

The occurrence and control of diseases of winter oilseed rape in England

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INTRODUCTION

A.D.A.S. plant pathologists have monitored crops of winter oilseed rape (Brassica napus L spp. oleifera) for diseases since 1976. Early surveys in eastern and south-eastern England (Cook and Evans, 1978; Gladders and Musa, 1979) demonstrated the importance of stem canker (Leptosphaeria maculans, asexual stage Phoma lingam). This paper describes (i) further survey work between 1977 and 1982, a period when the area of oilseed rape grown in England and Wales increased from 24,500 ha to an estimated 174,000 ha (Anon, 1978-82), and (ii) field trials to evaluate fungicidal control of ripening diseases, especially of dark leaf and pod spot (Alternaria brassicae).

MATERIALS AND METHODS

Disease surveys

Crops of winter oilseed rape were visited and assessed for disease. During 1977-80, the total number of crops surveyed each season in eastern and south-eastern England ranged between 49 and 67. In 1981 and 1982, the survey was extended to cover most areas of England and involved 108 and 204 crops respectively. Crops were

sampled at (a) green bud or early flowering and (b) pod ripening to harvest. The incidence and severity of each disease was determined on a whole plant basis using the methods described by Evans and Gladders (1981).

Fungicide trials

Single sprays of iprodione (0.5 kg a.i./ha) were applied between mid-flower (20 pods formed on the main raceme) and the end of flowering. Iprodione was applied either by tractor mounted hydraulic equipment or by knapsack sprayer (225-330 litres water/ha). In 1980, a 50% wettable powder was used; in 1981 and 1982, this was replaced by a 25% flowable formulation. In fungicide comparison trials, iprodione as one spray (at the end of flowering) or, as two sprays (end of flowering + 24 days later), was compared with a range of other fungicides, all applied at the earlier timing. These were:- captafol (1.34 kg a.i./ha), fenpropimorph (0.75 kg a.i./ha), imazalil (0.50 kg a.i./ha), prochloraz (0.40 kg a.i./ha), procymidone (0.75 kg a.i./ha) and vinclozolin (0.75 kg a.i./ha). In all trials, the % area of pods on the main raceme infected by A. brassicae and other fungal pathogens was recorded. Trials were of a randomised block design (3 or 4 replicates/treatment). Plots were swathed or direct combined as per farm practice.

RESULTS

The incidence of diseases in survey crops is illustrated in Figures 1 and 2. Downy mildew (Peronospora parasitica) was widespread in the spring most seasons. Light leaf spot (Pyrenopeziza brassicae, asexual stage Cylindrosporium concentricum) was more variable in its incidence but severe infection was relatively uncommon. The incidence and severity of Phoma stem canker have declined following the introduction of the more resistant cultivars Jet Neuf and Rafal. Alternaria pod spot has increased in importance since 1978. This disease is now the major fungal problem of winter oilseed rape in England. Iprodione has been shown to give effective control of Alternaria pod spot when applied as a single spray at the end of flowering (Table 1). A summary of the results of trials in which this fungicide was used for the control of A. brassicae is presented in Figure 3. Severe attacks of Sclerotinia stem rot were confined to a few crops; in 1982, only 4 of 204 survey crops were more than 20% affected. Clubroot (Plasmodiophora brassicae) was uncommon, although five outbreaks were confirmed in the west midlands during 1981-82, in each case on land recently cropped with brassicas.

