**The use of remote and proximal sensing for variable rate irrigation**

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Precision irrigation aims at improving productivity and sustainability by ad-dressing spatial as well as temporal variability of soil and crop water status. This chapter presents three case studies from Southeastern USA, Israel and Spain which relates to different attributes of precision irrigation: type of pre-cision (spatial by variable rate irrigation (VRI) system or temporal by auto-matic triggering), type of irrigation system, and type of data the system uses for irrigation decision. Each of the case studies addresses unique combination of attributes and together they draw a more complement picture of precision irrigation. All case studies have shown that timely data provides decision support for VRI management, i.e. soil moisture sensor-data (Southeastern USA and Spain) and thermal aerial imagery (Israel). The reliance on point-sensor data in the case studies from southeastern USA and Spain dictated the use of pre-determined IMZ, yet, enabled adaptive in-season irrigation man-agement. In-season remotely-sensed images can be further used for adaptive IMZ, i.e. to modify their boundaries, yet it is currently suits VRI in drip irriga-tion. From these case studies, it can be seen that full VRI implementation, which adapt for spatial and temporal changes, faces "site-specific" challenges, i.e. every irrigation system is unique, thus requires unique solutions.