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Dr Ahmed DOUAIK

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Born: on December 7, 1965 at Témara, Morocco

Citizenship: Moroccan

Employer: National Institute of Agricultural Research, Regional Center of Rabat, Research Unit on Environment and Conservation of Natural Resources, Rabat, Morocco

Duties: Statistician, Geomatician (GIS and Remote Sensing), and Agro-climatologist

Languages: Arabic, English, French

EDUCATION

- *Certificate in Principles and Applications of Remote Sensing and GIS in Natural Resources Management*, University of Twente, Faculty of Geo-information Science and Earth Observation (ITC), Enschede, The Netherlands, September-December 2009
- *PhD in Applied Biological Sciences, option: Land and Forest Management*, Ghent University, Ghent, Belgium, May 2000 - March 2005, Advisors: Prof Marc VAN MEIRVENNE from Ghent University, Belgium and Prof Tibor TOTH from Hungarian Academy of Sciences
- *MSc in Biometrics*, Hassan II Institute of Agricultural Sciences and Veterinary Medicine, Rabat, Morocco and University of Liège, Faculty of Agricultural Sciences, Gembloux, Belgium, September 1989 - September 1991, Advisor: Prof Rodolphe PALM
- *BSc in Agricultural Sciences*, Hassan II Institute of Agricultural Sciences and Veterinary Medicine, Rabat, Morocco, September 1985 - July 1989

POSTGRADUATION TRAINING

- *On-farm trials : design and analysis*, International Center for Agricultural Research in the Dry Areas (ICARDA), Amman, Jordan, 24 August - 4 September 2014
- *Statistical Design, Data Analysis and Biometrical Techniques in Agricultural Research*, ICARDA, Amman, Jordan, 23-27 June 2013
- *Statistical Analysis of Geospatial Data for Environmental Studies*, Mediterranean Agronomic Institute of Zaragoza (IAMZ), Zaragoza, Spain, 11-22 June 2012
- *Computational Genomics*, Mohamed V University, Rabat, 19-27 March 2008; speakers were from Mohamed V University, Rabat and Ghent University, Ghent, Belgium.
- *Characterizing spatial variability for agricultural planning and site-specific crop management in Mediterranean conditions*, IAMZ, Zaragoza, Spain, 7-17 March 2006.
- *Experimental design for bio-process engineering*, Ghent University, Ghent, Belgium, 2nd semester 2001/2002
- *Space-time data acquiring and processing*, Catholic University of Louvain, Louvain-la-Neuve, Belgium, 2nd semester 2000/2001
- *Geomatics applied to the environment*, Catholic University of Louvain, Louvain-la-Neuve, Belgium, 2nd semester 2000/2001

- ***Digital Landscape Image Interpretation***, Prof Rudi GOOSSENS, Université de Gand, Belgique, 2nd semestre 2000/2001
- ***Remote Sensing***, Ghent University, Ghent, Belgium, 1^{er} semester 2000/2001
- ***Land Information Systems***, Ghent University, Ghent, Belgium, 1^{er} semester 2000/2001
- ***Statistical principles in livestock production experiments: towards a better understanding and application of modern methods***, IAMZ, Zaragoza, Spain, May 1998
- ***Advanced statistical analysis of multi-locational variety trials***, ICARDA, Settat, Morocco, February 1997
- ***Tools for statistical and process-based modeling in agriculture***, IAMZ, Zaragoza, Spain, May 1996
- ***Biometrical methods in agricultural research***, ICARDA, Tunis, Tunisia, May 1995

