# Catalogue 2024

primediagnostics

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webshop: shop.wur.nl/primediagnostics

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## General information on antisera

- Antisera that are not on the list can be produced on request. Please inquire.
- Custom-made conjugates with fluorescent labels or AP can be produced upon request.
- Protocols are available at www.primediagnostics.com.
- The AP-conjugate and coating should be diluted 1000x.
- The coating and alkaline phosphatase (AP) conjugates are suitable for use in DAS-ELISA only.

## Storage information and stability

- After long time storage at -20 °C avoid repeated freezing and thawing, as this can influence the product quality considerably.
- Coatings and AP-conjugates should preferably be stored at 4 °C. At 4 °C antisera are stable for at least two years.
- Controls and IgG should be stored in aliquots at -20 °C. Avoid repeated freezing and thawing. When treated properly these reagents will remain stable for at least two years.
- For long time storage (periods longer than one year) store at -20 °C, prepare aliquots if necessary.
- Lateral flow devices, packed in their original unopened (sealed) envelopes can be stored at room temperature. They will remain stable until expiration date. Lateral flow devices, packed in their original opened envelopes will remain stable for two weeks.
- Luminex reagents should be stored at 4°C. They will remain stable for two years.
- Lyophilized positive control (VPC) contain lyophilized leaf material. The lyophilized VPC remain stable for 1 year when stored at 4 °C. A prepared VPC can be stored in aliquots of 0.2 mL and is stable for 1 month at -20 °C and at 4 °C for 1 day.

## Information concerning the quality of the antisera

- Antisera are biological products and differences in reactivity between batches are apparent. Prime Diagnostics exercises strict quality control and guarantees the reactivity as indicated on the batch quality sheet (if applicable).
- Negative controls are optimized for use in different crops and are not suitable for determination of the selectivity of the assay.
- Positive controls are qualitative and cannot be used for quantification!
- The criteria for reactivity of ELISA reagents for bacterial detection are an $OD_{405}$ reading of the 10 times diluted positive control (end concentration of $10^7$ cells/mL) of $OD_{405} > 1.0$ after 30 minutes of substrate incubation.
- The criterion for reactivity of ELISA reagents for virus detection is an $OD_{405}$ reading of the 10 times diluted positive control of at least 0.5 OD after 30 minutes of substrate incubation. The value of the $OD_{405}$ may however vary depending on the ELISA reader used.
- Within our quality control procedure, our antisera are tested for lack of reactivity against a variety of pathogens and/or plant compounds known to occur in combination with the given pathogen. However, within the context of any given test, the possibility of false-positive results with unrelated organisms or plant or matrix substances should always be considered.
- Within our quality control procedure, our antisera are tested for specificity against a wide variety of currently known and recognized pathogenic isolates, strains and patho-types of the subsequent pathogens. However, new pathogenic or non-pathogenic strains and isolates of a given pathogen may emerge over time. Prime Diagnostics cannot guarantee that such a new strain or isolate will be detected with equal efficiency.

## Antisera to plant-pathogenic bacteria

- Antisera labeled with different conjugates are available on request. Prices can be supplied upon request.
- For all bacteria non-infectious positive controls are available for use in DAS-ELISA or IIF. These controls have a concentration of $10^8$ cells/mL.
- Negative controls consisting of non-infectious bacteria or plant extract are available on request.
- The dilution of the IgG for IIF is dependent on the assay used and laboratory circumstances. It is recommended to determine the working dilution of the reagents under on-site conditions.
- The IgG is suitable for use in indirect immunofluorescense (IIF) detection.

## Virus inocula

- Freeze-dried virus particles, dried plant material (to be reconstituted in buffer) or purified virus for inoculating purposes can be obtained on request. The amounts are generally sufficient for small-scale screening experiments.

