

**Subject: Application letter
Chair ISHS WG Substrate Analysis**

Angers, October 6, 2023

Dear colleague(s),

I would be honored to be chair of the ISHS Working Group Substrate Analysis. Some of you already know me, and are familiar with my strong involvement for ISHS with my previous position as chair of the WG Growing Media (2015-2023).

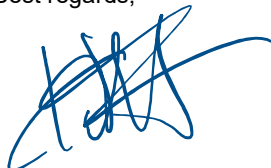
As Associate professor working at L'Institut Agro (France), I am currently leading several research projects focused on physical properties of growing media. We are developing new methods based on cutting-edge technologies for characterizing particle size and shape of growing media, as well as their hydraulic properties, with the aim of improving water and nutrient efficiency in soilless culture. These projects involve working with some international academic partners (North Carolina State University, Wageningen University, etc.) and several growing medium companies in France, Europe, and North America (Klasmann-Deilmann, Premier Tech, Kekkilä-BvB, etc.).

The tasks and responsibilities listed for this WG chair position perfectly match with those I performed as elected Chair of the ISHS Working Group Growing Media, and my current position as Associate Professor at L'Institut Agro. As you can see in my curriculum, I am deeply involved in sharing academic advances about growing media, as shown by my position as convener of two ISHS symposia (2005 and 2022), and many other activities such as the creation of a linked-in group Growing Media for Horticulture, my strong involvement for developing scientific networks and projects (recent submissions of an EU-COST proposal and of a Horizon Europe research project), etc.

More, my focus is always to link more academic scientists to the Growing Media Industry, and I would try to still reinforce these interactions as chair of the WG Substrate Analysis. I believe both are necessary to move forward in this time of change and opportunity in the industry, for which the issues about the high demand for peat alternatives and the needs of new methods for characterizing them are very important, regarding the current Growing Media market and the perspectives for 2050 (where the demand for growing media is expected to be four times higher than the current one).

I look forward to your response and your thoughts about my application.

Best regards,



Jean-Charles MICHEL

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Born in 1970

Associate Professor Growing Media and Soil Science

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Position & Degrees

- **Associate Professor** at L'Institut Agro, Angers. 1998-present
- **Chairman ISHS Working Group Growing Media**, Int. Soc. Horticultural Science (ISHS). 2015-23
- **Fulbright Scholar**, North Carolina State University, USA. 2014-15 (Horticultural Substrates Lab.)
- **Habilitation Thesis (HDR)**, University of Angers (France), Dec. 3, 2009 - *Water repellency of organic matter used as horticultural growing media and consequences on their physical properties.*
- **PhD** Environmental Science, ENSA Rennes (France), Sept. 17, 1998 - *Wettability of organic substrates used in Horticulture.*

Main distinctions

- 2 medals of honour of ISHS for the organisation of the:
 - *ISHS-IPS International Symposium on Growing Media, Angers, 2005*
 - *ISHS International Symposium on Innovative Technologies and Production Strategies for Sustainable Controlled Environment Horticulture, Angers, 2022*
- Fulbright Research Award, North Carolina State University, USA. 2014-15
- 1st Prize of the *Klasmann-Deilmann Award for applied research in Horticulture 1999*

Main teaching activities for L'Institut Agro (France)

- **Main teaching:** Growing media & Soilless culture, Soil Science, etc.
 - Licence: Geology 68h, Soil Science 35h
 - Master: Growing media & soilless culture 31h; Organic matter – Water & nutrient management in soil & soilless culture 26h; Tutoring of bibliographic synthesis, internships, projects
- Supervisor of the Master degree « Plant sustainable management in Horticulture » (2010-14)

Main international research recognition

- Publications & communications: 50 papers in peer-review journals, 1 book (Proceedings ISHS Symposium, Angers), 2 book chapters, 1 co-edition Special issue Agronomy, 10 international invited conferences, 72 communications in congresses and symposia, etc.
- Convenor of the ISHS-IPS International Symposium on Growing Media (Angers, 2005) and the ISHS International Symposium on Innovative Technologies and Production Strategies for Sustainable Controlled Environment Horticulture (Angers, 2022)
- Member of scientific committees of International Symposia (11); Chairman of sessions (9)
- Supervisor of PhD students (4) & Master students (20); Member of other supervising committees of PhD students (7)
- Manager of the collaborative international research academic – growing media industry projects: Ecol'eau Terreau (2012-18), Text'Eau Terreau (2019-24), Stabil'Eau Terreau (2023-26).

