

The use of drone or satellite NDVI imaging for early detection of seeps in the Mallee

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Project Title: Use of Normalised Difference Vegetation Index (NDVI) to Manage Seeps

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Key Messages

- The NDVI images from both UAV and satellites can be effectively used for the identification of potential seep areas, as well as indicating areas of poor crop growth that may be contributing recharge and should be targeted for strategic high-water use management options.
- Clearest indications were provided by late season UAV flights (mid-October in SA Mallee in 2017), while satellite images taken slightly later (mid-November 2017) appeared to provide a strong identification of potential seep areas at some sites.
- While many of these areas showed obvious physical signs of excess water accumulation throughout the season, the NDVI imaging often revealed a much larger area that was under threat, which was subsequently verified by soil testing post-harvest.
- Ground-truthing the images, proved vital in understanding and interpreting the information, taking into account other landscape issues, such as the proximity to deep sandy areas, as there were often other causes of similar seep related image features.
- The use of early (pre-2015) satellite NDVI imagery had poor resolution and was unhelpful in identifying the formation of seep areas. However, more recent NDVI satellite imaging has improved with pictures that are reasonably comparable to the more defined UAV NDVI maps.
- Cloud cover can compromise satellite image quality, but there are regular flights (fortnightly) that are accessible via the internet, which creates large advantages to its potential application.
- Further work is required to develop the practical application of this technology.

Why was the trial/project undertaken?

The rapid formation of seeps across Mallee landscapes is causing severe land degradation and loss of production for farmers. This trial provides an initial study into the potential use of NDVI to provide an early indication as to where seeps may be threatening to form, allowing farmers to apply practical and effective high-water use strategies to manage them before they get to the stage of causing irreparable damage.

How was the trial/project undertaken?

This project was conducted over 500ha on 2 farms at Karoonda and Mannum on land thought to be under threat from seeps. UAV NDVI flights were made in August and October, along with deep soil testing of areas showing concern. Satellite NDVI images were analysed, compared and ground truthed to assess their potential value as well.

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