## Orders and invoicing

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webshop : shop.wur.nl/primediagnostics

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## Abbreviations

| | | | |
|---|---|---|---|
| IIF | indirect immunofluorescence | CO | coating |
| DAS | double antibody sandwich | $OD_{405}$ | optical density at 405 nm |
| ELISA | enzyme linked immuno sorbent assay | mL | milliliter |
| LFD | later flow device | PC | positive control |
| AP | alkaline phosphatase | pv. | pathovar |
| VPC | lyophilized positive control | subsp | subspecies |

The antisera listed below are available for ELISA and Luminex format, LFD format on request. Ordering information and details of these formats can be found in the webshop of Prime Diagnostics: shop.wur.nl/primediagnostics.

| Pathogen (virus) | Acronym |
|---|---|
| Alfalfa mosaic virus | AMV |
| Alstroemeria carlavirus | AICV |
| Alstroemeria flower-banding virus | AIFBV |
| Alstroemeria mosaic virus | AIMV |
| Alternanthera mosaic virus | AltMV |
| Andean potato latent virus/Andean potato mild mosaic virus | APLV/ APMMV |
| Andean potato mottle virus | APMoV |
| Apple chlorotic leafspot virus | ACLSV |
| Apple stem grooving virus | ASGV |
| Arabis mosaic virus | ArMV |
| Bean common mosaic necrosis virus | BCMNV |
| Bean common mosaic virus | BCMV |
| Bean yellow mosaic virus | BYMV |
| Beet western yellows virus | BWYV |
| Bell pepper mottle virus | BePMV |
| Calibrachoa mottle virus | CbMV |
| Carnation etched ring virus | CERV |
| Carnation latent virus | CLV |
| Carnation mottle virus | CarMV |
| Carnation necrotic fleck virus | CNFV |
| Carnation ringspot virus | CRSV |
| Carnation vein mottle virus | CVMV |
| Cherry leafroll virus | CLRV |
| Chrysanthemum virus B | CVB |
| Cucumber green mottle mosaic virus | CGMMV |
| Cucumber mosaic virus | CMV |
| Cymbidium mosaic virus | CymMV |
| Dasheen mosaic virus | DsMV |
| Hosta virus X | HVX |
| Impatiens necrotic spot virus | INSV |
| Iris yellow spot virus | IYSV |
| Kalanchoe mosaic virus | KMV |
| Leek yellow stripe virus | LYSV |
| Lettuce big vein associated virus | LBVaV |
| Lettuce mosaic virus | LMV |

| Pathogen (virus) | Acronym |
|---|---|
| Melon necrotic spot virus | MNSV |
| Mirafiori lettuce big vein virus | MiLBVV |
| Odontoglossum ringspot virus | ORSV |
| Onion yellow dwarf virus | OYDV |
| Pea early-browning virus | PEBV |
| Pea seed-borne mosaic virus | PSbMV |
| Pelargonium flower-break virus | PFBV |
| Pelargonium line pattern virus | PLPV |
| Pepino mosaic virus | PepMV |
| Pepper mild mottle virus | PMMoV |
| Plum pox virus (‘sharka’) | PPV |
| Potato leafroll virus | PLRV |
| Potato virus A | PVA |
| Potato virus M | PVM |
| Potato virus S | PVS |
| Potato virus V | PVV |
| Potato virus X | PVX |
| Potato virus Y | PVY |
| Prune dwarf virus | PDV |
| Shallot yellow stripe virus | SYSV |
| Squash mosaic virus | SqMV |
| Strawberry latent ringspot virus | SLRSV |
| Streptocarpus flower-break virus | SFBV |
| Tobacco mild green mosaic virus | TMGMV |
| Tobacco mosaic virus | TMV |
| Tobacco ringspot virus | TRSV |
| Tomato aspermy virus | TAV |
| Tomato black ring virus | TBRV |
| Tomato brown rugose fruit virus | ToBRFV |
| Tomato bushy stunt virus | TBSV |
| Tomato mosaic virus | ToMV |
| Tomato ringspot virus | ToRSV |
| Tomato spotted wilt virus | TSWV |
| Tulip Virus X | TVX |
| Zucchini yellow mosaic virus | ZYMV |

