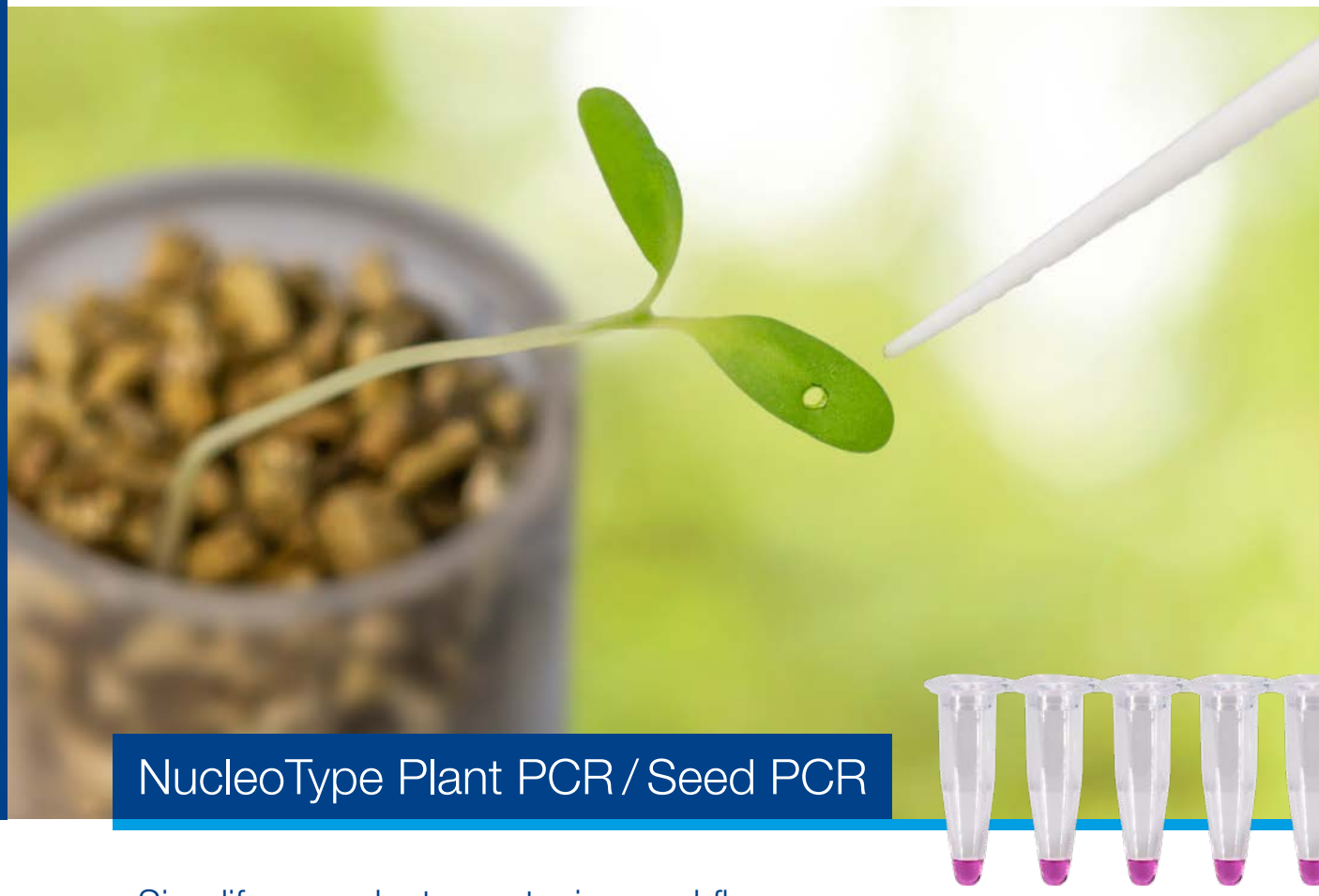
Bioanalysis

MACHEREY-NAGEL

Direct PCR from plant leaf and seed samples



NucleoType Plant PCR / Seed PCR

Simplify your plant genotyping workflow

- Patent pending plant sample transfer for superior PCR results
- Seed processing in less than 5 minutes
- Ready to go NucleoType HotStart PCR Master Mix included

PCR amplification from plant samples

NucleoType Plant PCR

Simplify your plant genotyping workflow

The NucleoType Plant PCR is designed for rapid plant typing experiments without the need for DNA purification. The kits enable a fast and convenient transfer of plant sample material directly into the ready to go HotStart PCR Master Mix. Tedious plant tissue sample collection such as leaf disc punching is not necessary. To harvest plant tissue the patent pending Plant Transfer Tool (PTT) just needs to be pierced in or through the leaf or petal tissue, followed by dipping the tool into the PCR Mix. The special coating of the PTT inactivates PCR inhibitors present in many plant materials to a considerably extend during sample transfer. After sample transfer, it is possible to store the PCR Mix for up to 2 hours at +4°C to +37°C before starting the cycling, admitting enought time to return from the growing site to the lab.

