

# GCP Crop Ontology

## www.cropontology.org

An online platform enabling participatory development, curation and annotation of crop trait information.



Luca Matteis<sup>1</sup>, Elizabeth Arnaud<sup>2</sup>, Milko Skofic<sup>3</sup>, Rosemary Shrestha<sup>4</sup>

<sup>1</sup>Bioversity International, Rome, Italy; l.matteis@cgiar.org

<sup>2</sup>Bioversity International, Montpellier, France; e.arnaud@cgiar.org

<sup>3</sup>Bioversity International, Rome, Italy; m.skofic@cgiar.org

<sup>4</sup>CIMMYT, El Batán, Texcoco, Mexico; r.shrestha2@cgiar.org

Why?

### The Initial Problem

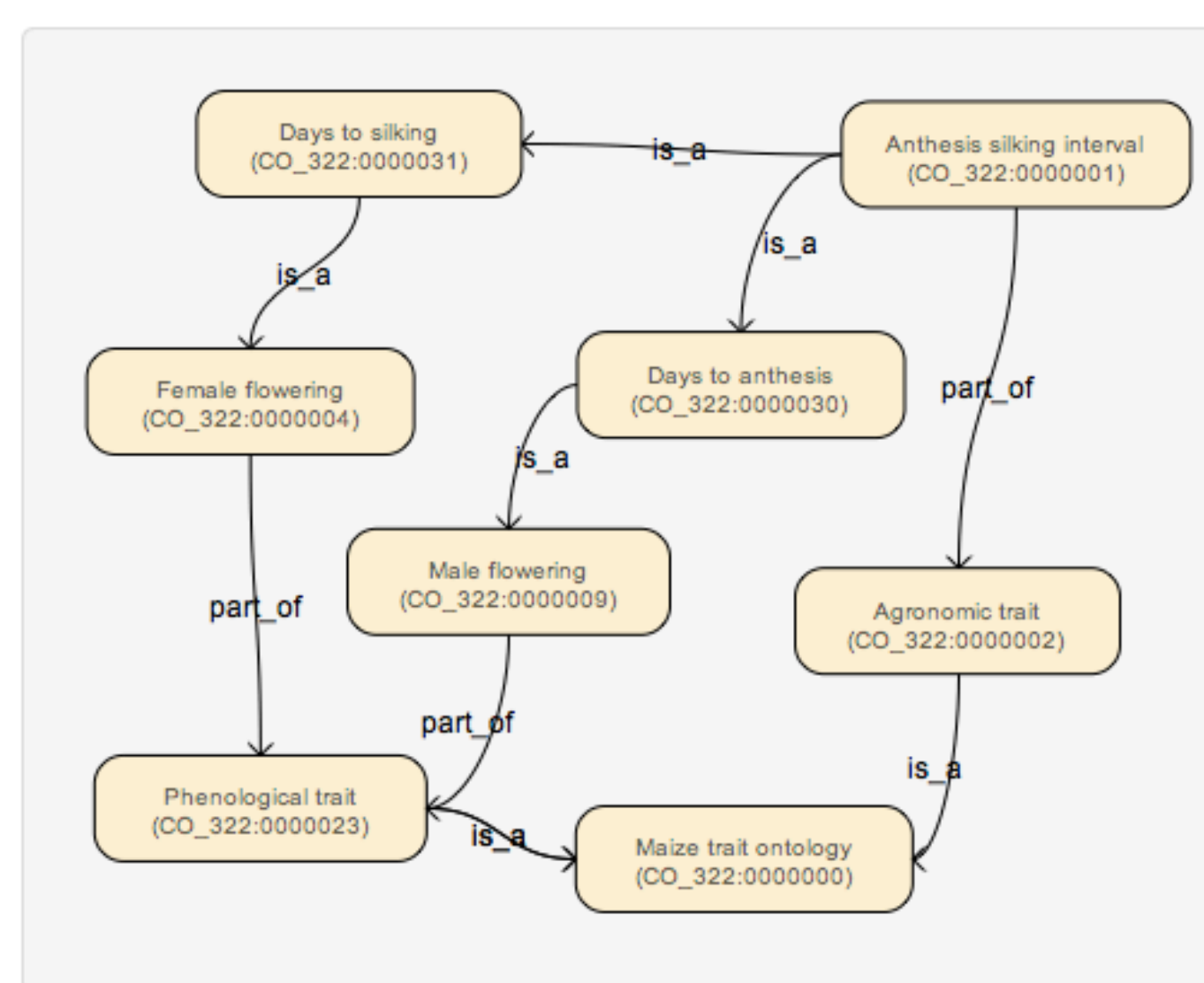
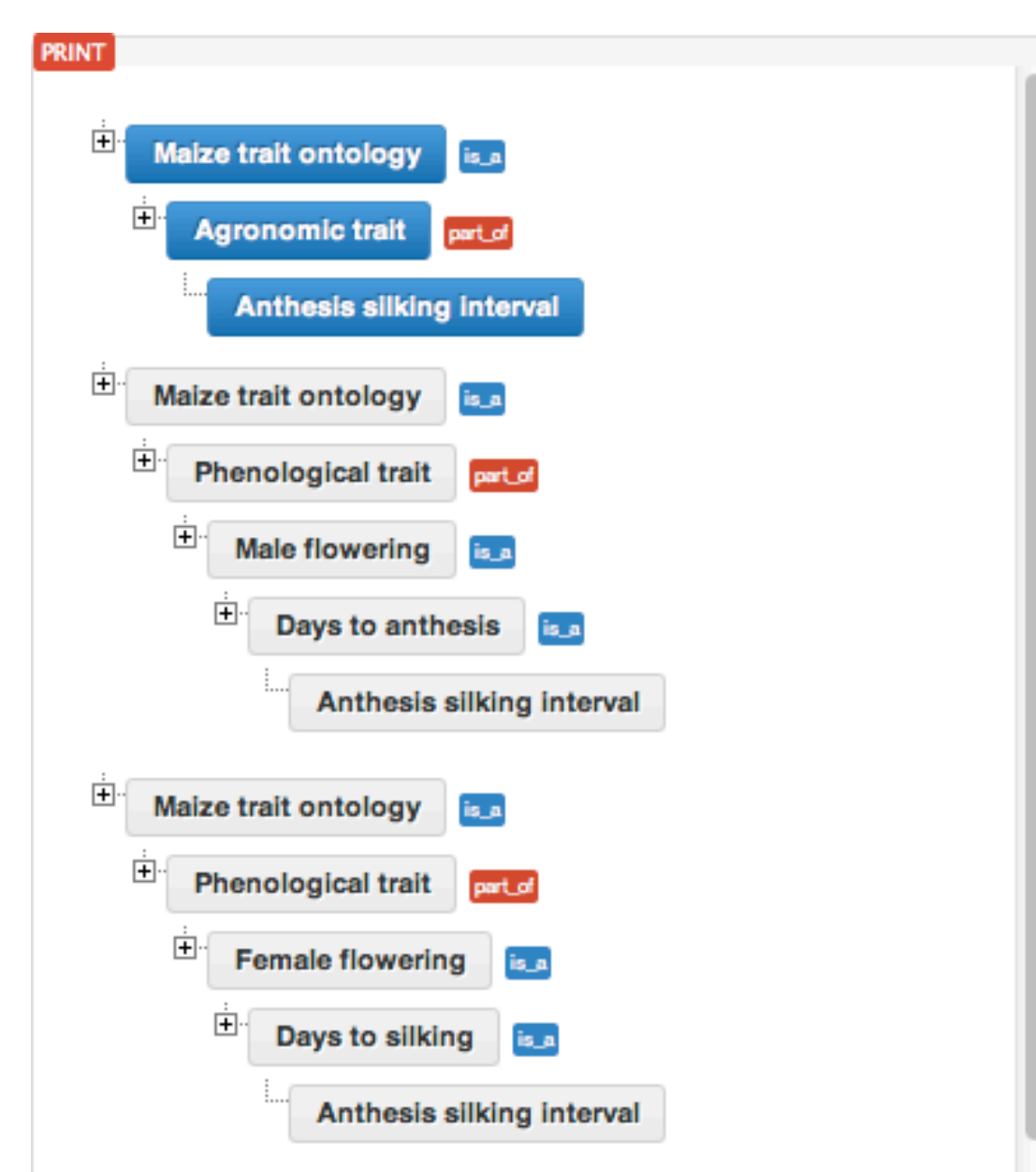
The volume of agriculture-related information and terminology related to phenotype, breeding, germplasm, pedigree, traits, among others, is increasing exponentially.

