



# NAK Services B.V.

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 KvK-nr. 53704274  
 BTW-nr. NL8509.83.174.B.01

To our relations

**Subject** : virus and bacterial diagnostics in potatoes  
**Date** : 18 July 2018  
**Character** : 2018/NS/210

## About NAK Services Ltd.

We analyse your potato tubers on virus, bacteria and/or nematodes in combination or separately. We offer you several high end examination methods for your seed potatoes. Hereby we work according EN-ISO 17025 norm and quality standards.

## Virus

We analyse potato tubers on different viruses with the ELISA- or PCR-technique.

Virus examination	ELISA	Real-time PCR
<b>Determined potato virus</b>	<p>PVA, PVM, PVS, PVX, PVY, PVV, PLRV (potato leaf roll virus), PMTV (potato mop top virus) and TSWV (Tomato spotted wilt virus)</p> <p>PVX can be examined separately from PVS, but can also be joined in one ELISA reaction. ELISA: combination is cheaper since costs are only charged for one virus</p>	<p>Standard: PVY, PVA, PVX and PLRV (potato leaf roll virus)</p> <p>Optional: PVS; max. 4 virus combinations in the PCR test</p> <p>TRV (tobacco rattle virus), PMTV (potato mop top virus) can also be tested in a PCR test. PMTV and TRV are tested on tubers with PMTV and/or TRV symptoms</p>
<b>Required time for examination</b>	<p>6 - 9 weeks. Only available in the period 15 August - 15 December</p> <p>The required time for examination depends on the weather conditions because the samples grow in a greenhouse</p>	<p>&lt; 2 weeks (Priority: within 1 week)</p> <p>The PCR test is done directly on tuber material which saves time compared to ELISA test</p>
<b>Sample size and packaging</b>	< 110 potato tubers delivered in mesh bag	200 tubers delivered in mesh bag
<b>Collecting</b>	<p>96 plants will be tested            4 tubers/plants collected            Max. 24 reactions per sample</p>	<p>50 tubers collected directly taken from the tuber (more dependable test)            4 reactions per sample</p>
<b>Retesting</b>	On request within two weeks after receiving results in case of low germination	Retesting is not necessary since germination is no part of the test



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## Erwinia: bacterial blackleg/stem rot test

We examine potato tubers on the presence of bacteria which causes blackleg/stem rot.

This test will detect (latent) infections of *Pectobacterium atrosepticum* (Pa), *Dickeya* spp. (Dic), *Pectobacterium parmentieri* (Pp) and *Pectobacterium carotovorum* spp *brasiliensis* (Pcb).

	<b>Erwinia</b>
<b>Required time for examination</b>	3 weeks (priority < 2 weeks)
<b>Sample size packaging</b>	200 potato tubers in a meshbag
<b>Collecting</b>	50 tubers collected (4 reactions per sample)
<b>Examination method</b>	Real-time PCR

## Meloidogyne chitwoodi and fallax

*Meloidogyne chitwoodi* (Mc) and *M. fallax* (Mf) are both quarantine nematodes that can cause severe damage to their host plants, of which *Solanum tuberosum* (potato) is the most important. Identification to species level is based on molecular method using the real-time PCR.

	<b>Meloidogyne chitwoodi and fallax</b>
<b>Required time for examination</b>	< 4 weeks. Priority < 2 weeks
<b>Sample size packaging</b>	200 potato tubers in a polypropbag
<b>Collecting</b>	100 tubers collected (2 reactions per sample)
<b>Examination method</b>	Real-time PCR (multi-plex)

## Ringrot and brownrot test

We offer tests for latent infections of bacterial ring rot caused by *Clavibacter michiganensis* subsp. *sepedonicus* (Cms) and/or brownrot caused by *Ralstonia solanacearum* (Rsol).

	<b>Ringrot and brownrot examination</b>
<b>Required time for examination</b>	< 2 weeks; The results of negative samples will then become available. In case of a suspect sample we will perform confirmation tests. The complete diagnosis of positive samples for Cms or Rsol will be performed within 15 weeks after completing the fast screening test
<b>Sample size packaging</b>	200 tubers in a polypropbag
<b>Collecting</b>	200 potato tubers collected (1 reaction per sample)
<b>Examination method</b>	IF-method (first screening test). When a sample gives a positive reaction in the first screening, the sample will be send to Dutch NPPO where additional tests will be carried out (second screening)



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## Combination of tests

We advise you to combine the various tests on the same potato sample of 200 tubers. Each analysis will be invoiced separately. In case of a combination of an Erwinia test with a virus test you will pay

€ 75,00 for the Erwinia test instead of € 165,00. *Meloidogyne* examination on 200 tubers will be € 125,00 instead of € 165,00.

**All** of the following examinations can be performed on one single potato sample of 200 tubers (see annex):

- Virus PCR (standard combination PVY, PVA, PVX and PLRV), on request PVS can also be tested
- Erwinia (Black leg tests)
- *Meloidogyne chitwoodi* and *M. fallax*
- Brownrot and ringrot.

## Sample labelling

- All your samples should be labelled with unique NAK Services labels which are available on request. Send your request by e-mail to [nak@nak.nl](mailto:nak@nak.nl)
- You should attach one label on the outside of the sample bag and one inside the sample bag
- The samples with GMO modified material should be marked with special GMO labels. Contact us before sending GMO samples.

## Test results

You receive the results as an Excel- and/or PDF-file, per e-mail.

We present the amount of positive reactions instead of percentage and spread. If you want the percentage of diseased plants and spread, you can use the [seedcalc8 program](#).

## Packaging and logistics

Please send your samples in sample bags closed with a ty-rop or string.

We are able to provide any transport and labelling material necessary for transporting your samples to our laboratory (use euro-pallets). Your samples must be transported in a temperature between 10°C and 25°C.

Samples are only accepted on weekdays from 8.00 - 17.00 hour (except on Dutch public holidays).

Before sending your samples, please inform us via [nak@nak.nl](mailto:nak@nak.nl) one week beforehand, before sending us your samples. Please provide us with the following details:

- 1) expected date of delivery
- 2) the amount of samples
- 3) description which tests need to be performed on your samples.

Delivery address: NAK Services Ltd., Randweg 14, 8304 AS Emmeloord, The Netherlands.

## Shipment non EU-countries

For shipments and import license from the Dutch Plant Protection Service is needed, which will be sent by NAK Services. Therefore you have to inform NAK Services about the exact number of samples you want to send per shipment, so we can prepare the documents.



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## **Advice and support**

Specific questions regarding tests, samples, analytical issues and logistics can be forwarded to our Customer service department via ☎ 0031 (0)527-635400 or [nak@nak.nl](mailto:nak@nak.nl)

The NAK standard terms and conditions for the supply and services apply to our activities.

With kind regards,

M.A.M. Puylaert  
Account manager NAK Services Ltd.

Attachments: - Overview test methods  
- Price list seed potato testing.