



An IFA initiative  
**sustainable  
fertilizer  
academy**



**ifa**

INTERNATIONAL  
FERTILIZER ASSOCIATION

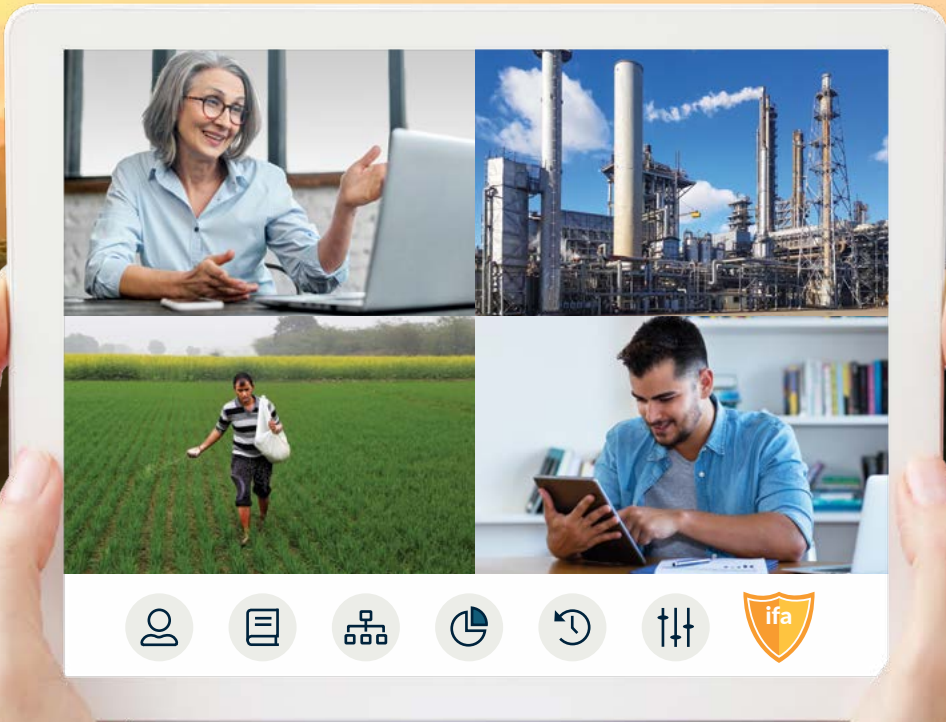
Helping to feed the world sustainably



IFA-SFA.ORG

## SUSTAINABLE FERTILIZER ACADEMY

All you need to know about sustainability  
in the fertilizer industry in one place



What is sustainability? How does it relate to fertilizers? How can I improve my company's performance? To help you answer these questions, and to help the fertilizer industry to accelerate its sustainability transformation, the International Fertilizer Association (IFA) has developed the virtual Sustainable Fertilizer Academy.

Founding  
Partners:

Academic  
Partner:



University  
Mohammed VI  
Polytechnic



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# Welcome to **IFA's Sustainable Fertilizer Academy!**

We are excited to offer you the opportunity to learn about sustainability within the fertilizer industry through the **Academy's** two levels of classes:

- **Level 1** is introductory. It covers the basics of sustainability within the fertilizer industry, giving you a comprehensive understanding of the challenges and opportunities in this field.
- **Level 2** is advanced. It is divided into Product and Nutrient Stewardship.

These classes will provide you with the knowledge and skills necessary to help you develop practical solutions for managing nutrients and producing fertilizers in a sustainable way.

The Academy is open to anyone who is interested in learning about sustainability within the fertilizer industry. There is no prerequisite to take either level, so you can start at whichever level suits you best.

**Join us at the **Sustainable Fertilizer Academy**  
and be a part of the movement towards a more sustainable future.**





# Level 1: INTRODUCTORY

Level 1 of the Sustainable Fertilizer Academy is an introductory and provides a basic understanding of sustainability within the fertilizer industry. You'll also gain an understanding of the different facets of sustainability, within different regions around the world, within finance, within biodiversity and more.

This Level is designed to be accessible to learners with varying levels of knowledge and experience, so it's a great starting point for anyone interested in sustainability and the fertilizer industry.

Once the final exam for Level 1 is completed, an Expert certification will be granted.

## Class 1A: INTRODUCTION TO SUSTAINABILITY

Class code:  
[L1: 1A]

**Module 1 - A Short Introduction to Corporate Sustainability:** The goal of this class is to provide a brief overview of business sustainability. Students will gain a fundamental understanding of the core dimensions of corporate sustainability, discover various approaches to corporate sustainability and gain insights into internal and external obstacles to implementing corporate sustainability.

**Module 2 - Implementation of Sustainability Models:** In this module, students will be introduced to various concepts about sustainability models and implementation considerations for organizations making the sustainability transition, including technological possibilities, designs, standards, regulations, certifications, consumer behavior and collaborations. Also taught is the application of these concepts to sustainable business model and considerations surrounding them.



**Esben Rahbek  
Gjerdrum Pedersen**

### MEET THE PROFESSOR

Esben Rahbek Gjerdrum Pedersen (ERGP) is a professor at Copenhagen Business School. His research mainly focuses on business model innovation and the operationalization of new management ideas into everyday organizational practices. The results from his research have been published in a wide range of academic journals, including Journal of Business Ethics, International Journal of Public Sector Management, Management Decision, Supply Chain Management, and International Journal of Operations and Production Management. The research has received international recognition, including Emerald Outstanding Paper Award and Emerald Social Impact Award.

Position:  
Professor

Workplace:  
Copenhagen Business School

Country:  
Denmark

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## Class 1 B: INTRODUCTION TO FERTILIZERS

In this introductory class on fertilizers, students will delve into the fundamental concepts of plant nutrition. Throughout this course, students will explore the three primary nutrients that are essential for plant growth: nitrogen, phosphorus, and potassium. These vital elements play crucial roles in various plant functions, and understanding their sources and functions is key to comprehending why farmers utilize fertilizers.

Some of the concepts in this class include the origins of these primary nutrients, the crucial roles these nutrients play in plant growth and development and the differences between organic and inorganic nutrient sources.



**Terry L. Roberts**

### MEET THE PROFESSOR

Terry L. Roberts was President of the International Plant Nutrition Institute (IPNI) until it ceased operations in 2019. He is a former President of the Potash & Phosphate Institute (PPI) and Foundation for Agronomic Research (FAR). Terry has 30 years' experience as a soil scientist and agronomist working in the global fertilizer industry. He currently provides consulting services to the fertilizer industry.

A native of Alberta, Canada, Terry grew up in a family-owned and operated retail fertilizer business. He received a B.S.A. in Crop Science (1981) and a Ph.D. in Soil Fertility and Plant Nutrition (1985) from the University of Saskatchewan. He has been a Certified Crop Adviser (CCA) since 1999. He was recognized as a Fellow of the American Society of Agronomy (ASA) in 2001, a Fellow of the Soil Science Society of America (SSSA) in 2017 and received ASA's Agronomic Service Award in 2013.

*Position:*

Former President of the International Plant Nutrition Institute (IPNI)

*Workplace:*

International Plant Nutrition Institute (IPNI)

*Country:*

Canada

## Class 2: INTRODUCTION TO REGULATORY ENVIRONMENT AND INTERNATIONAL COOPERATION

This class gives an overview of the sustainable regulatory environment in the context of international cooperation. Students will learn the evolution of the international regulatory environment and the mechanisms that are shaping environmental policy today, to understand the current sustainability agenda, climate targets, development of the UN Sustainable Development Goals, country commitments in terms of environmental protection, climate change and more.



**Mohammed Kharbach**

### MEET THE PROFESSOR

Mohammed Kharbach is a Professor of Practice in Energy Business & Sustainability at the Africa Business School, UM6P, Morocco. He is a mechanical engineer with a master's in energy, environmental and mineral economics, a master's in applied statistics and a doctorate in management sciences. In his previous roles, Kharbach was a Gas Strategy Advisor for the Abu Dhabi National Oil Company, head of gas supply and logistics for Dolphin Energy and a senior economist for the power planner in Abu Dhabi. His main research interests are focused on energy, environmental and regulatory economics with published work in Energy Economics, Energy Policy, Energy Strategy Reviews, Sustainable Cities and Society.

*Position:*

Professor of Practice in Energy Business and Sustainability

*Workplace:*

Mohammed VI Polytechnic University (UM6P)

*Country:*

Morocco

## Class 3: SUSTAINABLE FERTILIZERS – CHALLENGE OR OPPORTUNITY?

We are living in unprecedented times with a list of seemingly unsolvable problems like climate change and food security growing, and the pressure on the fertilizer industry to become a significant part of the global solution is rising. Is our license to operate at risk or is this the right time to revise all?

In this class, students will discover how the UN Sustainable Development Goals (SDGs) relate to fertilizers, what the present sustainability advancements in our fertilizer business are, and how fertilizer production and use may evolve the next 30 years.

### MEET THE PROFESSOR



Volker Andresen

Volker Andresen is a seasoned business development executive from Germany who joined the International Fertilizer Association (IFA) as Technical Director in 2012 and assumed the position of Sustainability Director in 2021. Volker led the development of IFA's product stewardship certification (Protect & Sustain), regular benchmarks on employee safety, production emissions and energy efficiency, as well as reports on the sustainable management and use of phosphogypsum. More recent projects include the development of a decarbonization roadmap for ammonia production which was presented at COP26 and the launch of IFA's Sustainable Fertilizer Academy ([www.ifa-sfa.org](http://www.ifa-sfa.org)). On top of his technical and sustainability tasks, Volker coordinated IFA's activities in the former Soviet Union for seven years before turning his regional focus to China. Prior to IFA, Volker held senior-level positions at IBM, Survey Sampling International and the World Liquefied Petroleum Gas Association. He has a master's degree in economics.

Position:

Sustainability Director and  
China Initiative Leader

Workplace:

International Fertilizer  
Association (IFA)

Country:

France



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## Class 4: SUSTAINABILITY IN DIFFERENT REGIONS

This class explores the concept of sustainability in different regions around the world. Over multiple modules, students will learn about sustainability in the fertilizer industry in Europe, North America, Africa, India, China and the Gulf region.

**Module 1 – Sustainability in Europe:** This module explores the concept of sustainability in Europe and the various actions implemented by the European fertilizer industry to ultimately meet Europe's climate and environmental objectives. Europe faces two major challenges in this area: the need for sustainable production of fertilizers at the industrial level and the sustainable use of fertilizers by farmers and land managers. The European fertilizer industry works closely with the European Union (EU) institutions to ensure a smooth, cost-effective transition in addition to its role in developing indicators and solutions to help promote sustainable and effective nutrient management. In this module, you will learn that to significantly decarbonize the industrial production of mineral fertilizers, a combination of policy decisions and economic drivers is essential.



Cecilia Dardes

### MEET THE PROFESSORS

Cecilia Dardes is the Agriculture and Environment Manager at Fertilizers Europe. Dardes has a master's of law from the University of Rome. Prior to joining Fertilizers Europe in March 2022, she spent seven years in Brussels working as a Policy Advisor for the Italian National Farmers' Organization (Coldiretti), focusing on EU agriculture and sustainability policies. Dardes speaks Italian, English, French and Spanish.

Position:

Agriculture and  
Environment Manager

Workplace:

Fertilizers Europe

Country:

Belgium



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Jasmine Barahman

Jasmine Barahman is the Climate Policy Manager at Fertilizers Europe. Barahman has a master's in Euro-Mediterranean integration and a master's in literature and European studies. Prior to joining Fertilizers Europe in February 2021, she worked for 10 years at the European Parliament, mainly focusing on industry, energy, social affairs, foreign policy and human rights. She also has experience working at the Italian Parliament. Barahman speaks Italian, Iranian, English and French.

Position:

Climate Policy  
Manager

Workplace:

Fertilizers Europe

Country:

Belgium



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## Class 4: SUSTAINABILITY IN DIFFERENT REGIONS

[L1: 4]

**Module 2 – Sustainability in Russia** – Currently not available

**Module 3 – Sustainability in North America:** The fertilizer industry is committed to advancing sustainable plant nutrition to reduce the environmental footprint of plant nutrient production and use in the U.S. Whether it be developing new products, practices or more efficient ways to manufacture fertilizer, the industry invests time and resources to not only produce fertilizer with fewer resources, but to also grow more food with less environmental impact. In this module, you will review in-field and production sustainability in the fertilizer industry in North America, specifically in the U.S.

