Technical Note TN620

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Winter oilseed rape pests and diseases

SUMMARY

- Winter oilseed rape is affected by a wide range of pests and diseases.
- New problems have started to appear as a consequence of changes in pesticide usage and weather patterns.
- This technical note provides an update on the biology of the main pests and diseases affecting crops.
- Integrated control measures to manage these problems are provided.

Foliar diseases

Downy Mildew (*Peronospora parasitica*)

Downy mildew is common on all brassicas. White fungal growth develops on the underside of leaves and brown irregular lesions develop on the upper leaf. Although it can be seen at any time during the crop, it is most severe on oilseed rape at the seedling stage, when it can cause seedling death or loss of vigour. Damage is worse in wet conditions, on late sown crops, or backward crops. The cotyledons and the first leaves can become severely affected with downy mildew. It is only in rare cases that treatment will be required. If the crop is severely infected, it may be best to leave the crop, and re sow with spring oilseed rape in the spring.

Light leaf spot (*Pyrenopeziza brassiae*)

Light leaf spot remains the most damaging disease to affect winter oilseed rape in Scotland. It can infect leaves, stems, flower buds and pods of winter oilseed rape. Spring oilseed rape is not affected but brassica vegetables can be affected.

The short period of time between harvest and sowing in Scotland results in leaf infection soon after sowing, but initially plants are symptomless. During November/December, pale green or water soaked lesions appear on older leaves, these lesions become brittle and crack easily when bent. In December/January symptoms become visible as large (1cm diameter) spots, fawn in colour with a crusty appearance.

During wet weather spore masses or spore droplets are produced on both surfaces of the leaf around the outer edge of lesions, often with apparently healthy green tissue. These spore droplets have the appearance of salt grains on the surface of the leaf and are diagnostic of the light leaf spot fungus. Spore droplets can develop on leaves in the absence of lesions during damp weather, particularly during the early phases of infection.

The presence of light leaf spot fungus can slow down the growth of leaves within the area of infection without affecting the rest of the leaf, resulting in curving of leaves around the point of infection.

Plants infected with light leaf spot in the autumn are susceptible to frost damage. Severe infections followed by a hard winter can lead to extensive plants loss. The remaining plants will compensate by producing more flowering branches later in the season but yield will be reduced.

Infection of the stem results in small brownish purple lesions often with black speckling around the edge. This can be confused with bruising caused when stems rub together. As the stems start to extend in spring, the lesions expand and by June can be several centimetres in length.

In severe cases stems split vertically along the lesion and occasionally break. These splits can allow access to other pathogens such as botrytis grey mould and sclerotinia. If infection occurs near the base of the stem, symptoms can be confused with stem canker caused by *Phoma lingam*.

Spores splashed on to flower buds cause growth distortion and failure of flowers to open. In wet weather spore droplets can be found on flower buds. Severe infections of pods and pedicels cause twisting and

curling. The whole raceme maybe distorted. Infection points on pods can act as entry sites for *Botrytis cinerea*, which can obscure the real problem. Severe pod infection leads to premature ripening and seed shedding.

Yield loss from light leaf spot

Yield losses due to light leaf spot in Scotland in high disease pressure sites can be considerable. Work funded by HGCA has shown that for every 10% of plants affected with light leaf spot at green bud stage (GS3,3) there is a potential 0.14 t/ha yield loss. Where no autumn fungicides are applied, susceptible varieties can have 100% plants affected with light leaf spot at GS3,3. This would equate to a yield loss of 1.4 t/ha. Resistant varieties can show up to 83% of plants affected with light leaf spot by GS3,3 equating to a yield loss of 1.2 t/ha if not treated with fungicide in the autumn. These figures indicate the importance of fungicide sprays for the control of light leaf spot in both susceptible and resistant varieties.

The HGCA recommended list data shows yield losses comparing treated and untreated plots to be in the region of 0.4-0.6 t/ha based on a wider range of sites throughout the UK.

Control of light leaf spot

There are several steps to controlling light leaf spot.

