Introduction

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In late 2013 a report was published that should have had alarm bells ringing loud and hard. A study by researchers at the University of Nebraska found that around 30 per cent of the main global cereal crops, including corn, rice and wheat, displayed an abrupt decrease in yields or had plateaued despite an increase in investment in agricultural research and development, education and infrastructure (Grassini *et al*. 2013). The study suggested that maximum potential yields under the industrial model of agribusiness had already occurred.

This would be worrying enough had global population numbers levelled off, but they had not. Global population at the end of 2013 was 7.2 billion and growing at a rate of 1.14 per cent. That translates to 82 million more people every year and, according to the revised projections from the United Nations, world population will be 9.6 billion by 2050 (United Nations, Department of Economic and Social Affairs, Population Division 2013).

Indeed, two years before, the United Nations' Food and Agricultural Organization (FAO) had found that farmers would have to produce 70 per cent more food by 2050 to feed the anticipated world population (FAO 2011). Yet, the FAO report acknowledged that a quarter of farmland is already highly degraded and warned that the trend needed to be reversed. As most available farmland is already being farmed, a major 'sustainable intensification' of agricultural productivity on existing farmland would be necessary. The report noted that climate change coupled with poor farming practices was leading to a loss of productivity.

The University of Nebraska study implies that, if there is little new land to farm and yields of major crops in many areas are plateauing or declining under the industrial model of farming, achieving the required 70 per cent increase in food production by 2050 will be very difficult indeed.

As 2014 broke, a paper from the University of NSW, published in *Nature*, predicted temperatures are on course to rise at least 4°C by the end of the century with potentially catastrophic results for agriculture (Sherwood *et al*. 2014). Earlier