### MEET THE PROFESSOR



Alice McKinnon

Alice McKinnon is the Director of Member Programs at The Fertilizer Institute (TFI). At TFI, McKinnon is responsible for leading, developing and executing elements of member programs and services strategy including sustainability and Environmental, Social and Governance. Previously, she was the Director of Membership and International Programs for the Global Cold Chain Alliance, where she managed member programs and its five regional offices in Belgium, Brazil, Guatemala, India and South Africa. McKinnon comes from a family of eight generations of ranching and farming in Texas and earned a bachelor's in economics with minors in business and English from Texas A&M University.

*Position:*

Director of  
Member Programs

*Workplace:*

The Fertilizer Institute

*Country:*

USA

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## Class 4: SUSTAINABILITY IN DIFFERENT REGIONS

[L1: 4]

**Module 4 – Sustainability in Africa:** This module will provide you an overview of sustainability challenges in African agriculture, particularly food insecurity. It highlights large yield gaps for major crops and how low fertilizer use contributes to yield gaps and land degradation. The module will also give you examples of nutrient management options that have shown to improve crop yields and farmer incomes and increase nutrient use efficiency - contributing to long-term environmental sustainability.

### MEET THE PROFESSOR



Pauline Chivenge

Pauline Chivenge is a Principal Scientist at the African Plant Nutrition Institute (APNI) based in Benguerir, Morocco. Chivenge has a doctorate in soils and biogeochemistry from the University of California, Davis. Most of her research has concerned soil and nutrient management in smallholder farming systems in sub-Saharan Africa and Asia. She has led international projects on the framework of diverse farming systems, covering biogeochemical nutrient cycling, natural resource management, watershed management, carbon sequestration, greenhouse gas emissions and sustainable ecosystems. She has supervised more than 20 master's and doctoral students in Africa and Asia and published more than 35 peer-reviewed journal papers and several book chapters. Chivenge is an Associate Editor for Geoderma - the global journal of soil science. Previously, Chivenge was a Senior Scientist in Soils and Nutrient Management at the International Rice Research Institute in the Philippines, working on sustainable management of soil and nutrients in rice-based cropping systems.

*Position:*

Principal Scientist

*Workplace:*

African Plant Nutrition  
Institute (APNI)

*Country:*

Morocco

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## Class 4: SUSTAINABILITY IN DIFFERENT REGIONS

[L1: 4]

**Module 5 – Sustainability Practices in Indian Fertilizer Production:** India is the second largest consumer and the third largest producer of fertilizers in the world. The country has more than 18 million tonnes of ammonia production capacity and plants that have been in operation for 50 years. You will learn about the three-decades long efforts by Indian ammonia, urea, acids and complex fertilizer plant operators to reduce consumption of fossil fuels, rock phosphate, water and other inputs. Measures such as process modifications, better process heat recovery and use of waste heat, switching to cleaner feed and fuel, and recovery and recycling of plant nutrients are discussed. Improving the reliability of fertilizer operations is key for sustainable production. The module also includes measures to improve the reliability of plant operations by using sustainable construction materials, replacing old equipment, and updating instrumentation.

### MEET THE PROFESSOR



Sachchida Nand

Sachchida Nand holds a doctorate in chemical engineering from the University of Ottawa, Canada, with a master's in Technology from the Indian Institute of Technology, Delhi. Nand was a postdoctoral fellow and lecturer at the University of Connecticut, U.S., and has worked at Hindustan Lever Research Centre, Mumbai, India. He has several years of research experience in India, Canada and the U.S. in the areas of hydrocarbon reforming, coal gasification, coal desulphurization and gas analysis. He has been with the Fertiliser Association of India for more than 35 years and is responsible for issues related to fertilizer production technologies, feedstocks, raw materials and fertilizer pricing policies. He has published more than 50 research and review papers in leading national and international journals and conference proceedings and has written more than 50 articles in leading Indian newspapers on energy policy and planning. In 2019, Nand was given the U.S. Awasthi-IFFCO Award for his lifetime contribution to the growth and development of the fertilizer industry. He is chairman and board member of several working groups and committees of the Government of India. He is a member of the Strategic Advisory Group for Sustainability of IFA.

Position:

Deputy  
Director General

Workplace:

Fertilizer Association  
of India (FAI)

Country:

India



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## Class 4: SUSTAINABILITY IN DIFFERENT REGIONS

[L1: 4]

**Module 6 – China Fertilizer Industry Sustainable Development Report:** This module will offer you an introduction to the Chinese economy and its double carbon policy, in addition to a brief overview of the Chinese fertilizer market. Topics in this module include operations, supply and demand management and future developments in the fertilizer market. National Chemical Information Center (CNCIC) is a state-owned service provider in China, established in 1959. China National Fertilizer Information Center is a professional research platform under CNCIC Consulting, which specializes in tracking and analyzing development and market dynamics of fertilizer markets in and beyond China.

### MEET THE PROFESSOR



Leo Hui Li

Leo Hui Li is the Project Director of China National Chemical Information Center (CNCIC) and the Chief Editor of China Fertilizer Market Weekly. Li graduated from Beijing Forestry University with a master's in forest chemical industry. Since joining CNCIC in 2009, Li has worked in the fertilizer information department and managed more than 100 fertilizer related projects, covering raw material resources, product portfolios, innovative technology, sales and marketing plans, mergers and acquisitions and company restructuring. He has been a keynote speaker at the Association Française de Commercialisation et de Mélanges d'Engrais in Reims, France, European Mineral Fertilizer Summit in Amsterdam, the Netherlands, IFA Asia Pacific strategic forum in Shanghai, China, the Gulf Petrochemicals and Chemicals Association (GPCA) fertilizer convention in Dubai and BioAg World Congress in Delhi, India.

Position:

Director

Workplace:

Fertilizer Information Center  
- China National Chemical  
Information Center

Country:

China



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## Class 4: SUSTAINABILITY IN DIFFERENT REGIONS

**Module 7 – Sustainability in the Gulf region:** Sustainable agriculture emphasizes production and food systems that are profitable, environmentally sound, energy efficient and improve the quality of life for both farmers and the public, and the GCC countries have witnessed very rapid economic and demographic growth over the past decade. In this class, you will be introduced to the growth which has led to un-sustainable consumption patterns of vital resources such as water, energy, food, highlighting the need for an urgent shift towards green growth and sustainable development strategies. You will learn on the new attitude of viewing sustainability as an opportunity for economic growth, industrial development, and innovation and how GCC countries have started to make sustainability an integral part of all sector strategies across government agencies and initiatives.

### MEET THE PROFESSOR



**Mohamed Ahmed  
Al-Hashemi**

Mohamed Ahmed Al-Hashemi has been working at Gulf Petrochemical Industries Company (GPIC) since 2009 as a Safety & Environment Superintendent. He has a bachelor's degree in environmental management and technology from the University of Glamorgan, Wales. He also has a NEBOSH – National & International Certificate, a NEBOSH in Process Safety Management, a IOSH Certificate, Firefighting Level 01, 02 and Emergency Controller Level 03. He is responsible for the Safety & Environment team within the Safety, Security, Health and Environment Department, where he ensures full compliance to safety & environment related aspects in all day to day activities. Al-Hashemi ensures that the emergency response team and emergency response planning is always established and available within the complex. He also oversees the environmental aspect of all the activities within the process plants and ensures compliance in regard to emission, effluent and waste management, plus stream lining all the activities in regard to energy efficiency and sustainable production. Al-Hashemi was also Selected as National Safety Council Rising Stars- NSC in 2014. In addition to her daily tasks, she is also active in corporate social responsibility, where she is a volunteer in delivering environmental lectures and coordinates environmental research program for schools, green wave campaign in collaboration with UNEP, volunteer for INJAZ program and mentors young students in STEM field.

*Position:*

**Safety and Environment  
Superintendent**

*Workplace:*

**Gulf Petrochemical  
Industries Company**

*Country:*

**Bahrain**

## Class 5: SUSTAINABILITY METHODOLOGY, MEASUREMENTS AND EVALUATION

This class will explore the various aspects and methods to measure and evaluate sustainability within the fertilizer industry. Divided into multiple modules, students will learn about ESG risk ratings, IFA's production benchmarking, the Protect & Sustain initiative and sustainability reporting.

**Module 1 – Introduction to Sustainability Reporting:** Sustainability reporting is becoming increasingly important for regulators, financiers, and society at large. New guidance and standards are in place for companies to transparently track and report their impacts and risks on sustainable development in a competency-based model. This module covers the value of sustainability reporting, which includes the fundamentals of the Global Reporting Initiative (GRI) and the most used sustainability reporting standards worldwide.

### MEET THE PROFESSOR



**Eléonore Arnoud**

Eléonore Arnoud, as Sustainability Consultant at Forethix, guides corporate organizations (from banking to transport and mining) and small and medium enterprises in integrating sustainability into their business models. She provides end-to-end support in organizations' sustainability journeys, including corporate social sustainability strategy, stakeholder engagement and reporting. Arnoud joined Forethix in early 2020 after completing her studies in corporate sustainable management at Louvain School of Management, Belgium, and Appalachian State University, U.S. She is a GRI Standards Certified Sustainability professional as well as a certified trainer. Arnoud is also a member of the Luxembourg CSR professional association.

*Position:*

**Sustainability Consultant**

*Workplace:*

**Forethix**

*Country:*

**Luxembourg**



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## Class 5: SUSTAINABILITY METHODOLOGY, MEASUREMENTS AND EVALUATION

**Module 2 – ESG Risk Ratings:** This module will provide to you a deep understanding of the world of ESG Risk Ratings. Knowing how exposed and how well companies manage their material ESG issues is now a critical part of making well-informed investment decisions. That is why the world's leading investors rely on ESG research and ratings for a consistent approach to evaluate financially material ESG issues that affect the long-term performance of their investments. Students will learn how Sustainalytics' ESG Risk Ratings may measure a company's exposure to industry-specific material ESG risks and how well a company is managing those risks. This multi-dimensional way of measuring ESG risk combines the concepts of management and exposure to arrive at an absolute assessment of ESG risk. You will gain insight to agricultural ESG Data pulled from Sustainalytics portfolio companies which supports understanding on trends and topic specific issues to be addressed within the industry. Finally, you will be shared OCP Group's perspective on how good ESG rating and performance can help Business, Financing, and Reputation.

### MEET THE PROFESSORS



**Daphné van Osch**

Daphné van Osch, joined the Sustainalytics Corporate Solutions team in 2019 and leads the business development of the corporate channel in the EMEA region. With a background in sustainable finance and consultancy, she previously worked for a French Asset Manager and a European ESG rating agency. Before starting in the Sustainalytics Corporate Solutions team, Osch ran her consultancy firm specialized in Socially Responsible Investment and CSR strategies. Osch has a bachelor's degree in International Business Management and a master's degree in Corporate Social Responsibility and Sustainable Development obtained in Madrid.

*Position:*  
Director

*Workplace:*  
Sustainalytics Corporate  
Solutions

*Country:*  
France

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**Luca Molinari**

Luca Molinari, is part of the Sustainability Corporate Solutions team based in Amsterdam, engaging corporate clients in the EMEA region. Molinari strives for integrating sustainability in the core business, enabling corporates to maximize their positive impact and improve their competitiveness in the market. Prior to joining Sustainalytics, Molinari worked as a Senior Consultant in the Climate Change and Sustainability Services team at Ernst & Young, consulting private and public organizations to devise and implement sustainability strategies, to measure the impact of business and industrial activities on society and environment, and to develop innovative business solutions with the aim of creating environmental, societal and economic value. Molinari has a Master of Science in International Business from the Copenhagen Business School and Bachelor of Science in business administration from the Catholic University in Milan.