1. Do not grow continuous oilseed rape – this reduces the source of infection of light leaf spot but also reduces the risk of other diseases (e.g. clubroot, phoma, sclerotinia). In continuous oilseed rape crops, remove all straw and plough in stubble – this reduces the source of infection
2. Use certified seed – this will ensure the plants are vigorous and will reduce the effect of light leaf spot.
3. Grow resistant varieties – most varieties now show moderate to good resistance. The variety Mendel is susceptible to light leaf spot and is a popular choice where clubroot risk is high. New varieties are expected to show good resistance both to light leaf spot and clubroot.
4. Fungicides – As a general programme we would recommend half to three quarters dose of fungicide in the autumn (late October to early December) and a half to three quarter dose of product in the spring at green bud (GS3,3). If fungicide sprays are delayed in the autumn due to the weather and soil conditions, sprays should be applied as soon as possible and should not be postponed until green bud. Fungicides which have activity against light leaf spot include the fungicides prothioconazole (Proline), tebuconazole (Folicur), prothioconazole + tebuconazole (Prosaro), flusilazole + carbendazim (Punch C). Activity from metconazole (Caramba) and difencoconazole (Plover) is insufficient to give effective control in the high risk conditions in Scotland. Information on fungicide activity is available from the HGCA website as part of the oilseed rape fungicide performance project.
5. A risk forecast is available on the HGCA website. All crops in Scotland will be at high risk, so the forecast is more appropriate for growers in regions in the south and west of England where the disease is more sporadic.

Phoma stem canker & leaf spot (*Phoma lingam*)

Phoma is a major problem in England, especially East Anglia, where it can cause 80% plant infection in some seasons. It is less common in Scotland, but it can be found in some continuous oilseed rape crops. In recent years it has become more common in mild winters.

The first symptoms are seen from October onwards, as fawn coloured spots. These produce black pin head bodies of the fungus, and the spores spread from these onto other leaves. These spots do not generally cause problems at this time, but they allow the fungus to become established on the plants. In the spring as temperatures rise, the disease develops more rapidly. The fungus moves from the leaves to the stem, and stem cankers appear on the stems from early flowering onwards. The cankers may girdle the stem, weakening the stem and leading to premature ripening and lodging. In Scotland, winter temperatures mean the fungus grows very slowly, so by the time it has moved from the leaf to the stem, the leaf is likely to have died. The fungus overwinters on crop debris.

Control of Phoma stem canker & leaf spot

Oilseed rape should not be grown more than one year in five to allow a proper break, and following crops should be sited well away from the previous crop to prevent infection from airborne spores on the previous year's stubble. Stubble should be ploughed well down to prevent the fungus on it from sporing. The second line of defence are fungicides. Controlling autumn infection with prothioconazole (Proline), prothioconazole + tebuconazole (Prosaro), difencoconazole (Plover), metconazole (Caramba), or flusilazole + carbendazim (Punch C) is necessary, plus a back up treatment in the spring. The fungicides will not cure the situation, but they help prevent the disease from spreading further. Further south, it is not uncommon to have three treatments (autumn, winter and spring).

White leaf spot (*Pseudocercosporella capsellae*)

This disease can be seen sometimes in the spring. It produces white spots from 1 - 5mm in diameter, and these may darken with age. The main source of infection is oilseed rape stubble. It is not an important disease, and is controlled by most fungicides applied to control light leaf spot in the autumn.

Ringspot (*Mycosphaerella brassicicola*)

This is common on other field brassicas, and is caused by *Mycosphaerella* sp. Circular grey-black spots up to 1.5 cm in diameter are produced on the leaves stems and pods. Small black fruiting bodies of the fungus appear in the lesions in concentric rings. Otherwise it may be confused with dark leaf spot. It is not a serious disease of Oilseed rape, and is controlled by many fungicides applied to control light leaf spot.

