



NAK Services B.V.

NAK Services B.V.
 Randweg 14
 Postbus 1115
 8300 BC Emmeloord
 Tel.: +31(0)527 635400
 Website: www.nak.nl
 E-mail: nakservices@nak.nl

Rabobank 1344.52.976
 IBAN NL13RABO0134452976
 BIC: RABONL2U
 KvK-nr. 53704274
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To our relations

Subject : virus and bacterial diagnostics in potatoes 2019-2020
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About NAK Services Ltd.

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

Shipment non EU-countries

Unfortunately, it is no longer possible to offer samples of potatoes from non-EU countries for research. This is a result of changed regulations and requirements that our laboratory must meet.

Virus

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

Virus examination	ELISA	Real-time PCR
Determined potato virus	PVA, PVM, PVS*, PVX*, PVY, PVV, PLRV (potato leaf roll virus), PMTV (potato mop top virus) and TSWV (Tomato spotted wilt virus) * PVX can be examined separately from PVS, but can also be joined in one ELISA reaction. Combination is cheaper since costs are only charged for one virus	Standard: PVY, PVA, PVX and PLRV* (potato leaf roll virus) TRV (tobacco rattle virus), PMTV (potato mop top virus) can also be tested in a PCR test. * Optional: PVS in stead of PLRV; max. 4 virus combinations in the PCR test
Required time for examination after receipt	6 - 9 weeks. Only available in the period 15 August - 15 December The required time for examination depends on the weather conditions because the samples grow in a greenhouse	< 2 weeks (Priority: within 1 week) The PCR test is done directly on tuber material which saves time compared to ELISA test
Sample size and packaging	< 110 potato tubers delivered in mesh bag	200 tubers delivered in mesh or polyprop bag
Collecting	96 plants will be tested 4 tubers/plants pooled Max. 24 reactions per sample	50 tubers pooled 4 reactions per sample
Retesting	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 PCR 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).

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

Meloidogyne chitwoodi and fallax PCR test

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.

	Meloidogyne chitwoodi and fallax
Required time for examination	< 4 weeks. Priority < 2 weeks
Sample size packaging	200 potato tubers in a polyprop bag
Collecting	100 tubers pooled (2 reactions per sample)
Examination method	Real-time PCR

Ringrot and brownrot IF test

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

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



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Combination of tests

We advise you to combine various tests on the same potato sample of 200 tubers. It reduces costs.

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

- Virus PCR (standard combination PVY, PVA, PVX and PLRV), PVS can also be tested in stead of PLRV.
- Erwinia (blackleg 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
- 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-rap. 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 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 needs to be performed on your samples.

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

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

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

With kind regards,

T. de Boer
Account manager NAK Services Ltd.

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