*Position:*  
Senior Associate

*Workplace:*  
Sustainalytics Corporate  
Solutions

*Country:*  
France

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**Bachir Mouhyi**

Bachir Mouhyi, is the lead of ESG compliance at OCP, within the Sustainability Platform of OCP. He ensures that the group's operations align with best ESG practices and continue improving to meet increasingly ambitious sustainability targets. As an engineer with 9 years of experience in consulting, focused on sustainability, renewables, energy efficiency and green mobility, Mouhyi invested in building a greener and more responsible future, where growth is only sustainable. He believes that curiosity, leadership and innovation will help discover new business models, which will allow the people to thrive and coexist, while respecting the environment and its biodiversity. Mouhyi has a Bachelor of civil/environmental engineering from McGill University, and a master in business analytics from HEC, Montréal.

*Position:*  
Lead ESG Compliance,  
Sustainability Platform

*Workplace:*  
OCP Group

*Country:*  
Morocco

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## Class 5: SUSTAINABILITY METHODOLOGY, MEASUREMENTS AND EVALUATION

**Module 3 – An Introduction to Protect & Sustain:** Protect & Sustain started in 2012 and has become the de facto global product stewardship standard for fertilizers. It was developed by IFA members, with external auditors, for IFA members. In this module, students will learn what makes Protect & Sustain unique, what are the benefits of this certification, and how to go about it.

### MEET THE PROFESSOR



**Kristofer Whitfield**

Kristofer Withfield has 17 years of experience in the audit and supply chain risk management sector, with a focus on technical, operational and commercial aspects. Withfield comes with broad sector experience in chemicals, utilities, rail, oil and gas, construction, mining and fast-moving consumer goods, in the U.K. and across the world. Withfield has managed supply chain risk management solutions and audit programs and has operated at all levels, from frontline to upper management, including the day to day operational and technical management of a £17 million global audit business. He is knowledgeable and experienced in social responsibility, business continuity, modern day slavery compliance and chemical product stewardship. He is a lead auditor of IS9001 and internal auditor of ISO14001, with certifications in Fire Risk Management, NEBOSH General Certificate and many industry-focused, custom-made audit solutions.

*Position:*

Head of Business Development,  
Supply Chain & Risk  
Management (Europe)

*Workplace:*

SGS

*Country:*

Switzerland



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## Class 5: SUSTAINABILITY METHODOLOGY, MEASUREMENTS AND EVALUATION

**Module 4 – IFA Production Benchmarking:** This module will explain to you the concept of benchmarking in general and more specifically, IFA's approach to benchmarks in fertilizer production. This module highlights how benchmarking processes back company efforts working towards sustainable development and provides an overview of benchmarking in theory to ensure consistency and uniformity in administration. You will learn on the overviews and descriptions of benchmarking in practice drawn from IFA's major benchmark projects: (1) safety, (2) environmental performance covering industrial emissions and (3) energy efficiency and CO2 emissions in ammonia production. The module concludes with reflections on how these various benchmarks could be leveraged to facilitate company transition and strengthen sustainable production practices.

### MEET THE PROFESSORS



**Benedyct D. Muirheid**

Benedyct D. Muirheid is an experienced manager with over 20 years' experience in international industry association management, commodity markets analysis, trade promotion and social and environmental impact management consultancy. He is currently a Managing Partner with MindSpring Associates based in Paris, France. Muirheid has held roles in various international organizations, where he executed the functions with the following scope: Business Development, Sustainable Business Strategy/ESG Integration, Energy & environmental concerns and more. Muirheid has a broad international work experience in various parts of the world, including in Asia, Africa, Russia & CIS, Central & Eastern Europe, and the Middle East. He has MBA from INSEAD, France, a bachelor's degree in Political Science from the University of Virginia, USA, and a graduate degree in applied psychology from the Sigmund Freud University, Austria.

*Position:*

Managing Partner

*Workplace:*

MindSpring Associates

*Country:*

France



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**Philip Smee**

Philip Smee is a Fellow of the Institute of Chemical Engineering and Chartered Engineer with more than 30 years of experience in the oil, gas, chemical and process engineering industries. Having held roles in operations, engineering, project management and performance management, Smee has lived and worked in Australia, New Zealand, Indonesia, China, Hong Kong, U.S., Saudi Arabia and the U.K. He is currently at Phillip Townsend and Associated, based in Houston, Texas, U.S.

*Position:*

Business Director

*Workplace:*

Phillip Townsend  
Associates

*Country:*

USA



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## Class 6: **ECONOMICS OF SUSTAINABILITY/ SUSTAINABILITY FINANCE**

This class will give students insights on sustainable finance and provide answers to questions on what sustainable finance is, what are the existing products, how are these products structured, what is the growth in the market, and what the current challenges are. Students will explore concepts within sustainable finance such as sustainable debt markets, sustainable loans/bonds and their principles, the evolution and growth of the sustainable bond market green bonds and social loans.

### MEET THE PROFESSOR



**Denise Odaro**

Denise Odaro heads investor relations globally for IFC and leads coordination on sustainable finance products. She joined IFC Treasury in 2012, establishing the investor relations function to complement IFC's \$17 billion annual funding program. Odaro is also responsible for the management of IFC's sustainable bonds program.

Odaro holds an MBA from Cornell University and qualified as a Barrister (England & Wales) at The Honourable Society of Lincoln's Inn. She has also been a central figure in the development of the sustainable bond market for nearly a decade, was a founding member of the Green Bond Principles Executive Committee and subsequently chaired the Social Bonds Working Group from 2016-2020. For her efforts in promoting sustainable bonds, Odaro was named "Personality of the Year" in 2020 by Environmental Finance Magazine.

Presently, Odaro is the Chair of the Steering Committee of the Green, Social and Sustainability Linked Bond Principles, the most referenced framework globally for thematic bonds, hosted under the International Capital Market Association (ICMA). She is also the co-host of Climate Biz, a top-rated podcast on sustainability and climate change solutions.

*Position:*

**Head of Investor Relations  
& Sustainable Finance  
Coordination**

*Workplace:*

**IFC**

*Country:*

**UK**

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## Class 7: **GLOBAL AGRICULTURAL INNOVATION AND INVESTMENT**

This class will introduce students to various concepts regarding Global Agricultural Innovation and Investment. Students will learn further of the historical development of plant nutrition, the current trends and factors that influence it, as well as the future of agricultural innovation and the value chain for agricultural and plant nutrients.

### MEET THE PROFESSOR



**Bob Morris**

Bob Morris is president of AndMore Associates, LLC, a global advisory firm providing strategic council on science and technology innovation, commercialization and new business opportunities to global stakeholders in the food, agriculture, and cleantech sectors. An advocate for entrepreneurship, innovation, higher education improvements, and science and technology initiatives, Morris is passionate about developing sustainable solutions in an evolving, dynamic global marketplace.

As past president of The Sulphur Institute, Morris led the successful promotion of sulphur as a viable investment and commercial product in agricultural and industrial markets worldwide among Fortune 500 corporations, associations, NGOs, and international government agencies around the world. Since this tenure, Morris recognized the need to accelerate agricultural innovation and has focused on the emerging AgTech sector from the outset, advising players across the spectrum from start-ups and investment funds to corporates.

*Position:*

**President**

*Workplace:*

**AndMore Associates,  
LLC**

*Country:*

**USA**

 **Connect on LinkedIn**

## Class 8: INTRODUCTION TO BIODIVERSITY

Nature is rapidly deteriorating globally, affecting biodiversity and the benefits it provides to businesses, people, and the planet. The increased awareness of biodiversity loss is leading to global and regional policies that will directly affect the fertilizer industry. Biodiversity is gradually emerging as the next frontier in sustainability, bolstered by the growing consensus among policymakers and investors on the need to tackle together the twin crises of climate change and biodiversity loss. In this context, this class aims to provide students with an overview of biodiversity-related impacts, risks, and opportunities for the fertilizer industry. Students will explore key nature-related definitions and concepts as well as barriers to and drivers of change. The class will also focus on policy trends that will help participants understand pressure points and anticipate regulatory changes that will affect their operations and decisions. Finally, the class will break down the risk implications for the fertilizer industry and suggest a pathway to turn biodiversity-related risk into opportunity by mid-century.

### MEET THE PROFESSOR



**Franck Gbaguidi**

Franck Gbaguidi covers geopolitical risk across a range of sustainability issues, with a focus on biodiversity policy, water resources, and environmental litigation. He is particularly interested in analyzing the next frontiers in sustainability policy and research for decision makers in the private sector. As a member of Eurasia Group's Energy, Climate & Resources (ECR) practice, Gbaguidi helps clients understand evolving sustainability trends and supports them in the design of solutions that turn political risks into opportunities. Gbaguidi holds three bachelor's degrees and four master's degrees, including a master's in public policy in energy, resources, and sustainability from Sciences Po, France and a master's in public administration in energy and environment from Columbia University, USA.

Prior to joining Eurasia Group, Gbaguidi held multiple energy and climate-related positions within the World Bank Group. Most recently, he was the Climate Adviser to the Managing Director of the International Finance Corporation (IFC). He also undertook research and consultancy work on carbon risk management for the European Investment Bank, clean and domestic energy solutions for the United Nations Capital Development Fund, energy policy in North America for the Centre on Global Energy Policy, and environmental crimes in Sub-Saharan Africa for the Earth Institute.

*Position:*

**Biodiversity & Water Lead**

*Workplace:*

**Eurasia Group**

*Country:*

**USA**

## Class 9: AI IN THE FERTILIZER INDUSTRY

The class "AI in the Fertilizer Industry" discusses the rise of adoption of Artificial Intelligence (AI) in the fertilizer industry. This class explores how AI technologies are used in various domains within fertilizer industry thereby promoting sustainable practices. Students will gain an understanding of how AI is used to optimize asset health, automate operations, increase efficiency and productivity of people, and improve environmental monitoring practices.

### MEET THE PROFESSOR



**Debasis (DB) Bhaumik**

Debasis "DB" Bhaumik is an entrepreneurial leader who has worked with and for many global Fortune 100 organizations across the Asia-Pacific, Europe, and North America. DB is currently the VP of Information and Digital Solutions at Nutrien. As part of his role, DB leads the Data and AI journey at Nutrien.

DB has worked in both technology services and industry, and has experience in domains like agriculture, mining, manufacturing, energy solutions, banking and finance, travel and transportation, healthcare, retail and logistics.

DB has an MBA with specialization in Finance and a Master of Science in Nuclear Physics. He loves teaching and has been associated with various academic institutions and colleges throughout his career. DB also serves on the board for several social organizations in Canada and is an Advisory committee member in Contd. Education and AI Department industry partnership for multiple Canadian universities. He is passionate about mentoring teams and individuals to achieve their full potential.

DB is also an Amazon bestselling author of Leadership books – 'Leadership 4.0' and 'Let's Do it Right'.

*Position:*

**Digital Transformation  
Leader**

*Workplace:*

**Nutrien**

*Country:*

**Canada**

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*" The curriculum was well thought out and informative. There were some truly dynamic speakers who were quite engaging and made the courses very interesting. I've learned quite a bit and am walking away with a long list of takeaways. I very much appreciate that IFA offers this Academy and look forward to the pursuing further programs with IFA."*

## **Student from level 2**



## **Level 2: INTERMEDIATE**

Level 2 of the Sustainable Fertilizer Academy is an intermediate level that is further divided on product stewardship (Level 2A) and nutrient stewardship (Level 2B). You will gain a better understanding of nutrient recycling, sustainable ammonia and phosphate production, sustainable food production and more.

Overall, Level 2 of the Sustainable Fertilizer Academy is designed to provide you with the essential knowledge and skills to devise pragmatic solutions for sustainable nutrient management and fertilizer production.

Once the final exam for Level 2 is completed, a Leader certification will be granted.

