Product Information: DAS-ELISA

Spongospora subterranea f. sp. *subterranea* (Sss) Powdery scab

Powdery scab of potato caused by Spongospora subterranea f. sp. subterranea (Sss) occurs world-wide in potato growing areas and can transmit potato mop-top virus. There is no good chemical control for the disease, hence prevention strategies such as „clean seed in clean soil" using diagnostic tools has been postulated as the most reliable disease control measure (2).

Specificity

The monoclonal antibodies were made against resting spores of Spongospora subterranea f. sp. subterranea (Sss) from potato tubers (1). The reagent is suitable for detecting resting spores on potato and in soil in the DAS-ELISA format. So far all isolates of Sss of several origins tested (France, Japan, New Zealand, Peru, Scotland, and Switzerland) were detected.

Cross-reaction has been observed with resting spores of the related Spongospora subterrranea f. sp. nasturtii which infects watercress but none with other related fungi such as Plasmodiophora brassicae nor with other Plasmodiophoromycetes nor with different Streptomyces sp. (causing common and netted scab of potato) (1). Hence this reagent is very suitable for distinguishing lesions on potatoes caused by Sss from those caused by Streptomyces scabies, Rhizoctonia solani or other fungi. The reactivity is limited to resting spores; other stages of Sss such as zoospores and zoosporangia do not react.

Detection limit:

Using the DAS-ELISA procedure recommended, one sporeball/ml of extraction buffer is detected. When using a commercial peeling machine, one tuber with two lesions was detected out of 19 healthy tubers in the wash water. In soil, the detection limit is 100 sporeballs/g soil (1).

This product was developed in cooperation with the Swiss Federal Institute of Technology (ETHZ), Zurich, Switzerland, and Horticulture Research International (HRI), Wellesbourne, UK.

Information on the antibodies

Coating IgG: monoclonal; conjugate: monoclonal

Sampling instruction

Adequate sampling for testing Sss is limited to tissue containing resting spores. Resting spores might be present on potato tuber (after established skin-set) or in melanized „old" root galls or in soil samples. Other stages of Sss such as zoospores and zoosporangia in roots, developing resting spores in „young" root galls and tubers before haulm destruction may not react.

Potato tuber certification:

An easy method of screening for the presence of the pathogen on tubers is achieved with a commercial kitchen peeling machine where tubers are vigorously moved around and their skin abraded on a rough uneven surface. Using tap water, all abraded debris are then flushed out into a sink, or collected. Best results were obtained with a sample size of about 20 tubers (approx. 1.5 kg). The machine was operated for approx. 15 sec. while rinsing the potatoes with approx. 500 ml of tap water (1). This wash water was collected and aliquots of 200 µl taken directly as samples. By using this procedure, one tuber infected with two lesions out of 19 healthy tubers has been detected (OD of 0.4 after 60 min substrate incubation).

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Confirmation of Spongospora:

Since there is no cross-reaction with other pathogens causing similar symptoms (e.g. Streptomyces scabies), this reagent is very well suited for the confirmation of Spongospora. Wash tubers gently, then cut slices of tuber peeling containing the potential Sss lesions. Homogenize these slices in extraction buffer «General» (Art. No. 110120) at a ratio of 1:10 - 1: 50 (w/v) in extraction bags (e.g. Art. No. 430100) using the HOMEX or grind with mortar and pestle. The presence of resting spores of Sss is indicated by a fast and strong reaction in this DAS-ELISA.

Soil examination:

Take soil samples from a depth of 10-30 cm from several locations. Dry these samples at RT or in a convection oven at 40-45°C. When completely dry, mix well and remove all particles >1-2 mm by passing the soil through a sieve. Homogenize 2 g of soil with 6 ml of extraction buffer «General» (Art. No. 110120) in presence of quartz sand in a tube on a shaker vigorously overnight. Spin or sediment the soil and sand particles and analyse the supernatant in DAS-ELISA.

References

(1) Merz, U., Walsh, J., Bouchek-Mechiche, K., Oberhänsli, Th., and Bitterlin, W. 2005. Improved immunological detection of Spongospora subterranea. European Journal of Plant Pathology 111:371-379

(2) Merz, U. and R.E. Falloon, 2009. Review: Powdery scab of potato - Increased knowledge of pathogen biology and disease epidemiology for effective disease management. Potato Research 52 (1), 17-37.

Ordering Information

BIOREBA offers the following formats:

Individual ELISA reagents for 96, 480 or 960 assays: IgG and/or conjugate for the working volume of 200 µl/test/well.

Reagent sets for 480 or 960 assays: IgG and conjugate, positive and negative controls, and microtiter plates (F-96) for a working volume of 200 µl/test/well.

Complete kits for 96, 480 or 960 assays: All reagents, controls, microtiter plates (F-96), buffers, and substrate necessary for a working volume of 200 µl/test/well.

ELISA buffers, equipment for sample preparation and disposables are also available.

For all Art. No. please refer to our product catalogue or our homepage www.bioreba.com and for prices and further information on any other product from BIOREBA, please contact your local distributor or our office in Switzerland.