The antisera listed below are available for IIF, other formats on request. Ordering information and details can be found in the webshop of Prime Diagnostics: shop.wur.nl/primediagnostics

| Pathogen (bacteria) | Acronym |
|---|---|
| *Curtobacterium flaccumfaciens pv. flaccumfaciens* | Cff |
| *Curtobacterium flaccumfaciens pv. oortii* | Cfo |
| *Clavibacter insidiosis* | Ci |
| *Clavibacter michiganensis subsp michiganensis* | Cmm |
| *Clavibacter michiganensis subsp sepedonicus* | Cms |
| *Dickeya chrysanthemi (Erwinia chrysanthemi)* | Ech |
| *Erwinia amylovora* | Eam |
| *Pectobacterium atrosepticum* | Eca |
| *Pseudomonas chichorii* | Pc |
| *Pseudomonas syringae pv. lachrymans* | Psl |
| *Pseudomonas syringae pv. mors-prunorum* | Psm |
| *Pseudomonas savastanoi pv. phaseolicola* | Psph |
| *Pseudomonas syringae pv. pisi* | Pspi |
| *Pseudomonas syringae pv. porri* | Pspo |
| *Pseudomonas savastanoi pv. savastanoi* | Pssa |
| *Pseudomonas syringae pv. syringae (strain specific)* | Pssy |
| *Pseudomonas syringae pv. tomato* | Pst |
| *Rhodococcus fascians* | Rhf |
| *Ralstonia solanacearum* | Rsol |
| *Xanthomonas axonopodis pv. dieffenbachiae* | Xcd |
| *Xanthomonas phaseoli pv. phaseoli* | Xcph |
| *Xanthomonas citri pv. fuscans* | Xcphf |
| *Xanthomonas axonopodis pv. begoniae* | Xcb |
| *Xanthomonas campestris* | Xccam |
| *Xanthomonas axonopodis pv. vesicatoria* | Xcv |
| *Xanthomonas axonopodis pv. fragariae* | Xf |
| *Xanthomonas hyacinthi* | Xch |
| *Xanthomonas hortorum pv. pelargonii* | Xcp |
| *Xanthomonas arboricola pv. pruni* | Xpru |

The antiserum listed below is available for LFD, other formats on request. Ordering information and details can be found in the webshop of Prime Diagnostics: shop.wur.nl/primediagnostics

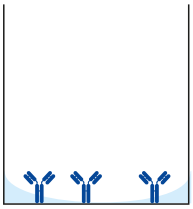
| Pathogen (fungi) | Acronym |
|---|---|
| *Phytophthora* | Phyto |

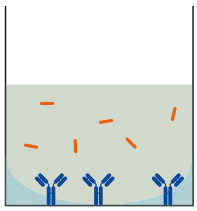
## Special terms and conditions of Wageningen Plant Research (WPR) concerning Prime Diagnostics Products