Sclerotinia (*Sclerotinia sclerotiorum*)

Sclerotinia is a soil-borne disease which can cause bleached lesions on the stem from mid May onwards. Under wet or humid conditions, a white fungus may develop on the lesions. Within the stem cavity, of the infected area, white bodies which later turn black can be seen. These are the sclerotia which are the resting bodies of the fungus. Affected stems may senesce early, resulting in white heads and lodging. Yield losses can be high if infections are severe. The black resting bodies (sclerotia) can remain in the soil for at least years and the sclerotia present near the soil surface will germinate in April/May forming small pale brown mushrooms. These will produce spores which become splashed onto the stems, or dispersed by air currents. The spores infect stems via dead or dying tissues, particularly fallen petals. In some seasons late infection of the lower leaves can occur. Petal tests can help determine the risk of disease and the need for a second fungicide treatment to prevent this.

Control of sclerotinia

The best fungicides to reduce sclerotinia are boscalid (Filan), azoxystrobin (Amistar) and prothioconazole (Proline). If applied at full flower, the petals become coated with the fungicide, and prevent sclerotinia spores attacking them when they fall further down the plant. To prevent later infections via leaves, it is important to maintaining high water volumes to get effective coverage of the crop. A second protectant treatment may also be required.

If you grow peas, beans, potatoes, linseed, carrots, swedes lettuce in the rotation, sclerotinia can cause serious losses in these crops, and oilseed rape is the only crop where some measure of control can be achieved.

Avoiding fields with a known history of sclerotinia is also important. Crops known to be susceptible to Sclerotinia include peas, beans, carrots, onions, and potatoes.

Grey Mould (*Botrytis cinerea*)

Botrytis occurs on all kinds of dead and dying plants and crop debris. Affected tissues rot and become covered with a grey furry mass, especially in wet conditions. It usually starts by attacking any damaged tissue, but later it can attack undamaged tissue for example where petals fall onto a green leaf, botrytis initially attacks the petal, then attacks the green leaf. Botrytis can also attack via damage caused by frost damage and fertiliser scorch. Stem lesions can also form, especially where stems have become damaged by cabbage seed weevil, or where petals have become trapped by a petiole. The fungus can attack pods late in the season, causing splitting, or internal infection of the seed. Fungicides applied at full flower to control sclerotinia will help reduce botrytis. Petals become coated with the fungicide, and protect the green leaf further down the plant. Applying fungicides once symptoms have appeared will have little effect on the disease. Crops protected against light leaf spot in the autumn have lower levels of botrytis on the pods later in the season. This is due to a reduction in light leaf spot on the pods, which subsequently allow botrytis to become established.

Dark leaf spot (*Alternaria brassicae*)

Alternaria is favoured by warm wet weather particularly during flowering and pod development when it can cause most damage if allowed to spread onto the pods. It causes dark spots on the leaves and pods which resemble targets. They may be surrounded by a yellow halo when they occur on the leaves. The spots reduce the green leaf area, which can result in poor pod fill, and they also weaken the pods causing pod splitting. The fungus can also attack the seed in the pod, and when sown this seed will rot. If crops are lodged, and the weather warm, Alternaria can become more common, as the lodged crop provides a humid microclimate. The source of the disease can be volunteer plants and debris on the surface. Seed infection can be controlled using seed treatments. The best timing for specific control of Alternaria is when symptoms are seen on the upper leaves and the pods.

White blister rust *(Albugo candida)*

This disease is relatively uncommon, but yield losses in excess of twenty percent have been recorded on susceptible cultivars when severely infected. White blister rust can cause disease problems on mustard (*Brassica juncea*) and occurs on cruciferous weeds. Races are generally fairly host or species specific (for example white rust from the weed shepherd's purse does not infect oilseed rape and vice versa). White to cream-coloured masses, or pustules appear on the underside of leaves from the seedling stage onward. Following infection of the stems and pods, raised green blisters form that turn white during wet weather. The most conspicuous symptom is the presence of swollen, twisted and distorted inflorescences called stagheads that become brown, hard and dry as they mature.

