Canadian Onion Production Depends on Fungicides

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Onion is one of the most important vegetable crops produced in Canada with an annual production of 210,000 tons valued at $74 million. Canadian production of onions is centered on the muck soils in the eastern provinces of Ontario and Quebec. In 1952, a leaf spot and wilt disease (Botrytis leaf blight, BLB) caused by Botrytis squamosa was first recorded in Ontario where widespread injury to the foliage of yellow bulb onions occurred [1]. A three-year research program in the 1950s demonstrated that fungicides prevented an average loss of 15% in onion yield [1].

Botrytis spores land on onion leaves and, in the presence of moisture, germinate and produce enzymes that kill leaf tissue. Botrytis leaf blight causes early death of the leaves and undersized mature bulbs. Severely affected onion fields may take on a blighted appearance with most leaves dead and dried out. Bulb size is reduced 50% or more by botrytis leaf blight. In eastern Canada, the disease is generally present every year [2]. Since there is a premium price for large onions, loss of Botrytis leaf blight control can have large economic consequences [2].

B. squamosa overwinters as sclerotia on crop residues, or on the soil surface. In the spring these sclerotia produce millions of spores that are dispersed by wind. Removal of cull piles and crop rotation are recommended cultural control methods. However, in Canada onions are produced on highly specialized farms with costly precision seeders, harvesters and storage systems. Long term crop rotation is not economically feasible [2]. Specialized muck soil required for optimal onion production results in close neighboring farms and spores disseminate easily.

There are no commercially available onion cultivars that are resistant to B. squamosa. A few of the early cultivars are known to be tolerant; however, these cultivars are not suitable for long-term storage and therefore represent a small part of the total onion acreage [4]. Consequently, in most onion production areas where BLB is a problem, the disease is managed through repeated applications of fungicides [4][3]. Onions are grown on conventional and organic farms. There are no registered fungicides effective against BLB for organic production.

Botrytis leaf blight monitoring networks were implemented in the late 1970s and early 1980s [2]. Most Canadian onion growers use the disease forecasts to time fungicide applications [2]. A common fungicide program for botrytis leaf blight in eastern Canada involves 6 to 14 applications per season [2].

References