Figure 1

The incidence of diseases at green bud/early flowering (i) and pod ripening/harvest (ii), eastern and south-eastern England, 1977-82

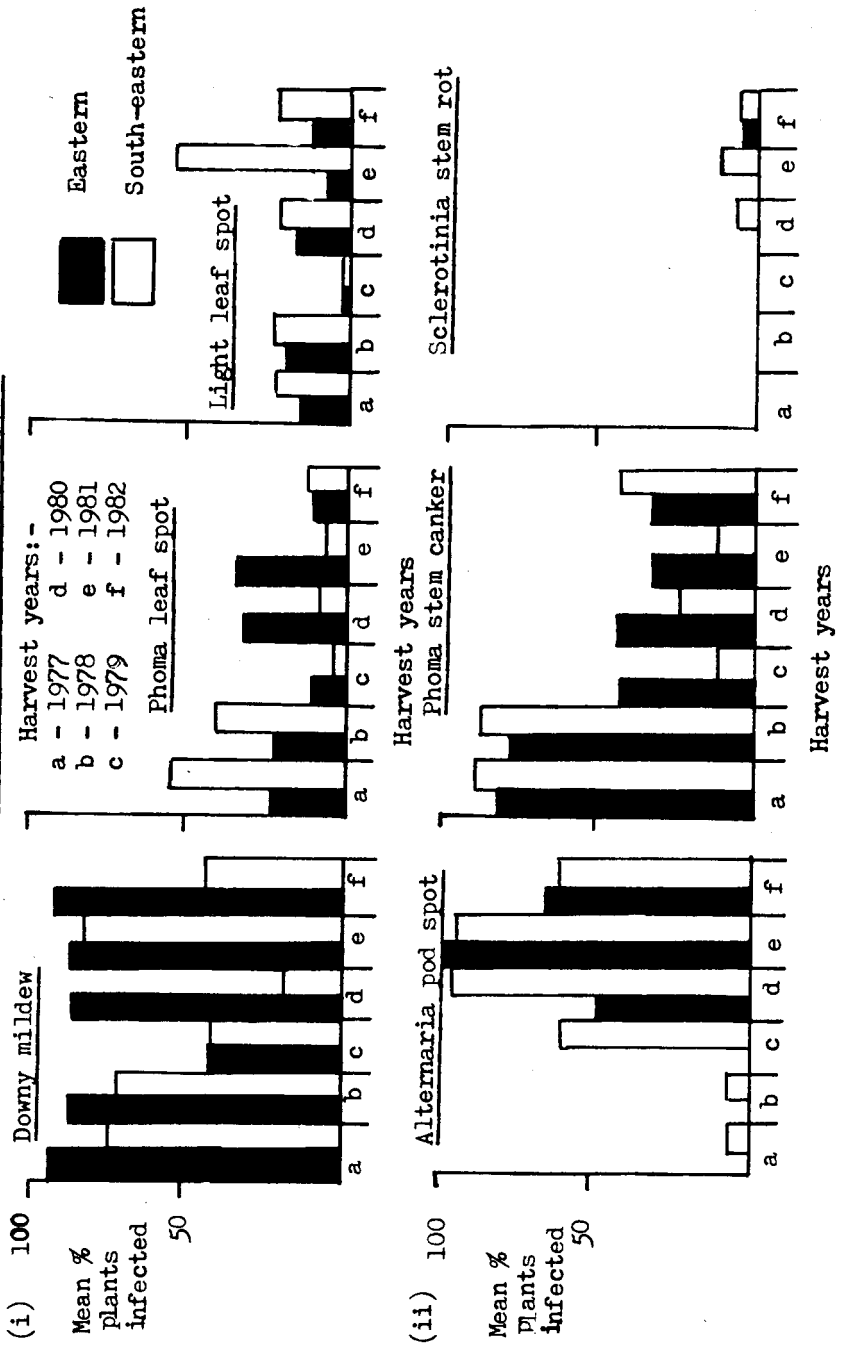


Figure 2

The incidence of diseases of winter oilseed rape at green bud (i) and at pod ripening (ii) in 1981 and 1982

