Book of Abstracts

Wageningen Soil Conference 2015

'Soil Science in a Changing World'

Editors:
B. Jansen
S.D. Keesstra
G. Mol
J. Wallinga
A.M. Zaal

23 - 27 August 2015
Wageningen
The Netherlands

Wageningen Soil Conference 2015
'Soil Science in a Changing World'
23 - 27 August 2015
Wageningen
The Netherlands

Editors: Saskia Keesstra[1], Gerben Mol[2], Anne Zaal[3], Jakob Wallinga[4], Boris Jansen[5]

[1] Wageningen University, Soil Physics and Land Management group, PO Box 47, 6700 AA Wageningen, The Netherlands
[2] Alterra Wageningen UR, Team Soil, Water and Land use, PO Box 47, 6700 AA Wageningen, The Netherlands
[3] Wageningen UR, Soil cluster, PO Box 47, 6700 AA Wageningen, The Netherlands
[4] Wageningen University, Soil Geography and Landscape group, PO Box 47, 6700 AA Wageningen, The Netherlands
[5] Universiteit van Amsterdam, Institute for Biodiversity and Ecosystem Dynamics (IBED), P.O. Box 94248, 1090 GE Amsterdam, The Netherlands

Cover design: Vormgeverij Mol

ISBN: 978-946173-168-5

Printing: Wageningen UR, Communication Services, Wageningen, The Netherlands

A QUANTITATIVE APPROACH ON VISUAL SOIL ASSESSMENT: VALIDATION AND REPRODUCIBILITY

VAN LEEUWEN, MARICKE[1] (MARICKE.VANLEEUWEN@WUR.NL); HEUVELINK, GERARD[1]; WALLINGA, JAKOB[1]; DE BOER, IMKE[1]; VAN DAM, JOS[1]; VAN ESSEN, EVERHARD[2]; MOOLENAAR, SIMON[3]; VERHOEVEN, FRANK[4]; STOOF, CATHELIJNE[1]

[1] Wageningen University and Research Centre, The Netherlands
[2] Aequator Groen & Ruimte, The Netherlands
[3] Royal HaskoningDHV, The Netherlands
[4] Boerenverstand, The Netherlands

Many agricultural soils around the world suffer from soil structure deterioration and a decline in soil organic matter, due to e.g. land use change or intensive farming practices. Visual soil assessment (VSA) can play an important role in monitoring soil quality and identifying soils that are in an early stage of degradation. VSA is becoming increasingly popular among farmers, organisations and companies aiming at sustainable crop production. Current methods for VSA, however, are subjective and have not been fine-tuned for differences between soil types. We aim to develop and validate a VSA method that is based on quantitative visual observations. Also we assess the reproducibility of this method when used by different types of observers. For validation of visual observations, we performed VSAs and took soil samples at 26 dairy farms (one field on each farm), located on sandy, clayey and peaty soils in the North of the Netherlands. Field observations were validated through laboratory analyses: the estimated number of biopores was validated with soil bulk density; the number of roots with root dry weight; the soil colour with soil organic matter content and the soil structure with aggregate size and stability. Furthermore, the estimated pasture cover was validated using image analysis of the soil surface; the number of gley spots with distance to ditches and drains; and the degree of soil compaction with measured penetration resistance. The reproducibility, i.e., the variance of visual estimates, was assessed by having eight farmers and nine soil scientists carrying out VSA on five different sites, located at sandy, clayey and peaty soils. Building on the validation and the reproducibility of the VSA, we will illustrate how visual soil assessment can contribute to a quantitative evaluation of soil functioning at dairy farms and thereby to sustainable crop production.