

Posters

IrroMono-IrroNet: a software to manage the inspections of sprayers already in use

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Abstract

After the issue of the new national guidelines on the inspections of sprayers already in use in Italy, a software to manage correctly the tests, to store the data and to analyze the results has been realized. The software has been made in collaboration with a software company (Ithan srl). The work has been divided in different steps: 1) the analysis of current situation in terms of existing software; 2) the setting of a parameters list to be included in the software; 3) the architectural design of data management; 4) some practical tests at the test stations. The IrroMono software consists of two parts: the first one is a stand-alone programme for the inspection, the second one is an intranet interface for managing the archives. In the paper are presented the main characteristics of the software and the possibility to study and monitor the inspection activities both at local and national levels.

Introduction

The periodical inspections of the sprayers already in use consist of a series of standardized procedures including technical and administrative contents (Biocca, 2007; Gil, 2007; Wehmann, 2007). During the inspections many parts and components of the sprayer are checked and sometimes it is necessary to make some simple calculations to control the tolerance threshold of some parameters. In addition, official documents, reporting at least the result of the inspection, are needed at the end of the inspections. The results have to be stored, monitored and studied. Moreover a transparent and impartial procedure has to be applied to the all users. As a consequence, an application software to manage the whole activity is highly demanded from all the subjects involved: the inspector, the sprayer's owner and the Administration in charge of the controls.

In the year 2004, the Italian Ministry of Agriculture funded a program related to the national coordination of activities of the sprayers inspection, coordinated by ENAMA. A national technical committee, coordinated by the University of Turin (Balsari et al., 2007a), has produced the national guidelines for the control of sprayers, replacing the different approaches currently adopted by individual Regions within their activities (Biocca and Severini, 2004). Among the activities provided by this program, an application software to manage the inspections according to the new testing protocols, Document No. 6 (field sprayers) and No. 7 (orchard sprayers) (Balsari et al., 2007b) has been projected and realised.

The main aims of the project were to obtain a software planned to:

- conform to the national test methodology (standards) for the functional test of sprayers;
- assist the inspector during the controls (e.g. providing a "checklist", calculating some control parameters, providing a database of nozzles and components properties, etc.);
- provide the necessary documents for the users and for the regional Administrations;
- allow the creation of a database to be shared between different regions;
- monitor the activity at a regional and national level.

The purpose of this paper is to illustrate the steps that have led to the realization of this software and to describe its main characteristics.

Design of the software

The first phase of the work consists of an analysis of existing software currently adopted in Italy. In this stage several applications were examined in terms of usability, reliability and agreement to the standard

requirements (Biocca et al., 2008). Since none of the existing software satisfied completely the requirements needed, it was decided to start the design of a new product.

The work has been divided in different steps. At the beginning, starting from the study of each part of the inspection protocol included in the national guidelines, it was created a list of parameters and controls to be included in the software. In addition to the list of functional and mechanical controls of the sprayer's components, the software includes: 1) the data for the identification of the sprayer owner; 2) the description of the main features of the sprayer. As a general criteria, it was decided to include a minimum required set of parameters and data in order to make simpler and faster the filling.

The software was compiled by the company Ithan srl using products licence free to third parties. It can be run in multi-platform (Windows or Linux), can be downloaded from the Internet and can work either on-line or off-line. The software consists of two parts: the first, called IrroMono, is a stand-alone application for managing the inspections, while the second part, IrroNet, is the intranet interface for managing the archives by means of a browser. IrroMono is divided into several sections (owner identification, sprayers description, functional working data, visual and instrumental controls and reports).

Three different documents can be printed at the end of the inspection:

- 1) a certificate of inspection, which has the value of determining that control has passed, not passed or has been suspended;
- 2) a test report, which contains in details the results of each control;
- 3) a memorandum, which is released when control has not passed, including a list of actions to be carried out by the owner of the machines in order to conclude successfully the control itself (list of requirements).

The documents are produced in pdf format. The confirmation of printing of the final documents blocks the further continuation of the changes on the control itself and allows the storage and historicizing.

The second part of the software, the application IrroNet, can manage:

- - the database of the inspected sprayers;
- - the history of controls on each sprayers;
- - the database of national inspection centres;
- - the database of owners;
- - the synchronization of data from the workshops to the central database.

With the same application it is possible to download data in a format suitable for a spreadsheet (e.g. Microsoft Excel) to obtain reports and statistics.

The architecture of data management is illustrated in the following figure.

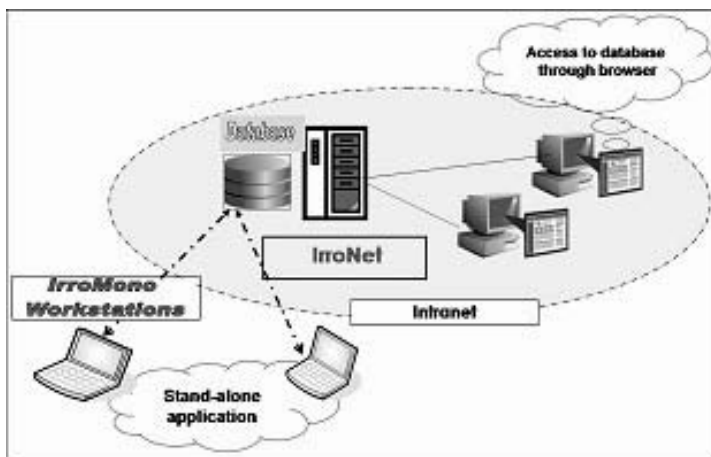


Fig. 1 Architecture of data management

Conclusions

The structure of the software includes the dual nature of the control of sprayers in use: the "inspection" on one side and the "technical service" on the other side. IrroMono software, developed in line with this philosophy, enabling it to operate at the control centre, in a flexible way, adapting to different operational situations present.

IrroNet software is an essential tool in managing and monitoring of control activities. In fact, with the application of the European Directive on sustainable use of pesticides, the ex-post evaluation and the planning activities of functional tests, may be monitored, allowing the competent authorities to carry out the scheduled investigation.

Further development of the software may include a version suitable to be run in a palm computer and the development of a programme devoted to the regulation (calibration) of the sprayer.

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