

IN MEMORIAM**Obituary: Ivan Impens (1935-2014)****Poor is the disciple who does not surpass his master**J. Bogaert^{1*}, I. Nijs² & R. Ceulemans²

Photo 1: Top: Ivan Impens (1960), research assistant of the INEAC in Yangambi (Belgian Congo). Bottom: Ivan Impens (1987), professor of ecology at the University of Antwerp (Belgium).

Ivan Impens was born in Melle (Belgium) on August 15, 1935 and passed away in Gentbrugge (Belgium) on March 21, 2014. After becoming a forestry engineer (1958) with a major in tropical forestry at the University of Ghent (Belgium) and a dissertation entitled “Phytosociological study of natural sprouts as a potential indicator of growth site value in the plantations of Yaluwe (ex Eastern Province) in the Belgian Congo”, Ivan Impens joined as a research assistant in 1960 the Institut National pour l’Etude Agronomique du Congo belge

(INEAC) in Yangambi (Belgian Congo, photo 1). In 1960, after Congo’s rather turbulent independence, he returned to Belgium where he continued his academic career as research assistant and research associate at the University of Ghent. He presented in 1965 his PhD dissertation entitled “Experimental study of physical and biological aspects of transpiration in the different layers of the canopy” [5]. In those years, his research mainly concerned the physical and physiological aspects and mechanisms regarding the exchange of gases and water between plants and the atmosphere at the leaf and stand level [6-8].

After a postdoctoral research stay (1965-1967) at Cornell University (Ithaca, New York, USA) [2-4,9], Ivan Impens returned to the University of Ghent. In 1973, Ivan Impens moved to the University of Antwerp, where he became the head of the plant ecology laboratory in the newly created biology department. This transfer to Antwerp marked the founding of a dynamic research group – now the research group of plant and vegetation ecology – today an international reference in terrestrial ecology. Ivan Impens became full professor in 1985 (photo 1) and retired in 2000. A colloquium was organized to celebrate over 40 years of ecological research by Ivan Impens [1]. His teaching activities at the University of Antwerp mainly concerned plant and vegetation ecology, plant sociology, and biogeography, courses offered in the biology program. His personal research disciplines can be summarized as plant ecology, environmental physics and physiology [10-12,14,15].

A multi-scalar and cross-disciplinary approach was always advocated by Ivan Impens which made him a pioneer in opening new research fields. The research findings of Ivan Impens and his collaborators have been published in highly ranked scientific journals such as *Agricultural and Forest Meteorology*, *Canadian Journal of Forest Research*,

1 Université de Liège, Gembloux Agro-Bio Tech, Unité Biodiversité et Paysage, Gembloux, Belgium.

2 Universiteit Antwerpen, Departement Biologie, Onderzoeksgroep Planten- en Vegetatie-ecologie, Wilrijk, Belgium.

* Corresponding author: Email: j.bogaert@ulg.ac.be

Ecology, Ecosystems, Environmental and Experimental Botany, Environmental and Ecological Statistics, Environmental Management, Experimental Agriculture, Forest Ecology and Management, Forest Science, Functional Ecology, Global Change Biology, Journal of Biogeography, Journal of Theoretical Biology, Journal of Tropical Ecology, Journal of Quantitative Spectroscopy and Radiative Transfer, Oecologia, Oikos, Photosynthesis Research, Plant Cell and Environment, Plant Ecology, Plant Physiology, or Tropical Agriculture. The topical diversity of the aforementioned journals underlines the large coverage of the research projects directed and inspired by Ivan Impens and his ability and ambition to combine applied research with conceptual approaches. Ivan Impens also co-authored two books [13,16]. His citation record illustrates the relevance of his scientific legacy, with a citation index of $H=26$ and over 2300 citations. A scientist lives forever through his publications and paradigms. The importance and principles of scientific communication and peer-evaluation have always been defended by Ivan Impens; research

findings had always to be subjected and exposed to the scientific community in order to be validated. A more complete list of his publications is given in [1] for the period 1961-2000 or can be found through a simple internet search. These publications illustrate the ambition of Ivan Impens to study a wide variety of ecosystems; the entire gradient, from arctic over temperate to (sub)tropical systems, has been covered by his research team.