## **Level 2A: PRODUCT STEWARDSHIP**

## Class 1: GREEN AND CIRCULAR ECONOMY

In this class, you will explore the transition of the European fertilizer industry towards carbon neutrality. You will assess the progress on benchmarks and talks through technological pathways and regulatory drivers. The bulk of greenhouse gas emission reduction in the EU has so far been achieved by reducing N<sub>2</sub>O emissions, with nitric acid production down to almost zero, and by gradually improving energy efficiency for ammonia synthesis. For the latter, we are arriving at a point of marginal returns on investments and to reach close to zero greenhouse gas emissions, there will be a need for drastic change. This comes with the development and adoption of alternative hydrogen production pathways to steam methane reforming. This class will also provide you details on regulatory drivers linked to the development of an EU hydrogen economy, as well as certification schemes required for the 'new-types of ammonia.' Beyond process emissions reduction through technological pathways, the concept of circularity will be explored, first through carbon capture and then by use.



**Antoine Hoxha**

### MEET THE PROFESSORS

Antoine Hoxha is Production and Agriculture Director at Fertilizers Europe. Hoxha holds a doctorate in chemistry from the University of Liège, Belgium, and an Executive MBA from Louvain School of Management, the Netherlands. Before joining Fertilizers Europe in 2010, he worked for eight years in the fertilizers industry at Prayon SA where he held positions in research and development and technology licensing. Previously, Hoxha worked at the University of Liège as a teaching assistant and at Warwick University in pharmaceutical related research. Antoine speaks French, Albanian, English, Portuguese and Italian.

*Position:* Production and Agriculture Director  
*Workplace:* Fertilizers Europe  
*Country:* Belgium

Connect on LinkedIn



**Theo Paquet**

Theo Paquet is Regulatory and Green Ammonia Officer at Fertilizers Europe. Paquet holds a master's degree in biotechnology from the University of Edinburgh and a master's in development and rural innovation from Wageningen University, the Netherlands. His professional background includes experience in EU policy and regulatory work with a strong focus on agricultural, health and biotechnological innovation. Theo speaks French, English, Italian and Spanish.

*Position:* Regulatory and Green Ammonia Officer  
*Workplace:* Fertilizers Europe  
*Country:* Belgium

Connect on LinkedIn

## Class 2: SAFETY AND SECURITY IN PRODUCTION

Ensuring workplace safety is a paramount concern for all individuals, as no one desires to sustain injuries. As such, prioritizing safety in the workplace should be of utmost importance. To achieve this, it is essential to assess the current safety situation and conduct a comprehensive risk assessment. Additionally, various tools and techniques for improving workplace safety exist, and it is crucial to explore and implement them effectively. To this end, students can engage with an experienced safety consultant in the fertilizer industry, who can provide expert guidance on various safety-related matters. This would enable them to obtain valuable insights and answers to critical questions, as well as explore available options for improving workplace safety.



**Jeff Dowson**

### MEET THE PROFESSOR

Jeff Dowson manages JD Business Enhancement LPP, offering consultancy and training for a wide range of subjects and standards including ESG, Safety, Security, Business Continuity, Environment, Quality and Risk Management, and training for Protect and Sustain. Dowson worked with General Society of Surveillance (SGS) for almost 28 years. As a qualified industrial chemist, with practical experience in quality, environment, health and safety, sustainability and ethics and security, Dowson joined SGS as a quality auditor. He then went on to develop Environmental Management Systems for the company, before co-authoring the Global OHSAS 18001 Health and Safety standard. Dowson also worked to develop Integrated Management Systems auditing to meet customer demands for more efficient auditing methodologies, and is the co-author of the Protect and Sustain standard.

Jeff also has in-depth knowledge of ESG, ISO 22301, ISO 28001 and TAPA security standards. During his time at SGS, Jeff has worked with many of the world's largest brand names to ensure they gained maximum benefit from effective auditing of their supply chains with both ISO standards and bespoke standards and ensuring their often complex supply chains deliver to the high requirements needed.

*Position:* Partner  
*Workplace:* JD Business Enhancement LLP  
*Country:* UK

Connect on LinkedIn



## Class 3: FERTILIZER QUALITY AND QUALITY CONTROL

Product quality is about meeting customers' expectations of physical and chemical quality along with services and delivery. While chemical quality is determined by the production process and selected raw materials, physical quality will be impacted through the multiple steps in the supply chain, including mechanical stresses and ambient conditions, before reaching the end user. This is more obvious for bulk deliveries. To minimize deterioration in quality and to avoid safety problems in transport, several factors must be controlled and managed. This class focuses on the contributing factors to physical and chemical quality, highlights some of the more important concerns and how to deal with them to ensure satisfied customers.

### MEET THE PROFESSOR



Jan-Petter Fossum

Jan-Petter Fossum heads the Health, Safety, Environment and Quality (HESQ) department at Yara International. Fossum has a master's in chemical engineering from Trondheim, University, Norway, and was employed by the fertilizer division of Norsk Hydro in 1984, which from 2004 became Yara International. He has held several positions in the company, primarily in plant management with experience in operations, optimization and sales of water electrolyzes. Fossum was Senior Vice President and Plant Manager between 1999 and 2010. Since 2010, he has been the Senior Vice President and head of the corporate HSEQ department, which is responsible for occupational health and safety, process and product safety, environment, product stewardship, chemical compliance, asset and personnel security, crisis management, audit and certification. Fossum is also the President of the International Fertiliser Society and a member of the Fertilizers Europe Technical Committee and IFA Sustainability Committee. He is a frequent speaker on Environmental Health and Safety related topics at conferences and associations.

<i>Position:</i>	<i>Workplace:</i>	<i>Country:</i>
Senior Vice President and Head of Corporate HESQ	Yara International ASA	Norway

## Class 4: SUSTAINABILITY IN AMMONIA PRODUCTION – PART 1

**Module 1:** This module on “The Function of Ammonia in the Future Energy Landscape” focuses on the possible role of ammonia in a sustainable energy economy. Students will learn about existing and future markets, as well as infrastructure and techno-economic elements? New applications of ammonia as a maritime fuel, stationary fuel and hydrogen transporter, will also be discussed.

**Module 2:** This module on “Low carbon ammonia synthesis technologies” focuses on the low carbon ammonia projects that have been announced in recent years. This module will provide students with insights on two categories: fossil-based ammonia production with reduced CO<sub>2</sub> and renewable ammonia production. Examples of operating and announced low carbon ammonia plants will also be discussed at length to illustrate recent developments.

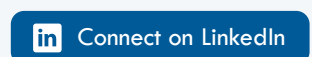
### MEET THE PROFESSOR



Kevin Rouwenhorst

Kevin Rouwenhorst graduated from the University of Twente (The Netherlands) in 2018, with a MSc degree in Chemical & Process Engineering, where he obtained his PhD for his research on 'Plasma-catalytic ammonia synthesis'. During the final year of his PhD research, Rouwenhorst worked part-time as an Innovation Engineer at Proton Ventures and as a Technology Manager at the Ammonia Energy Association, with the aim to accelerate the responsible use of low carbon ammonia as a zero-carbon fuel and hydrogen carrier.

<i>Position:</i>	<i>Workplace:</i>	<i>Country:</i>
Innovation Engineer at Proton Ventures and a Technology Manager	Ammonia Energy Association	USA





## Class 5: SUSTAINABILITY IN AMMONIA PRODUCTION – PART 2

[L2A: 5]

This class will go into the why the production of nitrogen-based fertilizers and fertilizers itself shall adapt to our changing world. Students will dive into various elements regarding sustainability in ammonia production such as: energy efficiency and CO<sub>2</sub> emissions from ammonia production, greening urea, and broader greener fertilizers. The class will also go into how green nitrogen-based fertilizers are produced, the technologies used to lower the carbon footprint of production, as well as its corresponding challenges.

### MEET THE PROFESSOR



**Gerardo Duarte**

Gerardo Duarte currently works as R&D process engineer at Stamicarbon. He has a bachelor of science in chemical engineering from the National Autonomous University of Mexico and a master of science from Eindhoven University of Technology, Netherlands.

Between 2009 to 2010, he worked as a manufacturing process engineer for a Mexican subsidiary of Chevron-Oronite and in 2012, he joined Yara Sluisikil, Netherlands as R&D process engineer, where he implemented product and process development for ammonium nitrate and nitric acid technologies. In 2018, Duarte started working for DSM Material Science Center in Geleen, Netherlands where he oversaw projects across different business units such as engineering materials and solar.

Gerardo Duarte joined Stamicarbon in 2020, where he is responsible for the coordination and execution of strategic innovation projects for the sustainable production of nitrogen-based specialty fertilizers.

*Position:*

Research And  
Development  
Engineer

*Workplace:*

Stamicarbon Strategic  
R&D Department

*Country:*

Netherlands

 Connect on LinkedIn

## Class 6: SUSTAINABLE PHOSPHATE PRODUCTION – PART 1

[L2A: 6]

Fertilizer use has increased at phenomenal rates following the Second World War, to meet the food demands of a rapidly growing population. Phosphorus is an essential element for agricultural productivity globally. Phosphate is the largest existing source for commercial manufacturing of phosphate fertilizers and phosphoric acid (H<sub>3</sub>PO<sub>4</sub>). Nearly 90% of the world's phosphate is expended by fertilizer industries whereas only 10% is utilized in other processes. Global food and water security depend upon sustainable phosphorus management. In addition, P sustainability is linked to a major extent to the P efficiency use and to the Phosphate recycling available technology. This class will provide students an overview of the big challenges of the phosphate industry and the P efficient use, generated waste and losses occurring within the whole value chain, starting from the mining and beneficiation passing by the chemicals and fertilizers production. Examples of chemical and thermochemical techniques for P recovery and recycling will be discussed.

### MEET THE PROFESSOR



**Hicham Benyoucef**

Hicham Benyoucef is the founder and head of the High Throughput Multidisciplinary Research Laboratory and co-director of Applied Chemistry and Engineering Research Centre at Mohammed VI Polytechnic University (UM6P). Before UM6P, Benyoucef was a postdoctoral researcher at Paul Scherrer Institute (PSI), Switzerland, where he participated in the "S-chain project" and "Green Power project," a joint venture of Belenos Clean Power, Ecole Polytechnique Fédérale de Lausanne and PSI. He also has experience with automation and high-throughput solutions and workflows designs for the chemical-biochemical process industry from his time at Chemspeed Technologies AG. Benyoucef holds a doctorate in chemistry from the Swiss Federal Institute of Technology, Switzerland.

*Position:*

Professor

*Workplace:*

Mohammed VI Polytechnic  
University (UM6P)

*Country:*

Morocco

 Connect on LinkedIn

## Class 7: SUSTAINABLE PHOSPHATE PRODUCTION – PART 2

From an independent, international, scientific and regulatory perspective, the classification of phosphoric acid and phosphogypsum as co-products was confirmed in 2013 by the International Atomic Energy Agency (Safety Report 78). A sustainable approach to phosphogypsum (PG) management and use is best achieved within an integrated resource management approach, designed to optimize the recovery, use and reuse of all phosphate (P) and phosphate-related resources. This includes a co-management strategy at field level integrating P and PG use regimens for both environmental and economic benefit. This class starts from the scientific premise that phosphogypsum and phosphoric acid are co-products of the “wet process” of phosphoric acid production. You will also examine the significance of the Safety Report 78, a catalyst to the global valorization and use of phosphogypsum.

### MEET THE PROFESSORS



**Julian Hilton**

Julian Hilton is the Chairman of the Aleff Group which he co-founded with Malika Moussaid, Ph.D. in 1992. Hilton holds a doctorate in philosophy from the University of Oxford, England. He has held several senior positions in academia, and he was appointed an expert of the European Commission, where he led several research and development projects between 1985 and 1996. He leads Aleff Group’s global project teams for industry clients in the mining, minerals and hydrocarbons sectors. Hilton’s focus is on sustainable development and the circular economy with a particular interest in valorization of secondary resources such as residues and tailings. He chairs the Sustainable Development Goals Delivery Working Group of the UN Economic Commission for Europe, the IAEA Environment working group on Naturally Occurring Radioactive Materials (NORM) industry tailings and residue valorization and sits on IFA’s Sustainability Committee, convening its phosphogypsum working group. He has led or participated in IAEA expert missions in more than 30 countries and is widely published.

