

Paolo Balsari

## ENTAM and SPISE – Two essential elements for harmonisation of testing of plant protection equipment (PPE) in European Union\*

ENTAM und SPISE – Zwei wesentliche Beiträge zur Harmonisierung der Geräteprüfung in der Europäischen Union

### Abstract

ENTAM (European Network for Testing of Agricultural Machines) is a network of European bodies involved in testing agricultural machines which aims to promote the agricultural machinery performance certification by a «third part», to implement standardised tests of the performance, safety and environmental aspects of agricultural machinery and tools, to guarantee the agricultural machinery manufacturers that their machines fulfil the present standard requirements and to allow the farmer to have the necessary and certified technical information about machinery in order to make a correct choice when purchasing a new machine.

SPISE (Standardised Procedure for the Inspection of Sprayers in Europe) is an European working group that aims to harmonise and promote sprayers inspection in the European Union (EU), to exchange information on sprayers inspection activities between EU Member States, to establish a pool of experts for consultations with the European Commission (DG SANCO) and to develop common rules for which Member States are responsible (subsidiarity).

Both ENTAM and SPISE represent two essential elements for the harmonisation of testing of plant protection equipment (PPE) within the European Union and are strongly supported by the activity of the Julius Kühn-Institut (JKI) (ex BBA) Application Technique Unit that has been led by Prof. Heinz GANZELMEIER until 2012.

\* Der Artikel basiert auf einem Vortrag anlässlich der Fachtagung Gerätetechnik zur Verabschiedung von Herrn Dr.-Ing. Ganzelmeier im September 2012.

**Key words:** Sprayer, certification, inspection, standard

### Introduction

Use of pesticides will remain essential for agriculture worldwide in the next future, as world population is continuously increasing (9 billion people will populate the world in 2050) and there is the need to guarantee food quantity, quality and profitability. Nevertheless increasing concerns about the use of pesticides focus especially on the safety for users and for consumers as well as on the environmental protection. There are therefore new demands for more responsible and appropriate spray application techniques. In this sense a key role is played by sprayers and spraying equipment. It is estimated that more than 2,2 million of sprayers are operated in the European Union (60% of them is represented by field crop sprayers) and that the EU market of new spraying equipment amounts to 200 000 units per year. Two new regulations recently approved in Europe (EU Directive 127/2009 Amendment of the Machinery Directive and EU Directive 128/2009 on sustainable use of pesticides) state specific requirements dealing with environmental and operator safety, that spraying equipment shall follow. Especially the Directive on the sustainable use of pesticides contains a set of prescriptions aimed at reducing the overall pesticide consumption and at optimising the application techniques in the field.

The Directive 127/2009/EC has a direct impact on brand new sprayers while Directive 128/2009/EC concerns sprayers already in use.

### Institute

DiSAFA – Università di Torino, Grugliasco (TO), Italia

### Correspondence

Prof. Dr. Paolo Balsari, DiSAFA – Università di Torino, Via Leonardo da Vinci 44, 10095 Grugliasco (TO), Italia,  
E-Mail: paolo.balsari@unito.it

### Accepted

1 September 2014

Working groups of ENTAM (European Network for Testing of Agricultural Machines) and SPISE (Standardised Procedure for the Inspection of Sprayers in Europe) are involved in supporting sprayer manufacturers and farmers to comply with the requirements foreseen by these European Directives.

**ENTAM: features and role**

ENTAM was established in 1997 through an agreement between ENAMA (Italian national board for agricultural mechanisation), DLG (Germany) and BLT (Austria). Nowadays ENTAM full members are 11, based in Austria, France, Germany, Greece, Hungary, Italy, Poland and Spain (Fig. 1). Bulgaria, Argentina, Brazil and Russia are observer members while FAO (Food and Agriculture Organization of the United Nations) is honorary member.

