



## 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*

## 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 to enhance the existing Modus resources ensuring test method information is accurately communicated. Additionally, the team is revising some of the technical aspects to make implementation easier to further drive adoption within the industry.

This work will initially focus on the Modus format that many labs are already using. The first deliverable will be a revised soil method code list that conveys more precise information about each test method with a clearly defined process for requesting corrections or additions to the list.



## 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.

## 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 added support for the ISO 19156 observations and measurements standard, a good fit for soil test data.
- Modus leverages the ag industry's existing investment in ADAPT, making it easier for farm management information systems to use soil test data.



<https://modusstandard.org>

## Questions?

Email us at:

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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)

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## 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 requirements and creating the new Modus version.

#### Will XML still be available?

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

#### What about JSON?

There is a clear demand for JSON support for soils data, so we will develop a Modus-based JSON schema.

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

Modus will be available under the AgGateway Digital Resource License designed to enable broad industry adoption but limit the creation of variations of the standard. Information is available here: <https://github.com/AgGateway/Modus/blob/main/LICENSE.md>

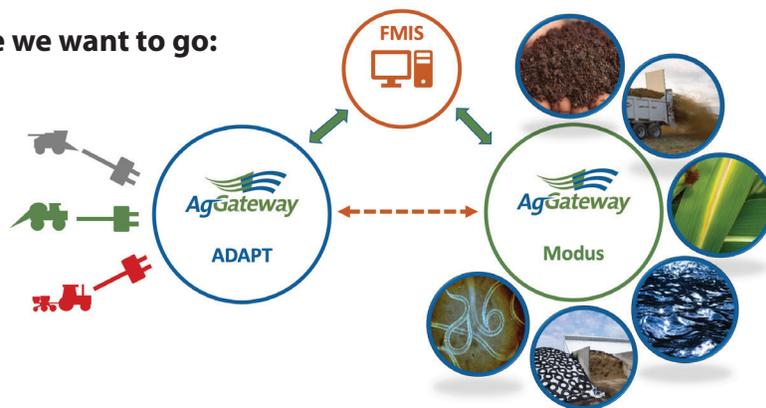
#### Is this going to stop at Modus?

The team is working with several organizations and working group participants to align where possible with other similar resources in the industry such as OAGIS and UNCEFACT/LOR

#### 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) and creating implementation guidelines to facilitate consistent implementation. This also includes establishing a standing committee providing the industry with a transparent means to request changes and additions to the Modus standard.

## 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.

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