

# BIOREBA



## Testing service

For the diagnosis of plant pathogens

Prices in Euro

Edition 2006

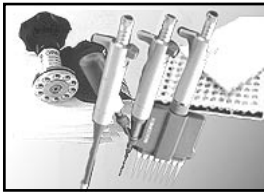


## Agro-diagnostics since 1980



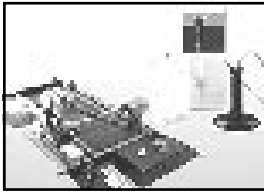
### Reagents

Antibodies, kits and buffers for the detection of more than 70 plant pathogens



### Disposables

Handheld homogenizers, bags for extraction and storage of samples, pipettes



### Laboratory equipment

HOMEX and SAPEX for the semi-automatic extraction and distribution. EASY WASH 2000 for fast and reliable washing of microtiter plates.



### R & D

Research and development department with many years of experience in development of antibodies and test formats according to the demands of our customers.

## Our experience = your profit

With a history of more than 25 years of experience and with our excellent choice of reagents, we are the best partner for your testing requirements.

## Presentation of our test service laboratory

Plant breeders, their customers and the government agencies ask for high quality of plant health. Our test service laboratory analyzes plant samples for presence of viral, bacterial and fungal pathogens. Samples are tested with the same reagents and equipment as offered to our customers world-wide. For most applications the DAS-ELISA (see below) provides best and most economical results. On special request, we are also offering analysis by molecular techniques, such as PCR.

BIOREBA has been offering this service for over 20 years, and tested many samples for customers in Switzerland and abroad. Among our customers we count:

- Federal and cantonal offices for plant protection
- Phytosanitary services
- Plant breeders and nurseries
- Horticultural enterprises

## ELISA test procedure

Our ELISA reagents are optimized for use in the double antibody sandwich procedure (DAS-ELISA) in certified microtiter plates. It is a robust procedure providing high test security and which is applicable to the testing of all major plant crops. Below a brief summary of the DAS-ELISA procedure is given:



1. Antibodies specific to a certain pathogen are adsorbed to the surface of the wells of a microtiter plate.



2. Plant samples are homogenized and the obtained extract distributed into the wells of the microtiter plates pre-treated with the antibodies. The pathogen (antigen) in the sample is recognized and captured by the antibodies.



3. Enzyme-labeled antibodies are added and react with antigen-antibody complex bound to the surface of the wells. All unbound reagents are eliminated by a thorough washing of the wells.



4. A substrate solution is added that undergoes a color change if the antigen was present in the sample.

The following pathogens can be detected in our test service laboratory by ELISA:



### Potato

Andean potato latent virus	(APLV)
Andean potato mottle virus	(APMoV)
Alfalfa mosaic virus	(AMV)
Potato leafroll virus	(PLRV)
Potato mop-top virus	(PMTV)
Potato virus A	(PVA)
Potato virus M	(PVM)
Potato virus S	(PVS)
Potato virus X	(PVX)
Potato virus Y	(PVY)
Potato virus V	(PVV)
Poty group test	(poty group)
<i>Spongospora subterranea</i> f. sp. <i>subterranea</i>	(Sss)
Tomato black ring virus-potato strain	(TBRV-p)
Tobacco necrosis virus	(TNV)
<i>Verticillium</i> spp.	(Verticillium)



### Vegetables

Arabis mosaic virus	(ArMV)
Bean common mosaic virus	(BCMV)
Bean common mosaic necrosis virus	(BCMNV)
Bean golden mosaic virus	(BGMV)
Cauliflower mosaic virus	(CaMV)
Cucumber mosaic virus	(CMV)
Garlic common latent virus	(GCLV)
Impatiens necrotic spot virus	(INSV)
Leek yellow stripe virus	(LYSV)
Lettuce mosaic virus	(LMV)
Onion yellow dwarf virus	(OYDV)
Papaya ringspot virus	(PRSV)
(= Watermelon mosaic virus 1)	
Pepino mosaic virus	(PepMV)
Potato virus X	(PVX)
Potato virus Y	(PVY)
Poty group test	(poty group)
Shallot latent virus	(SLV)
Squash mosaic virus	(SqMV)
Tobacco streak virus	(TSV)
Tomato mosaic virus	(ToMV)
Tomato spotted wilt virus	(TSWV)
Tomato yellow leaf curl virus	(TYLCV)
Tospovirus	(TSWV, INSV, TCSV, GRSV)
Turnip mosaic virus	(TuMV)
<i>Verticillium</i> spp.	(Verticillium)
Watermelon mosaic virus 1	(PRSV)
Watermelon mosaic virus 2	(WMV-2)
Zucchini yellow mosaic virus	(ZYMV)