TEACHING EXPERIENCE

- ***Experimental designs and their statistical analyses***, Regional Center of Agricultural Research of Tadla, Béni-Mellal, Morocco, 26 and 27 May 2015, audience : researchers from Burkina Faso, Mali, Mauritania, Niger, and Senegal (in French);
- ***Sampling methods and crop production estimation***, Regional Office of Agricultural Development of Souss-Massa, Agadir, Morocco, 16-18 December 2014 (in French);
- ***Use of ArcGIS 10 software: advanced level***, Ministry of Water, Rabat, Morocco, 10-14 November 2014 (in French);
- ***Use of ArcGIS software in hydro-agricultural planning***, Regional Office of Agricultural Development of Gharb, Kénitra, Morocco, 27-31 October 2014 (in French);
- ***Use of ArcGIS 10 software: initiation level***, Ministry of Water, Rabat, Morocco, 20-24 October 2014 (in French);
- ***New functionalities in GIS and image processing***, Regional Office of Agricultural Development of Gharb, Kénitra, Morocco, 13-17 October 2014 (in French);
- ***Design of agricultural experiments and their statistical analyses***, Regional Center of Agricultural Research of Tadla, Béni-Mellal, Morocco, 19 and 20 June 2014, audience : researchers from Libya (in Arabic);
- ***Statistical inference***, National Forest School of Engineers (ENFI), Salé, Morocco, audience : 3rd year students, academic year : 2013/2014 (in French);
- ***Principles of experimentation***. University of KhemisMeliana, KhemisMeliana, Algeria, May 2013 (in French);
- ***Causes and impacts of climatic change***, Béni-Mellal, Morocco, audience: farmers, 4-7 March 2013, (in Arabic)
- ***Methods of soil salinity assessment and monitoring in laboratory and in field***. Training workshop on Management and tools for saline water use in Agriculture, INRA in collaboration with the Arab Center for the Studies of Arid Zones and Dry Lands (ACSAD), Rabat, 10-13 December 2012, (in French)
- ***Mapping of salt-affected soils using GIS and spatial remote sensing***. Training workshop on Management and tools for saline water use in Agriculture, INRA in collaboration with the Arab Center for the Studies of Arid Zones and Dry Lands (ACSAD), Rabat, 10-13 December 2012, (in French)
- ***Geostatistics***, National Forest School of Engineers (ENFI), Salé, Morocco, audience : 3rd year students, since 2008/2009 (in French)

- ***Geostatistical spatializing of soil properties and agro-climatic parameters***, Hassan II Agronomic and Veterinary Institute, Rabat, Morocco, 17 June 2009;
- ***Soil salinity mapping using geostatistical methods: theory and case studies***, audience : researchers from Senegal, Hassan II Agronomic and Veterinary Institute, Rabat, Morocco, October 2006;
- ***Geostatistical modeling of soil salinity***, INRA in collaboration with the International Center for Biosaline Agriculture (ICBA), Rabat, Morocco, June 2005;
- ***SAS statistical software***, audience: researchers from INRA, Rabat. Many sessions were organized from 1995 to 1999;
- ***Systat statistical software***, audience: researchers from INRA, Rabat. Many sessions were organized from 1993 to 1995;
- ***Applied statistics and experimental designs***, audience: researchers from INRA, Rabat. Many sessions were organized from 1992 to 1998.

CONFERENCES, CONGRESSES, AND SYMPOSIA

1. ***Framework for predicting hydraulic properties of calcareous arid soils***, oral presentation, *General Assembly of the European Geophysical Union*, Vienna, Austria, 27 April – 2 May 2014
2. ***Climate change and agriculture : Evaluation of the impacts and the ways of mitigation and adaptation***, oral presentation, *1st International Polydisciplinary Congress 'Strategic Challenges of Sustainable Integrated Development in Africa'*, Sultan Moulay Slimane University, Béni-Mellal, Morocco, 5 and 6 June 2015
3. ***Some simple statistical methods for detecting climate change***, oral presentation, *1st National Colloquium 'Climate, Water, and Society'*, Sultan Moulay Slimane University, Béni-Mellal, Morocco, 18 and 19 March 2015
4. ***Contribution of the statistical methodology of the design of experiments to the optimization of crop fertilizers***, oral presentation, *1st North-African IPNI Workshop on Crop Fertilizer*, Marrakech, Morocco, 20 and 21 January 2015;
5. ***Characterizing mineral composition of a durum wheat collection for its valorization***, oral presentation, *1^{er} national workshop of biodiversity*, Sidi Mohamed Ben Abdellah University, Fez, Morocco, 17 December 2014;
6. ***Nutritional valorization of a durum wheat collection***, oral presentation, *1st international colloquium 'Natural Substances and Modeling' (CISNEM)*, Sidi Mohamed Ben Abdellah University, Taza, Morocco, 15-16 December 2014;
7. ***Impacts of the climate change on agriculture in Morocco***, oral presentation, *Symposium on Environmental Problems in the Arab World*, Sultan Qaboos University, Muscat, Oman, 26-28 February 2012
8. ***Recovery of spatial information for crop statistics from hypertemporal remote sensing***, oral presentation, *E-Agri (Crop monitoring as an E-agriculture tool in developing countries)* project workshop, INRA, Rabat, Morocco, 12-14 October 2011
9. ***Contribution of soil databases and land suitability to combating erosion in Morocco***, poster, *colloquium on water erosion and soil vulnerability in Maghreb*, Hassan II Institute of Agricultural Sciences and Veterinary Medicine, Rabat, Morocco, 12 and 13 October 2011
10. ***Soil fertility Models: Experimental designs and statistical analysis of data***, oral presentation, *OCP Project on Mapping fertility of agricultural soils of Morocco*, Kénitra, Morocco, 6 October 2011

