

Findings from user needs research

Carried out in 2022



1

Key out-takes

- The research produced few surprises, but clarified priorities
- Key issues are NUE improvement and other aspects of reducing environmental impacts whilst maintaining yields, coping with regulatory burden, and evaluation / verification of novel products and materials
- Primary information challenges are overload, difficulty in sorting credible information from dubious, silo'd communication and relevant networking
- Information needs to be provided in multiple formats, with 'layers' of detail
- The Society has considerable strengths with the people who know it, and faces many more opportunities than threats.
- Several possible actions were suggested – some specific / short term, others longer term and more abstract
- Implied conundrum – to what degree does the Society need, or wish, to change?



2

Background and objectives

- Fertiliser / crop nutrition is undergoing significant and disruptive change, largely driven by external forces, and will continue to do so
- Suggests that all organisations will need to adapt – and the ability to prosper will be helped by understanding the nature and impact of this change
 - User needs, opportunities, threats
- Objective of research is to provide information on the present and anticipated needs of Members for information
- To guide
 - Types of information required
 - 'Pain points' to overcome
 - Ways to provide information



3

Research structure and participant characteristics

- Discussion groups
 - Five groups, involving 16 people
 - 8 early career, 8 established
 - 10 agronomic, 6 production
 - 11 practitioner, 5 researcher
- Online, self completion survey on website
 - 16 responses
 - 5 academic researchers, 4 agronomist, 3 consultants, 4 other
 - Average years in role – 34
 - Locations – Germany, Israel, Netherlands, New Zealand, Norway, Sweden, UK



4

Discussion group questions posed

- Within the part of the industry where you operate, what are the key technical issues that need to be addressed?
- For those areas that are important, what change is occurring? How significant / rapid / disruptive is this, and what is driving it?
- Within the part of the industry where you operate, what are the barriers to the dissemination, uptake and application of technical information?
- Within the part of the industry where you operate – what are the areas / issues for which the technical knowledge needed to address them is most lacking?
- Of the various ways in which technical knowledge can be communicated, which ones do you prefer, and which ones do you like least?



5

Q. Within the part of the industry where you operate, what are the key technical issues that need to be addressed?

- **Widespread views**
 - Reduction of environmental impacts (nutrient leakage, carbon footprint) whilst maintaining yield
 - Improving NUE
- **Mentioned by several**
 - Development of product and process innovations – recycled materials, biologicals, green / blue NH_3 , diversion of NH_3 to transportation industries
 - Need to cope with impact of new regulations
- **Noteworthy point – how to develop more integrated solutions across current 'silos' e.g. plant breeding vs crop nutrition, or NUE vs plant health**
- See Notes for points made by a few



6

Q. For those areas that are important, what change is occurring?
How significant / rapid / disruptive is this, and what is driving it?

- **Widespread views**
 - Primary drivers are social trends and regulatory pressures
 - Degree of change is significant and will be disruptive
- **Noteworthy points**
 - Extension services / farmer support is the weakest link in the agricultural value chain (esp. in developing countries)
 - Demand for green NH₃ from larger and higher priced transport market could restrict fertiliser supply / force up the price of food
- See Notes for points made by a few



7

Q. Within the part of the industry where you operate, what are the barriers to the dissemination, uptake and application of technical information?

- **Widespread views**
 - No broad themes emerged
- **Mentioned by several**
 - Lack of understanding (of the detailed science), integration / silo'ed thinking between academics / scientists, policymakers and practitioners (both fertiliser industry and farmers)
 - Lack of time to assimilate information and/or build networks
- **Noteworthy point – fertiliser production process licensors are powerful and limit the exchange of technical production information**
- See Notes for points made by a few



8

Q. Within the part of the industry where you operate – what are the areas / issues for which the technical knowledge needed to address them is most lacking?

