

Leafy vegetables – Lettuce

Objective of this analysis

Measuring is knowing. Good, rapid and accurate information and knowledge is the basis for correct decision making in crop management. By correct assessing the actual situation in plant and soil, timely preventive actions can be taken. Preventive measures are often much less expensive than curative approaches, while still impeding or avoiding disease development in plants as well as reducing or eliminating losses in quality.

Which pathogens are detectable?

DNA multiscan® detects all important pathogens of lettuce and also indicates to what extent these are present in a sample. Research is constantly undertaken to expand the detection possibilities and to adjust the range of pathogens to monitor and address new problems as they occur. Please find an overview of the detectable pathogens below.

Pathogenic fungi		Beneficial and disease-suppressive fungi
Oomycetes	<i>Pythium</i> spp.	<i>Trichoderma</i> spp.
<i>Athelia (Sclerotium) rolfsi</i>	<i>Pythium aphanidermatum</i>	<i>Trichoderma asperellum</i>
<i>Botrytis cinerea</i>	<i>Pythium dissotocum</i>	<i>Trichoderma hamatum</i>
<i>Colletotrichum</i> spp.	<i>Pythium irregulare</i>	<i>Trichoderma harzianum</i>
<i>Colletotrichum coccodes</i>	<i>Pythium polymastum</i>	
<i>Colletotrichum gloeosporioides</i>	<i>Pythium sylvaticum</i>	
<i>Cylindrocladium</i> spp.	<i>Pythium ultimum</i>	
<i>Fusarium</i> spp.	<i>Rhizoctonia solani</i>	
<i>Fusarium oxysporum</i>	<i>Sclerotinia</i> spp.	
<i>Fusarium solani</i>	<i>Sclerotinia minor</i>	
<i>Penicillium</i> spp.	<i>Sclerotinia sclerotiorum</i>	Pathogenic bacteria
<i>Phytophthora</i> spp.	<i>Sclerotinia trifoliorum</i>	<i>Pseudomonas chicorii</i>
<i>Phytophthora cinnamomi</i>	<i>Verticillium</i> spp.	<i>Pseudomonas marginalis</i>
<i>Phytophthora cryptogea</i>	<i>Verticillium albo-atrum</i>	<i>Pseudomonas syringae</i>
<i>Phytophthora drechsleri</i>	<i>Verticillium dahliae</i>	<i>Pseudomonas syringae</i> pv. <i>porri</i>
<i>Plectosphaerella cucumerina</i>		<i>Pseudomonas viridiflava</i>

What can be expected from this analysis?

DNA multiscan® indicates which pathogens are present and the extent of their existence in a sample. Because of the knowledge and experience in the **DNA multiscan®** research laboratories, an estimate of the disease risk for over the entire season can be made from the results of the analysis. Furthermore, sound, well-reasoned advice can be given regarding appropriate preventive actions, control measures, possibilities for crop rotation, choice of variety, etc.

How is the advice formulated?

Advice is formulated based on the results of each analysis, other conditions of the cropping systems and the specific needs of and possibilities available to the individual company. In this phase, it is clear that the most reliable and complete information must be submitted with the sample in order to obtain the most direct response suited to a company's unique situation. When samples are submitted via ambassadors, the advice is then forwarded by these ambassadors following consultation with the research laboratory. [Click here to view an example of a report and advice document.](#)

What is the best way to collect samples of soil and plants for analysis with DNA multiscan®?

The quality and reliability of analysis results are determined to a high extent by the sample delivered. Hence, this must be representative of the site or situation and arrive in good condition at the laboratory. When a biological soil analysis is requested, it is recommended to also sample the entire growing plants (with roots) as they reflect soil problems.

Some recommendations for sampling:

- Sample plants with typical symptoms
- Sample plants representing different phases of disease development
- Take as many complete plants as possible. Try to keep the root system as intact as possible.
- Take living plants with clear symptoms. On dead plants too many saprophytic fungi and bacteria are found that could conceal the real cause of disease.
- When sampling soil for biological analysis purposes, it is important to sample both the affected and non-affected areas.
- Complete the information sheet as accurately as possible.

Some recommendations for sample storage and shipment:

- Soil samples for biological analysis should be handled or touched as little as possible. Place samples directly into the designated bags, seal immediately, keep cool, and submit as soon as possible to the laboratory.
- Put plant samples in spacious plastic bags to avoid shrinkage. Exceptions are fleshy fruits in an early infestation phase: please wrap these separately in newspaper and then place them in a plastic bag.
- Do not add extra water or moist paper to the bag; this increases the danger of quick decay and development of contaminants.
- Assure clear identification on the outside of the packaging (do not include the information sheet in the bag); including information in sample bags often poses readability problems.
- Keep plant samples in a cool place and submit them as soon as possible to the laboratory.
- In case of shipment via mail: pay extra attention to the packaging to prevent damage. Always send with express mail and avoid delays from weekend shipments.