#	1
Question	Can the technology that Stuart discussed be used or used in the near future to measure carbon sequestration in our farm hedgerows and trees. We currently measure gross carbon output from our farms but no allowance is made for individual farm carbon sequestration from hedgerows and plantations. If this was possible we would get a net carbon output from each farm.
Answer(s)	See here for a seminar before xmas on our work mapping hedgerows: https://www.teagasc.ie/environment/climate-change--air-quality/the-signpost-series-webinars/ Webinar 37

#	2
Question	Richa did you take natural variations in soil fertility into account for predicting grass growth and if not why not surely it is a big contributor?
Answer(s)	The satellite captures the effect of soil fertility in the impact on observed grass growth

#	3
Question	Thanks its a great resource. Just wondering have you taken account the difference between old pasture versus new reseeded pasture when growing grass or doing machine learning predictions.
Answer(s)	At the moment it's a whole farm approach-next stage is at field level and so then yes re-seeding will be an important issue to address

#	4
Question	How much accuracy machine learning techniques have as compared to normal supervised classification?
Answer(s)	It can be a small effect on accuracy but a big impact in error - so we might go from 90 to 95% accuracy using ML and that seems a small increase - but it means we are going from an error of 1 in 10 to and error of 1 in 20, that's the impact

#	5
Question	Are the estimated P loss results available as published map layers? (Local/regional/national)
Answer(s)	No

#	6
Question	Really impressive research everyone: what are the plans to leverage citizen science to improve habitat mapping in Ireland?
Answer(s)	Habitats are tricky for non-experts - I think the scope in citizen science in this area is on land use

#	7
Question	Farmers do not like measuring grass so farmers will be delighted with AI research Have you done any work on commonages to look at results based impact of Agri - schemes in the last 50 years? Why is it taking so long to update satellite maps in Ireland for use by farmers? Thanks to all!
Answer(s)	We have worked in mapping commonage in the TALAM project: http://erc.epa.ie/safer/iso19115/displayISO19115.jsp?isoID=3159

#	8
Question	To Stuart: how close are we in terms of data mapping to having all we need to develop a National Soil Strategy and National Land Use Plan.
Answer(s)	By spring the osi land cover map will be published - along with the Teagasc digital soil map sis, that is sufficient to develop a national scale strategy

#	9
Question	Can you explain why the R square value was lower in the July to Dec than in Jan to June.
Answer(s)	During the first half of the year which is Jan-June, the weather is better which means we can have a greater number of satellite images than in the second half of the year. As machine-learning are data driven algorithms this means any gaps in the data will affect the accuracy of the model. Hence, R square value is lower for the second model.

#	10
Question	And to Rob, has there been catchment level mapping of water flows to look at soft engineering methods for flood management.
Answer(s)	The Agricultural Catchments Programme looked at high resolution surface flow within a number of catchments nationally using high resolution LiDAR data. With a national LiDAR dataset, this kind of modelling could be replicated for every field countrywide. https://www.teagasc.ie/media/website/environment/climate-change/water-quality/acp/31_Thomas-resized.pdf Using Sentinel 1 SAR imagery (10 m resolution), fields or parts of fields that are regularly and persistently flooded can be monitored in near real time. The development of floods in unmonitored catchments can be observed. Combining SAR imagery and national LiDAR datasets could provide detailed information on flood extents, depth and volume. https://earthobservation.wordpress.com/2020/02/28/this-years-flood/

#	11
Question	Has Richa looked at using Radar instead of optical imagery for sensing grass growth seeing as cloud cover is causing an issue, particularly in the second half of the year?
Answer(s)	Our experience is that RADAR is good at detecting biomass removal (grazing, cutting) but not small changes due to growth - however we continue to study it as techniques improve

#	12
Question	Is it possible to measure P, K and Ca in soils from the work done ?
Answer(s)	Not directly, mainly because the soil is covered most of the time - Teagasc has worked in measuring crude protein in grass remotely and in the use of spectroscopy on in situ soil samples. But it is possible to detect the impact of low fertility on growth rates using the techniques we discussed

#	13
Question	Thanks for providing insight on recent EO techniques congratulations for great work for grassland management. Will it be possible to assess height variation in vegetations in like grassland, Scrub, forestland using historical optical data?
Answer(s)	In short, no, unless the data was collected for the purpose and most is not - OSI photogrammetry campaigns can give height data for forestry (flown every 5 years). Some satellites are used to capture photogrammetry for the creation of elevation models (but the resolution is too crude). Some RADRA data can be used for height detection but it is generally poor on vegetative surfaces. It is likely possible in the future.