The fungus overwinters as resting spores in decaying infected plant tissues (mainly stagheads) or as a seed contaminant. These spores may remain dormant in soil or on seed for a number of years. In the spring some of the spores germinate and infect the cotyledons and leaves of young susceptible plants. These infections develop and white pustules are formed on the underside of leaves or on stems. The pustules release chalk-like, air-borne spores that can spread the disease to other parts of the plant or to nearby plants to cause secondary infections on leaves, stems or flower buds. Stagheads develop from infected flower buds. At harvest, stagheads may be broken resulting in contamination of the seed with resting spores.

Control

There is little information regarding varietal resistance. Crop rotations with at least 3 years between crops remains the best method to minimise the risk of the disease.

Soil-borne diseases

Clubroot *(Plasmodiophora brassicae)*

Clubroot is a soil-borne disease which attacks all brassicas. It can cause losses in crops grown on land contaminated with the fungus, and levels can build up where oilseed rape is grown in short rotations, or brassicas are grown continuously in a contaminated field. Initial contamination can occur if diseased transplants are grown, or if contaminated fodder crops are put in a field, or by machinery spreading soil from a contaminated field.

The disease causes root malformations, (clubbing) and this can lead to stunted plants and wilting. It may only occur in patches, particularly where drainage is poor and the soil is acidic. It is best to avoid growing oilseed rape or any brassicas in fields known to be contaminated. Liming may help to reduce symptoms if it is not possible to avoid these fields. There is no chemical control.

The clubroot test allows farmers to find out which fields are infected and also the severity of the infection. A susceptible brassica species (Chinese cabbage) is grown in a soil sample under wet conditions in a glasshouse. After 6 weeks, the roots are assessed for clubroot. Depending on the severity of clubroot on the test plant roots, advice on the potential losses can be given if oilseed rape or any other brassica can be given. An updated molecular test is currently being developed. Once validated, it will provide a more rapid result.

Some varieties show better resistance to the disease than others. Mendel currently shows good resistance, but it can still show symptoms in high disease pressure situations. For more information on clubroot, see Technical Note TN602. Clubroot disease of oilseed rape and other brassica crops.

Damping off Diseases

These are caused by soil borne fungi such as *Rhizoctonia* and *Pythium* species. They rot the stems of the emerging seedlings, causing them to die. Cold wet soils are the worse conditions for these diseases, but early infections which cause seedling death can be controlled by seed treatments which contain Thiram.

Verticillium wilt *(Verticillium dahliae)*

Verticillium symptoms normally appear late in the season during dry spells of weather. First signs of the disease will be leaves turning yellow the dying back prematurely. Later the whole stem can die-back. In some cases only half the leaf is affected as a result of the soil borne fungus attacking the roots and infecting the water vessels (xylem). Affected stems and roots may have a grey fungal growth of verticillium on them. There is no fungicidal control measures you can take to manage the disease. As short rotations will increase the incidence of this soil-borne fungus, maintaining 4-5 years between oilseed rape crops is the only measure taken to manage the disease.

Beet western yellows

Beet western yellows is caused by a virus which is transmitted by the peach potato aphid (*Myzus persicae*). Tests of crops in Scotland showed that may were infected with the virus. In most cases crops do not show any symptoms, but in others, leaf purpling can occur. This symptom is easily mistaken for leaf purpling associated with weathering.

Oilseed rape pests

There have been changes in the profile and prevalence of several oilseed rape pests over the last few seasons, with some pests becoming more of a problem, and others spreading throughout Scotland. This has had an impact on insecticide use at times of the year when growers have typically not usually thought about applying insecticides.

Crops can be damaged from emergence (slugs, flea beetles), overwinter (rape winter stem weevil, cabbage stem flea beetles), to flower budding (pollen beetle) and through to pod formation (cabbage seed weevil, brassica pod midge) and spring-sown crops can be more susceptible to damage than the more tolerant autumn-sown crop.