Ivan Impens was always a great motivator of his collaborators. He challenged his students to excel, to explore, to be creative and to look outside their own discipline. "Poor is the disciple who does not surpass his master", was one of his leitmotifs. "Thinking outside the box", currently a popular paradigm in management, was a common practice already in the 1980s in his research unit. Ivan Impens will be greatly missed and remembered as an inspiring mentor of young researchers with an open mind and as an eminent scientist in the field of terrestrial ecology and environmental physics. The authors hope that his family may be consoled by his warm memories and may find the strength to deal with this loss.

Literature

1. Ceulemans R., Bogaert J., Deckmyn G. & Nijs I. (eds.), 2000, Topics in ecology: structure and function in plants and ecosystems. University of Antwerp, Wilrijk, Belgium, 329 p.
2. Hunt L.A., Impens I.I. & Lemon E.R., 1967, Preliminary wind tunnel studies of the photosynthesis and evapotranspiration of forage stands. *Crop Sci.*, **7**, 575-578.
3. Hunt L.A. & Impens I.I., 1968, Use of antitranspirants in studies of the external diffusion resistance of leaves. *Oecolog. Plantar.*, **3**, 1-6.
4. Hunt L.A., Impens I.I. & Lemon E.R., 1968, Estimates of the diffusion resistance of some large sunflower leaves in the field. *Plant Physiol.*, **43**, 522-526.
5. Impens I.I., 1965, *Experimentele studie van de fysische en biologische aspecten van de transpiratie in de verschillende lagen van de vegetatie*. PhD dissertation, Rijkslandbouwhogeschool Gent, Ghent, Belgium, 102 p.
6. Impens I.I. & Schalk J., 1965, A very sensitive electric dendrograph for recording radial changes of a tree. *Ecology*, **46**, 183-184.
7. Impens I.I., 1966, Diurnal changes in the internal and external diffusion resistances of upper and lower leaves in a crop of beans (*Phaseolus vulgaris* L.). *Oecolog. Plantar.*, **1**, 245-252.
8. Impens I.I., 1966, Leaf wetness, diffusion resistances and transpiration rates of bean leaves (*Phaseolus vulgaris* L.) through comparison of "wet" and "dry" leaf temperatures. *Oecolog. Plantar.*, **1**, 327-334.
9. Impens I.I., Steward D.W., Allen L.H. & Lemon E.R., 1967, Diffusive resistances at, and transpiration rates from leaves *in situ* within the vegetative canopy of a corn crop. *Plant Physiol.*, **42**, 99-104.
10. Impens I.I. & Lemeur R., 1969, The radiation balance of several field crops. *Arch. Met. Geoph. Biokl.*, Ser. B., **17**, 261-268.
11. Impens I.I. & Lemeur R., 1969, Extinction of net radiation in different crop canopies. *Arch. Met. Geoph. Biokl.*, Ser. B., **17**, 403-412.
12. Impens I.I., Lemeur R. & Moermans R., 1970, Spatial and temporal variations of net radiation in crop canopies. *Agr. Meteorol.*, **7**, 335-337.
13. Impens I.I., Ceulemans R., Huygens H., Martens C. & Nijs I., 1992, *Fotosynthese en plantengroei*. IWONL, Belgium, 230 p.
14. Longman editorial team, 1989, *Who's who in science in Europe: a biographical guide in science, technology, agriculture and medicine*, volume 2. Longman, Essex, UK, 2500 p.
15. Schalk J. & Impens I.I., 1964, Fluctuations journalières du diamètre d'un tronc d'arbre sous l'influence des variations microclimatologiques. *Arch. Met. Geoph. Biokl.*, Ser. B., **13**, 400-403.
16. Veroustraete F., Ceulemans R., Impens I.I. & Van Rensbergen J. (eds.), 1994, *Vegetation, modelling and climatic change effects*. SPB Academic Publishing, The Hague, The Netherlands, 249 p.

J. Bogaert, Belgian, PhD, Full professor, Université de Liège, Gembloux Agro-Bio Tech, Unité Biodiversité et Paysage, Gembloux, Belgium.

I. Nijs, Belgian, PhD, Professor, Universiteit Antwerpen, Departement Biologie, Onderzoeksgroep Planten- en Vegetatie-ecologie, Wilrijk, Belgium.

R. Ceulemans, Belgian, PhD, Full Professor, Universiteit Antwerpen, Departement Biologie, Onderzoeksgroep Planten- en Vegetatie-ecologie, Wilrijk, Belgium.