Hold bigger plant leaves easily by hand

For difficult to grasp plant leaves just take any supportive pad (not included)

Use the gripping tool of the PTT for small or hard to access plant leaves

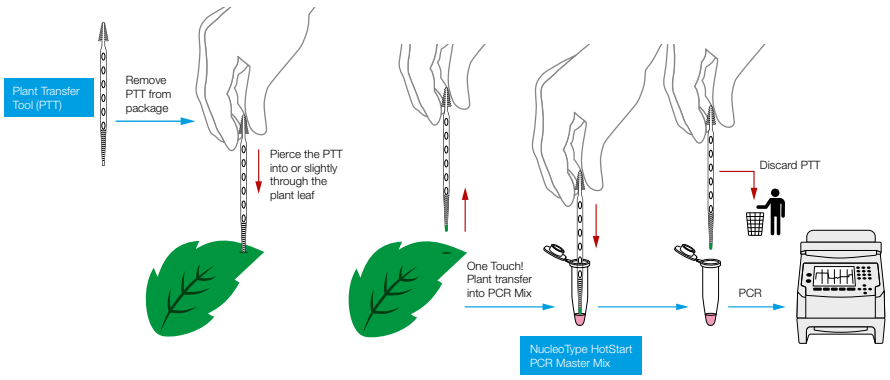
Product at a glance

PCR

NucleoType Plant PCR

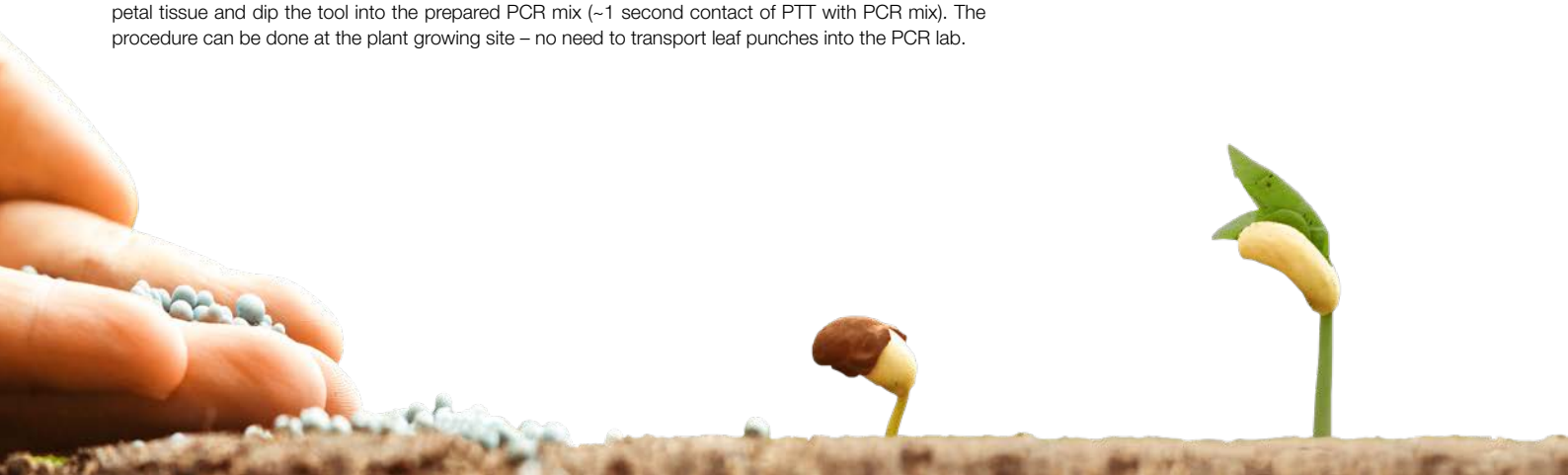
Technology	Direct PCR: Transfer of plant leaf aliquot with Plant Transfer Tool (PTT) directly into PCR mix
Format	10 µL PCR (optional up to 50 µL)
Sample type	Plant leaf material from e.g., corn, soybean, wheat, Arabidopsis, tobacco, cotton, grape wine, cress, as well as from kiwi, banana, and avocado fruit flesh
Preparation time	Sample preparation: < 1 min; PCR cycling: 30–90 min (cycler and target size dependent)
Amplicon size	Up to 1000 bp
Fragment size	> 300 bp–approx. 50 kbp; depending on sample processing
Analysis	Gel electrophoresis: Approx. 30 min (40 samples); Bioanalyzer®: Approx. 40 min (12 samples)

