experiment, the total dry mass yields of 3 and 6 harvests were evaluated. Soil pH and EC were measured before and after finish of each experimental stage.

The results of study show that all main factors (tap water, treated greywater, raw greywater) influenced significantly the total yield of ryegrass after three and six harvests in stage II. The most important factor influenced the total yield was treated greywater. Moreover, all interactions between two factors had significant effect on the total yield, except for interaction between treated greywater and raw greywater after 6 harvests. The experiment of stage II showed that tap water, treated greywater and their interaction had significant effect on soil pH, similarly all factors of irrigation water and their interactions influenced on soil EC. Treated greywater was the most important factor influencing on soil pH, while tap water was decisive in the case of soil EC.

In the experimental stage III, there were no significant effects of any factors and their interactions on the grass yield after 3 harvests. However, interaction between tap water and raw greywater as well as between treated greywater and raw greywater had significant effects on the total yield after six harvests. Soil pH was significantly influenced by interaction between tap water and raw greywater while soil EC by all main factors and interactions between tap water and treated greywater as well as between tap water and raw greywater, in which tap water was the most important factor.

In addition, the quality of leachate have tended to improve after 51 days of ryegrass growth till the end of stage II, indicating high treatment efficiency of greywater in the root zone.

Keywords: greywater, irrigation, tap water, greywater reuse, perennial ryegrass

