

Water, physical and physical-mechanical characteristics of the vertisols were investigated on seven soil profiles in the in the central part of the Republic of Macedonia (Štip, Probištip and Ovče Pole valleys). The investigated vertisols show very unfavorable water, physical and physical-mechanical characteristics, which obstruct the usage of these soils. In spite of the high water preservation, plants in these soils are not provided with enough water. Available water capacity is 12.32 mass %, or only 38 mass % of the whole moisture is available to plants. The retention curves are relatively close one to another. The greatest decline of the curves occurs at lower pressures. In dry sieving of the soil the aggregate fraction >10 mm is dominating (average 56.56%), which in the same time shows the lowest stability in water. That kind of structure makes these soils hard for tiling. The investigated samples of vertisols are highly plastic, with the plasticity index higher than 17, which significantly shorten the physical suitability of soil for tillage.



**Dalibor Jovanov**

MSc Dalibor Jovanov was born on 15.09.1980 in Sveti Nikole, Republic of Macedonia. He is a PhD Student in Pedology at the Faculty of Agricultural Sciences and Food, Ss. "Cyril and Methodius" University, Skopje, R.Macedonia. Currently, he is working at the Faculty of Agriculture, University "Goce Delčev", Štip, Macedonia.

Dalibor Jovanov

# Characteristics of Vertisols From Štip, Probištip and O. Pole Valleys



978-3-659-39003-6

**Dalibor Jovanov**

**Characteristics of Vertisols From Štip, Probištip and O. Pole  
Valleys**



**Dalibor Jovanov**

**Characteristics of Vertisols From Štip,  
Probištip and O. Pole Valleys**

**LAP LAMBERT Academic Publishing**

## **Impressum / Imprint**

Bibliografische Information der Deutschen Nationalbibliothek: Die Deutsche Nationalbibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über <http://dnb.d-nb.de> abrufbar.

Alle in diesem Buch genannten Marken und Produktnamen unterliegen warenzeichen-, marken- oder patentrechtlichem Schutz bzw. sind Warenzeichen oder eingetragene Warenzeichen der jeweiligen Inhaber. Die Wiedergabe von Marken, Produktnamen, Gebrauchsnamen, Handelsnamen, Warenbezeichnungen u.s.w. in diesem Werk berechtigt auch ohne besondere Kennzeichnung nicht zu der Annahme, dass solche Namen im Sinne der Warenzeichen- und Markenschutzgesetzgebung als frei zu betrachten wären und daher von jedermann benutzt werden dürften.

Bibliographic information published by the Deutsche Nationalbibliothek: The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at <http://dnb.d-nb.de>.

Any brand names and product names mentioned in this book are subject to trademark, brand or patent protection and are trademarks or registered trademarks of their respective holders. The use of brand names, product names, common names, trade names, product descriptions etc. even without a particular marking in this works is in no way to be construed to mean that such names may be regarded as unrestricted in respect of trademark and brand protection legislation and could thus be used by anyone.

Coverbild / Cover image: [www.ingimage.com](http://www.ingimage.com)

Verlag / Publisher:

LAP LAMBERT Academic Publishing

ist ein Imprint der / is a trademark of

AV Akademikerverlag GmbH & Co. KG

Heinrich-Böcking-Str. 6-8, 66121 Saarbrücken, Deutschland / Germany

Email: [info@lap-publishing.com](mailto:info@lap-publishing.com)

Herstellung: siehe letzte Seite /

Printed at: see last page

**ISBN: 978-3-659-39003-6**

Copyright © 2013 AV Akademikerverlag GmbH & Co. KG

Alle Rechte vorbehalten. / All rights reserved. Saarbrücken 2013

## TABLE OF CONTENTS

1. INTRODUCTION .....	1
2. MATERIALS AND METHODS .....	6
2.1. Description of the study area .....	6
2.2. Field research.....	6
2.3. Laboratory analyses .....	11
3. RESULTS AND DISCUSSION .....	14
3.1. MECHANICAL COMPOSITION .....	14
3.2. CLAY MINEROLOGICAL COMPOSITION .....	17
3.3. WATER-PHYSICAL AND PHYSICAL CHARACTERISTICS.....	21
3.3.1. Moisture retention (retention curves) .....	21
3.3.2. Aggregate composition (structure) .....	27
3.3.2.1. <i>Dry sieving</i> .....	28
3.3.2.2. <i>Wet sieving</i> .....	31
3.4. PHYSICAL-MECHANICAL CHARACTERISTICS .....	34
3.4.1. Plasticity (Atterberg limits) .....	35
4. CONCLUSION.....	39
5. REFERENCES.....	43