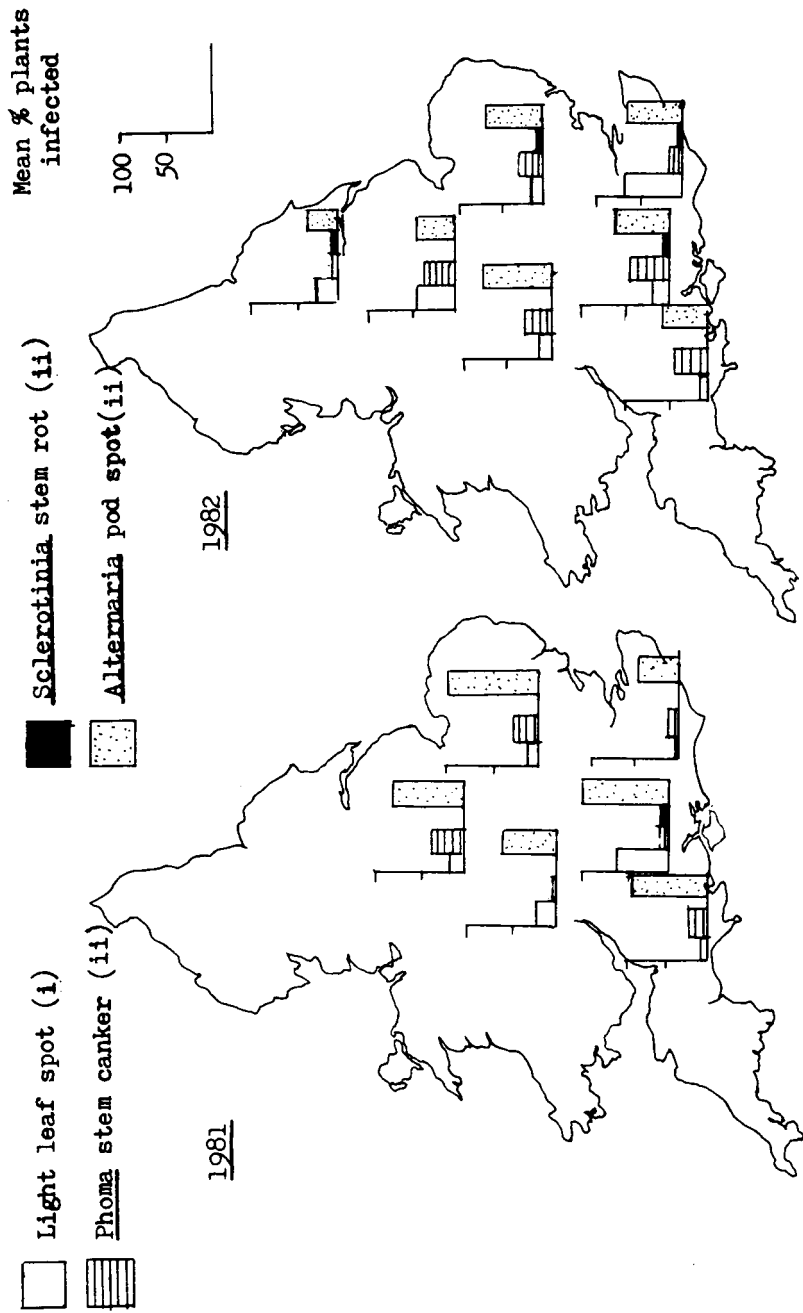
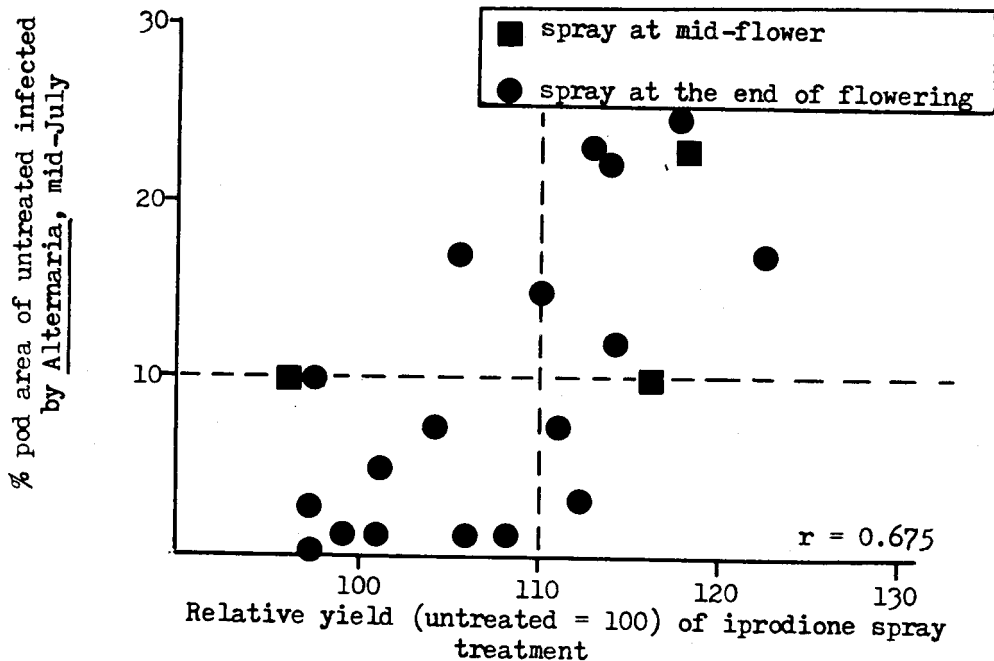


