

## AgGateway's Laboratory Data Standardization



### In a Nutshell

#### Problem:

Soil testing data underlies most fertilizer recommendations, but a variety of data formats in the industry makes it difficult for labs to scale, and to interoperate with farm management information systems. Bridging this gap will require a common soil test data format across regions and platforms that removes uncertainty about units of measure and methods used.

#### Solution:

AgGateway's Agricultural Lab Data Working Group was created to help the laboratory community implement a universal standard, compatible with the proven ADAPT framework and existing regional standards, with the intent of creating efficiencies for the labs, and making it easier to use the data in farm management information systems. The group's first step will involve integrating with the MODUS format that many labs have invested in.

*"Soil is the great connector of lives, the source and destinations of all. [...] Without proper care for it we can have no community because without proper care for it we can have no life."*

-Wendell Berry, *The unsettling of America: Culture and Agriculture*



## Soil Test Data Challenges

### Exchanging soil test data is important, but currently difficult

Current trends in sustainability, traceability and compliance reporting demand that growers gather and report ever-increasing amounts of data to justify their operations. Considering that soil test data is the most commonly used data layer in digital agriculture, and drives much agricultural decision-making, its reporting (both in commercial and regulatory settings) may likely become the norm.

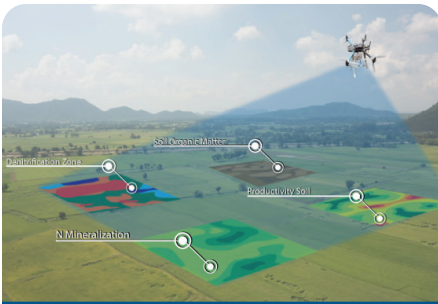
### What do standards have to do with this?

- **Errors are costly:** Trying to scale without data standards can lead to errors. The insufficient or excessive application of crop nutrition inputs that follow can affect margins and create regulatory liability.
- **Less friction = more scalability:** Interoperability is a bottleneck: soil testing is a low-margin activity, and scaling becomes very difficult for the soil test laboratories in the absence of clearly established standards (labs currently have to deal with over 70 data formats). Making data exchange easier will help labs scale and be more efficient.
- **Turnaround is a competitive advantage:** The one-week turnaround for soil data is a thing of the past. Fall application now happens right behind the combine; hitting the window of opportunity to collect representative samples and generate test results in time for the application gives laboratories very little time to test.
- **Automated data management,** from work order generation, sample collection, drying analysis and result distribution, will improve labs' efficiency and allow them to increase their sample throughput. In this competitive environment, the laboratories that can offer the best turnaround without compromising the quality of analysis are better positioned to gain market share and be more profitable.
- **Farm management information systems** are a big piece of this puzzle. Enabling grower-, advisor- and retailer-facing farm management software to produce work orders and consume test results will enable automation.

### AgGateway has a solution for how to make this work!

Recognizing these challenges and their importance for the success of digital agriculture, AgGateway created the Agricultural Lab Data Working Group. This group's goal is to partner with the laboratory community and help implement standards and formats that can interoperate with AgGateway's ADAPT ([www.adaptframework.org](http://www.adaptframework.org)), along with ISO 11783 files and other existing farm management data standards.

This work will initially focus on the MODUS format that many labs are already using. The first deliverable will be an ADAPT plug-in (on the premise that ADAPT is a recognized and adopted tool within the digital agriculture space, across regions and platforms) accompanied by implementation guidelines.



## Why are we talking about ADAPT here?

- ADAPT is an award-winning interoperability framework. Numerous companies use ADAPT to convert field operations data formats for use by their tools.
- The ADAPT team recently added support for the ISO 19156 observations and measurements standard, a good fit for soil test data.
- Creating an ADAPT plug-in for MODUS leverages the ag industry's existing investment in ADAPT compatibility, making it easier for farm management information systems to use soil test data.



<https://bit.ly/2WcoY0c>

Questions? Email us at:

[labtestwg@aggateway.org](mailto:labtestwg@aggateway.org)

To learn more about ADAPT, visit:

<http://www.adaptframework.org>

To learn more about AgGateway, including how to join:

[www.AgGateway.org](http://www.AgGateway.org)

## Together, let's take MODUS to a new level!

- MODUS emerged from the collaboration among a group of companies, academics and soil test laboratories.
- It's currently a set of XML schema files and code lists of laboratory tests.
- It is the most widely adopted format among North American soil labs.

## Q&A

### Question

### Answers

**Who will develop the new standard?**

AgGateway's Agricultural Lab Data Working Group is working with industry experts to collect and compile all the available standards. The group will use the expertise of ADAPT developers to build an industry accepted standard.

**Will XML still be available?**

Yes! We'll continue to offer the XML option for labs that already implemented MODUS as-is.

**What about JSON?**

There is a clear demand for JSON support for soils data; we'll develop a MODUS-based JSON schema.

**MODUS began as an open-source project. What license is it being distributed under?**

AgGateway is working with MODUS founders to clarify this point. ADAPT uses the Eclipse Public License; we hope to do the same with MODUS.

**Is this going to stop at MODUS?**

No. There are multiple standards that merit a closer look, including OAGIS, SOILML, and eLabs. However, we recognize that there is valuable expert knowledge embedded in MODUS that is being used and must be preserved; hence our starting point.

**Why do this in AgGateway?**

AgGateway has an antitrust and intellectual property framework that protects participating companies from litigation. It also has a critical mass that can make it easier for work to be maintained over time.

## Where we want to go:

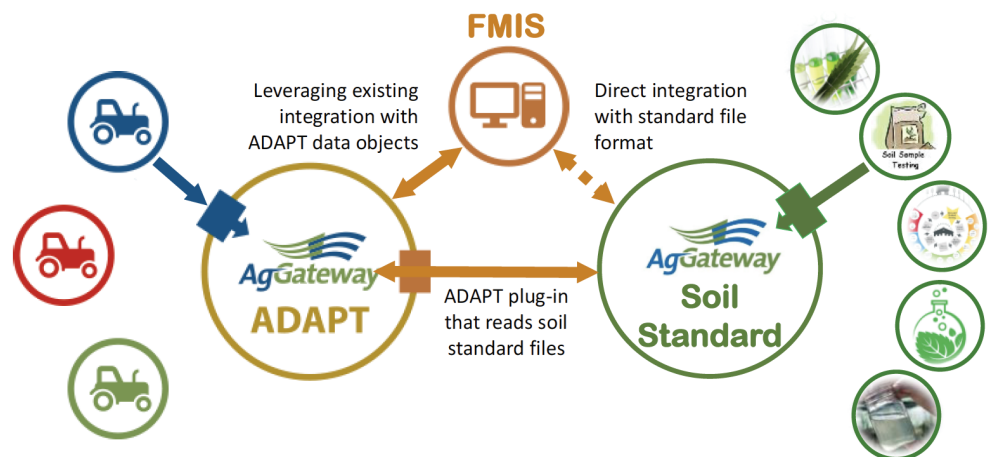


Figure 1: The initial approach involves adopting MODUS as an AgGateway-maintained standard (with XML and JSON serialization), creating an ADAPT plug-in to enable interoperability with the installed base of ADAPT users, and creating implementation guidelines to facilitate consistent implementation in both direct (i.e., MODUS in XML / JSON) and ADAPT-mediated modes.

## What we want from you

Get informed! Learn how AgGateway can support your business! Join our group and be part of making soil testing a plug-and-play solution for digital agriculture.