Blackspot manager – release of blackspot spores from pea stubbles

Jenny Davidson (SARDI, Adelaide), Peter Hooper and Stuart Sherriff (Allan Mayfield Consulting, Clare)

Key findings

- Early sowing plus large numbers of airborne spores caused severe blackspot infection in pea crops in 2009.
- Winter and spring rain increased severity of blackspot in the pea crops.
- Airborne blackspot spore numbers are expected to be high in 2010 since pea stubbles have severe disease loads.

Results

'Blackspot Manager', developed by Dr. Moin Salam of DAFWA, predicts the timing of airborne spore release from blackspot affected pea stubble for a given time of sowing. This model is used in Western Australia and South Australia to determine the disease risk associated with different sowing dates for field peas.

Research is being conducted at Hart field day site to validate the predictions made by 'Blackspot Manager'. Immediately after harvest in 2007 and 2008, three batches of blackspot infested pea stubble were collected from commercial pea crops in the Hart region, each with a different disease severity. Pieces of diseased stubble were placed into nylon mesh bags and put on the soil surface at the Hart field day site. Every fortnight, one bag of stubble per batch was collected and the stubble was wetted to release blackspot spores which were captured on slides in a wind tunnel. The spore numbers were counted microscopically (Figure 1) so they could be correlated with the predictions from 'Blackspot Manager'.

Many pea crops were sown in early or mid-May in 2009 in response to the dry springs of the previous three seasons. These crops were at 3-4 nodes when the numbers of blackspot spores in the air reached their maximum, causing severe infection in young crops. Furthermore, actual spore counts far exceeded those observed in previous season (Table 1), further exacerbating disease levels. Spore numbers in 2009 were so large that distancing crops away from pea stubbles was not as effective in reducing disease levels, unlike previous seasons when distance was an important control measure. Ongoing rain during winter and spring continued to increase blackspot levels, and finally in some crops the combination of hail and blackspot during podding caused severe lesions on pods and seeds.

High blackspot infection on pea stubbles leading into 2010 season suggests that the risk of blackspot in the coming season will be high, unless summer rains lead to an early release of spores. Weekly updates of the predictions of spore release will be available to the industry on the website 'http://www.agric.wa.gov.au/cropdiseases' beginning in late March and continuing until mid June.

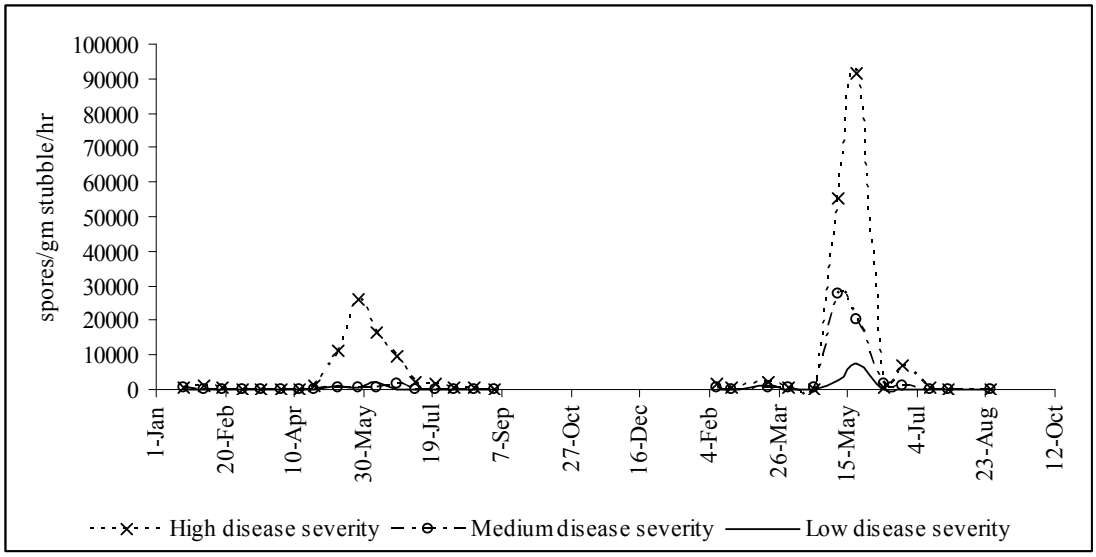

Figure 1. Numbers of blackspot spores released from pea stubbles with different levels of infection incubated at Hart field day site during 2008 and 2009 seasons.

Table 1. Total number of blackspot spores released from pea stubbles with different levels of infection incubated at Hart Field Day site during 2008 and 2009 seasons.
Spore numbers at the peak release time are in italics. Units = spores per gm of stubble per hour.

Stubble severity	2008		2009	
16 nodes infected *	71,436	*(26,205)*	159,059	*(91,695)*
8 nodes infected	4,304	*(1,642)*	53,320	*(27,653)*
4 nodes infected	4,205	*(2,384)*	11,830	*(7,555)*

* Many pea stubbles from 2009 crops have 16 nodes or more infected with blackspot.