Slugs

Slugs cause significant damage to both winter and spring-sown rape by eating the cotyledons and first true leaves. Slug damaged winter rape crops are more susceptible to damage from insect pests such as rape winter stem weevil and pollen beetle, as the vigour of the crop is reduced, and its ability to cope with further pest damage is weakened. The use of slug pellets to protect the crop at emergence is recommended if the field has a history of slug problems, but it is advised that prior to sowing, slug traps be used to determine the risk of slug damage. Molluscicide pellets should only be used if creation of a fine seedbed is not possible. There are a wide range of molluscicide products available containing the active ingredients metaldehyde and methiocarb. To maximise the efficacy of slug pellets, they should be applied when the soil surface is moist, and no rain is forecast, as mud splash can render pellets unpalatable to slugs and some pellets deteriorate when they get wet.

Flea beetles (*Phyllotreta* spp)

Occasionally, particularly if winter and spring rape is emerging in dry soil conditions, flea beetles (*Phyllotreta* spp.) can cause shot-holing of cotyledons and the first true leaves. If damage is extensive up to the first two leaves, then application of an insecticide may be justified if the weather is forecast to remain dry. Seed treatments will protect crops from flea beetle damage. Flea beetles are less damaging in wet weather.

Aphids (*Myzus persicae*)

In the autumn, peach-potato aphid (*Myzus persicae*) can transmit Turnip Yellows virus (TuYV), which can lead to reduced yields. In England yield reductions of up to 26% have been attributed to TuYV infection by aphids, which is often symptomless. It is likely that winter oilseed rape sown with insecticide treated seed will gain some protection from aphids and consequently from infection by TuYV, but milder autumns may well prolong the period of aphid flights into crops and subsequently the seed treatment may well be insufficient to prevent aphids from surviving and transmitting TuYV. Peach-potato aphids (*M. persicae*) and cabbage aphids (*Brevicoryne brassicae*) may be found overwintering on rape, but they do not cause any feeding damage until the summer. In the summer months, colonies of cabbage aphids may be seen on the stems, leaves and pods of both winter and spring rape plants. Problems are more likely in dry summers, and an aphicide treatment is recommended if approximately 10% of flowering heads of winter rape are infested with aphids during flowering, and 5% of spring sown rape plants infested during green-yellow bud. Note that insecticide treatments applied for other pests such as pollen beetle will have an effect against cabbage aphids as well.

Cabbage stem flea beetle *Psylliodes chrysocephala*)

Cabbage stem flea beetle (*Psylliodes chrysocephala*) has become more common on Scottish winter oilseed rape crops over the last few years. The beetles are noticeable in mid August/early September, often being caught up in the rape harvest. The beetles won't damage the harvested seed, but the beetles can cover trailers, walls, machinery and seed in their thousands as they seek a way out of the store.

The beetles feed for 2-3 weeks on rape seedlings before they lay eggs near germinating rape plants. The shot-holing of cotyledons and young leaves can lead to stunting of the crop. From October onwards newly hatched larvae seek out young rape seedlings, and tunnel their way into the stem of the plant and occasionally the growing point. This weakens the stems and allows water to enter their feeding tunnels which, when frosts occur, cause the leaves and stems to freeze, contributing to the winter loss of plants and foliage.

In the spring infested plants will remain stunted and topple over if the stems are severely damaged.

The use of an insecticide seed treatment on winter oilseed rape seed has probably been keeping cabbage stem flea beetle in check since its first appearance in 2002, but untreated crops have shown signs of adult beetle damage to the leaves. Whilst grubs of cabbage stem flea beetle have been found in rape stems in the spring, numbers have seldom been a cause for concern, as the vast majority of grubs found have been those of the rape winter stem weevil.

Rape winter stem weevil (*Ceutorhynchus picitarsis*)

The rape winter stem weevil (*Ceutorhynchus picitarsis*) caused significant damage in the 2004/2005 season, where many crops in the Lothians and Borders were damaged. The adult weevils migrate to oilseed rape fields in September/October and feed on the leaves, causing little damage. They begin to lay eggs on leaves 4 weeks after arriving on the crop. Eggs may be laid throughout the winter if the conditions remain mild. The eggs hatch during the winter and the legless larvae tunnel into the stem and down to the crown of the plant. The winter is spent feeding at the base of the stem until April/May, when the grubs leave the plants to pupate in the soil. Because the grubs feed over the winter months, damage does not become apparent until the spring when symptoms ranging from the production of many lateral