List of publications

- 1 DURAND S., JACKSON B.E., FONTENO W.C., **MICHEL J.C.**, 2022. Advances in substrate particle characterization using dynamic image analysis compared to sieving procedure for predicting water retention properties. *Acta Horticulturae*, accepted.
- 2 DURAND S., JACKSON B.E., FONTENO W.C., **MICHEL J.C.**, 2023. Quantitative Description and Classification of Growing Media Particle Morphology through Dynamic Image Analysis. *Agriculture, Special Issue Advanced Research on Soilless Culture in Horticultural Production*, 13(2), 396; <https://doi.org/10.3390/agriculture13020396>
- 3 DURAND S., JACKSON B.E., FONTENO W.C., **MICHEL J.C.**, 2022. Particle size distribution of growing media constituents using dynamic image analysis: parametrization and comparison to sieving. *Soil Science Society of America Journal*, <https://doi.org/10.1002/saj2.20518>
- 4 DURAND S., JACKSON B.E., FONTENO W.C., **MICHEL J.C.**, 2021. The use of wood fiber for reducing risks of hydrophobicity in peat-based substrates. *Agronomy*, **11**, 907. doi.org/10.3390/agronomy11050907
- 5 DURAND S., JACKSON B.E., BARTLEY P.C., FONTENO W.C., **MICHEL J.C.**, 2021. New tools for particle shape analysis of substrate components: initial results and future prospects. *Acta Horticulturae*, **1317**, 335-352. doi.org/10.17660/ActaHortic.2021.1317.39
- 6 DURAND S., JACKSON B.E., BARTLEY P.C., FONTENO W.C., **MICHEL J.C.**, 2021. Analyzing rehydration efficiency of hydrophilic (wood fiber) vs potentially hydrophobic (peat) substrates using different irrigation methods. *Acta Horticulturae*, **1317**, 343-350. doi.org/10.17660/ActaHortic.2021.1317.40
- 7 **MICHEL J.C.**, JACKSON B.E., FONTENO W.C., 2021. The use of coir for reducing risks of substrates hydrophobicity. *Acta Horticulturae*, **1305**, 449-454. doi.org/10.17660/ActaHortic.2021.1305.59
- 8 **MICHEL J.C.**, 2019. Relevant hydraulic properties of peat-based mixes for explaining root development according to irrigation strategies. *Acta Horticulturae*, **1266**, 353-360. doi.org/10.17660/ActaHortic.2019.1266.49
- 9 DONNERS M.P.J., VERHOEVEN J., **MICHEL J.C.**, 2019. Potential use of Recycled Stone Wool Substrate Granulate as Substrate Component. *Acta Horticulturae*, **1266**, 323-330. doi.org/10.17660/ActaHortic.2019.1266.45
- 10 **MICHEL J.C.** 2018. How to promote substrates' R&D? *Peatlands International*, **3**, 16-23. ISSN: 1455-8491
- 11 **MICHEL J.C.**, JACKSON B.E., FONTENO W.C., 2017. Classification of organic substrates' wettability from contact angle measurements and hydration efficiency tests. *Acta Horticulturae*, **1168**, 199-206. doi.org/10.17660/ActaHortic.2017.1168.26
- 12 **MICHEL J.C.**, KERLOCH E., 2017. Evolution of hydraulic properties and wettability of Organic Growing Media during Cultivation according to irrigation strategies. *Scientia Horticulturae*, **217**, 28-35. doi.org/10.1016/j.scienta.2017.01.023
- 13 CARON J., **MICHEL J.C.**, 2017. Overcoming physical limitations in alternative growing media with and without peat. doi.org/10.17660/ActaHortic.2017.1168.53
- 14 **MICHEL J.C.**, KERLOCH E., 2017. Evolution of Hydraulic Properties of Organic Substrates during Cultivation according to Irrigation Strategies and Root Growth. *Acta Horticulturae*, **1168**, 207-212. doi.org/10.17660/ActaHortic.2017.1168.27
- 15 **MICHEL J.C.** 2015. Wettability of Organic Growing Media used in Horticulture: A Review. *Vadose Zone Journal*. doi.org/10.2136/vzj2014.09.0124
- 16 **MICHEL J.C.** 2015. Effects of freezing on the physical properties and wettability of highly decomposed peats used as growing media. *European Journal of Horticultural Science*, 80(4), 190-195. ISSN 1611-4426 print, 1611-4434. doi.org/10.17660/eJHS.2015/80.4.7
- 17 KERLOCH E., **MICHEL J.C.** 2015. Pore Tortuosity and Wettability as Main Characteristics of the Evolution of Hydraulic Properties of Organic Growing Media during Cultivation. *Vadose Zone Journal*. doi.org/10.2136/vzj2014.11.0162
- 18 GRARD B.J.-P., BEL N., MARCHAL N., MADRE F., CASTELL J.-F., CAMBIER P., HOUOT S, MANOUCHEHRI N., BESANCON S., **MICHEL J.C.**, CHENU C., FRASCARIA-LACOSTE N., AUBRY C. 2015. Recycling urban waste as possible use for rooftop vegetable garden. *Future of Food: Journal on Food, Agriculture and Society*, **3** (1), 21-34.
- 19 **MICHEL J.C.**, CANNAVO P., 2014. Importance of peat particle size effects on spatial root distribution and changes on aeration properties. *Acta Horticulturae*, **1034**, 347-354. doi.org/10.17660/ActaHortic.2014.1034.43
- 20 CANNAVO P., **MICHEL J.C.**, 2013. Peat particle size effects on spatial root distribution, and changes on hydraulic and aeration properties. *Scientia Horticulturae*, **151**, 11-21. doi.org/10.1016/j.scienta.2012.12.021
- 21 **MICHEL J.C.**, KERLOCH E., BOZON E., CANNAVO P., 2013. Consequences of root development on the evolution of hydraulic properties of peat growing media under a constant and optimal water regime. *Acta Horticulturae*, **1013**, 159-165. doi.org/10.17660/ActaHortic.2013.1013.18
- 22 KAMMOUN RIGANE M., **MICHEL J.C.**, MEDHIOUB K., 2012. Changes in physicochemical properties during co-composting process of organic wastes with different C/N ratios: role of effluents. *Journal of Environmental Science and Engineering*, **1** (1A), 62-67.

