

# Product Information: DAS-ELISA

## Barley yellow dwarf virus (BYDV)

### Characteristics of barley yellow dwarf virus (BYDV)\*

Barley yellow dwarf luteovirus (BYDV) (6) infects cereals and grasses, causing economically important diseases in barley, oats, wheat, rye, corn, and rice (2-8). Virus isolates have been grouped according to vector specificity (up to 15 aphid species involved), virulence, and serology. For example, five groups have been differentiated in New York State, USA (6) and two main groups were identified in the UK (5, 8). Some characteristics are summarized in Table 1.

Table 1. Characteristics of BYDV strains\*

<sup>5</sup> English classification		<sup>6</sup> American classification				
		Serogroup 1			Serogroup 2	
<b>B</b>	<b>F</b>	<b>PAV</b>	<b>MAV</b>	<b>SGV</b>	<b>*RPV</b>	<b>RMV</b>
PAV-like	MAV-like					
Transmission by aphids						
<i>R. padi</i>	---	<i>R. padi</i>	---	---	<i>R. padi</i>	---
<i>S. avenae</i>	<i>S. avenae</i>	<i>S. avenae</i>	<i>S. avenae</i>	---	---	---
<i>S. grami-</i>	---	<i>S. grami-</i>	---	<i>S. grami-</i>	---	---
<i>num</i>		<i>num</i>		<i>num</i>		
---	---	---	---	---	---	<i>S. maidis</i>
<sup>6</sup> Virulence according to Rochow:						
---	---	strongly virulent	moderately virulent	weakly virulent	weakly virulent	weakly virulent
<sup>5</sup> Severity according to Plumb						
severe	mild	severe	mild	---	severe	---

(*R. padi* = *Rhopalosiphum padi*; *S. avenae* = *Sitobion (Macrosiphum) avenae*; *S. graminum* = *Schizaphis graminum*; *R. maidis* = *Rhopalosiphum maidis*)

### Specificity and sampling instruction for the BYDV reagents

BIOREBA has three reagents available for the detection of different BYDV strains by DAS-ELISA (1). They were made against virus strains similar to the main two groups identified in the UK (Type B and Type F) and to a Mexican isolate of BYDV-RPV, now called cereal yellow dwarf virus-RPV (CYDV-RPV). Studies in Switzerland showed that all BYDV isolates present could be detected with our ELISA reagents (2). For ELISA, stalks and young leaves are good tissue sources (4). Samples are homogenized 1:20 (w/v) in extraction buffer «General» (Art. No. 110120).

These products have been developed in cooperation with Agroscope, the Swiss centre of excellence for research in the agriculture and food sector.

### Barley yellow dwarf virus-type B (BYDV-B) (PAV-like)

These reagents were made against a BYDV strain which is efficiently transmitted by both *Rhopalosiphum padi* and *Sitobion (Macrosiphum avenae)* and is common in Western Europe (2, 4). Serologically, this strain is closely related to BYDV «Type B» (5) and is similar to BYDV-PAV. The reagents react in DAS-ELISA similarly with the PAV-strain and the B-strain, whereas only to a limited extend with «Type F» (5). Stalks and young leaves are good tissue sources for the ELISA (4).

### Information on the antibodies

Coating IgG: polyclonal; conjugate: polyclonal

\*Former BYDV serotype RPV (BYDV-RPV) was given a new name: Cereal yellow dwarf virus-RPV (CYDV- RPV)

### Barley yellow dwarf virus-type F (BYDV-F) (MAV-like)

These reagents were made against the BYDV «Type F» (5) (a MAV-like isolate), specifically transmitted by Sitobion (*Macrosiphum avenae*). The reagents also cross react to a certain extent (ca. 25 %) with BYDV «B» isolates (5) transmitted non-specifically by *Rhopalosiphum padi*, *S. avenae* and some other cereal aphids (4). Stalks and young leaves are good tissue sources for the ELISA (4).

#### Information on the antibodies

Coating IgG: polyclonal; conjugate: polyclonal

### Barley yellow dwarf virus-RPV (BYDV-RPV), now called cereal yellow dwarf virus-RPV (CYDV-RPV)

The antibodies were made against a Mexican isolate BYDV-RPV (3), efficiently transmitted by *Rhopalosiphum padi* (6). The reagents react in DAS-ELISA specifically with BYDV-RPV. Cross reactions with «Type B» and «Type F» (5) are neglectable. Stalks and young leaves are good tissue sources for the ELISA (4).

#### Information on the antibodies

Coating IgG: polyclonal; conjugate: polyclonal

#### References

- (1) Clark, M.F., and Adams, A.N. 1977. J. gen. Virol. 34:475-483.
- (2) Derron, J.O., Gugerli, P., Häni, A., and Widmer, A. 1986. Rev. Suisse Agric. 18:233-237.
- (3) Gugerli, P. 1996. Plant protection report - Swiss Fed. Agric. Res. Stat. of Changins 1996, pp.27.
- (4) Gugerli, P., and Derron, J.O. 1981. Rev. Suisse Agric. 13:207-211.
- (5) Plumb, R. 1974. Ann. appl. Biol. 77:87-91.
- (6) Rochow, W.F. 1970. Descriptions of plant viruses. No. 32. CMI/AAB. 4 pp.
- (7) Rochow, W.F., and Duffus, J.E. 1981. In E. Kurstak: Handbook of Plant Virus Infections and Comparative Diagnosis. pp.147-170.
- (8) Torrance, L., Pead, M.T., Larkins, A.P., and Butcher, G.W. 1986: J. gen. Virol. 67:549-556.

### 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](http://www.bioreba.com) and for prices and further information on any other product from BIORREBA, please contact your local distributor or our office in Switzerland.