O.26 - Enabling European DSSs access: weather data exchange

Röhrig, M., Sander, R.

ISIP e.V., Rüdesheimer Strasse. 60-68, 55545 Bad Kreuznach , Germany

Contact: office@isip.de

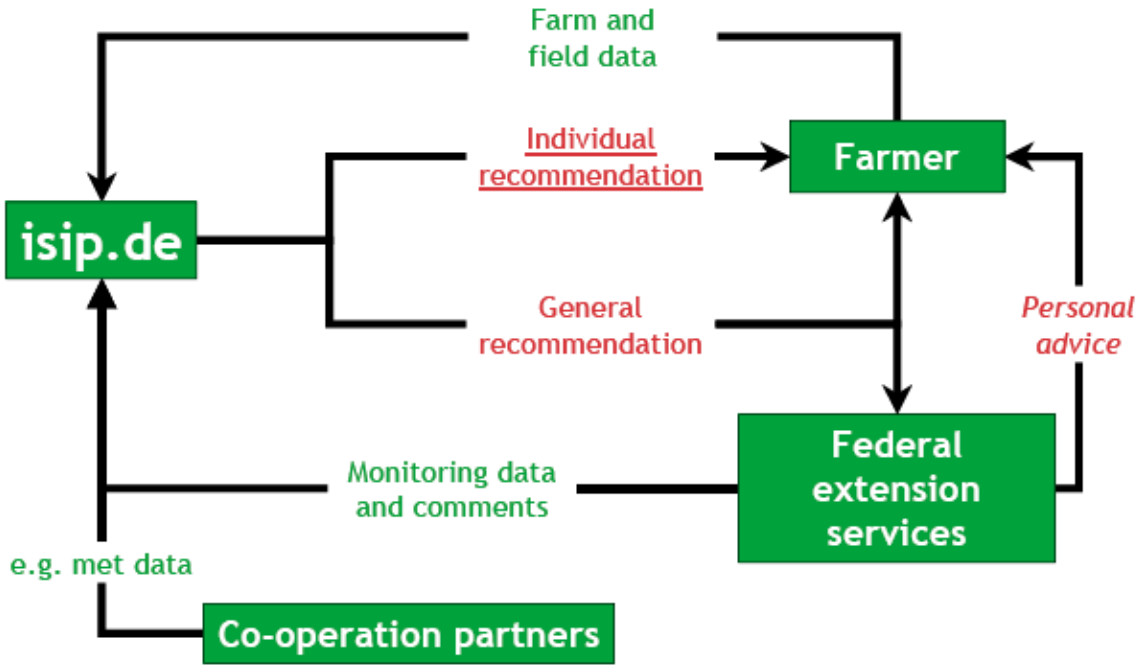
Abstract

Numerous models for plant pests and diseases have been scientifically developed in recent years. But their application in extension and practice has been limited. Funded by the German Environmental Foundation, the German Plant Protection Services (PPS) started a project in 2001 to close this gap: the Information System for Integrated Plant Production (ISIP, http://www.isip.de) was developed as a universal framework to implement weather-based simulation models on the Internet. Since then a total of twelve models for pests and diseases in various agricultural crops were integrated into the system, nine of which are publicly available and three are in validation. In general, the models have a regional output to give the user an overview of the current risk potential. This output is supplemented by data from field monitoring where available and by a written comment by the regional extension officer of the PPS. To increase the quality of the results, data from multiple weather stations may to be used. It is however important to be aware of the quality of the weather data. Therefore, the weather data itself and the weather sensors must be well described and validated. To realise an automated data capture and a variable sensor network, a common language to exchange the weather data must be found. The greater availability of weather data will also improve information exchange between scientists across Europe. Up to now the evaluation of simulation models is often restricted because weather data from other countries is not available. Currently, an initiative is being started to establish a collaborative network of meteorological experts; more details on this will be given at the conference.

ISIP, the Information System for Integrated Plant production, is a Germany-wide online decision support system. It was initiated in 2001 by the German federal extension services as a common advisory portal, thus achieving synergies by pooling existing information. Despite the centralised character of the system, the regional identity of the co-operating services was preserved by distributed administration and data input.

With the start of the system, the ISIP e.V. (e.V. = ‘registered association’) was established, which, by 2007, comprises 11 of the 16 federal extension services in Germany. Its four employees are located in an office in Bad Kreuznach, Rhineland-Palatinate. The system is designed to use modern information technology to make the primary task of extension services, information transfer, more efficient between the services and farmers. By combining general with specific data, recommendations can be refined from regional to individual.

Fig.1: Data flow in ISIP



Three types of information can be distinguished in ISIP, differing in scale. Decision support modules deliver the most specific results. They comprise results from a simulation model and/or monitored field observations as well as a comment from the regional extension worker.

This 'threefold decision support' gives a comprehensive overview for a defined pest or disease. More general information is provided in regional news.

Members of ISIP can maintain their own start pages in the system, where they can distribute topics ranging from contact data to legislative news. Furthermore, paper-based warning and information services are made available for download as PDF documents. The most general information is given in the encyclopaedia , where background information and standard recommendations for more than 20 crops and 200 pests and diseases are stored in a database.

The two target groups of the ISIP system, farmers and extension workers, benefit differently from the system. The farmer gains most from the online calculation of prognosis models, which deliver site-specific recommendations across a consistent user interface, easing the acquisition of information. The automatic warning service via SMS or email reduces the time farmers need to spend online as well as their response times to urgent situations. The extension worker benefits from the web-based input of monitored field data and his advisory comments.

This eliminates further processing and ensures fast and efficient information transfer especially for time-critical decisions. In the near future, new decision support modules for plant protection will be included. In addition, a special focus will be given to agronomic and horticultural model approaches. The encyclopaedia will also be extended to an even more comprehensive scale. On the technical side, the data exchange with the farm management information system (FMIS) via the exchange language agroXML will be implemented. A milestone will also be the upgrade of ISIP to incorporate a geographical information system (GIS).

The added value of ISIP is its up-to-date site-specific DSS modules, complemented by the latest regional news and a large database containing background information. The software framework of ISIP is built in an open and extensible architecture, which helps to speed up model development and to ensure fast knowledge transfer.

Hitherto, information flow was more or less unidirectional from the extension services to the farmer. With ISIP, an interactive network for information exchange between model developers, data providers, extension services, farmers and others has been set up. Using the Internet as the linking platform, ISIP is a comprehensive tool for decision support in integrated plant production.

The use of decision support systems results in a lower risk of crop damage by diseases and pests, and a lower input of active substances, from the use of adjusted dosages. The success of models comes despite its development occurring independently in a number of countries. The speed of development of these systems would have been substantially faster had there been real cooperation between countries or groups of researchers. Up to now the evaluation of simulation models is often restricted because weather data from other countries is not available.

To improve information exchange between scientists across Europe, data from multiple weather services/ weather stations may to be used. It is, however, important to be aware of the quality of the weather data. Therefore, the weather data itself and the weather sensors must be well described and validated. To realise an automated data capture and a variable sensor network, a common language to exchange the weather data must be found.

Currently, an initiative is being started to establish a collaborative network of meteorological experts, more details on this will be given at the conference.