Diseases of Winter Oilseed Rape in England and Their Interactions With Other Crops

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DISEASE INCIDENCE

ADAS plant pathologists have monitored crops of winter oilseed rape in England to determine the incidence and severity of diseases since 1976.

Alternaria leaf and pod spot *(A. brassicae)* increased in importance between 1979 and 1981. This disease has been less troublesome in recent seasons when weather immediately post-flowering has been relatively unfavourable for infection. Severe attacks have also been discouraged by the use of effective fungicide seed treatments and in 1983 and 1984, by the extensive application of fungicide sprays.

Stem canker *(Leptosphaeria maculans)* has declined in importance since 1978 following the introduction of the more resistant cultivars Jet Neuf, Rafal and Bienvenu. Although basal stem lesions were common on these cultivars they were mostly superficial and appeared to cause little damage.

Downy mildew *(Peronospora parasitica)* was usually the most common disease in the spring but plants tended to grow away from infection as leaves senesced and were lost during the flowering period.

Light leaf spot *(Pyrenopeziza brassicae)* was also common in the spring. Leaves were widely affected especially on the susceptible cultivar Jet Neuf. In 1983, cool, wet weather during stem extension and early flowering favoured infection. The disease spread to cause superficial lesions on most stems and dark, mealy discoloration of pods.

Significant levels of stem rot *(Sclerotinia sclerotiorum)* were recorded in 'survey' fields for the first time in 1982 when four of 204 crops were more than 20 per cent affected. Severely affected crops were located in Hamsphire, West Sussex and Yorkshire. Lower levels of this disease were seen elsewhere in the east and south-east. A few crops were slightly affected in 1983. In 1984, symptoms appeared unusually early (January) in a few crops in Kent, West Sussex and East Anglia, when up to 30 per cent of plants were affected. On the majority of these fields, winter oilseed rape was being grown for the first time in the rotation but in many cases crops known to be susceptible to sclerotinia particularly peas but also potatoes and dwarf beans, had been grown previously.

Clubroot *(Plasmodiophora brassicae)* was also uncommon, although a few outbreaks were recorded in the West Midlands and Yorkshire, mostly on land recently cropped with forage or vegetable brassicas.

White leaf spot *(Pseudocercorporella capsellae)* was found at a low incidence in southern counties in 1983 and 1984. This disease was more common in these areas and in the West Midlands in spring 1985. Extensive leaf infection and the first records of pod lesions were noted in a few crops of cv. Bienvenu in Hampshire and West Sussex in June 1985.

In 1984, low levels of cauliflower mosaic virus were common in eastern England.

FUNGICIDE TREATMENTS

Autumn and spring fungicide sprays

Trials during the period 1979-82 showed that fungicide sprays applied in the autumn, spring, or a combination of those timings, gave variable control of disease and inconsistent yield responses.

In 1983, autumn + spring sprays of metalaxyl or ofurace + bisdithiocarbamate gave useful control of downy mildew. Similar applications of prochloraz reduced light leaf spot and stem canker. In neither instance did disease control lead to an increase in yield. In 1984 prochloraz, prochloraz + carbendazim, carbendazim or benomyl + oil gave useful control of light leaf spot when applied in April to Jet Neuf. Disease control led to yield response of 9-12 per cent.

Flowering and post-flowering fungicide sprays

Fungicides have been evaluated for the control of alternaria pod spot. Results of 1982 and 1983 trials showed iprodione and procymidone to be more effective in this respect than either captafol, prochloraz or vinclozolin when applied at 95 per cent petal fall. Iprodione was also used to determine the optimum timing of a spray to control alternaria pod spot. In 1982 and 1983, alternaria did not develop on pods until mid-June. Single sprays of iprodione at 95 per cent petal fall or programmes involving a spray at this or a later timing gave effective control of pod infection. In 1982, the only single spray to increase yield was one applied as soon as 20 pods were formed on the main raceme. In 1983 however, sprays applied at 95 per cent petal fall or as soon as pod spotting was seen, gave consistent yield benefits. At only one site where disease pressure was high was there an added yield benefit from a second spray to supplement that at 95 per cent petal fall. Levels of alternaria pod spot were low in 1984 and iprodione applied at the end of flowering increased yield in only two of 12 trials. At severely infected sites a single spray of fungicide applied between the early pod stage and the end of flowering has led to yield increases of up to 0.9/tha. Fungicides are most likely to be justified where alternaria is spreading to the upper leaves between mid and late flowering. Work is in progress to attempt to forecast more precisely the development of alternaria as an aid to decision making on spray application.