- These “Special terms of delivery” of Wageningen Plant Research (WPR) and the “General Terms and Conditions” of Wageningen University & Research will apply to all offers and all agreements between WPR and client concerning Prime Diagnostics Products. In case of conflict between both terms, these “Special terms and conditions” takes precedence over the “General Terms and Conditions”.
- Only webshop and e-mailed orders that have been accepted by WPR will be handled. Orders by phone are not handled.
- Complaints regarding deficiencies of the products delivered by WPR should be deposited within 2 months after the purchase and should be supported by relevant test results obtained with the standard protocol of Prime Diagnostics. In the event that WPR declares a complaint to be founded, WPR will be exclusively obliged to effect performance as agreed upon as yet or to refund the purchase price paid, at WPR’s exclusive discretion.
- All agreements between WPR and the clients are governed by Dutch Law only. All disputes shall be handled exclusively by the competent court in The Hague, The Netherlands.
- All products are supplied under the condition that they are for the exclusive use by the client. They may not be sold, integrated into other commercial applications nor handed over to third parties without distribution or supply and license agreement.
- Antisera are biological products and differences in reactivity between batches may occur. Therefore any guaranty given by WPR is limited to the relative reactivity in a standard performed DAS-ELISA with a 10 times diluted positive control originating from Prime Diagnostics.
- By placing any order with WPR, the client declares that he/she has read and accepts these “Special terms of delivery” as well as the “General Terms and Conditions” of WPR and that he/she has complete knowledge of the current product information.
- Client shall use the material in appropriate containment conditions only for research purposes. In no event WPR shall be liable for any use by client of the material or any loss, claim, damage, or liability of whatever kind of nature, which may arise from or in connection with this agreement or the use, handling, storage or transport of the material. WPR shall be safeguarded by the recipient company against any claim regarding these matters. Any damage or loss to the material during transport is at the purchaser’s full risk.
- In the event of any liability of WPR, this liability will be limited to the invoice amount for that part of the order to which the liability pertains, on the understanding that this amount shall in no event exceed the amount WPR in such case will receive from its liability insurance.
- Most of the conjugated antibodies are stabilized with bovine serum albumin (BSA). Due to European legislation (EU DIR 1774/2002 and 668/2004) the use of BSA is not allowed in fields of human or veterinary medicine, agriculture, food or cosmetics. By ordering antibodies from WPR client acknowledges that the ordered product, containing BSA, will be used exclusively for research and analytical purposes. If required a form for the written declaration can be obtained on request or downloaded from our website www.primediagnostics.com.
- Most products are usually available from stock and are shipped within two weeks on receipt of the order. However, to ensure timely delivery, orders should be placed 8 weeks prior to the desired delivery date. In the event of force majeure WPR will be entitled to suspend performance of the agreement or to terminate the agreement without recourse to the courts and without any liability towards the client. Force majeure on the part of WPR means any circumstance beyond the control of WPR, for example: strikes, fire, war, damage, transport difficulties, export obstructions, defaults on the part of suppliers and legal bars to manufacture or to supply the products.
- Payment should be made by wire transfer (Euro Base Payment applying code SHA (shared costs)) using IBAN of WPR and BIC/SWIFT of RABOBANK within 30 days after date of the invoice.
- Permits, import charges or client’s formalities necessary for import by the client of the ordered products are not the responsibility of WPR. It is the responsibility of the client that the client takes care of this before placing an order. All necessary permits need to be in the possession of WPR before an order can be shipped and WPR cannot be held responsible for any damages or import charges that might occur from import problems. The client has to verify if the use of the products is allowed by its government.
- Prices are CPT (Incoterms 2020) in Euros (€), excluding VAT and all orders are charged with € 25.00 for handling. Orders exceeding € 5000.00 are free of handling costs.
- Specificity of the antisera is tested against strains known to be pathogenic at the time of the last actual testing. WPR cannot be held responsible for possible false positive or false negative results caused by newly emerging pathogens, developed resistance, pathogen strains or plant or matrix substances.
- The client has to verify the suitability of the products before purchasing the products. When the product information isn’t clearly enough the client has to ask WPR for more information.
- For payments the following VAT number of Wageningen Plant Research have to be used:
  - Domestic: NL811383696B07
  - Foreingn : NL806511618B01.
- WPR does not accept the responsibility for any direct or indirect damage that might arise from the use of delivered products. WPR shall be safeguarded by the recipient company against any claim regarding the delivery and / or the use of the delivered products.

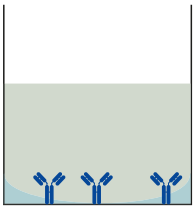
## Schematic overview of the ELISA procedure

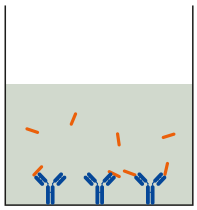
These figures do  not represent the correct dimensions of the reagents and consumables.



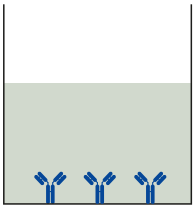


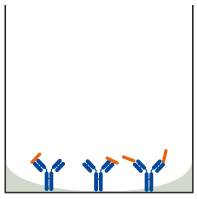
Add plant samples to antibody coated microtiterplate wells (top). Sample containing plant pathogenic organisms (left) , healthy plant material (right).