- Widespread views
 - No broad themes emerged
- Mentioned by several
 - What happens to nutrients in the soil?
 - How to manage rotations, improve soil quality / C, reduce fertiliser wastage?
 - Reliable data on efficacy of biologicals and other novel products
- See Notes for points made by a few



9

Q. Where is the most interesting innovation happening?

- Product innovation from non-industry entrepreneurs in USA, Europe and Japan (not established industry or research institutions)
 - Robotics, soil assessment technology
- Farming practice innovation from universities and farmers themselves
 - Rotation experiments, building soil health, valorisation of organic material, carbon sequestration
- Information innovation is coming from private sector online platforms
- Plus these research areas
 - Biotechnology e.g. in-plant N fixation
 - Cross over between crop nutrition and plant / human health



10

Q. Should the IFS experiment with more focused online event series / communities?

Broad agreement that this would be worth trying

- Perceived pros
 - Several participants had experience of something similar, and appreciated this
 - Each session has 1-2 presentations followed by a discussion
 - Focus could be on:
 - topics relevant to both crop nutrition and production – e.g. NUE / inhibitors / enhanced efficiency fertilisers
 - Simple 'how to' guidance
 - Bringing together scientists, practitioners, regulators and policy makers.
- Perceived cons / queries
 - How to encourage community development, rather than one-off events?
 - Would success require volunteer moderators?
 - Important to avoid creating silos or splits within the Society
 - Need to ensure that they do not detract from / compete with the conferences (ensure that presentations are short?)



11

Suggestions for the IFS to consider

Build on strengths of being a source of unbiased credible information, a platform for discussion of emerging issues, and covering both crop nutrition and fertiliser production

Run events that bring crop nutrition and fertiliser production people together

Provide (more) contextual review / overview papers

Do more to draw attention to historic, still relevant (forgotten?) knowledge

Access farmer driven innovation

Combine soils knowledge with crop nutrition

Consider setting up an information sharing network

Persuade academic researchers that the IFS is a relevant forum for their work (many do not think it is)

Develop an Artificial Intelligence 'curation' system to precis multiple articles

Does the name 'International Fertiliser Society' convey the right expectations?

Run a directory of webinars

Develop systematic scanning systems to capture all new research – becoming THE 'go to' source of evaluated, filtered, credible information on new developments



12

Information from online survey

Questions

- Most challenging technical issues
- Greatest change
- Types of technical knowledge most lacking
- Barriers to obtaining technical information

Summary of responses

- NUE, sustainability, soil management, growing regulatory burden, novel products (biologicals)
- Regulation, digitisation, novel products, moves away from mineral fertilisers
- Availability of adequate, reliable data; development of integrated solutions, analytical technology, lack of consistent soil tests, combining the small scale and the large scale
- Lack of adequate data, lack of time compared to the deluge of information, inability to separate 'wheat from chaff', 'silo' thinking and activity



13

Answers to research questions posed

- Considerable uniformity in answers to questions
- Primary issues driving demand for information
 - NUE improvement
 - Other aspects of reducing environmental impacts whilst maintaining yields
 - Coping with regulatory burden
 - Evaluation / verification of novel products and materials
- Main 'pain points'
 - Information overload
 - Difficulty in sorting credible information from dubious
 - Silo'd activity and lack of integrated thinking / solutions
 - How to connect / network with relevant peers
 - Desire to bring crop nutrition and fertiliser production people together
- Inconveniently, no one format of information suffices
 - Different people prefer different formats, in different circumstances
 - One common demand is to provide 'descending' levels of detail



14

Level of current IFS coverage / contribution (judgemental!)

- | | |
|---|------------|
| • Primary issues driving demand for information | |
| • NUE improvement | Quite good |
| • Other aspects of reducing environmental impacts whilst maintaining yields | Some |
| • Coping with regulatory burden | Little |
| • Evaluation / verification of novel products and materials | Little |
| • Main 'pain points' | |
| • Information overload | Little |
| • Difficulty in sorting credible information from dubious | Some |
| • Silo'd activity and lack of integrated thinking / solutions | Some |
| • How to connect / network with relevant peers | Little |
| • Desire to bring crop nutrition and fertiliser production people together | Little |



15

Other conclusions from research findings

- No surprises in the main themes to emerge
 - But these help to clarify and prioritise
- The IFS has considerable and relevant strengths with those who know it
 - Implied weaknesses come down to lack of resources
- The IFS faces more opportunities than threats
- Greatest challenge is arguably the complexity of monitoring and evaluating innovations coming from multiple sources
- There is interest in the IFS experimenting with sub-groups within the membership



16

Implied actions / questions for the IFS

- How can we better leverage our reputation for credibility and trustworthiness?
- Are we capturing all the innovation that is happening?
 - If not, should we aspire to?
 - If 'yes, we should aspire', what could / should we do differently / additionally?
- How can we more effectively bring crop nutrition and production Members together?
- How can we better bring together groups who are separated by 'silos'?
 - e.g. scientists, industry, farmers, policy makers
- Should we experiment with a focused series of online events?
- Do we need to change to maintain / improve our relevance?