11. ***Impacts of climatic changes on agricultural production***, oral presentation, *Series of internal seminars of the Regional Center of Agricultural Research of Rabat*, Rabat, Morocco, 28 February 2011
12. ***Impact of climate change on agricultural potentialities of lands in a semi-arid region of Morocco***, oral presentation, *International Conference on the Impacts of Climate Change on Agriculture and Biodiversity in the Arab Region*, Kuwait Institute for Scientific Research, Kuwait, 30 November – 2 December 2010
13. ***Soil salinity mapping using electromagnetic induction and geostatistics: Case study of Tadla plain, Morocco***, oral presentation, *Global Forum on Salinization and Climate Change*, University of Valencia, Valencia, Spain, 25 – 29 October 2010
14. ***Monitoring temporal stability and/or change of spatial patterns of soil salinity in the context of a changing climate***, oral presentation, *Global Forum on Salinization and Climate Change*, University of Valencia, Valencia, Spain, 25 – 29 October 2010
15. ***Best management practices for nitrogen and salinity off-site pollution control***, oral presentation, *Final coordination meeting of the Qualiwater project and International seminar*; Mediterranean Agronomic Institute of Zaragoza, Zaragoza, Spain, 19 – 21 October 2010
16. ***Mapping the risk of soil salinization: use of electromagnetic induction and non-parametric geostatistics***, oral presentation, *International Conference on Soil Classification and Reclamation of Degraded Lands in Arid Environments*, Environment Agency Abu Dhabi and International Center for Biosaline Agriculture, Abu Dhabi, United Arab Emirates, 17 – 19 May 2010
17. ***Mapping soil saturated hydraulic conductivity using geostatistical methods***, oral presentation, *2nd International Congress on Integrated Management of Water Resources and Challenges for Sustainable Development*, Ibn Zohr University, Agadir, Morocco, 24 – 26 March 2010
18. ***Use of low-quality waters for irrigation : monitoring spatial and temporal variability***; oral presentation, *4th coordination meeting of the Qualiwater project*, Adana, Turkey, 25 - 27 May 2009
19. ***Soil salinity mapping in the Tadla region, central Morocco, using electromagnetic induction and Geostatistics***, oral presentation, *3rd International Conference on Geo-resources of the Middle East and North Africa*, Cairo, Egypt, 21–24 Feb. 2009
20. ***Soil salinity Mapping of the Tadla region using electromagnetic induction and geostatistics***, oral presentation, *Seminar on Soil and water Quality: Tools for monitoring and study of spatio-temporal variability*, Hassan II Institute of Agricultural Sciences and Veterinary Medicine, Rabat, Morocco, 22 and 23 January 2009.
21. ***Geostatistically-based Delineation of Soil Fertility Management Units for Optimizing Plant Fertilisation***, poster, *5th Congress on Scientific Research Outlook in the Arab World*, Fez, Morocco, 28 - 30 October 2008
22. ***Assessment of Land Potentialities and Climatic Changes in a Semi-arid Region of Morocco***, poster presentation, *5th International Conference on Land Degradation*, Mediterranean Agronomic Institute of Bari, Bari, Italy, 18 – 22 September 2008
23. ***Use of low-quality waters for irrigation : monitoring spatial and temporal variability***, oral, *3rd coordination meeting of the Qualiwater project*, Tunis, Tunisia, 27 - 29 May 2008
24. ***Contribution of geostatistics to delineation of homogeneous zones of soil fertility for optimizing fertilization***, oral presentation, *2nd National Congress on Improvement of the Agricultural Production*, Settat, Morocco, 3 and 4 April 2008.
25. ***Soil salinity mapping using geostatistical methods***, poster, *1st National Congress on Improvement of the Agricultural Production*, Settat, Morocco, 16 and 17 March 2006.