- 23 CANNAVO P., HAFDHI H., **MICHEL J.C.**, 2011. Impact of root growth on the physical properties of peat substrate under a constant water regime. *Hortscience*, **46** (10), 1394-1399. doi.org/10.21273/HORTSCI.46.10.1394
- 24 KAMMOUN RIGANE M., **MICHEL J.C.**, MEDHIOUB K., MOREL P., 2011. Evaluation of physicochemical, biochemical and phytotoxicity of Tunisian mature agricultural wastes composts. *Acta Horticulturae*, **1013**, 225-230. doi.org/10.17660/ActaHortic.2013.1013.26
- 25 **MICHEL J.C.**, QI G., CHARPENTIER S., 2011. Water repellency of peats: a main factor influencing the evolution of their physical properties. *Acta Horticulturae*, **1013**, 167-174. doi.org/10.17660/ActaHortic.2013.1013.19
- 26 QI G., **MICHEL J.C.**, CHARPENTIER S., BOIVIN P., 2011. A laboratory method for continual measurement of water retention and shrink/swell properties of growing media during drying/wetting cycles. *Hortscience*, **46** (9), 1298-1302. doi.org/10.21273/HORTSCI.46.9.1298
- 27 QI G., **MICHEL J.C.**, CHARPENTIER S., BOIVIN P., 2011. A laboratory method for measuring physical properties of growing media and their evolution during drying/wetting cycles: preliminary results. *Acta Horticulturae*, **891**, 181-185. doi.org/10.17660/ActaHortic.2011.891.20
- 28 KAMMOUN RIGANE M., **MICHEL J.C.**, MEDHIOUB K., MOREL P., 2011. Evaluation of composts maturity, hydro-physical and physicochemical properties: indicator for uses as growing media component. *Compost Science & Utilization*, **19** (3), 226-234. doi.org/10.1080/1065657X.2011.10737006
- 29 COSENTINO D., HALLETT, P.D., **MICHEL J.C.**, CHENU C., 2010. Do different methods for measuring the hydrophobicity of soil aggregates give the same trends in soil amended with residue? *Geoderma*, **159** (1-2), 221-227. doi.org/10.1016/j.geoderma.2010.07.015
- 30 GIUFFRIDA F., **MICHEL J.C.**, 2010. Substrati di coltivazione per una orto-floricoltura sostenibile. *Italus Hortus*, **17** (4), 29-41.
- 31 **MICHEL J.C.**, 2010. The physical properties of peat: a key factor for modern growing media. *Mires and Peat*, **6**: Article 02, 1-6. <http://mires-and-peat.net/pages/volumes/map06/map0602.php>
- 32 **MICHEL J.C.**, 2009. Influence of clay addition on physical properties and wettability of peat growing media. *Hortscience*, **44** (6), 1694-1697.
- 33 **MICHEL J.C.**, 2009. Physical properties of growing media: state of the art and future challenges. *Acta Horticulturae*, **819**, 65-72. doi.org/10.17660/ActaHortic.2009.819.6
- 34 NAASZ R., **MICHEL J.C.**, CHARPENTIER S., 2009. Water repellency of organic growing media and its consequences on hysteretic behaviours of the water retention curve. *Acta Horticulturae*, **819**, 287-296. doi.org/10.17660/ActaHortic.2009.819.33
- 35 **MICHEL J.C.**, NAASZ R., CHARPENTIER S., CARON J., RIVIERE L.M., 2008. Water repellency and its influence on hydrodynamic properties of substrates: state of the art & recent developments. *Acta Horticulturae*, **779**, 121-129. doi.org/10.17660/ActaHortic.2008.779.13
- 36 MOREL P., GUILLEMAIN G., **MICHEL J.C.**, 2008. Temperature and salinity effects on measurements of growing media moisture content carried out with TDR & capacitance probes. *Acta Horticulturae*, **779**, 393-399. doi.org/10.17660/ActaHortic.2008.779.49
- 37 NAASZ R., **MICHEL J.C.**, CHARPENTIER S., 2008. Water repellency of organic growing media and its influence on hysteretic water retention properties. *European Journal of Soil Science*, **59** (2), 156-165. doi.org/10.1111/j.1365-2389.2007.00966.x
- 38 NAASZ R., **MICHEL J.C.**, CHARPENTIER S., 2008. Modelling oxygen and water flows in peat substrates with root uptakes. *Acta Horticulturae*, **779**, 191-197. doi.org/10.17660/ActaHortic.2008.779.23
- 39 NAASZ R., **MICHEL J.C.**, CHARPENTIER S., 2008. Microbial respiration on its consequence on air availability in substrates. *Acta Horticulturae*, **779**, 91-95. doi.org/10.17660/ActaHortic.2008.779.9
- 40 RIVIERE L.M., MOREL P., **MICHEL J.C.**, CHARPENTIER S., 2008. Growing media for Horticulture in France. *Acta Horticulturae*, **779**, 33-38. doi.org/10.17660/ActaHortic.2008.779.1
- 41 NAASZ R., **MICHEL J.C.**, CHARPENTIER S., 2005. The use of transient approaches for measuring hysteretic hydraulic properties of growing media in the laboratory. *Soil Science Society of America Journal*, **69** (1), 13-22. doi.org/10.2136/sssaj2005.0013
- 42 **MICHEL J.C.**, MOREL P., RIVIERE L.M., 2004. The importance of the hydric history on physical properties and wettability of peats. *Acta Horticulturae*, **644**, 275-281. doi.org/10.17660/ActaHortic.2004.644.37
- 43 POULENARD J., **MICHEL J.C.**, BARTOLI F., PORTAL J.M., PODWOJEWSKI S. 2004. Water repellency of volcanic ash topsoils from Ecuadorian Páramo related to hydrophobic organic materials and water content. *European Journal of Soil Science*, **55** (3), 487-496. doi.org/10.1111/j.1365-2389.2004.00625.x
- 44 MOREL P., **MICHEL J.C.**, 2004. Control of the moisture content of growing media by time domain reflectometry (TDR). *Agronomie*, **24** (5), 275-279. doi.org/10.1051/agro:2004023

