



An Overview of Current AgGateway Work

Introduction

This paper is a high-level overview of AgGateway current activities in North America, Europe and Latin America as of November 2019. This summary is project-specific and does not include ongoing work being done by AgGateway committees and other groups.

North America

ADAPT - Interoperability in Field Operations: ADAPT is AgGateway software that enables agriculture-data interoperability, helping ag retailers, agronomists and growers better manage data and apply it to make improvements in their operations. It is free and open source. The open source license is business friendly. Version 2 was recently released. The ADAPT team is adding features and fixing bugs in preparation for upcoming releases of the ADAPT Framework, the ADAPT Plugin, and the ISOXML Plugin.

Aerial Imagery (PICS): Aerial imagery can be an informative addition to a grower's decision-making process. Unfortunately, much of the aerial imagery produced today lacks sufficient metadata to enable users to get the most value out of the imagery they receive. AgGateway's Aerial Imagery Project (PICS) is defining metadata standards. The specification is in its final review by the working group.

Ag Retail Connectivity Planning: The Ag Retail Council and other interested members have been following up on the successful "Quick Connect" sessions to explore other ways to encourage sessions for trading partners to meet and establish concrete plans for implementation.

Automated Identification Data Capture for Products (AIDC): The AIDC Working Group's primary objective is to promote and enable automated identification capture for products throughout the input supply chain. The working group has documented processed, updated barcoding guidelines, and developed promotional material. The group has encouraged implementation of appropriate barcodes on product packaging and use of barcode scanners throughout the supply chain. Adoption to date has been slow, reportedly due to poor barcode support by manufacturers. Distributors and retailers have repeatedly asserted that they would invest in automated identification systems once standard barcodes are widely available on product packaging. The group is continuing its promotion efforts.

Business Rules Task Force (Cross-Council): This task force has been exploring areas where the various council segment implementation business rules can be harmonized. The group has been reviewing a draft harmonization document. The end goal is to deliver a Cross-Council Harmonized Business Rules document to be stored on the wiki page with other reference documents, managed by the Standards & Guidelines Committee.

Channel Integrity: A group of AgGateway members involved in crop protection is looking at ways to improve product stewardship by increasing their ability to track product. A key piece of this initiative would be a shared network to include manufacturers, distributors and ag retailers. The team has defined the scope and issued a call for participation to others in the industry earlier this fall. So far, nine members are participating in the effort. A subset of the group is finalizing a Request for Proposal to develop a prototype network. The deliverable for this first phase is a minimum viable self-contained system to record transactions between manufacturers, distributors and retailers for a limited number of products throughout a full crop production cycle.

Dispensing Work Order (Mix Ticket): Several AgGateway member companies that produce fertilizer blending equipment agreed to work together to develop standards to support blending and dispensing processes. The working group developed version 1 of a standard for dispensing work orders and work records. The work order specifies amounts and sources of inputs into a blending operation as well as the output locations. Work records include data about what was actually done. The working group is currently making refinements to version 1. The end result is to speed up the data exchange between blending equipment and a company's back office accounting processes, to drive business efficiency.

Irrigation (PAIL): AgGateway's irrigation work addresses processes and data requirements that enable more effective water management, thus conserving both water and energy. There are three parts to this irrigation standards work. Two parts were approved by AgGateway, then approved by ASABE (ANSI ASC) as a U.S. national standard, and then submitted to ISO to become a global *de jure* standard. The remaining part is in final review by the AgGateway working group.

Product Catalog: Some cooperatives plan to offer branded online store services to their retail members. Crop protection and seed manufacturers want to ensure that such online stores have complete, accurate and up-to-date information in their Product Catalog. AgGateway is working to define the data requirements and data standards to support that objective. To date, Syngenta and Land O'Lakes have developed a proof of concept message and this fall they tested a B2B integration. The proof of concept is based on OAGIS standards and enables a manufacturer to pass product data to a downstream system for a retail-facing eCommerce catalog. The proof of concept message is not finalized, and the team is looking for membership feedback as a next step.

Reference Data API: AgGateway distinguishes "reference data" from "transactional data". Reference data is the data specified in advance of the transactions in which they are used. This includes data such as code lists, identifiers, product information, and configuration parameters. The Reference Data API Working Group is specifying a solution to the challenge of acquiring reference data by users who require it. The working group has agreed to basic API principles and has stood up a proof-of-concept service.

Seed Messages: The New Seed Messages Working Group has documented processes and data requirements to support seed returns (after season), transfers (both internal and external), seed replants, and license and zone management. The result will bolster the steps a company takes for efficiency and customer service. It will also reduce some of the retailer struggles or pain points to manage these processes. This new work was published this fall and is available in CLICK and on the AgGateway website.

Testing: Another AgGateway team is addressing how to standardize data formatting for soil test results. Soil testing data is at the very base of most fertilizer recommendations, but only 30% of row crop land is using VRT application based on a soil test. One reason is that there is such a variety of data formats in

the industry, it makes it difficult for labs to scale, and to operate with Farm Management Information Systems. To bridge this gap, we need a common soil test data format across regions and platforms. The AgGateway Lab Data Standardization Working Group is working on a standard that will be compatible with the proven ADAPT framework and existing regional standards. The first step will involve integrating with the MODUS format. We'll use ADAPT to address interoperability. Next, the group will look at incorporating OAGIS work on work orders.