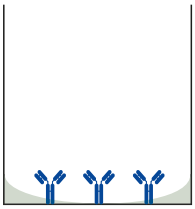


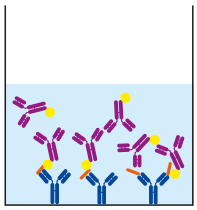
When samples contain plant pathogenic organisms these pathogens will be captured by the antibodies coated to the surface of the microtitre plate (left).
When no pathogens are present nothing will be captured (right).



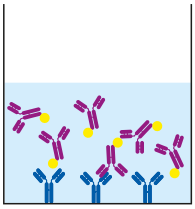


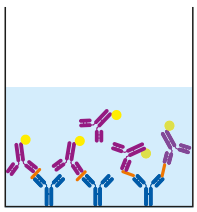
Wash microtitre plate to remove all debris from plant material. The captured pathogens remain captured (left) while in the healhty plant material nothing will remain (right).



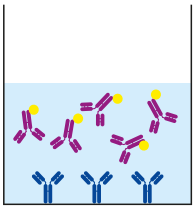


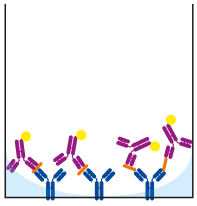
Add alkaline phosphate (AP) conjugated secondary antibodies.



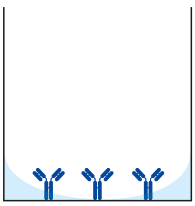


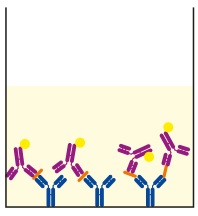
When samples contain plant pathogenic organisms AP-conjugated antibodies will bind to the captured pathogens (left). When no pathogens were captured the AP-conjugated secondary antibodies will not bind (right).



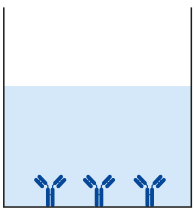


Wash microtitre plate. The AP-conjugated secondary antibodies remain captured (left) while in the healhty plant material nothing was captured and will remain (right).



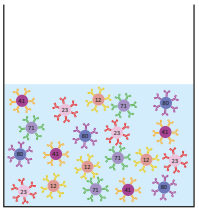


Examine result after adding substrate and incubating for 30 minutes.

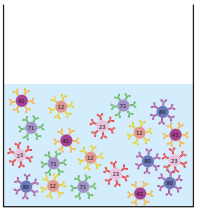


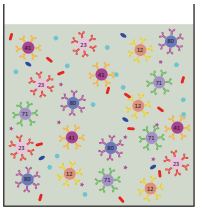
## Schematic overview of the Luminex procedure

These figures do not represent the correct dimensions of the reagents and consumables. The bead mixtures used contain hundreds of beads of different bead addresses. Each bead address is conjugated to one (1) specific antibody for one (1) specific plant pathogenic organisms. This makes it possible to test for multiple pathogens simultaneousy, each bead address - plant pathogen combination is specifid for the pathogen it was designed for.

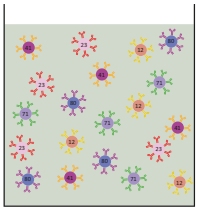


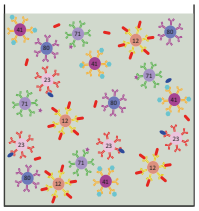
Add conjugated bead antibody mixture (hundreds of beads of the five bead addresses 12, 23, 41, 71 and 80, each conjugated with a specific antibody) to the microtiterplate wells.



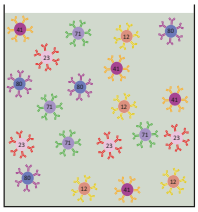


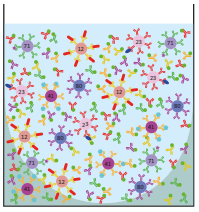
Add plant samples to microtiterplate wells, mix and incubate.



