Disease Control Pesticides Deliver High Value for Australia’s Pulse Crops

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Pulse crops grown in Australia include field peas, chick peas, faba beans, lentils, peanuts, mungbeans, vetch and lupins. The average gross value of production of pulse crops in Australia is $500 million per year from an area of 1.5 million hectares [1]. Pathogens that cause diseases of pulse crops are widely distributed throughout the pulse growing areas of Australia. These diseases reduce grain yield and quality. Blemishes on pulse seeds reduce quality from human consumption grade to stockfeed, with a large reduction in value [1].

Ascochyta blight is the most severe foliar disease of pulses. The disease affects all above ground parts of the plant and is characterized by necrotic lesions, which can girdle stems leading to breakage and severe yield reductions. Seed quality may also be reduced through seed discoloration or retardation of seed development [2]. Ascochyta blight was first identified in commercial chickpea crops in Australia in 1995 and ascochyta blight epidemics devastated the chickpea industry in 1998 and 1999. Losses in Victoria and South Australia exceeded 50%, with many crops completely destroyed [3].

Although the potential losses from disease in pulse crops in Australia is large, actual current losses are small due to the application of integrated controls which include the use of resistant varieties, cultural agronomic management methods, and the application of pesticides. Growers are encouraged to test seeds for pathogens, destroy infested crop residues, rotate fields to non-host crops, avoid planting adjacent to infested residues, delay sowing and apply foliar fungicides [4]. Seed treatment fungicides have been a key management strategy for controlling pulse crop diseases [4]. Insecticides are used to control vectors of certain diseases, for example as aphicides for control of virus transmission [1]. Current pulse cultivars are partially resistant to major pulse diseases, and foliar fungicides are critical in disease management [4]. Maximum suppression of ascochyta blight occurs when fungicides are applied to plants to protect them from infection during rain events [3].

A recent report from the Grains Research & Development Corporation (GRDC) estimates the current and potential costs from diseases of pulse crops in Australia [1]. The report estimates losses for each pulse crop resulting from leaf fungi, root and crown fungi, nematodes, bacteria and viruses. The reduction of potential losses to current losses was estimated and the contribution of planting resistant varieties, adoption of cultural methods and the use of pesticides in reducing potential losses to current levels was calculated. The GRDC estimates that Australian pulse crop growers spend $47 million on pesticides for controlling diseases with a return of $83.5 million as a result of the prevention of yield and value losses [1]. Thus, the use of pesticides adds about 17% to the annual value of pulse crops in Australia as a result of disease management.

References