## Fruit trees and small fruits

Apple chlorotic leaf spot virus	(ACLSV)
Apple mosaic virus	(ApMV)
Apple stem grooving virus	(ASGV)
Arabis mosaic virus	(ArMV)
Cherry leaf roll virus-ch	(CLRV-ch)
Cherry leaf roll virus-e	(CLRV-e)
Citrus tristeza virus	(CTV)
Papaya ringspot virus	(PRSV)
Plum pox virus (Sharka)	(PPV)
Poty group test	(poty group)
Prune dwarf virus	(PDV)
Prunus necrotic ringspot virus	(PNRSV)
Raspberry bushy dwarf virus	(RBDV)
Raspberry ringspot virus-ch	(RpRSV-ch)
Strawberry latent ringspot virus	(SLRSV)
Strawberry mild yellow edge potexvirus	(SMYEPV)
Tobacco ringspot virus	(TRSV)
Tobacco streak virus	(TSV)
Tomato ringspot virus-Ch	(ToRSV-Ch)
Tomato ringspot virus-PYBM	(ToRSV-PYBM)
Verticillium spp.	(Verticillium)
<i>Xanthomonas fragariae</i>	(Xfr)

## Ornamentals



Apple mosaic virus	(ApMV)
Arabis mosaic virus	(ArMV)
Cucumber mosaic virus	(CMV)
Impatiens necrotic spot virus	(INSV)
Pelargonium flower-break virus	(PFBV)
Pelargonium leaf curl virus	(PLCV)
Pelargonium line pattern virus	(PLPV)
Potato virus A	(PVA)
Potato virus X	(PVX)
Potato virus Y	(PVY)
Poty group test	(poty group)
Prunus necrotic ringspot virus	(PNRSV)
<i>Ralstonia solanacearum</i>	(Rs)
Strawberry latent ringspot virus	(SLRV)
Tobacco ringspot virus	(TRSV)
Tobacco streak virus	(TSV)
Tomato ringspot virus-Ch	(ToRSV-Ch)
Tomato ringspot virus-PYBM	(ToRSV-PYBM)
Tomato spotted wilt virus	(TSWV)
Tospovirus	(TSWV, INSV, TCSV, GRSV)
Verticillium spp.	(Verticillium)
<i>Xanthomonas campestris</i> pv. <i>pelargonii</i>	(Xcp)

## Field crops



Alfalfa mosaic virus	(AMV)
Barley yellow dwarf virus-type B	(BYDV-B)
Barley yellow dwarf virus-type F	(BYDV-F)
Barley yellow dwarf virus-RPV	(BYDV-RPV)
Beet necrotic yellow vein virus (Rhizomania)	(BNYVV)
Cucumber mosaic virus	(CMV)
Maize dwarf mosaic virus	(MDMV)
Impatiens necrotic spot virus	(INSV)
Potato virus X	(PVX)
Potato virus Y	(PVY)
Poty group test	(poty group)
Sugarcane mosaic virus	(SCMV)
Tomato spotted wilt virus	(TSWV)
Tospovirus	(TSWV, INSV, TCSV, GRSV)
Tobacco mosaic virus	(TMV)
Tobacco necrosis virus	(TNV)
Tobacco streak virus	(TSV)

## Grapevine

### Groupe 1



Arabis mosaic virus	(ArMV)
Grapevine fanleaf virus	(GFLV)
Raspberry ringspot virus-ch	(RpRSV-ch)
Raspberry ringspot virus-g	(RpRSV-g)
Strawberry latent ringspot virus	(SLRSV)
Tobacco ringspot virus	(TRSV)
Tomato ringspot virus-Ch	(ToRSV-Ch)
Tomato ringspot virus-PYBM	(ToRSV-PYBM)