- 45 **MICHEL J.C.**, TESSIER D., FAVROT J.C., 2003. Comportement et organisation de sols de Boulbène dans le Tarn. Quelques éléments sur le passage d'une structure prismatique à une structure verticale dans les horizons enrichis en argile. *Etude et Gestion des Sols*, **10** (2), 71-80.
- 46 CARON J., RIVIERE L.M. CHARPENTIER S., RENAULT P., **MICHEL J.C.**, 2002. Using time domain reflectometry to estimate hydraulic conductivity and air entry in growing media and sand. *Soil Science Society of America Journal*, **66** (2), 373-383. doi.org/10.2136/sssaj2002.3730
- 47 **MICHEL J.C.**, RIVIERE L.M., BELLON-FONTAINE M.N., 2001. Measurement of the wettability of organic materials in relation to water content by capillary rise method. *European Journal of Soil Science*, **52** (3), 459-467. doi.org/10.1046/j.1365-2389.2001.00392.x
- 48 **MICHEL J.C.**, BEAUMONT A., TESSIER D., 2000. A laboratory method for measuring the isotropic character of soil swelling. *European Journal of Soil Science*, **51** (4), 689-697. doi.org/10.1046/j.1365-2389.2000.00340.x
- 49 **MICHEL J.C.**, RIVIERE L.M., BELLON-FONTAINE M.N., 1999. Characterisation of the wettability of organic substrates (peat and composted bark) by adsorption measurements. *Acta Horticulturae*, **481** (1), 129-135. doi.org/10.17660/ActaHortic.1999.481.11
- 50 **MICHEL J.C.**, RIVIERE L.M., BELLON-FONTAINE M.N., 1999. Effects of water content on the wettability of peats. *Ecologie*, **30**, 13-17.

