Large Canadian Pulse Crop Exports Result from Fungicide Use

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Pulses are part of the legume family, but the term “pulse” refers only to the dried seed. Dried peas, edible beans, lentils and chickpeas are the most common types of pulses. In Canada, pulse crops increased from 1.3 million hectares in 1995 to 3.0 million hectares in 2010, while production increased from 2 million tons to 5.2 million tons [1]. Canada is the world’s largest exporter of pulses; in 2010, Canadian pulse exports grew to nearly 4.3 million tons representing over $2.1 billion. India is the largest export market for Canadian pulses.

Three distinct Ascochyta blight pathogens are major problems for Canadian growers of faba beans, lentil and chickpea. Ascochyta fungi infect all aerial parts of the plant and can be distinguished by characteristic circular necrotic lesions on both leaflets and pods. These lesions reduce photosynthetic area and subsequent seed yield and induce seed discoloration, which lowers the value of seed [2]. Lesions on chickpeas can girdle the stem, leading to breakage and subsequent death of the stem—the entire plant dies if the main stem is girdled at the collar region. The pathogen can survive for more than four years on infected seed and crop residue and can spread 10-15 kilometers among fields via airborne spores [3]. In Canada, chickpea yield losses of up to 100% have occurred as a result of Ascochyta epidemics while the combined decrease in seed yield and seed grade has caused a loss of more than 70% of lentil value [2][4].

Although genetic resistance is available in some cultivars, it is only partial and starts to break down at flowering. Lack of resistance in chickpea, lentil and faba bean cultivars adapted to Canada’s growing regions results in fungicides playing an important role in the management of disease [4]. Fungicide applications in chickpea have had a substantial impact on seed yield—at one site, yield in the untreated check was less than 5% of the best fungicide treatment [5]. Lentil fungicide tests report yield increases of 20-60% [6]. Wherever Ascochyta blight occurs, disease management relies on an integrated approach. This usually includes a four-year crop rotation, the selection of cultivars with partial resistance, the use of disease-free seed and fungicidal seed treatments and foliar fungicide applications during the growing season [7]. In Canada, the timely and efficient use of fungicides has remained a major factor in the successful management of Ascochyta blight and the economic viability of pulse crops [7].

References