Traceability: Teams are currently focused on three tracks under the umbrella of provenance: crop protection, seed and grain. They've document processes and identified data requirements within what they refer to as islands of integration for each area. The group is determining if there is interest in a new Working Group to look at the data linkages between the various areas. There's also interest in a new Working Group to address field product identification. The goal would be to improve product identification within field work records. Finally, a group is extending the previous work done on grain traceability by looking at new technology to address the challenges they uncovered in the initial pilots. The major benefits of these traceability efforts are obvious: The ability to track and trace product for customer service, food safety and regulatory compliance.

Europe

ADAPT Plug-In for Homologa: Homologa is the Global Plant Protection Products Database, containing information regarding plant protection products from more than 70 countries. AgGateway Europe is working to develop an ADAPT interface for the Homologa database. This interaction point enables FMIS and other companies to get machine-to-machine (M2M) access to the most up-to-date information about the use of allowed crop protection products throughout Europe.

EU IoF 2020 program: As a participant in the Internet of Food & Farm program of the European Union, AgGateway will bring forward ADAPT solutions in several proof-of-concept implementations in data sharing in arable farming. The goal of participation is to promote AgGateway and AgGateway solutions and to support new initiatives on data sharing.

Farm and CropField identification: AgGateway is standing up a special interest group on Farm and CropField identification, with the goal to enable the linkage of crop-related data from different industry sources through standardized identifiers.

Engage with GS1 Global: GS1 is the global leading initiative in developing and promoting standards for key identifiers for data exchange in supply chains, such as the GLN (Global Location Number), GTIN (Global Trade Item Number) and GPC (Global Product Classification). GS1 and AgGateway will take the initiative to meet with Copa Cogeca (the European farmers organization) to discuss the need for, and feasibility of a global standard for farm (farmers) identification, using the GS1-GLN.

Soil and Weather Data: The Soil & Weather DDEs (Data Dictionary Entry) project will assist growers in recording the weather and soil conditions using the tractor cab terminal in the field during spraying. Alignment with the ISO machine standard (ISO11783-11) will leverage relationships with the Association of Equipment Manufacturers (AEM) and Agriculture Industry Electronics Foundation (AEF). This work will also allow compliance with United Kingdom legislation regarding the recording of this type of data.

Data Exchange with Contractors: The goal is to develop a standard data exchange method for exchanging WorkOrders and WorkRecords between FMIS and administrative systems of contractors, in order to make it easy on the farmer to collect crop related data.

T&T Crop Protection Products: AgGateway would like to roll out Cristal's track and trace agrochemical labelling standards for crop production product throughout the supply chain. AgGateway members Bayer, BASF, Adama are involved. The standard is based on GS1 identifiers and is applicable to other interested regions. The goal of the initiative is to be able to do recalls in case of a bad batch, to support return orders, and to support efficient the logistics in the supply chain.

Potato Production Chain Data Exchange: AgGateway will support machinery manufacturers in implementing data sharing in the potato production chain. The goal is to support precision farming in the growing, harvesting and storing of potatoes through implementation of machine-to-machine data exchange standards.

Milking Robots: Farmers will benefit from easier exchange of data between milking and feeding equipment as AgGateway develops a standard interface for this exchange, in alignment with the initiative of the International Committee for Animal Recording (ICAR). We expect the work to also improve individual cow management, which can in turn lead to higher productivity and animal well-being.

Climate Computers: AgGateway teams would like to develop a standard interface to exchange data with process computers used in pork and poultry production, such as climate computers and systems for feeding, weighing and counting. The goal is to support sensor-based monitoring of animal and plant production. The work will also enable compliance with the food industry's demands for transparency.

Smart Agri Hubs: AgGateway is considering what role it may have in this new European initiative in data sharing.

ICAR: The International Committee for Animal Recording (ICAR) promotes the development and improvement of animal identification, performance recording and evaluation in farm animal production. Among other things, ICAR develops the standard for data exchange with milking robots and feeding systems. AgGateway aims to on-board ICAR as a strategic partner in order to promote the ICAR standards for data exchange in dairy farming.

Slaughter Results: AgGateway is also organizing interest to develop a standard for exchanging slaughter reports from slaughterhouses to farmers and accountancy, for broilers, pork and bovine animals.

Latin America

Interoperability (ADAPT): A working group is assessing how AgGateway's ADAPT software for interoperability in field operations can be implemented to support crop production in Brazil, including for sugar cane.

Data Soil Labs Integration: AgGateway is creating a working group to explore ways to better integrate and convert data units that come from the 200 soil laboratories in Brazil, which produce about 4 million soil analyses a year. Discussions have included the entities that regulate the quality of soil analysis (Embrapa Soils and IAC - Agronomic Institute of Campinas), soil laboratories, and soil laboratory software companies. The group will focus on integrating data from participating labs so that companies can better use this critical data in making decisions and recommendations.

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