Main objectives of ENTAM are:

- 1) to promote the agricultural machinery performance certification by a «third part»
- 2) to implement standardised tests of the performance, safety and environmental aspects of agricultural machinery and tools
- 3) to guarantee the agricultural machinery manufacturers that their machines fulfil the present standard requirements
- 4) to allow the farmer to have the necessary and certified technical information about machinery in order to make a correct choice when purchasing a new machine

ENTAM bodies test the agricultural machines following the network's common methodology, defined by an ENTAM Technical Working Group (TWG), which is based on ISO and EN standardised methodologies. If a standardised method is not available for a specific test then an officially agreed ENTAM test methodology (approved within the TWG) is applied.

At the end of testing activities ENTAM issues a test report in English and the machine becomes “ENTAM registered”.

A Team of Competence is then responsible for the recognition of test activities performed within ENTAM test stations. For instance, concerning sprayers, a ring test on the same sprayer was made at the end of the Nineties within the test stations operating in ENTAM in order to validate the results and to allow the mutual recognition of results obtained by each test station. In practice, when a sprayer is tested by one ENTAM test station then the other ENTAM member bodies are requested to recognise the results obtained, giving an official recognition number to the test report.

The test report contains a description of the machine with the main technical data, the main results of the functional tests with an assessment table that indicates the performance level reached for each single parameter examined (e.g. tank over volume, tank agitation system, accuracy of pressure gauge, etc.), information about testing of safety and the list of the ENTAM member bodies recognising the tests performed (Fig. 2-4).

According to ENTAM database (updated at September 2012) the total number of ENTAM recognised spraying