shoots at stem extension, to stunting of the plant, through to complete death of the plant in severe infestations occur. Cutting open the stem base usually reveals the weevil grubs and the hollowed out tunnels in the stem and crown. Management of rape winter stem weevil involves targeting the adult weevils in the autumn, before the weevils have had a chance to lay their eggs. Consequently monitoring of the appearance of the weevils in winter rape crop from September is necessary as there is a 3-4 week window of opportunity to control the adult weevils before they have begun to lay eggs on the crop. Treatment with a pyrethroid insecticide is recommended once weevils begin to appear in crops, possibly as a tank-mix with the light leaf spot fungicide treatment if the timings are appropriate. Currently available insecticide seed treatments do not appear to be effective.

Pollen beetle (*Meligethes* spp.)

Pollen beetles (*Meligethes* spp.) (also known as blossom beetles) are probably the most common pests seen on Scottish rape crops. The greenish, black beetles, are seen on rape crops from mid- April onwards. The beetles chew their way into flower buds to get access to the pollen within. Once crops have flowered, the pollen is readily accessible and damage is minimal. Winter rape plants tend to be able to compensate for some loss of pods by diverting resources into producing larger seeds, but if the crop has suffered from significant slug or pigeon damage, then this ability to compensate is reduced. Consequently, there is a different treatment threshold for backward winter rape crops.

Winter rape crops that have overwintered well and suffered little stress from slugs or pigeons, need to exceed 15 pollen beetles per plant throughout the crop at the green-yellow bud stage before an insecticide treatment is likely to be worthwhile. In Scotland most winter rape crops have begun flowering before pollen beetles migrate into crops, and whilst the 15 beetles/plant threshold may be exceeded during flowering, this is no threat to the crop, and no insecticide treatment for pollen beetle should be applied to a flowering rape crop.

Backward rape crops cannot compensate for pollen beetle damage, and consequently as few as 5 beetles per plant at green-yellow bud may be sufficient to justify an insecticide treatment.

Spring rape crops are very susceptible to pollen beetle damage, having little capacity to compensate for pest damage. Consequently, one beetle per plant at green-yellow bud is capable of having a significant effect on yield, and an insecticide treatment is recommended if this threshold is achieved throughout the crop. More than one insecticide treatment may be needed as recolonisation of the crop can occur rapidly. Once crops have flowered, no insecticide treatment is needed regardless of how many pollen beetles there are per plant.

Pyrethroid insecticide resistant pollen beetles are widespread throughout Europe, and have been confirmed in the South East of England. Consequently adherence to the treatment thresholds on winter and spring oilseed rape crops is strongly advised, with a move away from the reliance on pyrethroid insecticides for pollen beetle control. The neonicotenoid insecticide thiacloprid is recommended for use in areas where insecticide resistant beetles have been found, or if use of pyrethroid insecticides has resulted in poor control.

Cabbage seed weevil (*Ceutorhynchus assimilis*)

Cabbage seed weevils (*Ceutorhynchus assimilis*) may be seen on crops from late April. The adults feeding on buds and pods cause little damage, but they lay eggs in developing pods, and the grubs feed within the pods on the seeds. The grubs exit the pod via a pin-sized exit hole, which can allow diseases to enter as well as providing an entry point for brassica pod midges to lay eggs within the pod.

Seed weevil numbers need to exceed 2 per plant throughout the crop from flowering onwards to justify an insecticide treatment, and in most seasons this threshold is not reached.

Brassica pod midge (*Dasineura brassicae*)

Brassica pod midge (*Dasineura brassicae*) lay their eggs within developing oilseed rape pods. On hatching, the small (1-2 mm) larvae feed on the inside of the pod wall, leading to distorted pods which eventually lead to pod-shatter and loss of seed. Pod midge utilise holes in developing rape pods for egg-laying, and these holes may be due to feeding or oviposition punctures by cabbage seed weevil, or feeding punctures by other insects such as capsids.

