

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/332223451>

The Timber Tracking Tool Infogram. Overview of wood identification methods' capacity.

Method · April 2019

DOI: 10.13140/RG.2.2.27920.25603

CITATIONS

0

READS

222

1 author:



Nele Schmitz

Thünen Institute

62 PUBLICATIONS 687 CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:



Global Timber Tracking Network [View project](#)



VLIR-KMFRI [View project](#)



GTTN

Global Timber
Tracking Network

The Timber Tracking Tool Infogram

Overview of wood identification methods' capacity

April 2019

Editor: Nele Schmitz

Contributors*:

Hans Beeckman¹, José Antonio Cabezas², María Teresa Cervera², Edgard Espinoza³, Juan Fernandez-Golfin², Peter Gasson⁴, John C. Hermanson⁵, Marysol Jaime Arteaga⁶, Gerald Koch⁷, Frederic Lens⁸, Sandra Martínez-Jarquín⁹, Kathelyn Paredes Villanueva^{10,11}, Tereza C.M. Pastore¹², Tahiana Ramananantoandro¹³, Rudolf Schraml¹⁴, Hilke Schröder¹⁵, Alexandre Sebbenn¹⁶, Niklas Tysklind¹⁷, Charlie Watkinson¹⁸, Alex C. Wiedenhoef⁵

José Bolaños, Jo Van Brusselen (The GTTN secretariat)

Affiliations:

1-Royal Museum for Central Africa, Tervuren, Belgium; 2-INIA-Centro de Investigación Forestal, Madrid, Spain; 3-National Fish and Wildlife Forensic Lab, Ashland, OR, USA; 4-Royal Botanic Gardens, Kew, UK; 5-US Forest Service Forest Products Laboratory, Madison, WI, USA; 6-FSC International, Supply Chain Integrity Program, Lima, Peru; 7-Thünen Institute of Wood Research, Bergedorf, Germany; 8-Naturalis Biodiversity Center, Leiden, The Netherlands; 9-Department of Biochemistry and Biotechnology, CINVESTAV Unidad Irapuato, Irapuato, Mexico; 10-Universidad Autónoma Gabriel René Moreno, Santa Cruz, Bolivia; 11-Wageningen University & Research, Wageningen, The Netherlands; 12-Laboratório de Produtos Florestais, Serviço Florestal Brasileiro, Brasília, Brazil; 13-Mention Foresterie et Environnement, Ecole Supérieure des Sciences Agronomiques, Université d'Antananarivo, Antananarivo, Madagascar; 14-WaveLab, University of Salzburg, Salzburg, Austria; 15-Thünen Institute of Forest Genetics, Grosshansdorf, Germany; 16-Instituto Floresta de São Paulo, São Paulo, Brazil; 17-Institut National de Recherche Agricole, Kourou, Guyane Française; 18-Agroisolib UK Ltd, York, UK

Icons by Freepik from www.flaticon.com

Recommended citation:

Schmitz, N. (ed.), Beeckman, H., Cabezas, J.A., Cervera, M.T., Espinoza, E., Fernandez-Golfin, J., Gasson, P., Hermanson J.C., Jaime Arteaga, M., Koch, G., Lens, F., Martínez-Jarquín, S., Paredes-Villanueva, K., Pastore, T.C.M., Ramananantoandro, T., Schraml, R., Schröder, H., Sebbenn, A.M., Tysklind, N., Watkinson, C., Wiedenhoef, A.C. 2019. The Timber Tracking Tool Infogram. Overview of wood identification methods' capacity. Global Timber Tracking Network, GTTN Secretariat, European Forest Institute and Thünen Institute.

Front cover:

NIRS Wood ID Project, T.C.M. Pastore

* Names are listed in alphabetical order.

Find out more at



gtn@efi.int



www.globaltimbertrackingnetwork.org



[@GTTNetwork](https://twitter.com/GTTNetwork)

LEGEND:

Methods generally suitable

Methods conditionally suitable

ⓘ : see next page for extended legend

1

anatomy

2

DNA

3

isotopes

4

DART

5

NIR

6

MV

Authentication question

Taxonomic identity of a specimen

Geographic origin of a specimen

Species level

Genus level

Country or region

Forest concession

Individual tree

1 2 4
5 6

1 2 4
5 6

1 2 3
4 5 6

Natural forest

Planted forest

2*

2 3 4 5

2* 3 5*

Analysis requirements

On site identification

Time-frame for identification

Resolution of geographic origin

Cost per specimen

Yes

No

1 m-1 h

1 d-1 w

4-6 w

Less than 1 km

More than 1 km

1-100 €

100-200 €

200-600 €

1 5

2

1 5

1 3

2 3

2 3

1 2 3

1 5

1 3

1 2

6

3 4

6

4 5

4 5 6

6

4 5

3

Test^① specimen characteristics

Type of test specimen

Minimal test specimen size

Solid wood

Pulp, paper, fibreboard

Smaller than 1 cm³

Bigger than 1 cm³

Veneer, plywood

Charcoal

Manufactured or raw wood

1

1 3 4

1 2

1 2
3 4

1 5

Heartwood

5 6

5 6

With resins or treated chemically

Without resins and untreated

Treatment unknown

Sapwood

Sap- or heartwood

1 2 3 4 5 6

1 2 3 4 5 6

1 2 3 4 5 6

1 2 3





1 2 3

4 5 6

Extended legend

The different wood identification methods:

1. Wood anatomy
2. Genetics
3. Stable isotopes
4. Direct Analysis in Real Time Time-of-Flight Mass Spectrometry (DART TOFMS)
5. Near-InfraRed Spectroscopy (NIRS)
6. Machine Vision (MV)

-  If reference specimens were collected from an individual tree or from a specific plantation, wood coming from that tree/plantation could be identified as such at the end of the supply chain. However, if no reference specimens were taken from the plantation, the DNA or NIRS profile will identify the geographic origin of the seed material used for that plantation and not the actual geographic position of the plantation.
-  Squares of the same colour should be interpreted together. For example, method 2 has a resolution of less than 1 km only in the case of an individual tree.
-  Test specimens have to be distinguished from reference specimens, for which there are different requirements. See the [GTTN sampling guide](#) for information on reference specimen requirements.
-  For conditionally suitable methods, contact an expert to discuss the specific case.

WHERE TO FIND AN EXPERT?

The infogram shows the current wood identification capacities of the different timber tracking tools. If you have identified one or more suitable methods for your identification request, you can send an inquiry to the [experts](#). **Contact data of the timber tracking experts** can be found via the [Find a Partner](#) button on the GTTN website.

GROWING POSSIBILITIES

Apart from the methodological capacities, whether a timber specimen can be traced back to its species/genus or its geographic origin also depends on the **availability of reference data**. Reference databases are continuously growing as is the **science behind the methods**. With time, the capacities of the different wood identification methods will only increase.



GTTN

Global Timber
Tracking Network

With support from



Federal Ministry
of Food
and Agriculture

by decision of the
German Bundestag

www.globaltimbertrackingnetwork.org

The objective of the Global Timber Tracking Network (GTTN) is to promote the operationalization of innovative tools for wood identification and origin determination, to assist the fight against illegal logging and related trade around the globe. GTTN is an open alliance that cooperates along a joint vision and the network activities are financed through an open multi-donor approach. GTTN phase 2 coordination (2017-2019) is financed by the German Federal Ministry of Food and Agriculture (BMEL).