STUDIES ON DECISION MODELS FOR THE CONTROL OF BLACKLEG (*LEPTOSPHAERIA MACULANS*)

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Summary

Leptospaeria maculans is an important pathogen of oilseed rape in Germany. In this study it was tested if ascospore discharge, leaf infection in autumn or spring or the distribution of aggressive and non-aggressive strains of *L. maculans* are suited criteria to predict disease severity or to determine the timing of fungicide applications. None of the tested criteria was qualified to fulfill this function.

1) Introduction

Blackleg caused by *Leptosphaeria maculans* is one of the most important diseases of oilseed rape in Germany. The pathogen can be divided in at least two subgroups, called aggressive or non-aggressive strains. Only aggressive strains produce the phytotoxin sirodesmin (Koch et al., 1989). The disease severity varies between years and locations. Resistant cultivars and fungicide application are used to reduce the disease severity. The success of fungicide applications is uncertain and subjected to vacillation. So far, at the time of fungicide application in autumn or spring there is no possibility to predict disease severity of blackleg at growth stage DC 85, following the scale of SCHÜTTE et al. (1982). The aim of this work was to study whether ascospore discharge, infestation of the leaves or distribution of aggressive and non-aggressive isolates are suited criteria to determine the time of fungicide application.

2) Material and methods

To compare the infestation with *L. maculans*, disease incidence and severity of the leaves was scored at the beginning of December on both locations in the cultivar Lirajet. The disease severity at growth stage DC 85 was scored using the scale of KRÜGER (1982).

In order to evaluate the relationship between leaf infestation in autumn and early spring and the disease severity of the root neck at DC 85, a linear correlation between these parameters was calculated.

The distribution of aggressive and non-aggressive isolates was determined to obtain data on the significance of pathogen variability for the disease severity. Rapeseed residues from 8 locations were collected after harvest in the years 1991, 1992 and1993. Only material from the root neck region was used. From each location 50-100 single ascospore isolates were selected. Pigmentation and sirodesmin production in vitro was evaluated, following the method of KOCH et al (1989).

3) Results and discussion

The ascospore discharge was similar on both locations and years. The first ascospores were observed in the mid of September. After mid of December no more ascospores were detectable. The highest number of ascospores were approximatly 120 spores per day on both locations. Nevertheless the disease incidence in Kiel was 55 and 80% in 1991 and 1992, and in Braunschweig 8 and 15%, respectively. Again at growth stage DC 85 the disease severity was higher in Kiel than in Braunschweig.

There was no clear relationship between leaf infestation with *L. maculans* in autumn or spring and disease severity at DC 85. The correlation coefficients are shown in Table 1.

The studies on the distribution of aggressive and non-aggressive strains of *L. maculans* revealed, that on all locations and in every year aggressive strains were prevalent. About 80-100% of the strains did not produce pigments and sirodesmins were detectable.

Table 1: Correlation coefficients between disease incidence of the leafs in autumn and spring and disease severity in DC 85.

Cultivar	Lirajet		Falcon	
	Autumn	Spring	Autumn	Spring
1991/92	0,62**	0,2	0,5*	0,4*
1992/93	0,6 *	0,4	0,4	0,3
1993/94	0,4	0,2	0,4*	0,4*

* remarks statistical significance.

None of the tested criteria was suited to predict disease severity in DC 85 or as a threshold value for fungicide applications.

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