*Position:*  
**Chairman**

*Workplace:*  
**Aleff Group**

*Country:*  
**UK**

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**Malika Moussaid**

Malika Moussaid, is the Chief Executive Officer of the Aleff Group, where she oversees many of the Group’s global projects, covering oil and gas, phosphates, mining and processing of mineral resources and increasingly, clean energy sources including nuclear and renewables. Moussaid also leads the group’s stakeholder initiatives to achieve and sustain its social license to operate, in its shift towards a circular economy. In 1987, she was promoted to Vice-Dean; the first Moroccan woman to hold this position. She has presented at the Sustainability Conference of the Arab Fertilizer Association, the 7th EU Africa Business Forum on sustainability and the Green Revolution 2.0.

Moussaid has a doctorat de troisième cycle from the Sorbonne University, France and is the founder of L’ecole supérieur d’informatique et gestion in Fes, Morocco.

*Position:*  
**CEO**

*Workplace:*  
**Aleff Group**

*Country:*  
**UK**

## Class 8: SUSTAINABLE MINING

This class has been developed with the aim of providing participants with a background in the principle basics and challenges relating to Mining Sustainability. The first part of the class covers general topics related to operators’ engagement and the industry’s adoption and implementation of actions and strategies in the area of sustainability in the minerals and metals sectors. The second part provides students with guidelines and best practices for environmental considerations and elements of control, particularly in connection with water stewardship, waste management and progressive rehabilitation.

### MEET THE PROFESSOR



**Abdelhadi Khaldoun**

Abdelhadi Khaldoun has 13 years of experience in the mining industry and applied research projects. His works and research interests mainly cover engineering geology, mining design, excavation technologies and rock waste valorization. Khaldoun began his career in 2009 at MANAGEM Group as a Geotechnical Engineer and joined OCP Group in 2016. He was involved in many mining projects within Morocco and number of African countries. Khaldoun currently works as a Senior Scientist within the Geology and Sustainable Mining Department of UM6P. He holds an engineering geology degree from ENSMR (Rabat, Morocco) and a doctorate in engineering sciences from the Mohammadia School of Engineering, University Mohammed V (Rabat, Morocco).

*Position:*  
**Senior Research Engineer**

*Workplace:*  
**Mohammed VI Polytechnic University (UM6P)**

*Country:*  
**Morocco**

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## Class 9: AMMONIA TECHNOLOGY ROADMAP

This class provides an overview of the International Energy Agency's (IEA) Ammonia Technology Roadmap, released in October 2021. Ammonia is the starting point for all mineral nitrogen fertilizers, forming a bridge between the nitrogen in the air and the food we eat. Around 70% of ammonia is used to make fertilizers, with the remainder used for a wide range of industrial applications, including plastics and synthetic fibers. Ammonia production accounts for around 2% of total final energy consumption and 1.3% of CO2 emissions from the energy system. This class will teach you how the IEA roadmap uses scenario was used to investigate three possible futures for ammonia production. The Stated Policies Scenario will be discussed, which offers modest advances but falls far short of a sustainable trajectory. The Sustainable Development Scenario, in which the sector adopts the technologies and policies required to put it on a path aligned with the Paris Agreement's goals, and the Net Zero Emissions by 2050 Scenario, a trajectory for the ammonia industry compatible with reaching net zero emissions globally for the energy system by 2050. The class concludes with a chapter outlining the necessary roles and actions for key stakeholders - governments, producers, financial and research institutions - and establishes milestones and decision points.

### MEET THE PROFESSOR



**Peter Levi**

Peter Levi joined the Energy Technology Policy Division of the International Energy Agency (IEA) in 2016 and now leads the sectoral analysis of Industry within the Division. His work focuses on the technologies and policies that can be employed to mitigate greenhouse gas emissions, from 'hard to abate' sectors, within industry, as well as cross-cutting themes such as energy security, hydrogen, carbon capture and electrification. Before joining the IEA, Levi worked in the private sector for three years in engineering consultancy. He has a doctorate in engineering with a master's in philosophy engineering from the University of Cambridge.

*Position:*

**Industry Lead, Energy  
Technology Policy Division**

*Workplace:*

**International Energy  
Agency (IEA)**

*Country:*

**France**

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## Class 10: FINANCE FOR SUSTAINABILITY

This class will introduce you to the world of ESG finance. The class provides a brief and concise introduction to this complex topic as well as a presentation of the wide variety of new ideas, capabilities and opportunities that are increasingly available to companies in the fertilizer sector. Through this class, students will learn how the world of ESG finance is developing and the importance of its place in building a more sustainable future.

### MEET THE PROFESSOR



**Kobi Ilia**

Kobi Ilia has served as Vice President, ICL - Group Treasurer since May 2017. Ilia joined ICL in 1998 and led various positions in financial fields, Sales & Marketing and Procurement. He now leads the Global Treasury department within ICL, which includes Treasury Operations, Debt & Cash Flow Management, Risks - Exposures & Hedging and Credit Insurance & Collections. In recent years, Ilia has promoted Sustainability Finance within ICL and enhanced the interfacing and integration between ESG teams and the Finance organization.

During 2021, Ilia was delighted to lead the first ever Sustainability-Linked Loan (SLL) for an Israeli company and among ICL's peers. Ilia is keen to contribute his positive experience to promote sustainability finance for a better world. Ilia holds a bachelor's degree in economics and a Master of Business Administration in business management from Ben Gurion University, Israel.

*Position:*

**Vice President and Group Treasurer**

*Workplace:*

**ICL**

*Country:*

**Israel**

## Class 11: SUSTAINABLE WATER MANAGEMENT

In the manufacturing process, water is a key element used in varying volumes, either directly or indirectly, depending on the fertilizer type. With an overview of water usage and wastewater creation, this class will instruct you on sustainable water management in fertilizer manufacture. Challenge to minimize losses and improve the reuse and recycle of water, to reach the UN sustainability goals, will also be discussed. The class outlines a simple and clear roadmap, with achievable targets, to help reach maximum water efficiency usage. This includes an action plan focused on understanding the cycle of water in fertilizer manufacturing and master key operations in the fertilizer manufacturing plant, as a pre-requisite to define qualitatively and quantitatively, the wastewater generated during the production process.

### MEET THE PROFESSOR



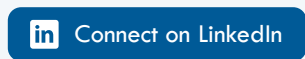
**Hicham Benyoucef**

Hicham Benyoucef is the founder and head of the High Throughput Multidisciplinary Research Laboratory and co-director of Applied Chemistry and Engineering Research Centre at Mohammed VI Polytechnic University (UM6P). Prior to working at UM6P, Benyoucef was a postdoctoral researcher at Paul Scherrer Institute (PSI), Switzerland, where he participated in the "S-chain project" and "Green Power project"; a joint venture of Belenos Clean Power, Ecole Polytechnique Fédérale de Lausanne and PSI. He also has experience with automation, high-throughput solutions and workflow designs for the chemical-biochemical process industry from his time at Chemspeed Technologies AG. Benyoucef holds a doctorate in chemistry from the Swiss Federal Institute of Technology, Switzerland.

*Position:*  
Professor

*Workplace:*  
Mohammed VI Polytechnic  
University (UM6P)

*Country:*  
Morocco



## Class 12: NET ZERO EMISSIONS

Carbon markets enable adopters of conservation practices to receive additional financial compensation while providing an avenue for businesses to offset some of their emissions. This class, presented by an agronomist from the Agoro Carbon Alliance, will give you a brief overview of carbon markets, their role in agriculture and how they fit with reducing greenhouse gas emissions resulting from fertilizer application.

### MEET THE PROFESSOR



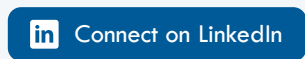
**Matt Rellaford**

Matt Rellaford is a Carbon Science Agronomist for the Global Science Team at Agoro Carbon Alliance - initiated by Yara - prior to which he was the company's carbon cropping agronomist for the Pacific Northwest, U.S. Rellaford has also worked in the U.S. as an agronomic researcher in Pennsylvania and North Dakota, and as a precision ag manager in Idaho. Rellaford has also spent time working in education, recreation management and international development and has lived and worked in five foreign countries. He lives in Idaho Falls, Idaho, with his wife and two little boys. His favorite hobbies are mountaineering, kayaking, camping, art and gardening. Rellaford has a master's degree in plant science from North Dakota State University.

*Position:*  
Carbon Science  
Agronomist

*Workplace:*  
Agoro Carbon Alliance

*Country:*  
Canada



## Class 13: SCOPE 1&2 EMISSIONS REPORTING

This class will delve into topics regarding greenhouse gas foot-printing, carbon foot-printing and the Science Based Targets (SBTs) Initiative. Students will learn about the GHG accounting standards that guide the foot-printing process, how emissions are categorized based on their origin, the advantages and disadvantages of different GHG calculations approaches and the importance of SBTs.

### MEET THE PROFESSOR



**Viktorija Stojcheva**

Viktorija Stojcheva (MSc) is a Managing Consultant in the Sustainability segment at Guidehouse. She has experience in environmental impact assessments, value chain carbon foot-printing, greenhouse gas inventory building following international protocols and greenhouse gas monitoring. Stojcheva has worked with companies and organizations to estimate their projected emissions and required emission reductions in line with climate science and the Paris Agreement. She has extensive experience in building emission abatement strategies for organizations operating in various sectors, including agriculture, food and beverage processing, transport and the built environment. Additionally, Stojcheva has experience in helping companies and industries recognize the business opportunities that are emerging from the climate and energy transition and building robust medium- and long-term strategies around these opportunities.

*Position:*  
Managing Consultant

*Workplace:*  
Guidehouse

*Country:*  
USA

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## Class 14: SCOPE 3 EMISSIONS REPORTING

In this class, students will examine fertilizer emissions in the field, with a focus on emissions from the soil during fertilizer application and possible fertilizer industry emission-reduction solutions. The class will dive into what scope 3 emissions are, including how emissions from the use of mineral fertilizer count toward the fertilizer sector's overall scope 3 emissions, different ways to reduce emissions and potential savings across different regions of the world.

### MEET THE PROFESSORS



**Tom Hegarty**

Tom Hegarty joined SYSTEMIQ in 2021 after approximately 10 years in the UK Civil Service, primarily in HM Treasury. At SYSTEMIQ, Hegarty has been worked on food and farming-related projects, including working with the fertilizer sector to develop a pathway for reducing emissions from fertilizer use on farms, with a private equity firm to examine the case for investing in vertical farming and with the World Bank and others on finance for food system transformation as part of the UN Food Systems Summit.

At HM Treasury, Hegarty led teams working on the distributional impacts of decarbonization in the UK, and advising Treasury ministers on UK natural environment, agriculture and circular economy policy. Hegarty also worked on social policy at the UN and economic structural adjustment programmes at the European Commission, as well as other policy roles in HM Treasury and the Cabinet Office. Hegarty is an economist by background.

*Position:*  
Associate

*Workplace:*  
SYSTEMIQ

*Country:*  
UK

 [Connect on LinkedIn](#)



**Paddy Ellen**

Paddy Ellen joined SYSTEMIQ in April 2021 and has worked on multiple pioneer advisory and knowledge generation projects across the Food and Agricultural practice. Ellen pivoted from a successful commercial career in fast-moving consumer goods (FMCG) into sustainability through the 'On Purpose' leadership program for professionals transitioning to work in social and environmental impact. Besides SYSTEMIQ, Ellen also worked at Sustainable Ventures, Europe's largest cleantech start-up ecosystem, where he coached founders in commercialization and HR advice, as well as setting up job creation schemes to broaden access and social mobility in the sustainability sector. He holds a first-class bachelor's degree with honors in in Korean studies from the University of Sheffield, where he graduated with highest grade in the East Asian Studies department.

*Position:*  
Associate

*Workplace:*  
SYSTEMIQ

*Country:*  
UK

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## Level 2B: NUTRIENT STEWARDSHIP

### Class 1: A NEW PARADIGM FOR PLANT NUTRITION

Class code:  
[L2B: 1]

This class will provide you details on the management of nutrients for sustainable agricultural production. The New Paradigm for Responsible Plant Nutrition contributes to productive and profitable farms, improved quality of water and air, better soil health, climate change mitigation, global food security and better human nutrition. You will learn on the paradigm's six critical actions which include: sustainability-driven nutrient roadmaps, digital crop nutrition solutions, nutrient recovery and recycling, nutritious crops, climate-smart fertilizers and accelerated innovation.