**Fig. 1.** Geographical distribution of 11 ENTAM full members.

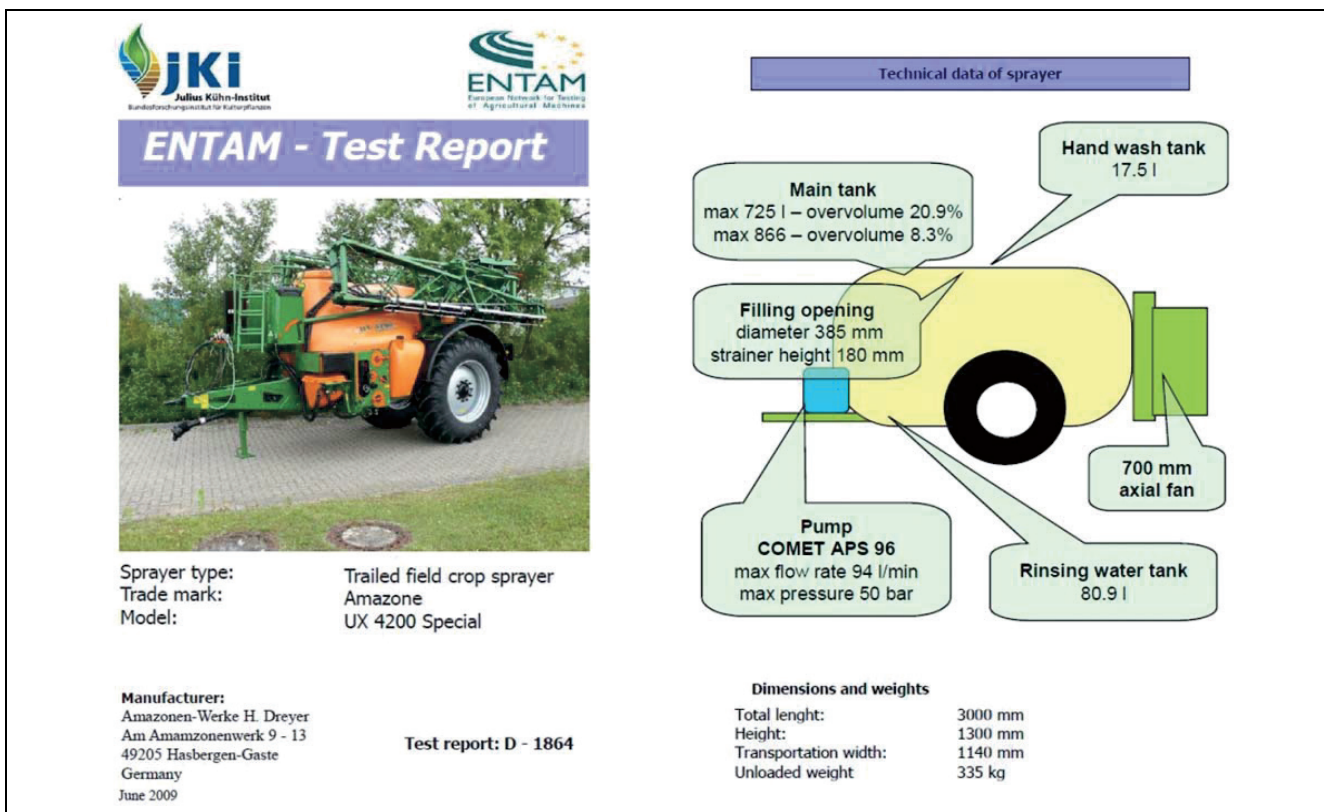


Fig. 2. Example of ENTAM test report for a sprayer: front page and scheme of main technical features.