Procedure



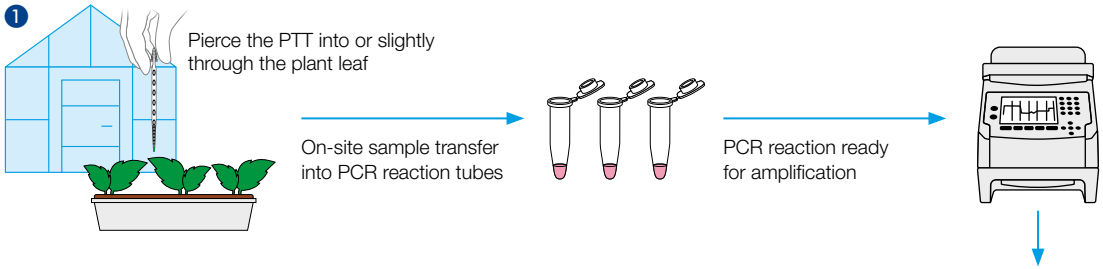
Sample processing

Sample uptake, interaction with coated reactive substance on the Plant Transfer Tool (PTT) and transfer into PCR reaction mix requires less than 5 seconds. Just pierce the PTT into or throught the leaf or petal tissue and dip the tool into the prepared PCR mix (~1 second contact of PTT with PCR mix). The procedure can be done at the plant growing site – no need to transport leaf punches into the PCR lab.



PCR amplification from plant samples

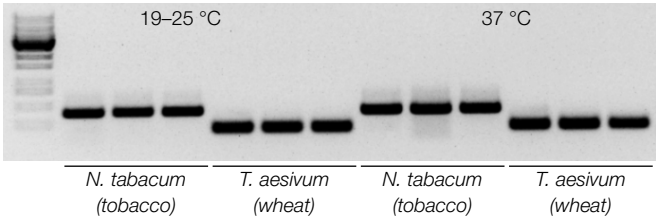
Application data

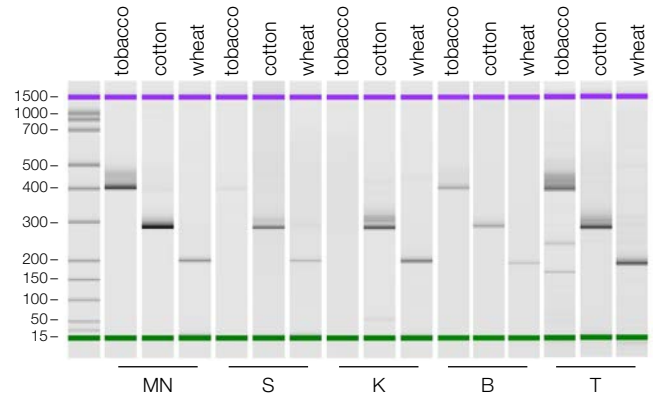


Take the lab to your greenhouse – On site sample transfer

Challenging plant samples derived from e.g. tobacco or wheat leaf were processed with the NucleoType Plant PCR kit utilizing the Plant Transfer Tool. The data demonstrate, that plant sample material can be obtained and transferred into the PCR at the plant growing site (1) and that there is up to 2 h time to return to the lab before starting the PCR cycling (see picture 2). Alternatively, PTT with adhering plant material can be stored for up to two hours and transported to the lab before dipping into the PCR (data not shown).

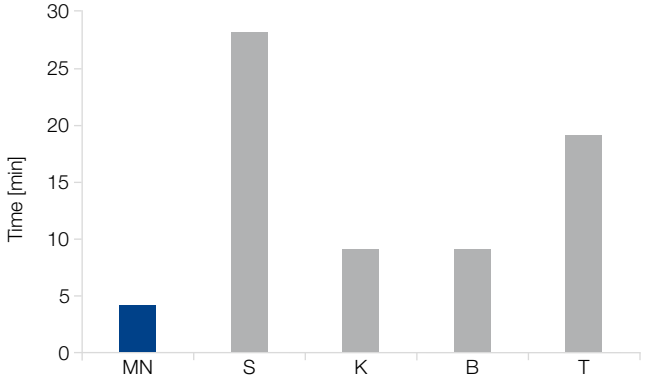
2 PCR after 2 h reaction tube storage at:





Highly specific amplification with the NucleoType Plant PCR kit

The NucleoType Plant PCR kit (MN) was used to analyze plant leaves from tobacco, cotton, and wheat in comparison to diverse competitors (processed according to manufacturer's recommendations). PCR was performed by amplification of a 422 bp fragment (tobacco), 308 bp fragment (cotton) and a 201 bp fragment (wheat). The Bioanalyzer® results demonstrate a higher specificity with less undesired amplifications in comparison to the competitor kits from S, T, K, B.