#### MEET THE PROFESSOR



**Tom Bruulsema**

Tom Bruulsema is the Chief Scientist at Plant Nutrition Canada, where he provides support for the nutrient stewardship programs at Fertilizer Canada, The Fertilizer Institute and the International Fertilizer Association. Previously, he was Vice-President for the International Plant Nutrition Institute's programs in the Americas. From 2015 to 2017, he led the institute's Phosphorus Program and from 1994 to 2015, he was the Director for Eastern Canada and the Northeast U.S. Bruulsema has been recognized as a Fellow of the American Society of Agronomy, the Soil Science Society of America and the Canadian Society of Agronomy. Earlier in his career he was a research associate at the University of Minnesota (1994) and an agronomist with the Mennonite Central Committee in Bangladesh (1986-1990). He has a doctorate in soil science from the Cornell University, U.S., and a master's in crop science from the University of Guelph, Canada.

*Position:*  
Chief Scientist

*Workplace:*  
Plant Nutrition Canada

*Country:*  
Canada

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## Class 2: **NUTRIENT BUDGET AND NUTRIENT USE EFFICIENCY**

This class will introduce to you, Nutrient Use Efficiency (NUE) and highlights of the increasing need to improve NUE to feed a growing population sustainably. The class answers four major questions about nutrient NUE. What is it? How has it been innovating for countries around the world? What are the key drivers? What are the challenges and opportunities tied to implementation and improvement?

### MEET THE PROFESSOR



**Xin Zhang**

Xin Zhang is an Associate Professor at the University of Maryland Center for Environmental Science, U.S. Zhang's research aims to evaluate how socioeconomic and biogeochemical processes affect the global nutrient cycle and the sustainability of agricultural production. Based on this, she provides policy input for mitigating nutrient pollution while meeting global food and biofuel demands. Her research approaches are from both natural sciences, including the Earth System Model and atmospheric measurements, and social sciences, such as econometrics analysis. Zhang collaborates closely with economists, modelers and field experimentalists worldwide and she has published papers on various peer-reviewed journals, including Nature and Proceedings of the National Academy of Sciences. She has received research grants from multiple institutions, including the National Science Foundation and has completed internships and projects at various national and international organizations, including the United Nations and China's Ministry of Environmental Protection. Zhang holds a doctorate in environmental studies from Yale University.

*Position:*  
Associate Professor

*Workplace:*  
University of Maryland,  
Center for Environmental  
Science

*Country:*  
USA

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## Class 3: **POLICIES AND ROADMAPS FOR SUSTAINABLE NITROGEN MANAGEMENT**

This class on policies and roadmaps for sustainable nitrogen management will provide students with information on the central challenges of creating policies to address nitrogen pollution. Students will analyze the balance between policies that manage nitrogen's role as a nutrient versus as a pollutant and explore the potential for a more comprehensive approach to nitrogen policy, accounting for all major actors in the agri-food system.

### MEET THE PROFESSOR



**David Kanter**

David Kanter is an Associate Professor of Environmental Studies at New York University and the Chair of the International Nitrogen Initiative. Kanter's research examines new policy options for addressing nutrient pollution and how to manage the transition to a global agri-food system consistent with the Sustainable Development Goals. Prior to his current position, Kanter was a Postdoctoral Research Fellow at The Earth Institute at Columbia University. He received his bachelor of science in chemistry and law from the University of Bristol in the UK and his MA and doctorate in science, technology and environmental policy from Princeton University.

*Position:*  
Associate Professor

*Workplace:*  
New York University

*Country:*  
USA

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## Class 4: DATA-DRIVE, MORE PRECISE CROP NUTRITION

Data-driven information that can be used to improve on-farm decision making is more readily available, easier to store and access and more affordable today than any other time in history. You will learn on the sources of georeferenced data, which include, but are not limited to, soil type maps, soil fertility maps, crop yield maps, and remotely sensed imagery collected using satellites, airplanes, and unmanned aerial vehicles. Combining these data layers, using farm management software or agricultural applications will also be discussed, which allows farmers to make fertilizer management decisions that account for spatial and temporal variability which affect crop productivity, resulting in more precise crop nutrition.

### MEET THE PROFESSOR



Steve Phillips

Steve Phillips holds a doctorate in agronomy from Oklahoma State University, U.S. Phillips is the Principal Scientist for the African Plant Nutrition Institute, headquartered in Benguerir, Morocco. Phillips has more than 25 years of experience in leading applied agronomic research and educational outreach programs, focused on improving the performance of diverse cropping systems around the world. He has worked in academia and industry, most recently for the International Plant Nutrition Institute (IPNI) as Director of the North American Program. As a university professor, Phillips led an internationally recognized research program in Precision Agriculture (PA) and developed the first crop sensor algorithms for nutrient management in the eastern U.S. At IPNI, he served as the organizer and chairman of the InfoAg Conference, the premier PA event in the world. He has authored some 200 scientific publications and is a recognized expert in the field of PA with numerous invitations to provide keynote lectures at events in 20-plus countries. Phillips was honored in 2017 with the Agronomic Industry Award from the American Society of Agronomy.

Position:

Principal Scientist at African  
Plant Nutrition Institute (APNI)

Workplace:

African Plant  
Nutrition Institute  
(APNI)

Country:

Morocco



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## Class 5: NUTRIENT RECOVERY AND RECYCLING

This class digs into circular economy solutions for greater nutrient recovery and recycling. Crop-livestock integration, less food waste, by-products use and increased nutrient recovery and recycling are key measures to optimize nutrient use efficiency across the whole food supply chain will be discussed.

**Module 1 - Circular Economy Solutions - Challenges, Action, and Outcome:** Crop-livestock integration, less food waste, by-products use and increased nutrient recovery and recycling are key measures to optimize nutrient use efficiency across the whole food supply chain. You will be instructed on solutions for a circular economy need to fit guiding principles, which include to safeguard and regenerate the health of our (agro) ecosystems; avoid non-essential products and the waste of essential ones; prioritize biomass streams for basic human needs; recycle by-products of (agro)ecosystems and entropy: use renewable energy while minimizing overall energy use. This class presents circular economy solutions for improved nutrient recovery and recycling complete with insights into challenges, actions, and outcomes.

**Module 2 - Circular Economy Solutions - Technology and Impact** Technologies need to maximize biomass utility, especially to rearrange agricultural landscapes and food systems with organically produced fertilizers. This includes processed animal manures, digestate and food and feed residues, and the extraction of nutrients from city waste. This module will present to you the various circular economy solutions for greater nutrient recovery and recycling, key technologies and their impacts. It also discusses issues in relation to the use of organic fertilizers and presents options for nutrient recovery from cities are presented.

### MEET THE PROFESSOR



Pytrik Reidsma

Pytrik Reidsma is the Associate Professor at Plant Production Systems, Wageningen University & Research, the Netherlands. Reidsma is an expert in the integrated assessment of sustainability and resilience of farming systems. This includes the agronomic, economic, environmental and social impacts of nutrient management and policy. She combines experimentation with modelling, data analysis and participatory approaches. Reidsma is the Editor of Agricultural Systems and is a member of the editorial boards of the European Journal of Agronomy, Land Use Policy and Frontiers in Sustainable Food Systems, Climate-Smart Food Systems section. She is also a member of the Scientific Panel on Responsible Plant Nutrition (sprpn.org), the EU Nitrogen Expert Panel (www.eunep.com) and the core team of the strategic programme, Connected Circularity, at Wageningen. Reidsma has published more than 75 articles in peer-reviewed journals. She collaborates with farmers, governments, industry and other stakeholders to accelerate the transition towards a more sustainable and resilient farming and food system.

Position:

Associate Professor in  
Sustainable and Resilient  
Agriculture

Workplace:

Wageningen  
University  
& Research

Country:

Netherlands



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## Class 6: NUTRITION-SENSITIVE AGRICULTURE

This class will link agriculture versus human nutrition, nutrition-sensitive farming and biofortification, and will examine how food crops can be produced with a higher nutritional value to address persistent as well as emergent mineral nutrient deficiencies. It will also cover the triple burden of undernutrition, which is the combination of micronutrient malnutrition, obesity and other non-communicable diseases.

**Module 1 - Nutrition Sensitive Agriculture:** This module provides you an overview of the importance of nutrition in the agriculture sector and overall, in food systems. It summarizes the latest data on the multiple forms of malnutrition and trends that are negatively impacting societies, the shift in the health and environmental sustainability of diets and the drivers of those trends and changes. Concepts of how food security links to malnutrition and the nutrition transition will also be discussed. The module also provides you with an insight into how agriculture could be “nutrition sensitive” or designed in a way that has nutrition benefits including what types of foods are grown, how to ensure that nutritious foods are available and accessible for consumers and how supply chains overall can be re-oriented with nutrition outcomes in mind.

### MEET THE PROFESSOR



Jessica Fanzo

Jessica Fanzo is the Bloomberg Distinguished Professor of Global Food Policy and Ethics and Vice Dean of Faculty Affairs at the Nitze School of Advanced International Studies (SAIS) at Johns Hopkins University, U.S. Fanzo holds appointments in the Berman Institute of Bioethics and the Bloomberg School of Public Health. She serves as the Director of Hopkins' Global Food Policy and Ethics Program and as Director of Food and Nutrition Security at Hopkins' Alliance for a Healthier World. Fanzo is also the Editor-in-Chief for the Global Food Security Journal and leads on the development of the Food Systems Dashboard, in collaboration with GAIN. From 2017 to 2021, Fanzo served on the Food Systems Economic Commission, the Global Panel of Agriculture and Food Systems for Nutrition Foresight 2.0 report and the EAT-Lancet Commission. She was also the Co-Chair of the Global Nutrition Report and Team Leader for the UN High-Level Panel of Experts on Food Systems and Nutrition. In 2021, she published her first book, *Can Fixing Dinner Fix the Planet?* and co-wrote *Global Food Systems, Diets and Nutrition: Linking Science, Economics, and Policy*. Fanzo holds a doctorate in nutrition from the University of Arizona and completed a Stephen I. Morse postdoctoral fellowship in immunology in the Department of Molecular Medicine at Columbia University.

Position:

Professor of Global  
Food Policy and Ethics  
and Vice Dean  
of Faculty Affairs

Workplace:

Nitze School of Advanced  
International Studies (SAIS)  
at Johns Hopkins University

Country:

USA

## Class 6: NUTRITION-SENSITIVE AGRICULTURE

**Module 2 - Overcoming hidden hunger through biofortification:** This module will introduce students to the concept of 'hidden hunger' by exploring the essential micronutrients in the global food system, including the requirements that are needed to provide a healthy diet for people at a global scale. The module will then present solutions to hidden hunger such as supplementation, fortification, biofortification and access to diverse diets. Finally, the module will guide students through the analysis of case studies on biofortification (e.g., selenium fertilizer, HarvestPlus, biofortified forages for livestock) which have been used to alleviate hidden hunger.

### MEET THE PROFESSOR



Martin Broadley

Martin Broadley is Director of the Sustainable Soils and Crops Strategic Area at Rothamsted Research. His research seeks to increase the understanding of mineral nutrient dynamics in agriculture and food systems. A particular focus is on improving the nutritional quality of crops for human and livestock diets. This work includes collaborations with soil and crop scientists, human/animal nutritionists and social scientists. It also includes the development of long-term research and training partnerships with higher education and government research institutes in several countries in Africa. From 2017–2021, Broadley was a part-time Senior Research Fellow (Agriculture & Food Systems) in the Research and Evidence Division of the Foreign, Commonwealth & Development Office (FCDO); he retains a Chair in Plant Nutrition at the University of Nottingham.

Position:

Science Director

Workplace:

Rothamsted Research

Country:

UK



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## Class 7: TECHNOLOGY INNOVATION AND NOVEL FERTILIZERS

Fertilizers are increasingly being produced in an more environmentally-friendly manner and with the capability to control the release of nutrients to the plant. This class will examine the innovations in fertilizer formulation that are leading to the development of environmentally friendly fertilizers that maximize nutrient capture and minimize losses of nutrients. Fertigation and foliar fertilization will also be covered in this class.