26. **Comparison of space-time interpolation methods of soil salinity**, oral presentation, workshop 'Monitoring space-time dynamics of soil chemical properties to improve soil management and environmental quality', Ghent University, Ghent, Belgium, 8 and 9 December 2005
27. **Detecting and monitoring temporal changes of spatially variable soil salinity**, oral presentation, 8th international meeting on soils with Mediterranean type of climate, Moroccan Soil Science Society, Marrakech, Morocco, 9 to 11 February 2004
28. **Soil salinity mapping using spatio-temporal kriging and Bayesian maximum entropy**, oral presentation, *Pedometrics'03: the 5th International conference on Pedometrics* (International Union of Soil Science), Department of Soil Sciences, University of Reading, UK, 11 and 12 September 2003
29. **Spatio-temporal kriging of soil salinity rescaled from bulk soil electrical conductivity**, oral presentation, *GeoEnv02: the 4th European conference on Geostatistics with environmental applications*, Polytechnic University of Catalonia, Barcelona, Spain, 27 to 29 November 2002
30. **Spatial and temporal aspects of soil salinization in a sodic grassland**, oral presentation, *International Symposium on Sustainable Use and Management of Soils in Arid and Semi-arid Regions*, University of Murcia, Spain, 22 – 26 September 2002

PUBLICATIONS

1. Zouahri A, Dakak H, **Douaik A**, El Khadir M et Moussadek R. (2015). Evaluation of groundwater suitability for irrigation in the Skhirat region, Northwest of Morocco. *Environmental Monitoring and Assessment*, 187: 4184.
2. Bouhafa K, Moughli L, Daoui K, **Douaik A** et Taarabt Y. (2015). Soil properties at different distances of intercropping in three olive orchards in Morocco. *International Journal of Plant and Soil Science*, 7: 238 – 245.
3. Ouhaddach M, Mouhssine F, Hmouni D, El Yacoubi H, Zidane L, Douaik A et Rochdi A. (2014). Effet du chlorure de sodium (NaCl) sur les paramètres de germination du blé tendre (*Triticum aestivum* L.). *European Journal of Scientific Research*, 127 : 298 – 310.
4. Ismaili S, **Douaik A** et Moughli H. (2014). Soil fertility mapping: comparison of three spatial interpolation techniques (ordinary kriging, inverse distance weighted, and spline). *International Journal of Engineering Research and Technology*, 3: 1635-1643
5. El Asri A, Ait Aguil F, OuazzaniTouhami A, **Douaik A**, Benkirane R et Douira A. (2014). Study of the height growth of carob tree seedlings of different ages and grown under two different water regimes. *International Journal of Recent Scientific Research*, 5 : 811-813.
6. El Asri A, Ait Aguil F, Douira A, **Douaik A** et OuazzaniTouhami A. (2014). Evaluation of the impact of water stress and irrigation on carob tree two year seedlings in Northeast of Morocco. *Research and Reviews in Biosciences*, 9 : 137-141.
7. Manzali R, Bouksaim M, Bendaou M, Zouahri A, **Douaik A**, Benchakroun M et Saidi N. (2014). Evaluation of technological potential of new developed Moroccan hexaploid oat lines. *International Journal of Engineering Research and Technology*, 3: 1759-1767.
8. **Douaik A**. (2014). Application of statistical methods and GIS for downscaling and mapping crop statistics using hypertemporal remote sensing. *Journal of Statistical Science and Application*, 2: 93-101
9. Khlosi M, Cornelis WM, **Douaik A**, Hazzouri A, Habib H et Gabriels D. (2013). An exploratory study of the interaction between soil hydraulic properties and other physical and chemical properties of Syrian soils. *Vadose Zone Journal*, 12(4). doi:10.2136/vzj2012.0209.

