1 PLANT DISEASES – AN INTRODUCTION

Humankind has struggled with plant diseases since the dawn of agriculture. There are references in the Old Testament to the ravages of rust and blight on cereals and grapevines in the ancient world. The potato famine in Ireland in the 1840s led to the mass migration of Irish refugees to Australia, Britain and North America so that today, almost one in 10 Australians can trace their ancestry back to Ireland. The cause of the famine was the potato blight pathogen *Phytophthora infestans*, which destroyed plants and tubers under prolonged wet and cold weather.

Plant diseases are intimately connected with current issues facing agriculture and the environment. Global warming and rainfall reliability will have a considerable influence on disease distribution and severity in crops. Plant diseases are a major factor in world food security and biosecurity issues are a key component in international trade agreements. The absence of many damaging pathogens in Australia provides competitive advantage in trade and access to new markets. Furthermore, savings in costs associated with managing or eradicating these pathogens means that, in some cases, production is more efficient and sustainable than in overseas countries.

Fig 1.1 Healthy produce is a team effort between growers, horticulturists and plant pathologists.

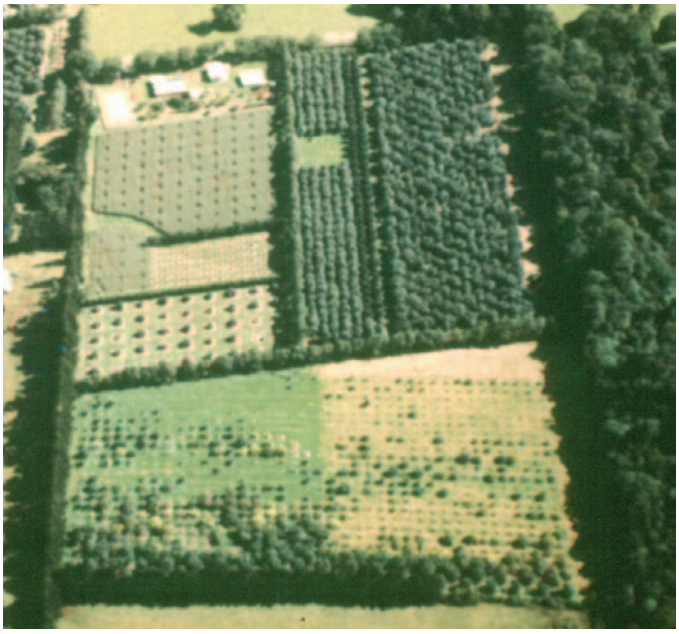

Fig 1.2 The healthy farm (above) used the latest disease management systems. The sick farm (below) allowed the root rot disease Phytophthora to develop.

Causes of disease in plants

A simple definition of a plant disease is any disturbance that interferes with the plant's normal structure, function or economic value. Plant diseases divide conveniently into (a) those caused by parasitic microorganisms or pathogens, and (b) non-parasitic diseases or disorders. These latter include mineral excesses and imbalances, incorrect storage conditions after harvest, environmental influences (such as atmospheric pollutants) and herbicide damage. Table 1.1 lists some physiological disorders of perennial fruit crops.