**Module 1 - Novel Fertilizers:** This module examines the key objectives when designing novel fertilizers and the different strategies needed for different nutrients given their behavior in the soil-plant system. You will understand examples of existing and emerging novel technologies and key soil processes to consider for novel nitrogenous, phosphatic and micronutrient fertilizers.

### MEET THE PROFESSOR



Mike McLaughlin

Mike McLaughlin is a Professor in the School of Agriculture Food and Wine and the Director of the Mosaic-sponsored University of Adelaide Fertiliser Technology Research Centre. Mike holds a doctorate from the University of Adelaide, Australia, and a master's in agricultural science from the University of Reading, UK. McLaughlin's research interests are in soil and fertilizer chemistry and crop nutrition. He has published almost 400 research papers on fertilizer chemistry, soil fertility, crop nutrition and fertilizer contaminants and holds several patents covering novel fertilizer formulations.

Position:  
Professor  
and Director

Workplace:  
School of Agriculture Food  
at the University of Adelaide  
Fertiliser Technology  
Research Centre

Country:  
Australia

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## Class 7: TECHNOLOGY INNOVATION AND NOVEL FERTILIZERS

**Module 2 - Agricultural Biologicals:** Plant or agricultural biologicals are naturally occurring microorganisms or biologically derived biochemicals, which in some conditions can be alternatives to chemical protection and stimuli of crops. In contrast to their chemical counterparts, biologicals are derived from living organisms that exhibit positive effects on plant protection and the overall fertility of soils and crop production. This module about agricultural biologicals will provide students with knowledge on this important and timely R&D agricultural topic. The module aims to address questions regarding agricultural biologics such as: What are agricultural biologicals? How are they defined in different countries and regions? How is the Ag-Biologicals market growing globally and geographically? It will also examine the challenges inherent in advancing sustainability through biological solutions.

### MEET THE PROFESSOR



Adnane Bargaz

Adnane Bargaz began working for OCP Group as a researcher at the Direction of Research and Development (R&D) in November 2016, before moving to become an assistant professor (seconded from OCP in July 2018) at Mohammed VI Polytechnic University (UM6P) in Benguerir. Bargaz holds a doctorate (Jan. 2012) in plant agro-physiology from the Faculty of Sciences and Techniques of Marrakech and INRAE-SupAgro of Montpellier. Ten years later and in recognition of his academic achievements, Bargaz was awarded an HDR certificate of the University of Montpellier, the highest university degree awarded in France in the supervision of research.

Prior to joining R&D – OCP and UM6P, Bargaz worked as a postdoctoral researcher at the Swedish University of Agricultural Sciences and the University of Toronto (2013-2016). His research particularly focused on investigating tolerance mechanisms of legumes (as sole- or inter-crops) and their N<sub>2</sub>-fixing symbionts in response to abiotic constraints, notably phosphorus deficiency and water limitation.

At Mohammed VI Polytechnic University, Bargaz undertakes research and teaching activities in the general field of plant science, particularly plant-microbe interactions with specific focus on plant below-ground mechanisms likely responsible for nutrient use efficiency and abiotic stress tolerance.

Position:  
Professor Researcher

Workplace:  
Mohammed VI Polytechnic  
University (UM6P)

Country:  
Morocco

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# Class 7: **TECHNOLOGY INNOVATION AND NOVEL FERTILIZERS**

**Module 3 – Fertigation:** Fertigation is the application of fertilizers through irrigation water. Water and fertilizer are the most limiting factors of agricultural food production under irrigation in arid and semiarid regions. You will learn about the concept of fertigation, and how it enhances both Fertilizer Use Efficiency (FUE) and Water Use Efficiency (WUE), contributing towards food production and yield, food quality and the environment while ensuring farming sustainability. You will also learn on 4R fertigation stewardship - the application of the right sources, at the right rate, time and placement of both water and fertilizer.

## MEET THE PROFESSOR



**Munir Rusan**

Munir Rusan is a faculty member at Jordan University of Science and Technology where he specializes in soil fertility and plant nutrition. Rusan's main line of research is nutrient cycling in agroecosystem and in wastewater treatment and reuse. He is actively involved in the transfer of knowledge and technology to farmers across the region to improve agriculture production and to enhance fertilizer and water use efficiency. He was awarded the Distinctive Scientific Research Award by the Arab Organization for Agricultural Development and from Arab Fertilizer Association. Rusan is a certified expert on Higher Agricultural Education awarded by the Agriculture Engineers Association, and he has published 68 papers and presented at 57 conferences.

*Position:*  
Professor

*Workplace:*  
Jordan University

*Country:*  
Jordan

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## Class 8: NUTRIENT STEWARDSHIP PRACTICE

This class examines regional approaches such as 4R Stewardship in North America, Integrated Soil Fertility Management (ISFM) in Africa and China).

**Module 1 – North American Regional Approach, 4R Nutrient Stewardship:** This module describes approaches to nutrient stewardship in North America. It provides students with examples of and instruction in the North American regional approach of 4R Nutrient Stewardship, which is intended to address water quality and greenhouse gas emissions, and explains how these activities contribute to the six actions of the new paradigm for Responsible Plant Nutrition.

### MEET THE PROFESSOR



Tom Bruulsema

Tom Bruulsema is the Chief Scientist at Plant Nutrition Canada, where he provides support for the nutrient stewardship programs at Fertilizer Canada, The Fertilizer Institute and the International Fertilizer Association. Previously, he was Vice-President for the International Plant Nutrition Institute's programs in the Americas. From 2015 to 2017, he led the institute's Phosphorus Program and from 1994 to 2015, he was the Director for Eastern Canada and the Northeast U.S. Bruulsema has been recognized as a Fellow of the American Society of Agronomy, the Soil Science Society of America and the Canadian Society of Agronomy. Earlier in his career he was a research associate at the University of Minnesota (1994) and an agronomist with the Mennonite Central Committee in Bangladesh (1986-1990). He has a doctorate in soil science from the Cornell University, U.S., and a master's in crop science from the University of Guelph, Canada.

Position:  
Chief Scientist

Workplace:  
Plant Nutrition Canada

Country:  
Canada

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## Class 8: NUTRIENT STEWARDSHIP PRACTICE

**Module 2 - Sustainable Intensification and Integrated Soil Fertility Management in Sub-Saharan Africa:** Sustainable intensification and integrated soil fertility management in sub-Saharan Africa covers Integrated Soil Fertility Management (ISFM) as a pathway to the Sustainable Intensification (SI) of smallholder farming systems in sub-Saharan Africa (SSA). ISFM is conceptualized around a set of interventions aiming at maximizing the agronomic efficiency of nutrient inputs for economic and environmental reasons. First, the module will highlight to you a set of generic principles underlying ISFM, assembled through many decades of agronomic research. Second, in response to the often-observed large gradients in soil fertility status at short distances, a typical feature of densely populated smallholder farming systems in SSA, an approach to develop site-specific input recommendations is presented in the module, building on new tools and data generated during the past decade. Third, the module presents evidence linking improvements in crop yields through the appropriate use of fertilizer to improved soil organic carbon stocks - a key indicator for soil health and one of the components of SI besides enhanced productivity - and stability of productivity against external shocks such as climate change.

### MEET THE PROFESSOR



Bernard Vanlauwe

Bernard Vanlauwe leads the Central Africa hub and the Natural Resource Management research area at the International Institute of Tropical Agriculture (IITA), in Kenya. Prior to this appointment, Vanlauwe was the leader of the Integrated Soil Fertility Management program of the Tropical Soil Biology and Fertility research area of the International Center for Tropical Agriculture. He has published more than 200 papers in scientific journals and some 180 in other forms, as well as (co-) supervised more than 40 doctoral theses and 60-plus master's students. He is facilitating the development of an Excellence in Agronomy Initiative as part of the One CGIAR (formerly the Consultative Group for International Agricultural Research) reform process. Vanlauwe has a doctorate in applied biological sciences from Katholieke Universiteit Leuven, Belgium.

Position:  
R4D Director

Workplace:  
International Institute  
of Tropical Agriculture (IITA)

Country:  
Nigeria

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## Class 8: NUTRIENT STEWARDSHIP PRACTICE

**Module 3 – Nutrient Management for Food Security and Sustainability:** This module examines the different challenges and strategies in nutrient management to ensure sustainable food security. Students will learn about and explore various methods such as Integrated Soil-Crop System Management (ISSM), conserving fertilizers to increase yield and nutrient use efficiency (NUE) and Science and Technology Backyard (STB), which have enabled the fertilizer industry in protecting the environment as well as improving crop and soil management.

### MEET THE PROFESSOR



**Fusuo Zhang**

Fusuo Zhang is the Dean of the School of Agriculture Green Development (AGD) and the President of the National Academy of Agriculture Green Development at China Agricultural University, Beijing. His research is mainly focused on how to simultaneously achieve high crop yield, high nutrient use efficiency and high levels of environmental protection in order to ensure food security and realize sustainable development in China. Over the past 30 years, Zhang has developed a series of integrated crop and nutrient management technologies for this purpose. Zhang obtained his doctorate in plant nutrition from the University of Hohenheim in Germany and has published over 400 peer-reviewed papers, including in journals such as Science, Nature and Proceedings of the National Academy of Sciences (PNAS). Zhang received the 2007 IFA International Crop Nutrition Award as well as the 2014 Award for Agricultural Science from the World Academy of Science. He pioneered a new model of transfer of knowledge to farmers and fertilizer industry which was successfully tested in 15 provinces across China. Zhang has received three national and five provincial awards for science and technology advances and has been elected as member of the Chinese Academy of Engineering and the International Eurasian Academy of Science.

*Position:*

Dean, President

*Workplace:*

School of Agriculture Green Development (AGD),  
National Academy of Agriculture Green Development at China Agricultural University,  
Beijing

*Country:*

China

## Class 9: SUSTAINABLE FOOD PRODUCTION CHAINS

This class will examine in detail the theories underlying regenerative agriculture. Following the class, students will understand the definition of regenerative agriculture and the history of the concept. Students will examine whether the claims made for regenerative agriculture can withstand scrutiny. The class will continue into a discussion of the key criticisms of how regenerative agriculture is framed, in which students will learn what it means in practice for those working in the agricultural industry and will end by delving into measuring and monitoring the progress towards a regenerative agricultural system.

### MEET THE PROFESSOR



**Ken Giller**

Ken Giller is Personal Professor of Plant Production Systems at Wageningen University. His research focuses on smallholder farming systems in sub-Saharan Africa, and in particular problems of soil fertility with emphasis on the temporal and spatial dynamics of resources within crop/livestock farming systems. He leads a number of initiatives such as N2Africa - Putting Nitrogen Fixation to Work for Smallholder Farmers in Africa. Giller is co-chair of the Thematic Network 7 on Sustainable Agriculture and Food Systems of the Sustainable Development Solutions Network (SDSN) of the United Nations and a member of the Unilever Sustainable Sourcing Advisory Board. Giller joined Wageningen University in 2001 after holding professorships at Wye College, University of London and the University of Zimbabwe.

*Position:*

Professor of  
Plant Production  
Systems

*Workplace:*

Wageningen  
University & Research

*Country:*

Netherlands



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## Class 10: **BIODIVERSITY AND FERTILIZER USE**

This class discusses how fertilizer use impacts biodiversity. The class will first provide students with a definition of biodiversity and an analysis of the major trends and biodiversity threats observed in recent decades. The class will then summarize how nutrients have negative or positive effects on different aspects of biodiversity at different scales. Students will discover the main biodiversity targets and how they are increasingly becoming a necessity for a sustainable business strategy. Finally, the class will provide an overview of how to manage nutrients in agriculture in order to preserve biodiversity using a case study.