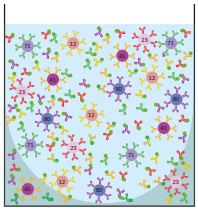


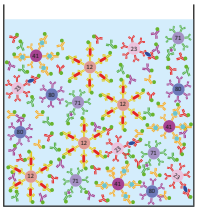
During incubation the plant pathogens will be captured by the specific antibodies conjugated to their bead address (left). If no pathogens are present nothing will be captured (right).



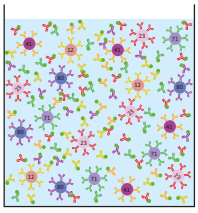


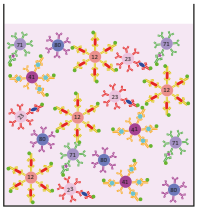
After a wash step a mixture of biotinylated secondary antibodies is added and incubated.



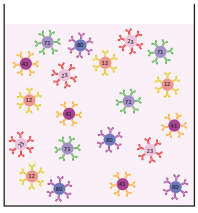


During this incubation the biotinylated secondary antibodies will bind to the plant pathogens (left). If no pathogens are present no biotinylated secondary antibodies will bind (right).





After a wash step all antibodies, that didn't bind are removed and a dye (SA-PE) is added. The SA-PE will bind to the biotine and after a short incubation the samples can be measured. The higher the signal the more of the detected plant pathogen present in the sample.

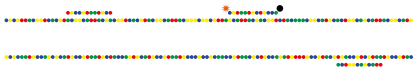


| Sample | Plant pathogen | | | | |
|---|---|---|---|---|---|
| | 1 (bead 12) | 2 (bead 23) | 3 (bead 41) | 4 (bead 71) | 5 (bead 80) |
| 1 | 2500 | 200 | 1356 | 230 | 28 |
| 2 | 27 | 30 | 29 | 33 | 31 |
| n | x | x | x | x | x |

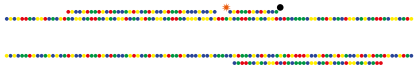
## Schematic overview of the TaqMan procedure

These figures do  not represent the correct dimensions of the reagents and consumables.

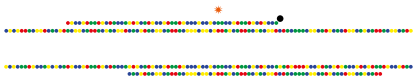
After DNA isolation specific primers and probe are added to the sample. The probe consists of quencer () and a fluorescent () molecule. When fluorophore and quencher are in proximity, quenching inhibits any fluorescence signals.



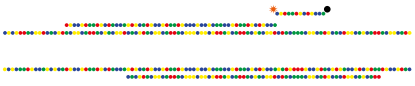
1. When the target is present  the primers and probe will bind to the DNA (left) at a specified temperature. If the target isn't present the primers and/or probe wil not bind (right).

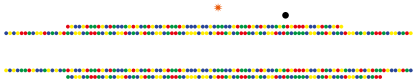


2. Next, the temperature is decreased and polymarase will elongate the primers.

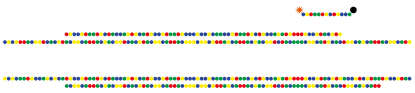


3. During elongation the polymerase will displace and cleave the probe, releasing a fluorescent molecule which will be measured (left). The fluorescence detected in the quantitative PCR is directly proportional to the fluorophore released and the amount of DNA template present in the PCR. When the probe didn't bind the probe is not cleaved and no fluorescent molecule will be released.

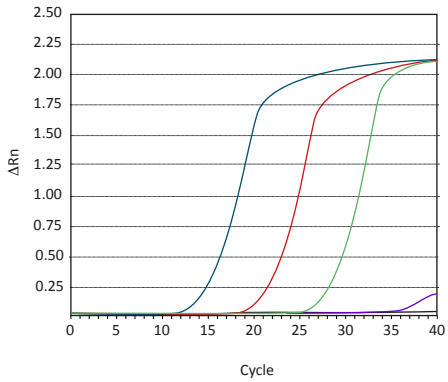




4. After increasing the temperature the DNA denaturates and two single DNA strands are formed and the whole proces of binding and elongation can start over again (1). Now with the doubled amount of targets.