Reliable and fast sample preparation without the risk of cross contamination

The preparation time (4 PCR reactions with 3 different primer pairs) from sample uptake, to the start of PCR cycling is efficiently reduced due to the disposable Plant Transfer Tool (PTT). The NucleoType Plant PCR kit (MN) is one of the fastest genotyping kits on the market and in comparison to the competitor kits (S, T, K, B) there is no need for time consuming decontamination / cleaning of puncher/scalpel or sample lysis.

PCR amplification from seed samples

NucleoType Seed PCR

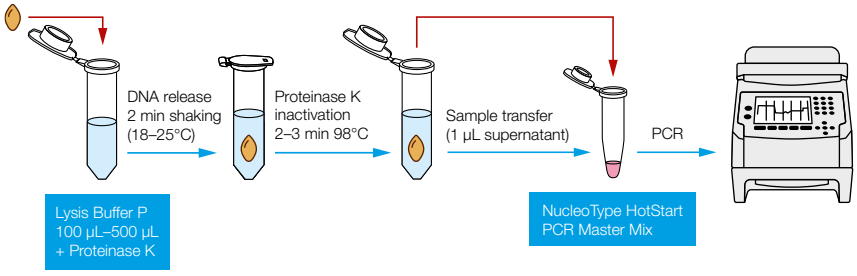
Speed up your seed genotyping workflow

DNA purification from whole or ground seed material is a time consuming and elaborate process. The NucleoType Seed PCR has been conceived for fast genotyping experiments without the need for DNA purification. For hard plant material, e.g. seeds, which hamper sample transfer with the Plant Transfer Tool (PTT), the NucleoType Seed PCR kit provides – instead of the PTT – the optimized Lysis Buffer P and Proteinase K for a simple sample preparation within a few minutes.

Product at a glance

	PCR NucleoType Seed PCR
Technology	Simple sample preparation suitable for hot start PCR
Format	10 µL PCR (optional up to 50 µL)
Sample type	Hard plant material like e.g., seeds from soybeen, wheat, corn, rice, as well as from moss, fern leaf, and fir needle
Preparation time	Sample preparation < 5 min; PCR cycling: 30–90 min (cycler and target size dependent)
Amplicon size	Up to 2000 bp
Analysis	Gel electrophoresis: Approx. 30 min (40 samples); Bioanalyzer®: Approx. 40 min (12 samples)

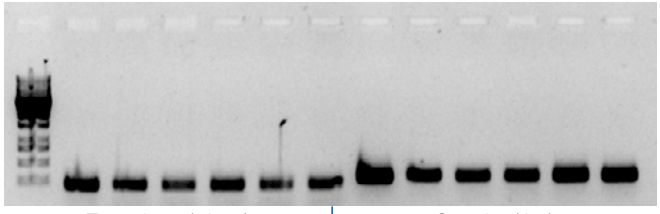
Procedure



Sample processing

The seed sample is placed into an adequate volume of Lysis Buffer P containing Proteinase K. After incubation of 2 min while shaking at room temperature (18–25°C), DNA is released. Subsequently the Proteinase K is deactivated at 98°C (2–3 min). Afterwards, 1 µL of template DNA (supernatant) is transferred into the PCR mix.

Application data



Seed sample genotyping

Seed samples (wheat and rice, n = 6) were placed into 100 µL Lysis Buffer P and incubated for 2 min while shaking at room temperature (18–25°C). After Proteinase K deactivation at 98°C (2–3 min), an aliquot of 1 µL template DNA was transferred into the PCR mix. A 201 bp fragment for wheat and a 308 bp for rice was amplified.

Ordering information

Product	Specifications	Preps	REF
NucleoType Plant PCR	Plant Transfer Tool (coated) for interaction with PCR inhibitors; NucleoType HotStart PCR Master mix (2x) containing polymerase, dNTPs, buffer, enhancer, loading dye and stabilizer	25 / 100 / 500	743202.25 / .100 / .500
NucleoType Seed PCR	Lysis Buffer P; Proteinase K; NucleoType HotStart PCR Master mix (2x) containing polymerase, dNTPs, buffer, enhancer, loading dye and stabilizer	25 / 100 / 500	743203.25 / .100 / .500

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MACHEREY-NAGEL

MACHEREY-NAGEL GmbH & Co. KG · Neumann-Neander-Str. 6–8 · 52355 Düren · Germany

DE / International:
Tel.: +49 24 21 969-0
Fax: +49 24 21 969-199
E-mail: info@mn-net.com

CH:
Tel.: +41 62 388 55 00
Fax: +41 62 388 55 05
E-mail: sales-ch@mn-net.com

FR:
Tel.: +33 388 68 22 68
Fax: +33 388 51 76 88
E-mail: sales-fr@mn-net.com

US:
Tel.: +1 484 821 0984
Fax: +1 484 821 1272
E-mail: sales-us@mn-net.com

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