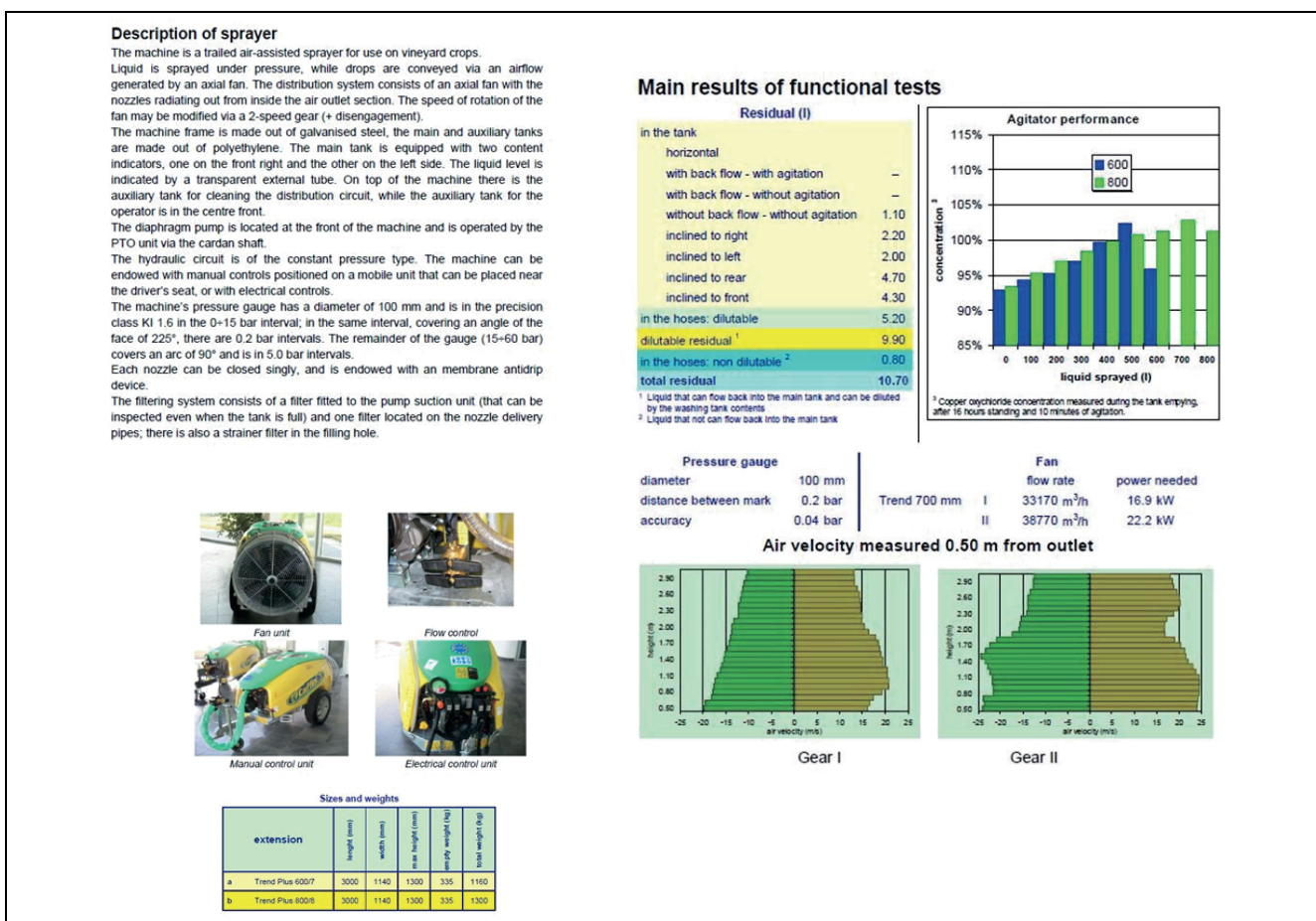


Fig. 3. Example of ENTAM test report for a sprayer: description of the machine and main test results.



