

Intisari

Penelitian ini bertujuan untuk mengetahui nilai laju infiltrasi dan hubungannya dengan sifat-sifat tanah pada berbagai kemiringan lereng dan penggunaan lahan di sub-DAS Bompon, Kabupaten Magelang, Jawa Tengah. Karakteristik penggunaan lahan dan topografi beragam yang dimiliki oleh sub-DAS Bompon ini akan berpengaruh pada laju infiltrasi. Nilai laju infiltrasi yang berbeda-beda akan mempengaruhi ketersediaan air, erosi, dan pola banjir yang ada. Penelitian ini dilakukan dengan menentukan 30 titik pengambilan sampel tanah yang ada di sub-DAS Bompon berdasarkan satuan peta lahan (SPL) hasil tumpang susun (*overlay*) peta penggunaan lahan, peta kemiringan lereng, dan peta jenis tanah. Data dianalisis menggunakan pendekatan rancangan percobaan faktorial yang terdiri dari dua faktor yaitu kemiringan lereng dan penggunaan lahan. Kelas kemiringan lereng terdiri dari 4 aras yaitu agak landai, landai, agak curam, dan curam. Tipe penggunaan lahan terdiri dari 3 aras yaitu kebun campur, tegalan, dan sawah. Penelitian dilakukan pada musim kemarau. Infiltrasi dilakukan menggunakan *single ring infiltrometer* dan *guelph permeameter* pada bidang olah atau teras. Pengamatan infiltrasi dilakukan selama 1 menit (5 kali), 4 menit (5 kali), 9 menit (5 kali), dan 16 menit (5 kali) pada setiap titik. Hasil pengamatan dihitung laju infiltrasinya menggunakan persamaan Philip. Hasil penelitian menunjukkan bahwa perbedaan kemiringan lereng dan penggunaan lahan memberikan pengaruh nyata terhadap nilai laju infiltrasi. Berat volume tanah dan kandungan fraksi lempung juga mempengaruhi nilai laju infiltrasi. Nilai laju infiltrasi pada kebun campur agak landai memiliki rata-rata $8,9 \text{ cm.jam}^{-1}$, kebun campur landai memiliki rata-rata sebesar $8,4 \text{ cm.jam}^{-1}$, kebun campur agak curam memiliki rata-rata $7,9 \text{ cm.jam}^{-1}$, kebun campur curam memiliki rata-rata $18,3 \text{ cm.jam}^{-1}$, sawah agak landai dengan rata-rata $0,03 \text{ cm.jam}^{-1}$, sawah landai dengan nilai rata-rata $0,4 \text{ cm.jam}^{-1}$, tegalan agak landai dengan rata-rata $7,5 \text{ cm.jam}^{-1}$, tegalan landai memiliki nilai rata-rata $11,1 \text{ cm.jam}^{-1}$, tegalan agak curam dengan nilai rata-rata $10,3 \text{ cm.jam}^{-1}$, dan tegalan curam dengan nilai rata-rata $11,7 \text{ cm.jam}^{-1}$.

Kata kunci: laju infiltrasi, kemiringan lereng, penggunaan lahan, berat volume

Abstract

The objective of this research was to determine the soil infiltration rate and its correlation with soil properties in various slope and land use in Bompon sub-watershed, Magelang, Central Java. Various characteristics on slope and land use in Bompon sub-watershed would affect the rate of infiltration. Different infiltration rates would affect water availability, erosion, and flood patterns. A total of 30 soil samples were collected based on soil mapping unit from overlaying landuse map, slope level map, and soil map. Data were analyzed using a factorial experimental design approach with two factors, slope level and land use. There are four classes of slope level (nearly flat, wavy, hilly, steep) and three types of land use (mixed plantations, dry lands, paddy fields). This research was conducted in dry season. Infiltration was performed using a single ring infiltrometer and guelph permeameter in the terrace of slope. Observation of infiltration was carried out for 1 minute (5 times), 4 minutes (5 times), 9 minutes (5 times), and 16 minutes (5 times) at each point. The result showed that slope level and land use variation significantly affected on soil infiltration rate. Furthermore, bulk density and clay content also affected the soil infiltration rate. Infiltration rate in mixed plantations in nearly flat slope was 8.9 cm.h⁻¹ in average, mixed plantations in wavy slope was 8.4 cm.h⁻¹ in average, mixed plantations in hilly slope was 7.9 cm.h⁻¹ in average, mixed plantations in steep slope was 18.3 cm.h⁻¹ in average, paddy fields in nearly flat slope was 0.03 cm.h⁻¹ in average, paddy fields in wavy slope was 0.4 cm.h⁻¹ in average, dry lands in nearly flat slope was 7.5 cm.h⁻¹ in average, dry lands in wavy slope was 11.1 cm.h⁻¹ in average, dry lands in hilly slope was 10.3 cm.h⁻¹ in average, and dry lands in steep was 11.7 cm.h⁻¹ in average.

Keywords: infiltration rate, slope level, land use, bulk density