



## Science Days for the UN Food Systems Summit, 7 July 2021

### HIGHLIGHTS

#### A NEW PARADIGM FOR PLANT NUTRITION

How should plant nutrition evolve in the next decades to support human nutrition in a low-carbon, environment-friendly and circular economy?

The members of the Scientific Panel on Responsible Plant Nutrition (SPRPN) have developed a vision for such transformation. In their New Paradigm for Plant Nutrition, the food and nutrition requirements of a rising global population are met, farmers' livelihoods are improved, while harmful environmental impacts caused by nutrient losses are minimized.

Why is a new paradigm needed? SPRPN Chair Tom Bruulsema, Chief Scientist, Plant Nutrition Canada explains: "Plant nutrition faces enormous challenges. Human manipulation has more than doubled the global scale of cycling for several key nutrients. Productivity and food security are still critical needs, but the new paradigm must embrace all dimensions of a sustainable food systems approach, including greenhouse gas emission reduction, carbon sequestration, pollution and biodiversity, waste and nutrient recycling, nutrition and health. Bringing the multiple issues together into a single paradigm provides opportunity to minimize trade-offs, seek synergies, and integrate with broader efforts. For example, in Canada, the fertilizer industry is exploring opportunities for integrating its 4R Nutrient Stewardship programs within a national index for performance in agri-food sustainability."

How will plant nutrition change with green development in Asia? SPRPN member Dr. Fusuo Zhang, China Agricultural University, notes that China is rapidly changing from a paradigm of maximum production to one of improved nutrient use efficiency and reduced waste.

What is essential to drive transformation in smallholder farming systems in sub-Saharan Africa? SPRPN member Dr. Bernard Vanlauwe, International Institute of Tropical Agriculture (IITA), Kenya, demonstrates improved productivity is key. Integrated soil fertility management with increased nutrient inputs benefits smallholder livelihoods and improves soil health.

How can global nutrient cycles be optimized for sustainable food systems? SPRPN member Dr. Xin Zhang, University of Maryland Center for Environmental Science (UMCES), USA shows the needs for broadening the scope of nutrient management beyond farms, considering the critical role of socioeconomic dynamics, and enabling collaborations across the boundaries of disciplines, sectors, and nations.

What transformations in plant nutrition are needed for low-emission development in agriculture? SPRPN member Dr. Lini Wollenberg, CGIAR Research Program on Climate Change, Agriculture & Food Security (CCFAS), USA notes that precise matching of nutrient inputs to crop nutrient needs is essential to reducing the global warming potential of agricultural production.

Achieving the new paradigm for plant nutrition will depend on the collaboration of all stakeholders influencing the cycling of nutrients: the global fertilizer industry, policymakers, farmers, traders, retailers and consumers. The fertilizer industry has embraced this new vision and is undergoing a significant transformation towards sustainability as a core business objective.