Light leaf spot (*Pyrenopeziza brassicae*) and its impact on home-saved seed

Kerr C WALKER, Elaine J BOOTH & Karene G SUTHERLAND
Scottish Agricultural College, Craibstone Estate, Bucksburn, Aberdeen Scotland AB21 9YA
Email: k.walker@ab.sac.ac.uk

Introduction

Light leaf spot is one of the most important diseases of winter oilseed rape in the UK. It has been estimated that approximately £10 million are spent on fungicides to control diseases in winter oilseed rape but despite this losses of up to £48 million/year are attributed to light leaf spot (Fitt *et al*1997).

Light leaf spot thrives in cool wet conditions and although levels of disease fluctuate widely from year to year in England, levels tend to be both more consistent and higher in the north of the UK (Walker & Booth, 1992). This is well recognised by plant breeders who send many thousand winter rape breeders lines for outdoor screening tests in Aberdeen. No artificial inoculation is required and reliance is solely on natural infection.

Home-saved seed

Current depressed farm incomes in the UK - particularly in the cropping sector - have resulted in growers minimising their growing costs at every opportunity. As seed costs account for up to 25% of a rape growers variable costs many have resorted to home-saving seed as a means of minimising expenditure (Chadwick, 1999). Where home-saved seed is used, there is no evidence that the growers change any of their crop management inputs and most growers see this as a total saving in expenditure.

Trial

In 1997, it was decided to examine the performance of home-saved seed in terms of light leaf spot levels. This was done by sourcing seed from a harvested variety trial in which half the replicates had been fungicide treated and half untreated. The fungicide programme for the treated portion of the trial consisted of cardendazim + flusilazole (50:100 g active ingredient (a.i.) ha^{-1}) applied on 28 November and 9 April, and iprodione + thiophanate-methyl (500:500 g a.i. ha^{-1}) applied on 22 May.

Both treated and untreated blocks of each variety had come from a single seed stock. All other inputs to the variety trial were the same and harvesting was conducted on the same day for both treated and untreated blocks.

Harvested seed of treated and untreated blocks from 6 varieties was selected representing a range of light leaf spot resistance ratings. The varieties were Falcon, Express, Apex, Gazelle, Bristol and Contact. Seed was sown in the light leaf spot nursery on 8 September 1997 in 3 replicates in a split plot design in a 2 metre single row. Each row was 30 cm apart. No fungicides were applied over the course of the season and light leaf spot levels were assessed on 24 March 1998. Scoring was on a 1-9 basis as indicated in Table 1.

Table 1 Description of symptoms for scoring light leaf spot infection in winter oilseed rape

Score	Description
1.	All leaves severely infected
2.	All plants severely infected
3.	All plants infected, some severely infected
4.	All plants moderately to severely infected
5.	All plant moderately infected
6.	Moderate to slight infection on all plants
7.	Slight infection on nearly all plants
8.	Slight infection on some plants
9.	None or very slight infection

Results and Discussion

Light leaf spot scores for the 6 varieties from treated and untreated seed are presented in Table 2.

Table 2 Light leaf spot levels in lines grown from seed harvested from fungicide treated and untreated plots.

Variety	*Treated*	*Untreated*	*Mean*
Apex	6.67	5.00	5.83
Bristol	4.67	4.33	4.50
Contact	6.00	6.33	6.17
Express	6.33	6.00	6.17
Falcon	7.33	5.00	6.17
Gazelle	6.67	7.00	6.83
Mean	6.28	5.61	

SED	Variety	±	0.557
SED	Treatment	±	0.321
SED	Variety x Treatment	±	0.787

As expected there were significant differences in light leaf spot infection levels between varieties. Generally the scores tended to follow the pattern found in the SAC Winter Oilseed Rape Recommended List (Anon 1998). However, there was an overall significant effect of seed source on light leaf spot level. Plots grown from seed taken from harvested plots where no fungicide had been applied had significantly higher levels of light leaf spot than plots grown from seed harvested from plots where fungicide had been applied. There was no significant variety x treatment interaction but some varieties appeared to be more sensitive to seed source than others. The data tends to lend credence to the theory that light leaf spot is seed borne but it could also be argued that the effect of light leaf spot on the plots the previous season may have resulted in the harvested seed having poorer grain quality overall which resulted in these effects. The authors consider this second theory to be less likely. Irrespective of the theory, the effects noted here are of significance to growers home-saving seed.

Conclusion

From the growers viewpoint, the increased level of disease implies additional cost, either in reduced yield or extra fungicide where home-saved seed is used. This cost may be in the form of additional fungicide sprays or simply in an increased level of active ingredient in the existing programme. At present, this is not taken into account. Clearly further work is required to evaluate more completely potential loss of yield to the grower. In addition further work of an epidemiological nature is required to confirm exactly how the disease is carried within/upon the seed. This work is in progress.

References

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