Book

- 51 **Proceedings of the International Symposium on Growing Media (ISHS-IPS), 2008**. Ouvrage coordonné par **J.C. MICHEL** Acta Horticulturae, 779. Ed. **J.C. MICHEL**. ISBN 978 90 6605 015 0, 704 pages.

Chapter of book

- 1 CARON J., **MICHEL J.C.**, 2021. Understanding and optimizing the physical properties of growing media for soilless cultivation. In *Advances in Horticultural Soilless Culture*. 32p. Burleigh Dodds Science Publishing. ISBN-13: 9781786764355. 442p.
- 2 CARON J., ELRICK, D., **MICHEL J.C.**, NAASZ R., 2007. Physical properties of organic soils and growing media: water and air storage and flow dynamics. In *Soil Sampling and Methods of Analysis, 2nd edition*, CRC Press. ISBN 13:978-0-8493-3586-0. pp. 885-912.

Papers & communications for Symposium & congress ¹

Reviewed papers

- 1 DURAND S., JACKSON B.E., FONTENO W.C., **MICHEL J.C.**, 2022. Advances in substrate particle characterization using dynamic image analysis compared to sieving procedure for predicting water retention properties. *ISHS International Symposium on Innovative Technologies and Production Strategies for Sustainable Controlled Environment Horticulture*, August 14-20 2022, Angers, FRA. [O]
- 2 LARGANT L., **MICHEL J.C.**, 2022. Growing Media in France: past, present and future. *ISHS International Symposium on Innovative Technologies and Production Strategies for Sustainable Controlled Environment Horticulture*, August 14-20 2022, Angers, FRA. [P]
- 3 DURAND S., JACKSON B.E., BARTLEY P.C., FONTENO W.C., **MICHEL J.C.**, 2021. New tools for particle shape analysis of substrate components: initial results and future prospects. *ISHS International Symposium on Growing Media, Soilless Cultivation and Compost Utilization in Horticulture*, August 22-27 2021, Ghent, BEL. [O]
- 4 DURAND S., JACKSON B.E., BARTLEY P.C., FONTENO W.C., **MICHEL J.C.**, 2021. Analyzing rehydration efficiency of hydrophilic (wood fiber) vs potentially hydrophobic (peat) substrates using different irrigation methods. *ISHS International Symposium on Growing Media, Soilless Cultivation and Compost Utilization in Horticulture*, August 22-27 2021, Ghent, BEL. [O]
- 5 DURAND S., **MICHEL J.C.**, 2021. The particle shape of peats: a complementary analysis for their characterization. *16th International Peatland Congress*, May 3-6 2021, Tallinn, EST. [O]
- 6 **MICHEL J.C.**, JACKSON B.E., FONTENO W.C., 2021. The use of coir for reducing risks of substrates hydrophobicity. *ISHS International Symposium on Growing Media, Soilless Cultivation and Compost Utilization in Horticulture*, June 24-28 2019, Milano, ITA. [O]