Table 1
Comparison of fungicides for control of Alternaria pod spot, 1982

Treatment	Date of spray treatment	% pod area infected by <u>Alternaria</u> , 13/7	Yield (t/ha)
iprodione	1/6	1.4 ***	3.52
iprodione	1/6 + 25/6	0 ***	3.52
captafol	1/6	9.1 **	3.55
fenpropimorph	"	10.1 **	3.51
imazalil	"	10.9 *	3.38
prochloraz	"	8.6 **	3.26
procymidone	"	0.6 ***	3.46
vinclozolin	"	9.1 **	3.64
untreated	-	16.6	3.35
S.E.D.		+ 2.21	+ 0.13

*, **, *** significantly less than the untreated at $P < 0.05$, 0.01 and 0.001 respectively. 1/6 - 95% petal fall

Figure 3
The effect of controlling Alternaria on the yield of winter oilseed rape, 1980-82



DISCUSSION

The expansion in area of oilseed rape grown in England has been accompanied by an increase in levels of Alternaria brassicae infection. The build-up of Alternaria has been favoured by a number of factors which include a trend towards earlier sowing (Evans and Gladders, 1981) and the increased use of TCA as a pre-emergence herbicide (Gladders and Musa, 1982). The work of Hozyo et al (1972) suggests that the pod walls are the most important photosynthetic organs post-flowering. It is therefore vitally important to the achievement of high yields that pods are kept green and free of ripening diseases such as Alternaria, for as long as is possible. An iprodione spray has been shown to protect pods against A. brassicae for a period of up to seven weeks following application at 95% petal fall (Evans and Gladders, 1981). At trial sites where untreated pods had 10% or more of their area infected by A. brassicae in mid-July, iprodione generally gave an economic yield increase, often in excess of 10%. Where levels of infection were less than 10%, yield responses were very much more variable. Work is in progress to attempt identify during mid- to late- flowering those crops most likely to yield an economic response from fungicide treatment. Meanwhile, farmers in areas where Alternaria pod spot is regularly a problem apply fungicide as a prophylactic spray (at mid-flower, when 20 pods are formed on the main raceme) or delay treatment until the first appearance of symptoms on the pods. Sclerotinia stem rot is not yet a major disease problem of oilseed rape in England. Nevertheless it poses a potentially serious threat to winter rape. Work has begun to evaluate possible means of forecasting Sclerotinia attack and to investigate fungicidal control.

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