



In a Nutshell

Problem:

Soil testing data underlies most fertilizer recommendations, but a variety of data formats in the industry makes it difficult to 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 Laboratory Data Standardization Working Group was created to help the ag laboratory community implement a universal standard that is 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 steps have focused on updating and integrating 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 Standardization: Why It Matters, How It Happens

Exchanging soil test data is fundamental, 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. Since soil test data is a cornerstone in digital agriculture that drives agronomic decisions, the ability to record and report it seamlessly and accurately is essential. Unfortunately, systems currently in place do not allow for seamless soil test data movement.

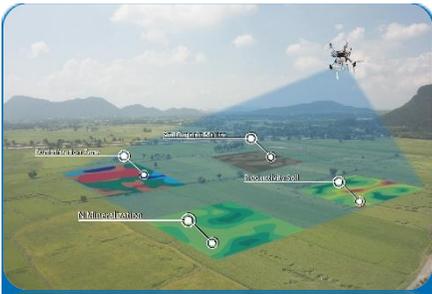
Why standardization is the answer.

- **Less friction = more scalability:** A key pinch point is that soil test labs currently must deal with more than 70 data formats. Soil testing is a low-margin activity, and scaling services becomes very difficult in the absence of clearly established standards. Making data exchange easier will help improve efficiency.
- **Errors are costly:** Trying to scale without data standards can lead to errors. The over- or under-application of crop nutrition inputs that follow can affect margins and create regulatory liability.
- **Turnaround is a competitive advantage:** Farm operations today have the equipment available to apply crop nutrients right behind the combine at harvest. This significantly shrinks the time allotment for sample collection and soil test processing. Through data standardization, labs will be able to slash the time required to accept, process, and return results on soil tests. In a highly competitive industry, the laboratories that can offer the best turnaround without compromising the quality of analysis will gain significant market share and be more profitable.
- **Improving FMIS Functionality:** Data standardization will foster automation by enabling grower-, adviser-, and retailer-facing farm management software to seamlessly consume test results and produce work orders.

AgGateway is driving the solution.

Recognizing these critical challenges and opportunities, AgGateway created the Laboratory Data Standardization 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), 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/2WcoYoc>

Questions?

Email us at:

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

Member.Services@AgGateway.org

Taking MODUS to the Next 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.

Soil Test Data Standardization FAQ

Question	Answer
Who will develop the new standard?	AgGateway's Laboratory Data Standardization 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 data 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.

How This Will Work:

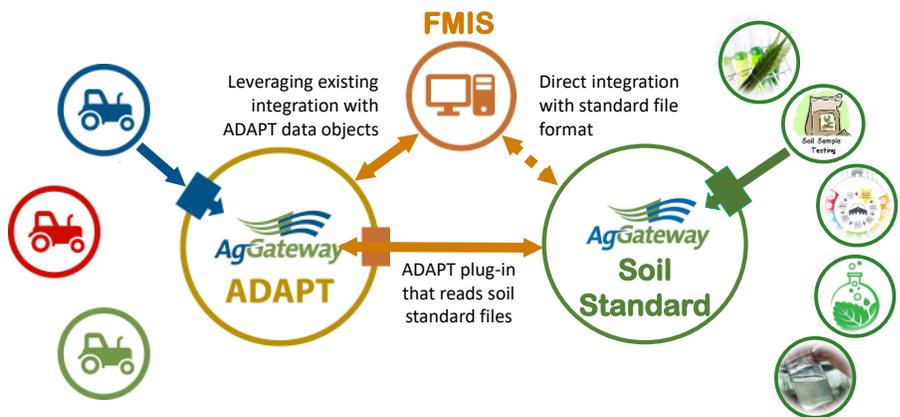


Figure 1: The initial approach involves adopting MODUS as an AgGateway-maintained standard (with XML and JSON serialization), creating an ADAPT plug-in to enable interoperability with the installed base of ADAPT users, and creating implementation guidelines to facilitate consistent implementation in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

We Need Your Active Participation

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.