In order to facilitate access to the data held within and/or across the databases, GCP initiated the development of a Crop Ontology, a tool to facilitate powerful manipulations of the data through ontology-driven approaches.

What is it?

This curation and annotation web site is a participatory tool that enables you to browse the Crop Ontology, search for specific terms and access the definition, as well as additional information.

### Browse crop specific Ontologies

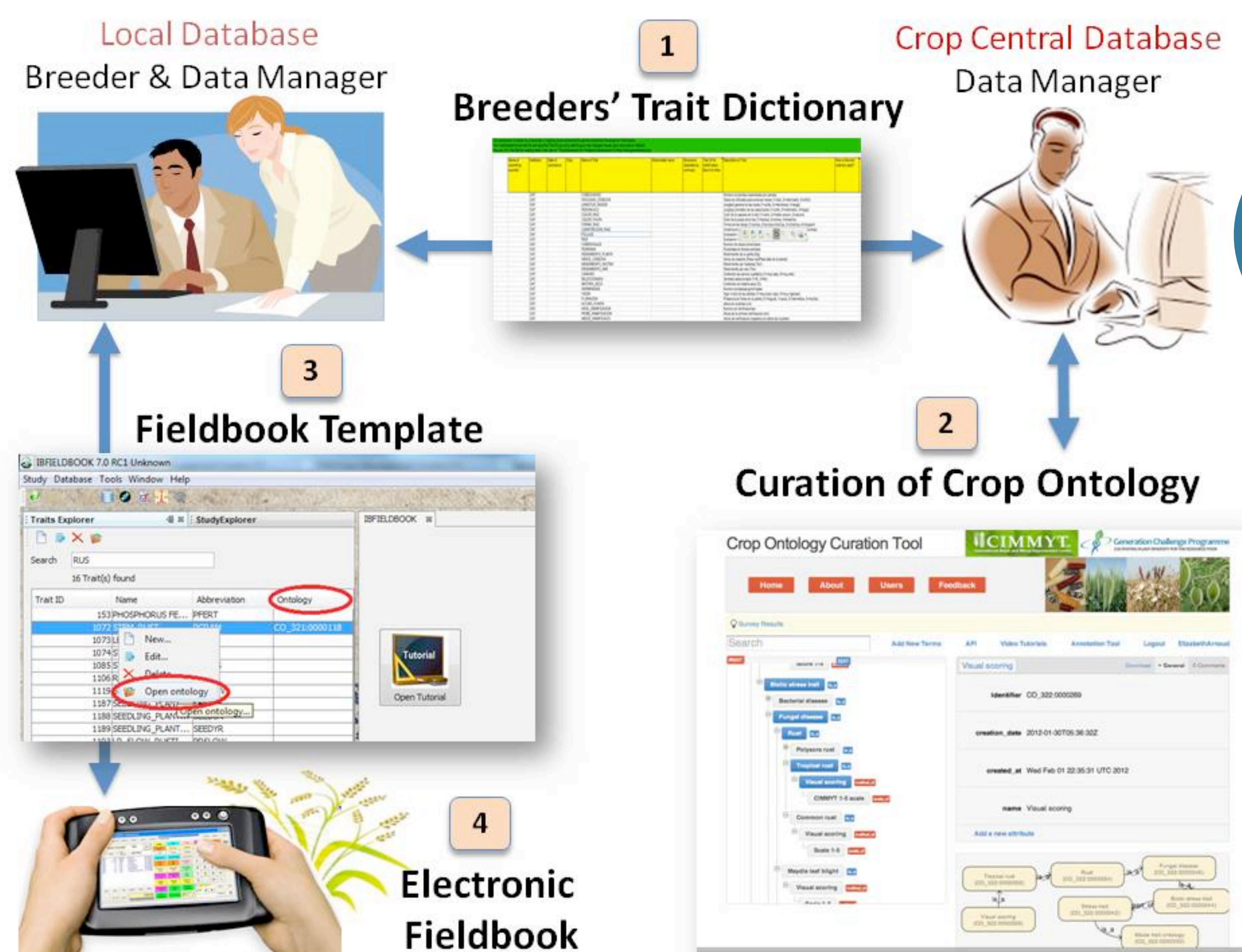
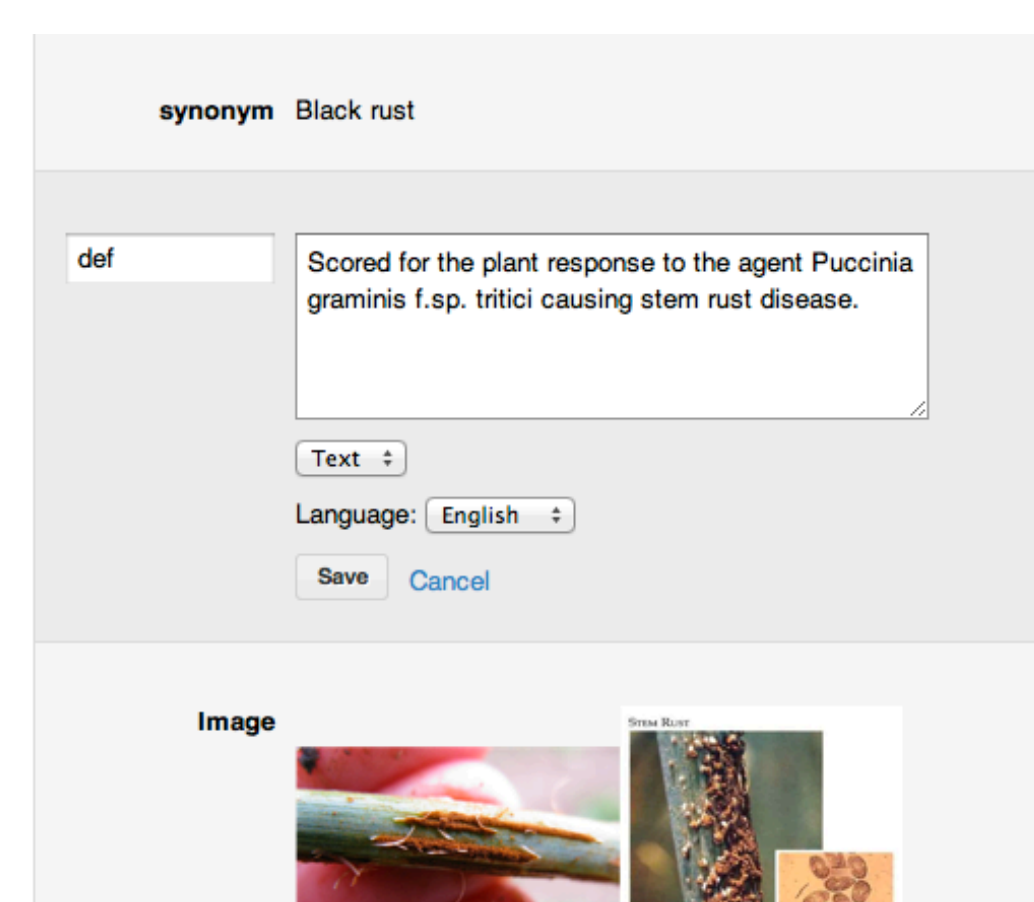


Navigate through the Ontology and find traits of interest. Retrieve traits information such as their name and definition and see the connections with other elements of the Ontology.