¹ [O] = Oral communication, [P] = poster

- 7 **MICHEL J.C.**, 2019. Relevant hydraulic properties of peat-based mixes for explaining root development according to irrigation strategies. *ISHS International Symposium on Growing Media, Soilless Cultivation and Compost Utilization in Horticulture*, August 20-25 2017, Portland, OR, USA. [O].
- 8 DONNERS M.P.J., VERHOEVEN J., **MICHEL J.C.**, 2019. Potential use of Recycled Stone Wool Substrate Granulate as Substrate Component. *ISHS International Symposium on Growing Media, Soilless Cultivation and Compost Utilization in Horticulture*, August 20-25 2017, Portland, OR, USA. [P].
- 9 **MICHEL J.C.**, JACKSON B.E., FONTENO W.C., 2017. Classification of organic substrates' wettability from contact angle measurements and hydration efficiency tests. *ISHS International Symposium on Growing Media, Composting & Substrate analysis*, September 6-11 2015, Vienna, Austria. [O].
- 10 **MICHEL J.C.**, KERLOCH E., 2017. Evolution of Hydraulic Properties of Organic Substrates during Cultivation according to Irrigation Strategies and Root Growth. *International Symposium on Growing Media, Composting & Substrate analysis*, September 6-11 2015, Vienna, Austria. [O].
- 11 **MICHEL J.C.**, SCHMILEWSKI G., LARGANT L., 2015. Growing Media in France and Europe: Inventory and Current Perspectives. *American Society for Horticultural Science Conference*, August 3-7 2015, New Orleans, USA [O]. *HortScience*, **50**(9), S285.
- 12 **MICHEL J.C.**, JACKSON B.E., FONTENO W.C., 2015. Effect of Water Content of the Hydration Efficiency of some Organic Substrates. *American Society for Horticultural Science Conference*, August 3-7 2015, New Orleans, USA [O]. *HortScience*, **50**(9), S284.
- 13 **MICHEL J.C.**, JACKSON B.E., FONTENO W.C., 2015. Wetting agent addition for limiting risks of hydrophobicity of peat substrate. *American Society for Horticultural Science Conference*, August 3-7 2015, New Orleans, USA [O]. *HortScience*, **50**(9), S284.
- 14 **MICHEL J.C.**, KERLOCH E., 2015. Effects of different Irrigation Strategies on the Evolution of Peat Hydraulic Properties during Cultivation. *American Society for Horticultural Science Conference*, August 3-7 2015, New Orleans, USA [O]. *HortScience*, **50**(9), S253.
- 15 **MICHEL J.C.**, KERLOCH E., 2015. Towards a Better Irrigation Management in Soilless Culture by taking into account the Influence of Root Development on the Evolution of Hydraulic Properties of Substrates. *American Society for Horticultural Science Conference*, August 3-7 2015, New Orleans, USA [O]. *HortScience*, **50**(9), S244.
- 16 **MICHEL J.C.**, CANNAVO P., 2014. Importance of peat particle size effects on spatial root distribution and changes on aeration properties. *International Symposium on Growing Media & Soilless Cultivation*, June 17-21 2011, Leiden, The Netherlands. [O].
- 17 **MICHEL J.C.**, KERLOCH E., BOZON E., CANNAVO P., 2013. Consequences of root development on the evolution of hydraulic properties of peat growing media under a constant and optimal water regime. *International Symposium on Growing Media, Composting & Substrate analysis*, October 17-21 2011, Barcelona, Spain. [O].
