Assessing tephra impacts on agricultural systems: the case for standardisation of an analysis protocol

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Agricultural systems can be vulnerable to the physical and chemical impacts of tephra deposition. Accurate impact assessment is needed to identify potential losses and provide support for farmers immediately after the eruption and over the longer recovery period. Previous tephra fall events have shown that it is important to understand the physical and chemical characteristics of the tephra, soil and depositional environment. Climatic conditions may also be important in determining the impacts of tephra fall on agricultural systems. Data from previous events has shown that agricultural losses have been predominantly due to the physical nature of the tephra, except in instances where tephra has contained elevated concentrations of fluoride. To date some impact assessment studies have included different analytical protocols to chemically and physically analyse tephra, leading to issues with the comparison and interpretation of results across different industry and infrastructure groups and tephra fall events. A standard set of methods for testing agricultural land and assessing the impacts after tephra fall is needed. We are developing a standard analysis protocol using information from previous impact assessments and laboratory experiments. This protocol will identify the tephra and soil properties and any climatic characteristics that need to be quantified and the most accurate methods to use. The creation of a standard protocol will streamline the analysis process and provide greater comparative and transparent analysis of results for each tephra fall and between different tephra falls. This will enhance stakeholder's ability to decide the most effective mitigation strategies.