

## RECOMMENDED LISTS

### **AHDB Recommended Lists (RL) for cereals and oilseeds: Verticillium stem stripe of oilseed rape**

This protocol was believed to comply with relevant agrochemical, environmental and other regulations at the time of writing but it is the responsibility of the contractor to ensure that it continues to comply. In the event of non-compliance the protocol should not be followed but the Field Trials Manager should be notified at once of how the protocol requirements would breach regulations.

Any deviation from this protocol other than under the circumstances described above may result in a breach of contract and should be agreed in advance.

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**Changes from previous version**

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## **Part 1: General Information**

### **1.1. Location of test**

Not specified.

### **1.2. Source of inoculum**

The trial site can be naturally or artificially infected. There should be uniform disease distribution across the trial. Inoculation of sites, where required, should be done as follows:

- Soil should be inoculated 1-2 weeks after sowing.
- Inoculum should consist of a maize meal and vermiculite substrate which has previously been infected with UK isolates of *V. longisporum* and incubated at room temperature until abundant microsclerotia have formed.
- The mixture should be air dried before spreading on the test plots, using an amount calculated to give between 40-100 colony forming units cm<sup>2</sup> of soil.

### **1.3. Trial type**

Either small (3–6m long), or larger (e.g. 12m long) plots may be used. There will be 4 replicates per variety. The trial should not go to yield. The trial should be established and maintained in line with the [WR22-26 AHDB winter oilseed rape trials protocol](#), with the exception of fungicide treatments, where one autumn treatment to control stem canker should be used as needed.

### **1.4. Number of tests each year**

There will be two trials per year.

### **1.5. Varieties in test**

All RL P1 and candidate winter oilseed rape varieties, approximately 40. The sowing list will be supplied by the RL team.

### **1.6. Assessment**

#### **1.6.1. Timing of assessment**

The timing of assessment is crucial. Yellowing of half a leaf (Appendix 1) is considered to be an early symptom of verticillium stripe and can be observed at the base of the canopy from the end of April onwards. From mid-June onwards plots should be inspected regularly. First symptoms of verticillium stripe are usually yellow streaks running the length of the stem or a large branch. Often, this is a single streak per stem, and it will eventually become more obvious and turn brown (Appendix 1). Symptoms should be assessed weekly during late June or early to mid-July. Symptoms can develop rapidly over a period of 7 to 14 days and the best assessment date can vary between years. Scoring too early could mean under-estimation of symptom incidence and severity, even with scraping to reveal sub-epidermal symptoms. Equally, scoring too late could mean difficulty in seeing verticillium on stems which are rapidly drying out. In crops that remain very green at the end of the season, symptoms may not be fully expressed until a few days after desiccation.

### 1.6.2. Disease assessment method

Disease assessments should be done on stems that have been removed from the plot so the entire circumference of the stem can be assessed easily. Pull up 30 stems per plot and score the middle to upper thirds of each stem for the presence of stem shredding and black microsclerotia. Stems should always be scraped to confirm whether or not infection is present. Some varieties, particularly those slower to mature, will only exhibit internal symptoms. Assign stems to infection classes defined in Table 1. Calculate an index (0-100) by multiplying the number of stems in each category by the numerical value of the category, dividing by the total number of stems, and multiplying by 100/5.

Table 1. Infection classes for severity of verticillium symptoms on oilseed rape stems.

Scale point	Description
0	no symptoms
1	1–25% circumference affected
2	26–50% circumference affected
3	51–75% circumference affected
4	>75% circumference affected
5	severely affected and plant dead

If no microsclerotia are visible, scrape back a section of stem so that any sub-epidermal grey discolouration typical of verticillium infection can be seen. If this is present, revise scores to take it into account.

### 1.6.3. Assessment of other diseases

If other disease such as phoma stem canker are observed, this should be noted in the trial diary, but it is not a requirement to assess diseases other than verticillium.

## Appendix 1 – Assessment key for *Verticillium longisporum*

### Typical *Verticillium* stem stripe symptoms



Figure 1. Early leaf symptoms of verticillium stripe on a susceptible variety in mid-May **yellowing of half a leaf.**



Figure 2. Characteristic striping along the length of the stems observed in early July.



Figure 3. Close up of verticillium stripe showing an affected branch and the distinction between the brown stripe and green plant tissue.



Figure 4. Scraped stem reveals vascular staining not visible on the outside of the stem.



Figure 5. Microsclerotia, exposed due to the stem surface becoming dried out, paper-like and splitting, on winter oilseed rape in mid-July.