### Groupe 2

Grapevine fleck virus	(GfKV)
Grapevine leafroll-associated virus 1	(GLRaV 1)
Grapevine leafroll-associated virus 2	(GLRaV 2)
Grapevine leafroll-associated virus 3	(GLRaV 3)
Grapevine leafroll-associated virus 6	(GLRaV 6)
Grapevine leafroll-associated virus 7	(GLRaV 7)
Grapevine virus A	(GVA)

## Recommendations for grapevine tests

For the timing and selection of the appropriate test sample it is important to know that the concentration of the viruses may vary according to season, plant organ, meteorological conditions, and species of the virus.

In general, grapevine viruses are detectable by ELISA in leaves or in the wood of mature canes. Testing of mature canes is possible for both groupes, however, for testing leaves, differences occur and we recommend taking into account following suggestions for sampling (indications valid for Western Europe):

For viruses of groupe 1:

- Young leaves at beginning of the vegetation period (May - June).
- Wood of mature canes.

For viruses of groupe 2:

- Mature leaves and petioles at the end of the growing season (end of August - October).
- Wood of mature canes.
- For testing root stocks, wood of mature canes is the only reliable sample tissue.

## PCR tests

Since recently, we are offering PCR («polymerase chain reaction») analysis for pathogens, which can hardly or not at all be detected by ELISA:

- Phytoplasmas (MLO) on grapevine, fruit trees, small fruits
- Rupestris stem pitting-associated virus on grapevine
- Bacterial diseases on potato (Rs and Cms)
- other pathoges on request

Contact us as early as possible to specify sampling and conditions of the assay.

## What requirements do we ask from your part?



- 1 Please contact us by phone, fax, or e-mail for to arrange conditions and timing, and for ordering the quantity of extraction bags necessary for your leaf samples.

1	.....
2	.....
3	.....

- 2 Record your samples on a list with ongoing numbers and label your samples accordingly.



- 3a **Leaf samples:** take approx. 0.25 g of plant material. A piece of 4x4 cm (or several small fragments) are generally recommended. Place the sample in the extraction bag (always in the same compartment, please), at approx. one third of the height of the bags.



- 3b **Wood samples:** Cut branches of 30 - 50 cm in length (or at least 2-3 internodes). Label the samples with self-adhesive paper according to your list. Do not use dry (dead) wood samples.



- 4 Send the samples with priority (over night) shipping to:

**BIOREBA AG**  
**Chr. Merian-Ring 7**  
**CH-4153 Reinach BL1**  
**Switzerland**

Avoid shipping during week-ends or holidays.

If required, attach the import autorisation issued by the Swiss federal office for agriculture provided by Bioreba.



- 5 3 to 4 days after receipt of the samples, you will receive the written report of the test results.

## **ELISA tests**

Our test service guarantees

- independent testing
- double well tests
- reliable results
- report within 5 working days
- confidentiality

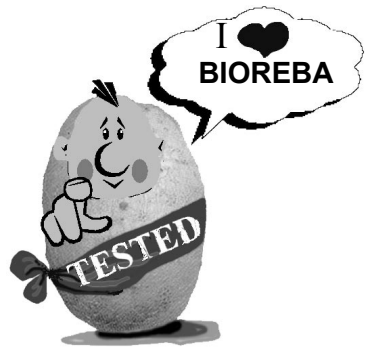
Number of samples	price per test	
	for 1 pathogen per sample	for each additional pathogen per sample
1-5 samples	€ 13.–	€ 4.–
6-10 samples	€ 11.–	€ 3.50
11-20 samples	€ 9.–	€ 3.–
21-60 samples	€ 8.–	€ 3.–
61-139 samples	€ 7.–	€ 2.50
140-400 samples	€ 6.–	€ 2.–

### **Additional costs:**

A basic fee of € 80.– is added to each order. For extraction of wood, bulbs, or onion, an additional fee of € 2.–/sample will be charged.

Prices are in Euros, VAT not included.

For large or standing orders ask for a special quote.



**BIOREBA AG**

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