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agroXML – the Standard for Data Exchange in Agriculture

Farmers are subjected to a multitude of documentation and verification obligations of agricultural practices. agroXML introduces a standard, which simplifies data storage and exchange. agroXML is based on the XML international standard and contains the agroXML scheme and several content lists. agroXML is available in an extended version 1.2. The Bundesamt für Verbraucherschutz und Lebensmittelsicherheit (Federal Agency for Consumer Protection and Food Safety) provides a list of pesticides monthly, and the KTBL updates and integrates it into agroXML. Various partners participate in the development of agroXML.

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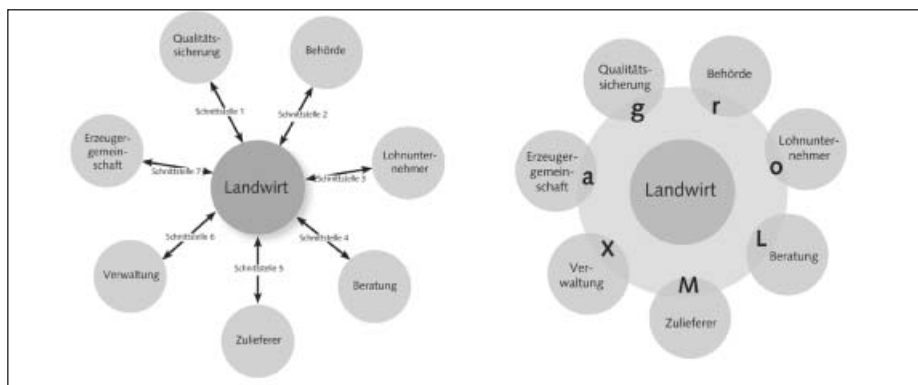
Fig. 1: Data exchange without and with agroXML

Farmers are subjected to a multitude of obligations concerning documentation and verification of agricultural practices. Due to a lack of standardized interfaces, the necessary data often have to be transferred manually from one software program into another or have to be transcribed from screen into paper forms (*Fig. 1*). agroXML will put a stop to this problem by introducing a standardized language for data exchange. Individually arranged interfaces between communicating parties are substituted by generalized processes of data exchange (*Fig. 1*). Usage of information technology and electronic communication with external partners is significantly facilitated and more efficient as soon as agroXML is introduced as a standard. Accessing certain services and kinds of data (e. g. geodata, web services) and directly using a farm management information system (FMIS) becomes possible. Documentation and application for agricultural support programs, traceability and quality assurance are facilitated and automated step by step. Because of extensive obligations against an increasing number of business partners, agroXML is especially beneficial for the farmer. The implementation of agroXML is taking place in the software and service products of the producers of farm management information systems and agricultural service providers.

Functionality of agroXML

agroXML is based on the international standard XML, a method for structured data storage. agroXML describes properties and relations of agricultural issues. It consists of an agroXML-schema, supplemented with content lists.

agroXML-schema
An XML-schema constitutes the basis of data exchange. It describes structure and semantics of XML instances, e. g. obligatory fields, the sequence of data elements and the data types.

In the agroXML-schema, all data, which can be exchanged on a farm, are structured and put in relation to each other (*Fig. 2*). For every data exchange case, agroXML profiles define fields, which are to be filled with content. Thus, it is ensured, that data exchange works completely. That way, application case specific instances can be generated. An instance is an XML file, which actually transports data, built according to the rules of a schema. The instance can be exchanged with the respective partner. The advantage of agroXML is that in all agricultural exchange processes a unified schema with a unified structure is used.

For a better overview, XML schemata can be depicted in a graphical representation. *Figure 3* shows the schema for the measure „pest control", which is comprised of the components Machine, Field, Person, Pesticide etc.
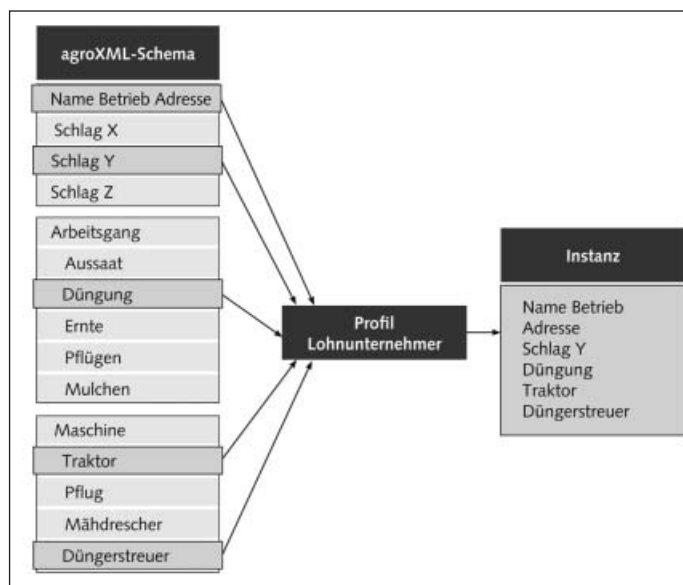
Fig. 2: Components of agroXML