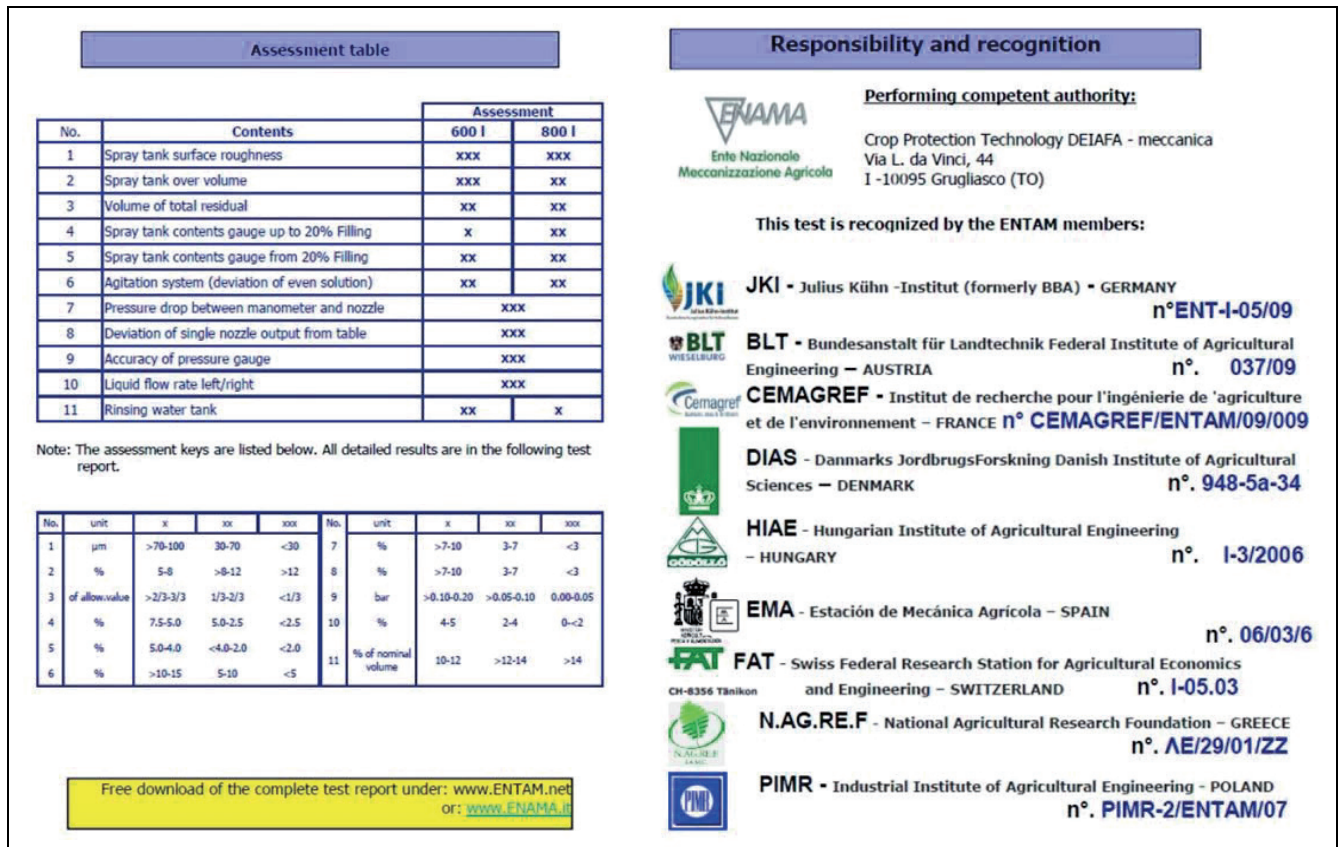


Fig. 4. Example of ENTAM test report for a sprayer: assessment table of test results and final page containing the indication of the performing competent authority and of the ENTAM members recognising the test.

equipment amounted to 114 whose 34 were air-assisted sprayers for arboreal crops, 30 were field crop sprayers, 49 were hydraulic spray nozzles and one was an induction hopper.

Trend of ENTAM tested sprayers and components s is continuously increasing as reported in Fig. 5. and in Fig. 6.

ENTAM is now focussing towards the improvement of the “third party” certification for providing a proof of the CE conformity according to what is prescribed by EU Directive 127/2009 and is looking for extending the ENTAM certification to other types of sprayers (e.g. hand held spraying equipment).

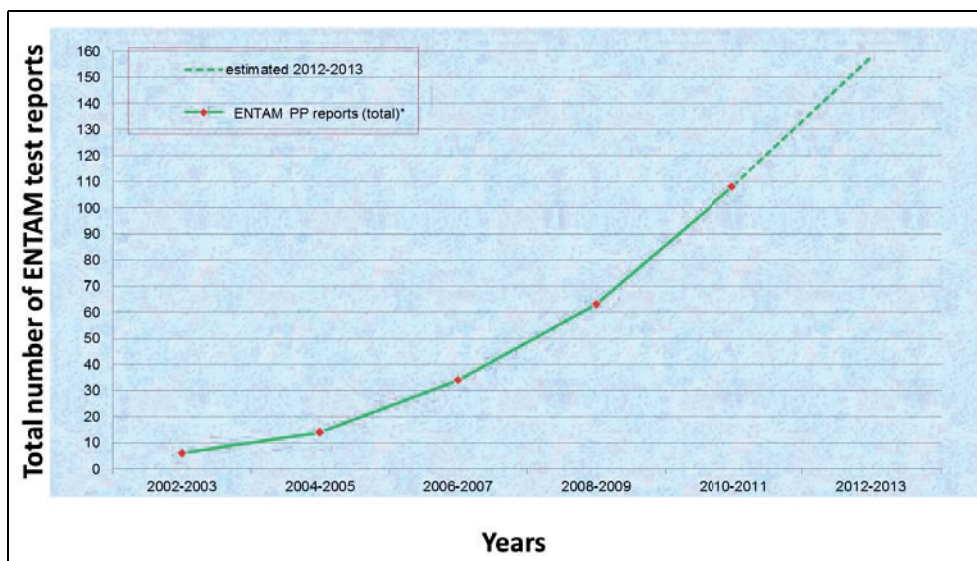


Fig. 5. Trend of ENTAM test reports regarding spraying equipment issued since 2002.