Fungicides have also been evaluated for the control of sclerotinia stem rot. In 1983, a single spray of iprodione or of vinclozolin (applied at the time of ascospore release) gave effective control of low levels of sclerotinia but did not increase yield. The trial was repeated in 1984 on heavily contaminated land. Iprodione and thiophanate-methyl applied at the first appearance of apothecia reduced sclerotinia from 48 to 7 and 2 per cent stems affected and increased yield by 43 per cent and 29 per cent respectively (untreated – 2.65 t/ha). When applied 10 days later (at the time of spore release), vinclozolin was more effective than iprodione or prochloraz giving 2 per cent as opposed to 15 per cent or 13 per cent stems affected and increasing yield by 44 per cent. 28 per cent and 27 per cent respectively. Work is in progress to forecast the risk of sclerotinia infection by attempting to identify (a) fields with high levels of inoculum in the soil and (b) weather conditions suitable for ascospore release and infection of winter rape.

DISEASE INTERACTIONS

There has been considerable concern in both agriculture and horticulture about disease interactions. ADAS plant pathologists have monitored reports of disease problems where interactions were suspected and formally surveyed vegetable brassicas to quantify disease levels. This subject was discussed in several papers at the 1984 British Crop Protection Conference and reviewed by Gladders (1984 British Crop Protection Conference – Pests and Diseases, pp. 791-798).

Table – Incidence of leaf and button diseases in brussels sprouts adjacent to winter oilseed rape and distant from oilseed rape. England and Wales 1983 and 1984

	1983		1984	
	Adjacent to oilseed rape	Non-adjacent	Adjacent to oilseed rape	Non-adjacent
Number of crops examined	29	110	33	104
ALTERNARIA				
% Plants with leaf symptoms	37	47	14	19
% Buttons affected	1.5	3.0	0.3	1.9
DOWNY MILDES				
% Plants with leaf symptoms	55	36	8	27
% Buttons affected	1.1	0.2	0	0.2
LIGHT LEAF SPOT				
% Plants with leaf symptoms	5	2	27	15
% Buttons affected	2.6	1.6	10.0	3.4

Sclerotinia

Many of the sclerotinia attacks in oilseed rape have occurred on sites previously cropped with peas and cereals. This provides circumstantial evidence that pea cropping has led to a build-up of sclerotinia and recent observations in Sussex confirm that pea crops can produce large number of *Sclerotinia* sclerotia.

Clubroot

There have been few reports of clubroot in England, but those that have occurred are linked to previous brassica cropping, particularly root crops for stock feed. Further expansion of oilseed rape in the north and west of the UK could result in more widespread problems.

Vegetable Brassicas

ADAS has surveyed brussels sprouts in October/November to assess disease levels. Crops planted immediately adjacent to oilseed rape were specifically selected whenever possible and these formed about one quarter of the total crops examined. Three diseases were common in both oilseed rape and vegetable brassicas (see Table), namely alternaria (mainly *A. brassicae*), downy mildew *(Peronospora parasitica)* and light leaf spot *(Pyrenopeziza brassicae).*

The crops adjacent to oilseed rape were growing within 50 metres of the rape seed, but no gradients of disease were detected. The lower incidence of alternaria in adjacent crops may be partly explained by the greater use of iprodione fungicide on these fields. Over the two years of the study, there was some indication that light leaf spot may have spread from oilseed rape to vegetable brassicas, but the effects of other diseases were inconsistent.

Virus Diseases

In 1984, cauliflower mosaic virus was common at low levels in oilseed rape, particularly in eastern England. The distribution was not closely linked to vegetable brassica cropping, although the virus had been found in these crops in 1983. Beet western yellows virus is currently under investigation and it is known to be widespread in oilseed rape. There is the possibility of interactions with sugar beet and other hosts of the virus or virus vector (thought to be mainly *Myzus persicae*).

Conclusions

In England there is circumstantial evidence of disease interactions between oilseed rape and both vegetable and fodder brassicas. Other arable crops such as peas and sugar beet are occasionally involved, but to date disease interactions have resulted in few serious disease outbreaks.