The above steps can be repeated up to 40 tims and in each repetition more fluorescent molecules will be released. In this way the signal is amplified exponentially. When plotted inm a graph (Fig.



| Comparison between ELISA and Luminex xMAP | |
|---|---|
| ELISA | Luminex xMAP |
| Workflow | |
| 1. Coat microtitre plate | 1. Sample extraction |
| 2. Sample extraction | 2. Add bead mixture to the wells of microtitre plate |
| 3. Transfer samples to the wells of microtitre plate | 3. Transfer samples to the wells of microtitre plate |
| 4. Incubate and wash | 4. Incubate and wash |
| 5. Add secondary antibody-AP conjugate | 5. Add secondary antibody mixture |
| 6. Incubate and wash | 6. Incubate and wash |
| 7. Add reporter | 7. Add streptavidin-R-phycoerythrin |
| 8. Incubate and analyse | 8. Incubate, wash and analyse |
| Multiplex | |
| No, multiplex not possible | Yes, up to 20 targets simultaneous detectable |
| Speed | |
| Depending on incubation times 16 to 24 hours | Finished in less than 4 hours |
| Consumables and labour input | Consumables and labour input |
| For each new target extra amounts of consumables and labour needed | Consumables and labour input not influenced by number of targets (pathogens) |
| Flexible | |
| No, coated or pre-coated microtitre plates needed | Yes, on demand the tests can be performed |
| Generaly, whole plate has to be used | Depending on sample numbers (part of plate can be used) |
| Evaporation of samples in the wells at the edges of the plate | All wells of microtitre plate can be used |
| Reliability | |
| Duplos needed for reliable results | No duplos needed, for each targets more than 50 repetitions are measured |

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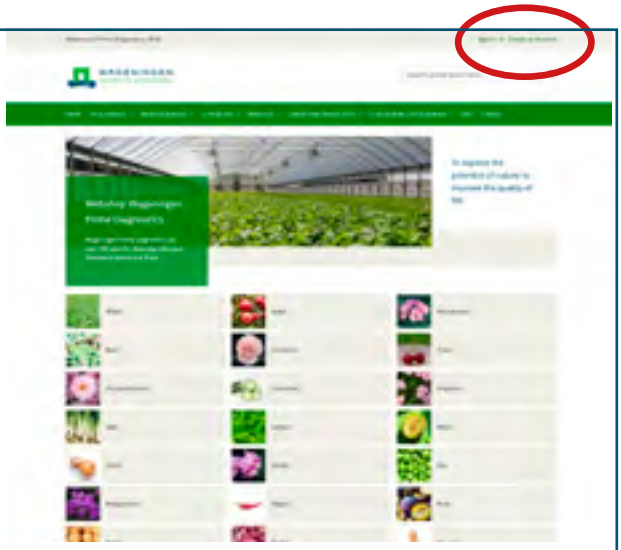
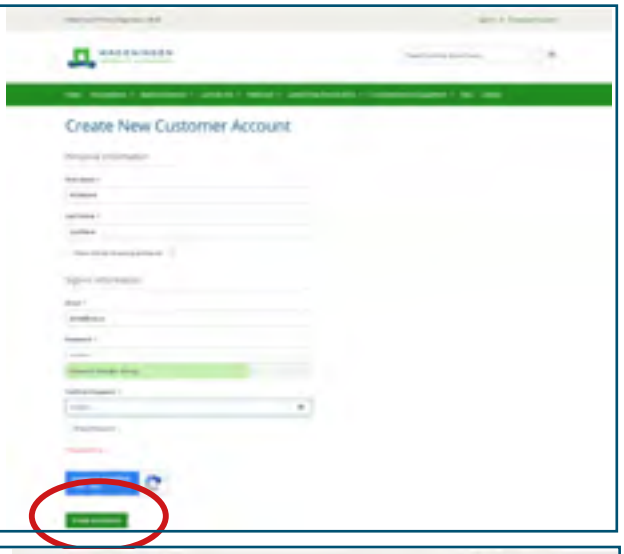
Or copy https://shop.wur.nl/primediagnostics to your web browser

This will open the webshop of Prime Diagnostics.
If you already created an account: login