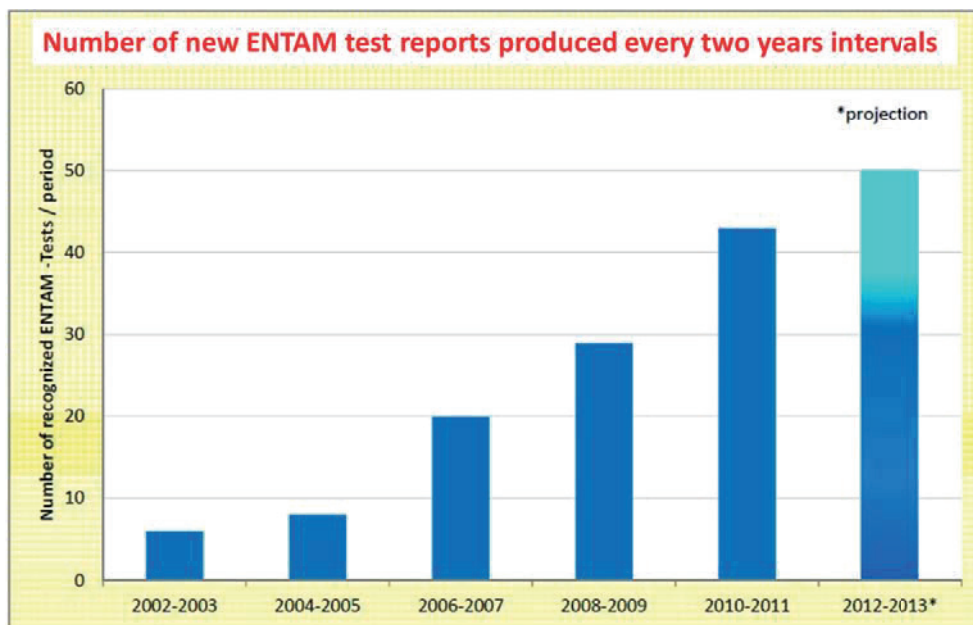


Fig. 6. Number of ENTAM test reports regarding spraying equipment issued every two years intervals since 2002.

Moreover there is the intention to consider more the environmental aspects of a sprayer in the ENTAM certification process, for instance applying an ad hoc instrument like TOPPS-EOS (see [www.topps-life.org](http://www.topps-life.org)) that was developed to assess how much a sprayer model is environmentally friendly on the basis of its technical features and accessories available.

### SPISE: features and role

SPISE is a working group established by Prof. Heinz GANZELMEIER during the first SPISE workshop that was held at Biologische Bundesanstalt für Land- und Forstwirtschaft (BBA), now Julius Kühn-Institut (JKI), in Braunschweig in 2004. It consists of five members coming from Belgium, France, Germany, Italy and the Netherlands, representing the Member States with most experience in the fields of inspection of sprayers at that time.

Main objectives of SPISE are:

- 1) to harmonise and promote sprayers inspection in the European Union
- 2) to exchange information on sprayers inspection activities between EU Member States
- 3) to establish a pool of experts for consultations with the European Commission (DG SANCO)
- 4) to develop common rules for which Member States are responsible (subsidiarity)

Since 2004 four SPISE Workshops were held (Fig. 7) with the aim to facilitate the exchange of experiences among the EU Member States concerning the inspection of sprayers in use and to focus on the possible common actions aimed at managing the inspection activity in an harmonised way across the European Union. The fifth SPISE workshop is foreseen in October 2014 in Montpellier (France).

In particular, specific working groups were activated within SPISE with the aim to:

- 1) Develop a common proposal concerning how to deal with sprayers minor defects
- 2) Develop a common proposal concerning how to deal with brand new sprayers
- 3) Define a common risk assessment procedure for Pesticide Application Equipment (PAE) to be exempted from the inspections
- 4) Define a common way on how to “certicate” the workshop activity (quality assurance)
- 5) Create a SPISE database with all MS authorized inspectors and workshops
- 6) Collect from Member States the available training material and make it downloadable on the SPISE website ([www.spise.jki.bund.de](http://www.spise.jki.bund.de))
- 7) Define which are the minimum workshop facilities necessary and orchard parameters knowledge to be able to make orchard sprayers adjustment at the workshop during the inspection

SPISE members meet European Commission DG SANCO delegates at regular intervals, updating them about the status of sprayer inspections in EU and discussing possible actions useful to support the harmonisation of test procedures and of the management of inspection activity in the Member States.

### Perspectives of ENTAM and SPISE

ENTAM and SPISE can provide benefits to different categories of stakeholders dealing with pesticide application: sprayer manufacturers, farmers and PPP manufacturers.