- 18 **MICHEL J.C.**, QI G., CHARPENTIER S., 2011. Water repellency of peats: a main factor influencing the evolution of their physical properties. *International Symposium on Growing Media, Composting & Substrate analysis*, October 17-21 2011, Barcelona, Spain. [O].
- 19 KAMMOUN RIGANE M., **MICHEL J.C.**, MEDHIOUB K., MOREL P., 2011. Evaluation of physicochemical, biochemical and phytotoxicity of Tunisian mature agricultural wastes composts. *International Symposium on Growing Media, Composting & Substrate analysis*, October 17-21 2011, Barcelona, Spain. [O].
- 20 QI G., **MICHEL J.C.**, CHARPENTIER S., BOVIN P., 2011. A laboratory method for measuring physical properties of growing media and their evolution during drying/wetting cycles: preliminary results. *ISHS-IPS, International Symposium Growing media*, June 1-5 2009, Charlotte, USA. [O].
- 21 HAFDHI H., CANNAVO P., **MICHEL J.C.**, 2010. Conséquences du développement racinaire sur les propriétés physiques d'un substrat horticole maintenu en confort hydrique. *Bulletin GFHN*, 35èmes journées scientifiques, 23-25 Novembre 2010, Louvain La Neuve, Belgique, **36**, 143-144 [O].
- 22 KAMMOUN RIGANE M., **MICHEL J.C.**, MEDHIOUB K., 2010. Evolution of the physico-chemical properties of Tunisian agricultural wastes during composting process. *Proceedings of the 14th Ramiran International Conference: Treatment and use of organic residues in agriculture*, September 13-15 2010, Lisbon, Portugal [P].
- 23 **MICHEL J.C.**, QI G., CHARPENTIER S., BOVIN P., 2010. Evolution of water repellency of organic growing media used in Horticulture and consequences on hysteretic behaviours of the water retention curve. *EGU*, May 2-7 2010, Vienna, Austria. *Geophysical Research Abstracts*, **12**, 3455 [O].
- 24 NAASZ R., **MICHEL J.C.**, CHARPENTIER S., 2009. Water repellency of organic growing media and its consequences on hysteretic behaviours of the water retention curve. *ISHS-IPS, International Symposium on Growing media*, September 2-8 2007, Nottingham, U.K. [O].

- 25 MOREL P., GUILLEMAIN G., MICHEL J.C., 2008. Temperature and salinity effects on measurements of growing media moisture content carried out with TDR & capacitance probes. *ISHS-IPS, International Symposium on Growing media*, September 4-10 2005, Angers, France. [P].
- 26 NAASZ R., MICHEL J.C., CHARPENTIER S., 2008. Modelling oxygen and water flows in peat substrates with root uptakes. *ISHS-IPS, International Symposium on Growing media*, September 4-10 2005, Angers, France. [O].
- 27 NAASZ R., MICHEL J.C., CHARPENTIER S., 2008. Microbial respiration on its consequence on air availability in substrates. *ISHS-IPS, International Symposium on Growing media*, September 4-10 2005, Angers, France. [O].
- 28 RIVIÈRE L.M., MOREL P., MICHEL J.C., CHARPENTIER S., 2008. Growing media for Horticulture in France. *ISHS-IPS, International Symposium on Growing media*, September 4-10 2005, Angers, France. [O].
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