<u>A study on the effect of compaction on transport properties of soil gas and water. II:</u> <u>Soil pore structure indices</u>

| Publons | (not set) |
|-----------------|---|
| ID | |
| Wos ID | WOS:000340698600021 |
| DOI | 10.1016/J.still.2014.01.008 |
| Title | A study on the effect of compaction on transport properties of soil gas and water. II: Soil pore structure indices |
| First Author | |
| Last Author | |
| Authors | Kuncoro, PH; Koga, K; Satta, N; Muto, Y; |
| Publish Date | NOV 2014 |
| Journal Name | SOIL & TILLAGE RESEARCH |
| Citation | 40 |
| Abstract | Experimental data on the effects of compaction and applied organic matter (OM) on macropore structure indices, more particularly on pore continuity, have yet rarely been documented. In this study, static compaction was simulated in the laboratory at 150, 225, and 300 kPa upon rice husk, rice straw, compost, sawdust, and wood bark-mixed soils and control. Measurements of relative gas diffusivity (D-p/D-0)(100) and air permeability (k(a100)) were conducted at -100 cm H2O soil matric suction after measurement of saturated hydraulic conductivity (k(s)). Corresponding dry bulk density (rho(d)), total porosity (f), and air content (epsilon(100)) values were also determined. Volume of macropores (phi >= 30 mu m) and micropores (phi < 30 mu m) were expressed as volume of air and water at -100 cm H2O soil matric suction, respectively, relative to the volume of soil solid. Specific gas diffusivity (S-D100) and specific air permeability (S-ka100) were calculated as (D-p/D-0)(100)/epsilon(100) and k(a100)/epsilon(100), respectively. Analogous to the S-D100 and S-ka100, specific hydraulic conductivity (S-ks) was defined as k(s)/epsilon(100). The results showed that compaction significantly increased rho(d), which was followed by a reduction if and the mixed OM resulted in a significantly lower rho(d) and higher f than the control. The volume of macropores was reduced by compaction whereas the volume of macropores than the control. Compaction resulted in more tortuous macropores for gas diffusion (lower S-D100) and less continuous macropores for gas convection (lower S-ka100) for which a significant difference was more pronounced between the 300 and 150 kPa compactions. Compaction also result in a higher S-ka100 than the control. In addition, the mixed OM also seemed to result in a higher S-ks 100 than the control. In addition, the mixed OM also seemed to result in a higher S-ks than the control. In addition, the mixed OM also seemed to result in a higher S-ks than the control. In addition, the mixed OM also seemed to resul |
| Publish Type | Journal |
| Publish Year | 2014 |
| Page Begin | 180 |
| Page End | 187 |
| lssn | 0167-1987 |
| Eissn | 1879-3444 |
| Url | https://www.webofscience.com/wos/woscc/full-record/WOS:000340698600021 |
| Author | PURWOKO HARI KUNCORO, S.TP, M.Agr, Ph.D |