Pod midge in crops is not usually noticed, as infested pods are usually concentrated on the edges of crops where damage by birds often masks low infestations. Control of pod midge has tended to reply on the prevention of feeding/oviposition punctures by cabbage seed weevil, and adequate control of seed weevil should minimise any risk of pod midge attack.

Turnip sawfly(*Athalia rosae*)

Turnip sawfly (*Athalia rosae*) has become a cause for concern in English oilseed rape crops but has yet to be seen as a problem in Scotland.

Larvae are greenish black in colour and they feed on leaves which can quickly be skeletonised. There is little information on the damage potential on oilseed rape in the UK, although reports from England confirm that severe leaf feeding damage is possible. Where severe damage to leaves occurs, a spray with a pyrethroid insecticide (with approval for control of cabbage stem flea beetle on oilseed rape) may be necessary.

Leaf production growth stage

Green bud growth stage

Yellow bud growth stage

Full flower growth stage

Clubroot *(Plasmodiophora brassicae)*

Downy mildew (*Peronospora parasiticia*)

Light leaf spot close up of lesion (*Pyrenopeziza brassicae*)

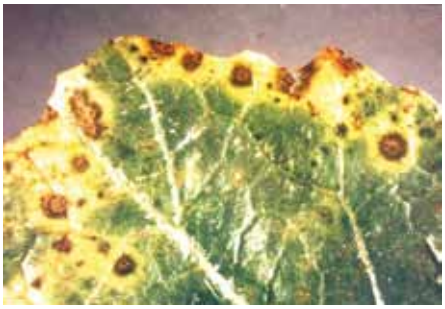
Phoma leaf spot (*Phoma lingam*)

Light leaf spot (*Pyrenopeziza brassicae*)

Sclerotinia apothecia (*Sclerotinia sclerotiorum*)

Botrytis on pods (*Botrytis cinerea*)

Sclerotinia symptom on stem



Dark leaf spot (*Alternaria brassicae*)

Dark leaf spot on pods (*Alternaria brassicae*)

Slug damage

Flea beetle damage

Cabbage stem flea beetle

Rape winter stem weevil

Pollen beetle

Cabbage seed weevil

Turnip sawfly larvae

Splitting of an oilseed rape pod due to brassica pod midge larval feeding

Table 1: Main treatment timings for diseases

Disease	Seed treatment (pre-sowing)	1-3 true leaf stage (GS 1,1-1,3)	4-9 true leaf stage in autumn (GS 1,4-1,9)	Green bud stage (GS3,3)	Yellow bud to 1st flower (GS3,7-4,1)	50% all buds opened (GS4,5)	30-70% potential pods (GS5,5-5,7)
Damping off diseases	Yes	No	No	No	No	No	No
Downy mildew	No	Yes	No	No	No	No	No
Light leaf spot	No	No	Yes	Yes	No	No	No
Phoma leaf spot	No	No	Yes	Yes	No	No	No
White leaf spot	No	No	Yes	No	No	No	No
Sclerotinia	No	No	No	No	Yes (high risk)	Yes	Yes (high risk)
Botrytis	No	No	No	No	Yes	Yes	Yes
Alternaria	Yes	No	No	No	No	Yes	Yes

Table 2: Treatment thresholds or timings for pests

Pest	Seed treatment (pre-sowing)	1-3 true leaf stage (GS 1,1-1,3)	4-9 true leaf stage in autumn (GS 1,4-1,9)	Green bud stage (GS3,3)	Yellow bud to 1st flower (GS3,7-4,1)	50% all buds opened (GS4,5)	30-70% potential pods (GS5,5-5,7)
Slugs	Slug pellets	Slug pellets					
Flea beetles	Yes						
Aphids					10% flowering heads affected	10% flowering heads affected	
Cabbage stem flea beetle	Yes						
Rape winter stem weevil	No	Yes	Yes				
Pollen beetle				15/ plant normal crop 5/plant (backward crops)			
Cabbage seed weevil						2 per plant	
Brassica pod midge						Prevented by controlling cabbage seed weevil	

Always read the label before using pesticides. Products and approvals mentioned in this technical note may have changed since publication.

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