Concerning sprayer manufacturers ENTAM can support the design and realisation of new machines fulfilling the present Standard requirements, stimulating them to re-

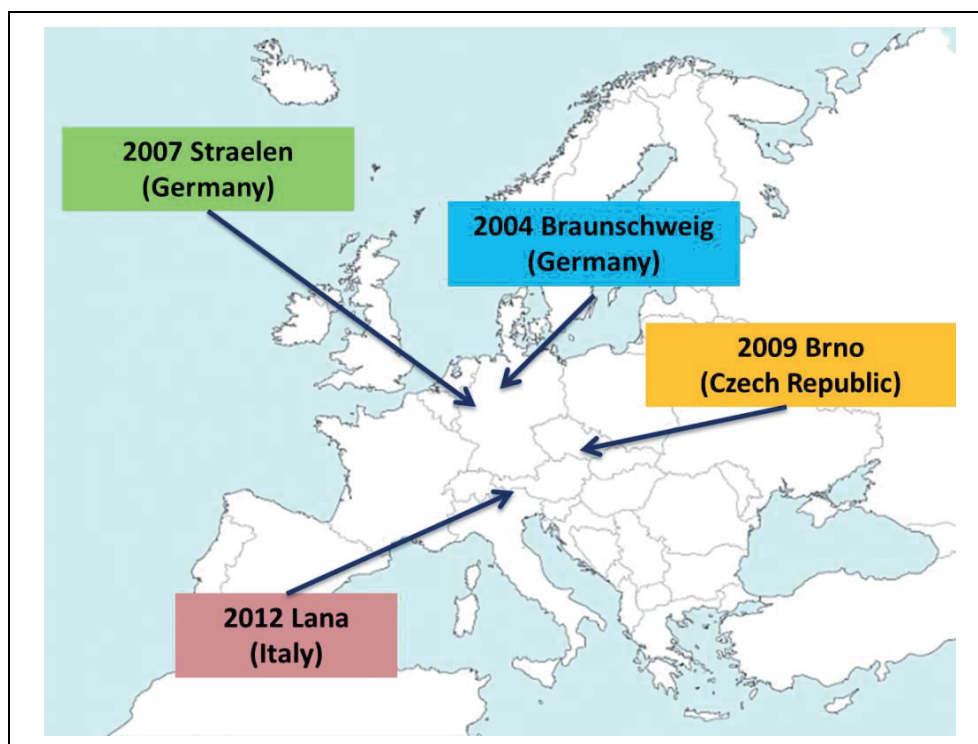


Fig. 7. Location of SPISE workshops held between 2004 and 2012.

search and develop new technical solutions for enabling the operators to operate PPP application in safer conditions and respecting the environment. ENTAM and SPISE together can favour the possibility to get financial incentives for purchasing new certified spraying equipment.

ENTAM and SPISE can provide farmers with a higher awareness about the importance of spraying equipment adjustment to obtain PPP treatments efficacy, with indications for a more targeted use of pesticides. Moreover ENTAM activity may allow the farmer to have the necessary and certified technical information about machinery in order to make a correct choice when purchasing a new machine.

Thanks to ENTAM activity in particular, also PPP manufacturers can get more and new technical information about sprayers that can be used to optimise PPP formulations for improving their mixing phase in spraying equipment and for enabling an easier sprayer cleaning at the end of the application.

All the EU community may take advantage from the activities carried out within ENTAM and SPISE networks

as a more responsible and proper use of sprayers means less consumption of pesticides, less contamination risks for operators, the environment and bystanders, therefore less social costs due to PPP application. Moreover, to reduce the amount of pesticides applied is also useful to limit risks of PPP residues in food products.

ENTAM and SPISE can also represent a way to promote job opportunities, for instance in the ambit of research and development for spraying equipment at sprayer companies level and within test stations in charge of inspecting sprayers in use.

Both ENTAM and SPISE were established thanks to the fundamental support of BBA (actually JKI) Application Techniques Unit, led by Prof. Heinz GANZELMEIER until 2012, and the work of this unit will continue to play a key role for promoting the use of functional sprayers in all European Union, improving sprayer technologies, incrementing awareness about correct use of plant protection equipment, giving technical support to farmers and sprayer manufacturers and harmonising rules about spraying equipment within the European Union.