If you are a first time user: Select “Create an Account” ,
and follow the steps in the guide shown below

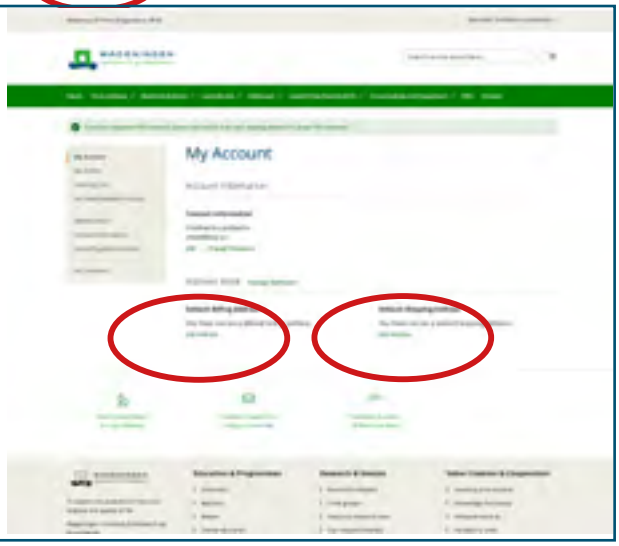


This will open the following screen:

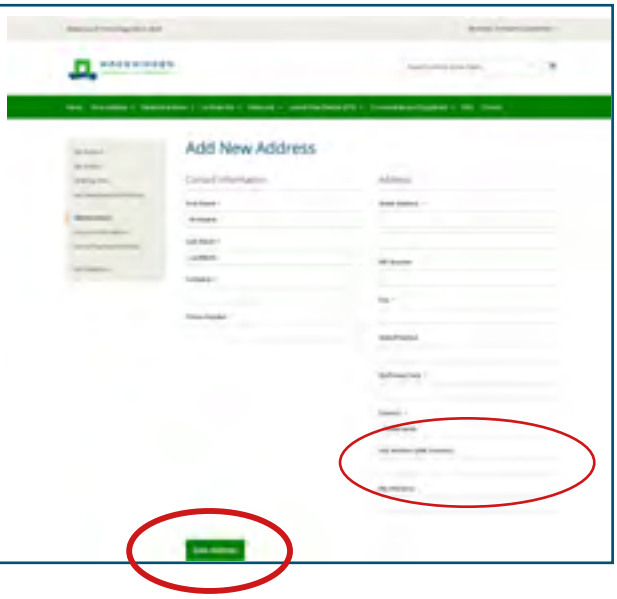



Fill in the required fields (marked with *), next click “Create an Account”.

After the account is created, please fill in the billing address, if the shipping address is different you need to provide this information as well.

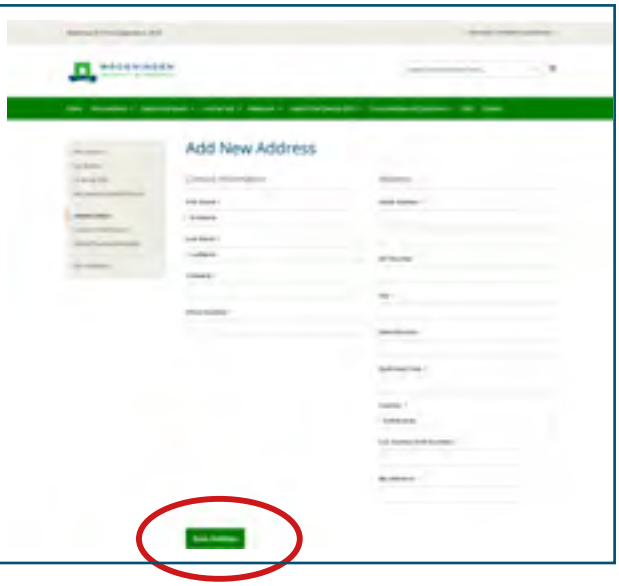


Add address details, and if applicable Chamber of Commerce number




Save address, and go to shipping address

Save shipping address

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