10. Bouhafa K, Moughli L, Bouchoufi K, **Douaik A**, and Daoui K. (2014). Nitrogen Fertilization of Olive Orchards under Rainfed Mediterranean Conditions. *American Journal of Experimental Agriculture*, 4: 890-901
11. Dakak H, Zouahri A, Iaaich H, Moussadek R, El Khadir M, **Douaik A**, Soudi B, and Benmohammadi A. (2014). Apport des Systèmes d'Information Géographique au diagnostic de la pollution nitrique des eaux souterraines : Cas de la zone de Skhirate, Maroc. *Revue des Régions Arides*, 33 : 75-79
12. El Asri A, AitAguil F, **Douaik A**, OuazzaniTouhami A and Douira A. (2013). Study of the effect of irrigation on the growth of carob plants in eastern Morocco: planting with seedlings a year. *Journal of Animal and Plant Sciences*, 19: 2941 - 2947
13. Chehaibi S, **Douaik A**, Gharbi R, and Abrougui K. (2012). Effects of the density of the mechanical aeration on the resistance to penetration of a turf soil and its impact on the plant root behavior. *Agricultural Segments*: 3(1) AGS/1578
14. Moussadek R, Mrabet R, Dahan R, **Douaik A**, Verdoodt A, Van Ranst E and Corbeels M. (2011). Effect of tillage practices on the soil carbon dioxide flux during fall and spring seasons in a Mediterranean Vertisol. *Journal of Soil Science and Environmental Management*, 2 : 362 – 369.
15. Dakak H, Soudi B, Benmohammadi A, **Douaik A**, Badraoui M et Moussadek R. (2011). Prospection de la salinité des sols par induction électromagnétique sur la plaine du Tadla (Maroc): tentative d'optimisation par analyse géostatistique. *Sécheresse*, 22 : 178 – 185.
16. Aragues R, Urdanoz V, Cetin M, Kirda C, Daghari H, Ltifi W, Lahlou M et **Douaik A**. (2011). Soil salinity related to physical soil characteristics and irrigation management in four Mediterranean irrigation districts. *Agricultural Water Management*, 98: 959 – 956.
17. Khlosi M, Cornelis WM, **Douaik A**, Van Genuchten T et Gabriels D. (2008). Performance evaluation of models that describe soil water retention curve between saturation and oven dryness. *Vadose Zone Journal*, 7: 87 – 96.
18. **Douaik A**. (2007). *Contribution of geostatistics to the delineation of homogeneous zones of soil fertility for the optimization of plant fertilization*. Work presented for the promotion to Chief Engineer, Rabat, Morocco, October 2007;
19. **Douaik A**, Van Meirvenne M et Toth T. (2007). Statistical methods for evaluating soil salinity spatial and temporal variability. *Soil Science Society of America Journal*, 71: 1629 – 1635.
20. Chehaibi S, **Douaik A**, Pieters JG et Verschoore RA. (2007). Effets de la vitesse de travail du sol sur son état structural et le comportement du tracteur et de l'outil. *Revue de l'INAT*, 22 : 109 – 121.
21. **Douaik A**, Van Meirvenne M et Toth T. (2006). Temporal stability of spatial patterns of soil salinity determined from laboratory and field electrolytic conductivity. *Arid Land Research and Management*, 20: 1 – 13.
22. **Douaik A**. (2005). *Evaluation of the space-time variability of soil salinity by statistical, geostatistical and Bayesian maximum entropy methods*. PhD thesis, Ghent University, Ghent, Belgium, March 2005;
23. **Douaik A**, Van Meirvenne M et Toth T. (2005). Soil salinity mapping using spatio-temporal kriging and Bayesian maximum entropy with interval soft data. *Geoderma*, 128: 234 – 248.
24. **Douaik A**, Van Meirvenne M, Toth T et Serre ML. (2004). Space-time mapping of soil salinity using probabilistic Bayesian maximum entropy. *Stochastic Environmental Research and Risk assessment*, 18: 219 – 227.

25. Ansari MA, Patel BA, Mhase NL, Patel DJ, **Douaik A** et Sharma SB. (2004). Tolerance of chickpea (*Cicerarietimum*) lines to root-knot nematode, *Meloidogynejavanica* (Treub) Chitwood. *Genetic Resources and Crop Evolution*, 51: 449 – 453.
26. Ansari MA, Rupela OP, **Douaik A**, GopalakrishnanS et Sharma SB. (2002). Effect of culture filtrates of *Pseudomonas striata*, *Trichodermaharzianum*, *T. viride* and *Aspergillus awamori* on egg hatch of *Meloidogynejavanica*. *International Journal of Nematology*, 12: 131 – 136.
27. **Douaik A**. (1993). *Comparison of the statistical softwares Minitab, SAS, Stat-ITCF and Systat*. 1st part of the work presented for my tenure at INRA, November 1993;
28. **Douaik A**. (1993). *Conception of the application Design based on Systat for the statistical analysis of experimental designs* (in French). Second part of the work presented for my tenure at INRA, November 1993;
29. **Douaik A**. (1991). *Forecasting crop yields using exponential smoothing methods* (in French). MSc thesis, University of Liège, Faculty of Agricultural Sciences, Gembloux, Belgium, September 1991.