

Precision Agriculture

Precision Agriculture aims to optimise management using innovative technology that is non-invasive, quick, and easy for farmers to incorporate. There are significant inefficiencies in fertiliser use in Northern Ireland and Europe as a whole. Blanket applications of inorganic fertilisers have created a situation in which some areas are over-supplied with nutrients, resulting in GHG emissions and nutrient losses to waterways, while other areas are experiencing nutrient deficiencies and sub-optimal yields. Recent studies have shown that grass yield can vary by as much as 4 t/ha within single fields.

The generation of accurate yield maps for grassland is the key step in the development of Precision Agriculture in this area. Agri-Environment Branch conducted research in 2002 looking at the use of satellite imagery (then the highest resolution readily available data) to predict yield (Figure 1).

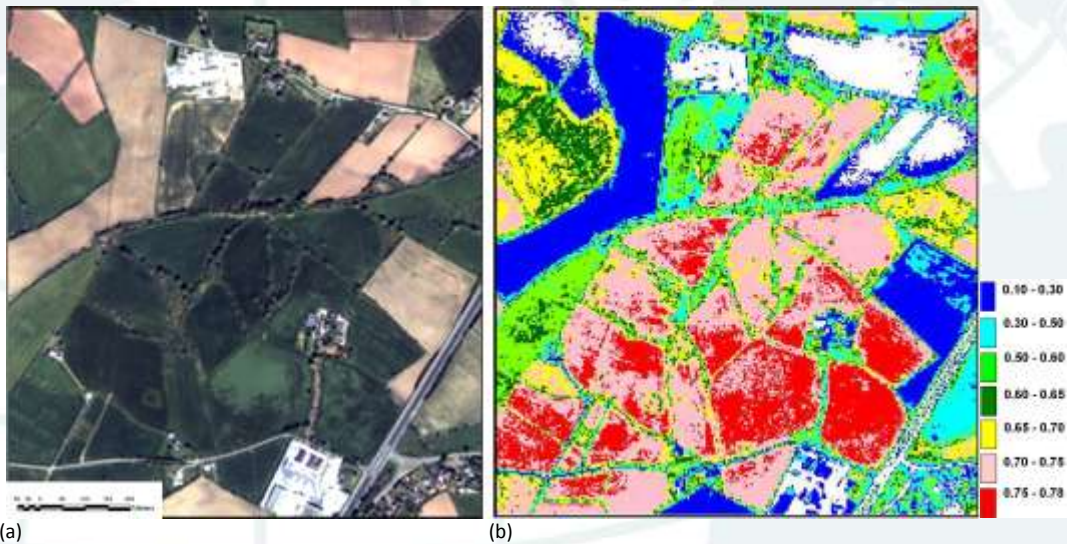


Figure 1. (a) IKONOS 4m true colour orthoimagery. (b) NDVI calculated from the IKONOS 4m multispectral imagery.

Unmanned Aerial Vehicles

The advent of sophisticated, relatively inexpensive Unmanned Aerial Vehicles (UAVs) has overcome the limitations of using remotely sensed satellite imagery in areas prone to cloud cover. Agri-Environment Branch have recently purchased a Sensfly eBee UAV (Figure 2). The eBee has a flight time of up to 50 minutes, enabling it to cover up to 12 km² in a single flight. The unit is equipped with 16 MP true colour and infrared cameras, enabling it to capture aerial imagery at a resolution of up to 1.5 cm/pixel. This multispectral capability allows production of high definition NDVI (and other reflectance indices) mapping. An example of true colour imagery captured is illustrated in Figure 3. Agri-Environment Branch will be using the UAV to investigate the potential for production of cost effective grassland yield mapping allowing application of precision management techniques.



Figure 2. Sensfly eBee UAV

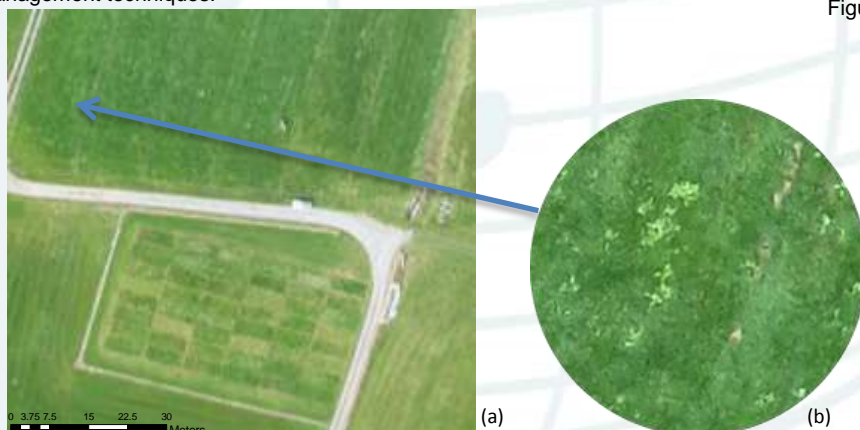


Figure 3. (a) Orthoimagery captured by the eBee at 3 cm/pixel. (b) Detail of image showing pasture weeds.