Fig. 3: agroXML-scheme for the measure „plant protection"

agroXML content lists

agroXML provides content lists for several components which are often characterized as entry fields in electronic forms like e. g. types of machines, pesticides or plant varieties. These enable software producers to offer lists to the user to choose by point-and-click using the mouse. Thus erroneous input and passing on of wrong data is avoided. Only the unique identifiers, which are connected to the names are recorded in the document. Using these identifiers for searching the content lists, the receiving software can display and process the correct names automatically.

It is the goal to win the respective official institutions to take the responsibility for provision and updating the content lists.

Current state of agroXML development

agroXML-schema

agroXML version 1.0 was finished in May 2006. The extended version 1.2, which contains elements for quality assurance, will be available in 2007.

The published versions are available for implementation in the software products of the producers of farm management information systems as well as for partners in data exchange like e. g. ISIP (Information systems for integrated plant production), EurepGAP, InVeKoS and the KTBL as information provider.

agroXML content lists

The most urgent need concerning standardised lists is seen in the area of pesticides. The Federal Agency for Consumer Protection and Food Safety (Bundesamt für Verbraucherschutz und Lebensmittelsicherheit -

BVL) provides names, active substances and identification numbers of admitted pesticides in a monthly update rhythm.

Besides the list of pesticides, the list of machines, which is compiled by the KTBL, is available.

In cooperation with with the Bundessortenamt (BSA), the details for the provision of the list of varieties are worked out. Plans exist to make also a European and an international list of varieties for agroXML available.

The agroXML-schema is provided as a download on the internet. The content lists can be accessed via a central server in their current version.

Cooperating Partners

To develop agroXML and establish it as a standard, cooperation with appropriate partners in the industry is necessary. For that purpose, the agroXML working group, which attends the development of agroXML, was founded. The actual development work is done by the expert group software development, which coordinates the results in regular meetings. Taking part in development are:

agrocom GmbH & Co Agrarsystem KG, Bielefeld; agroproject Technologie und Informationssysteme GmbH & Co KG, Greven; agroSat Consulting GmbH, Baasdorf; Claas Selbstfahrende Erntemaschinen GmbH, Harsewinkel; Helm Software, Ladenburg; ISIP (Informationssystem Integrierte Pflanzenproduktion), Bad Kreuznach; John Deere, Agricultural Management Solutions, Zweibrücken; Landdata-Eurosoft, Pfarrkirchen.
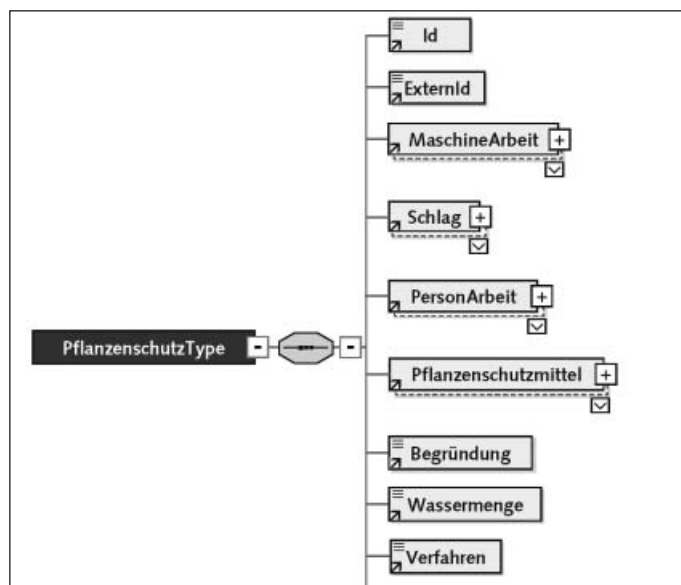
Applications

After presentation of the first agroXML interfaces by the cooperating partners at the agritechnica 2005 the first applications of agroXML are developed. These software products will be presented at the annual congress of the GIL during 5th to 7th of March 2007 in Stuttgart-Hohenheim and at the KTBL-days 17th and 18th of April 2007 in Munich together with project results and experiences from prototypical applications.

Already in productive usage is access to the field work calculator of the KTBL (*www.ktbl.de*) from FMIS of Helm and BASF. Using this tool, the user can import economic data like machine costs and work time requirements of individually compiled machinery combinations in agroXML format into his FMIS and store these data. This kind of usage of agroXML is as well at the disposal of other software producers.

Thank you