24 Section Introduction

Agriculture faces many challenges, such as climate variability, water shortages, labour shortages due to an aging urbanized population, and increased concern about issues such as animal welfare, food safety, and environmental impact (Wark, et al. 2007). The modern dilemma in most agricultural systems is to achieve high process efficiency, low costs, and good planning confidence in spite of a turbulent environment with limited manpower and resources. One approach to balancing these conflicting demands has been greater mechanisation and automation. Initially automation has involved better data acquisition and distribution within the industry, ultimately this will lead to autonomous machines working alongside human farm managers to achieve greater, and potentially cheaper, agricultural production (Graves 2013).

Wireless sensor networks that can interact over the InterNet and provide remote control of agricultural activates such as irrigation and animal drafting as they move through various handling yards to reach water have been in use for some time now. Radiofrequency identification (RFID) has also been common practice to provide paddock to plate tractability of production animals such as cattle and sheep have also been in place for several years.

Early agricultural practices were focused on individual plants and animals. During the industrial and green revolutions, the focus of agriculture shifted from the individual production unit to the flock, herd, or paddock. Modern data acquisition systems are refocusing agricultural production back to the individual plant or animal. This section will briefly explore how radiofrequency and microwave systems are being used to achieve some of these outcomes.

References