### MEET THE PROFESSOR



**Achim Dobermann**

Achim Dobermann is the Chief Scientist of the International Fertilizer Association (IFA). He provides scientific advice to IFA, its members and stakeholders to promote responsible plant nutrition and nutrient stewardship. Prior to joining IFA, Dobermann served as the Director and Chief Executive of Rothamsted Research in the UK (2014-2019), Deputy Director General of the International Rice Research Institute (IRRI, 2008-2014) and has held several senior positions in academia. He has more than 30 years of field experience working in every world region, leading numerous research programs on novel solutions for the sustainable management of agricultural systems.

Dobermann has a doctorate in soil science and a master's in tropical agriculture from the University of Leipzig, Germany. He has authored or co-authored more than 110 journal papers, several books and numerous technical and outreach publications. He is an Editor for the international journal *Global Food Security*. Dobermann is a Fellow of the American Society of Agronomy, the Soil Science Society of America and the Crop Science Societies of the Philippines. As a member of the Leadership Council of the Sustainable Development Solutions Network, he leads a Massive Open Online Course on Feeding a Hungry Planet.

*Position:*  
**Chief Scientist**

*Workplace:*  
**International Fertilizer  
Association (IFA)**

*Country:*  
**France**

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# SUSTAINABLE FERTILIZER ACADEMY

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## PROFESSORS AT A GLANCE

### Level 1 INTRODUCTORY

Professor: Workplace:

<b>Esben Rahbek Pedersen</b> Professor	<b>Copenhagen Business School</b>	
<b>Terry L. Roberts</b> Former President of the IPNI	<b>International Plant Nutrition Institute (IPNI)</b>	
<b>Mohammed Kharbach</b> Professor of Practice in Energy Business and Sustainability	<b>Mohammed VI Polytechnic University (UM6P)</b>	
<b>Volker Andresen</b> Sustainability Director and China Initiative Leader	<b>International Fertilizer Association (IFA)</b>	
<b>Cecilia Dardes</b> Agriculture and Environment Manager	<b>Fertilizers Europe</b>	
<b>Jasmine Barahman</b> Climate Policy Manager	<b>Fertilizers Europe</b>	
<b>Alice McKinnon</b> Director of Member Programs	<b>The Fertilizer Institute</b>	
<b>Pauline Chivenge</b> Principal Scientist	<b>African Plant Nutrition Institute (APNI)</b>	
<b>Sachhida Nand</b> Deputy Director General	<b>Fertilizer Association of India (FAI)</b>	
<b>Leo Hui</b> Director	<b>Fertilizer Information Center - China National Chemical Information Center</b>	
<b>Mohamed Al Hashemi</b> Safety and Environment Superintendent	<b>Gulf Petrochemical Industries Company</b>	
<b>Reem Al Bastaki</b> Environmental Engineer	<b>Gulf Petrochemical Industries Company</b>	
<b>Eleanore Arnoud</b> Sustainability Consultant	<b>Forethix</b>	
<b>Daphne Van Osch</b> Director	<b>Sustainalytics Corporate Solutions</b>	
<b>Luca Molinari</b> Senior Associate	<b>Sustainalytics Corporate Solutions</b>	
<b>Bachir Mouhyi</b> Lead ESG Compliance, Sustainability Platform	<b>OCP Group</b>	
<b>Kristofer Whitfield</b> Head of Business Development, Supply Chain & Risk Management (Europe)	<b>SGS</b>	
<b>Philip Smees</b> Fellow	<b>Institute of Chemical Engineering and Chartered Engineering</b>	
<b>Benedyct Muirheid</b> Managing Partner	<b>MindSpring Associates</b>	
<b>Esohe Denise Odaro</b> Head of Investor Relations & Sustainable Finance Coordination	<b>IFC</b>	
<b>Bob Morris</b> President	<b>AndMore Associates, LLC</b>	
<b>Franck Gbaguidi</b> Biodiversity & Water Lead	<b>Eurasia Group</b>	
<b>Debasis (DB) Bhaumik</b> Digital Transformation Leader	<b>Nutrien</b>	

### Level 2A INTERMEDIARY

Professor: Workplace:

<b>Antoine Hoxha</b> Production and Agriculture Director	<b>Fertilizers Europe</b>	
<b>Theo Paquet</b> Regulatory and Green Ammonia Officer	<b>Fertilizers Europe</b>	
<b>Jeff Dowson</b> Partner	<b>JD Business Enhancement LLP</b>	
<b>Jan Petter Fossum</b> Senior Vice President and Head of Corporate HESQ	<b>Yara International ASA</b>	
<b>Kevin Rouwenhorst</b> Innovation Engineer at Proton Ventures and a Technology Manager	<b>Ammonia Energy Association</b>	
<b>Gerardo Duarte</b> Research And Development Engineer	<b>Stamicarbon Strategic R&amp;D Department</b>	
<b>Hicham Benyoucef</b> Professor	<b>Mohammed VI Polytechnic University (UM6P)</b>	
<b>Julian Hilton</b> Chairman	<b>Aleff Group</b>	
<b>Malika Moussaid</b> CEO	<b>Aleff Group</b>	
<b>Abdelhadi Khaldoun</b> Senior Research Engineer	<b>Mohammed VI Polytechnic University (UM6P)</b>	
<b>Peter Levi</b> Industry Lead, Energy Technology Policy Division	<b>International Energy Agency (IEA)</b>	
<b>Kobi Ilia</b> Vice President and Group Treasurer	<b>ICL</b>	
<b>Matt Rellaford</b> Carbon Science Agronomist	<b>Agoro Carbon Alliance</b>	
<b>Viktorija Stojcheva</b> Managing Consultant	<b>Guidehouse</b>	
<b>Paddy Ellen</b> Associate	<b>SYSTEMIQ</b>	
<b>Thomas Hegarty</b> Associate	<b>SYSTEMIQ</b>	

### Level 2B INTERMEDIARY

Professor: Workplace:

<b>Tom Bruulsema</b> Chief Scientist	<b>Plant Nutrition Canada</b>	
<b>Xin Zhang</b> Associate Professor	<b>University of Maryland, Center for Environmental Science</b>	
<b>David Kanter</b> Associate Professor	<b>New York University</b>	
<b>Steve Philipps</b> Principal Scientist at African Plant Nutrition Institute (APNI)	<b>African Plant Nutrition Institute (APNI)</b>	
<b>Pytryk Reidsma</b> Associate Professor in Sustainable and Resilient Agriculture	<b>Wageningen University &amp; Research</b>	
<b>Jessica Fanzo</b> Professor of Global Food Policy and Ethics and Vice Dean of Faculty Affairs	<b>Nitze School of Advanced International Studies (SAIS) at Johns Hopkins University</b>	
<b>Martin Broadley</b> Science Director	<b>Rothamsted Research</b>	
<b>Michael McLaughlin</b> Professor and Director	<b>School of Agriculture Food at the University of Adelaide Fertiliser Technology Research Centre</b>	
<b>Adnane Bargaz</b> Professor Researcher	<b>Mohammed VI Polytechnic University (UM6P)</b>	
<b>Munir Rusan</b> Professor	<b>Jordan University</b>	
<b>Bernard Vanlauwe</b> R4D Director	<b>International Institute of Tropical Agriculture (IITA)</b>	
<b>Fusuo Zhang</b> Dean, President	<b>School of Agriculture Green Development (AGD), National Academy of Agriculture Green Development at China Agricultural University, Beijing</b>	
<b>Ken Giller</b> Professor of Plant Production Systems	<b>Wageningen University &amp; Research</b>	
<b>Achim Dobermann</b> Chief Scientist	<b>International Fertilizer Association (IFA)</b>	

Please visit [www.ifa-sfa.org](http://www.ifa-sfa.org) to register and for more information on the IFA's **Sustainable Fertilizer Academy**, or contact Alexandra Dorison, our sustainability education coordinator, by email at [adorison@fertilizer.org](mailto:adorison@fertilizer.org).

If you have subject-matter expertise and would like to teach at the SFA, please contact Alexandra.

#### Founding Partners:





# ACADEMY IN NUMBERS

2 time finalist of online education awards by:

- ESAE (European Society of Association Executives)
- AAE (Association of Association Executives)

**17** classes  
on nutrient  
stewardship



**18** classes  
on product  
stewardship



**+45**

professors



**+200**

registered  
students



**+25**

companies  
where students  
are employed



**+70**

students received  
certification



**+40**

online videos



**2**

languages:  
English and  
Spanish  
(more to come)



**+25**


countires  
where students  
are coming from

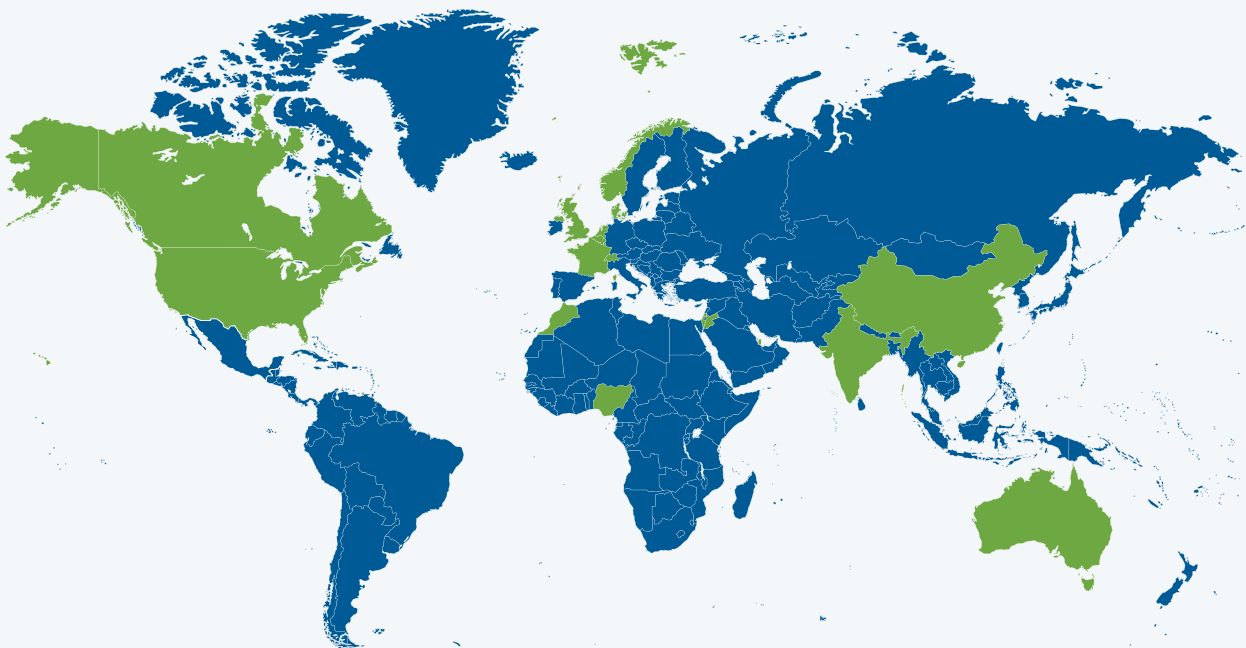


**24/7**

availability of  
the academy

## WHERE DO PROFESSORS COME FROM?

 Countries where teachers are based





## WHAT'S NEXT?

If you are interested in learning more about all the facets of sustainability within the fertilizer industry, enroll today at the **Sustainable Fertilizer Academy**. To register for the academy, please follow these simple steps:

1. Click on the “Sign-up” button located on the [Academy's website \(ifa-sfa.org\)](https://ifa-sfa.org).
2. Fill out the registration form with your details, including your name, email address, chosen Level of study and billing information.
3. Once you have submitted your registration form, you will receive a confirmation email with your login and password.
4. After registration, you will receive an invoice for the Level you have chosen. Payment can be made through transfer, credit card, or Stripe.
5. Once your payment has been processed and approved, you will receive a confirmation email from **IFA**. This email will also contain information on how to access your class content.

By following these steps, you will have successfully registered for the **Sustainable Fertilizer Academy** and will be on your way to gaining valuable knowledge about sustainability as well as nutrient and product stewardship.

If you have completed Level 1 and would like to move on to Level 2, please contact us. We will send you another invoice, and once processed, you will have access to new class content.

Once you have completed the exams, IFA will officially communicate your certificate within 72 business hours.