### Participatory online curation

Through a user-friendly website we allow people from anywhere in the world to access and collaborate on the ontology.

The system works similarly to Wikipedia. It allows anyone to sign up and create their ontologies. However, only after a moderator has validated their terms do they then become "public".



How did we build it?

The Ontology data is stored inside a non-relational database. We use the cloud computing power provided by Google App Engine which allows us to maintain high-availability across different geographical locations.

### Powered by Open Source

Crop Ontology is built on a range of modern open source technology including Google App Engine, jQuery, HTML5 and CSS3. The entire source code is available on GitHub.



→ <https://github.com/lmatteis/Crop-Ontology>

The GCP Crop Ontology currently provides validated names, definitions and relations for traits for eight crops: cassava, chickpea, groundnut, maize, musa, potato, rice, sorghum and wheat. Trait lists are being developed for common beans and cowpea.

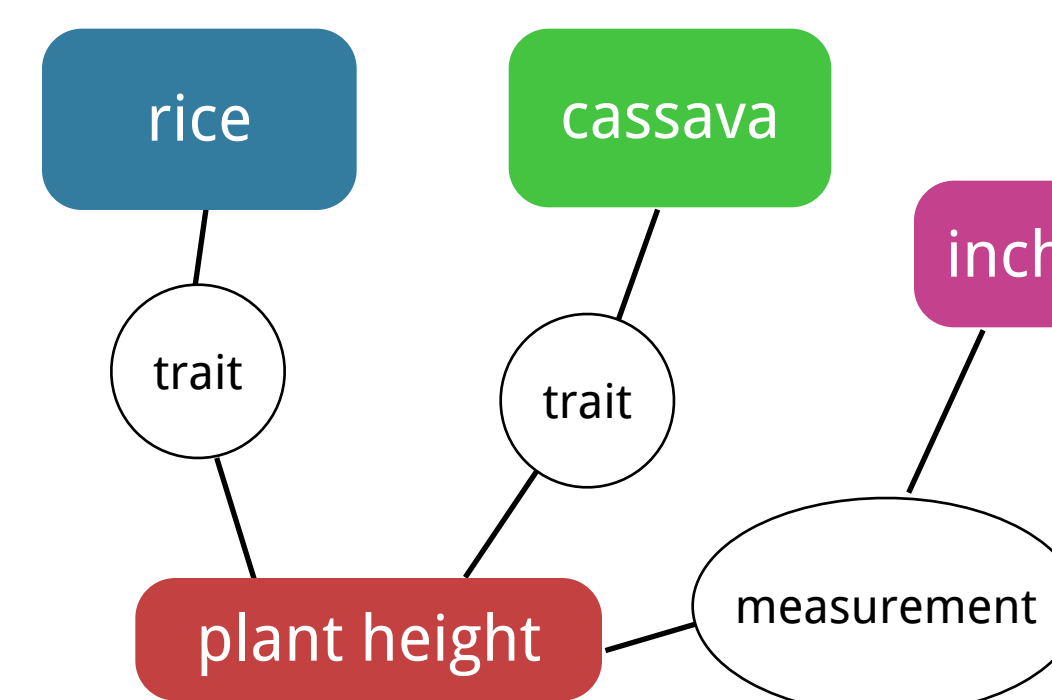
Observations

### Web standards

Thanks to web standards such as HTML5 and CSS3, we can build highly interactive and easy to use interfaces. This allows users to more easily create and edit ontologies from any computer or mobile device.



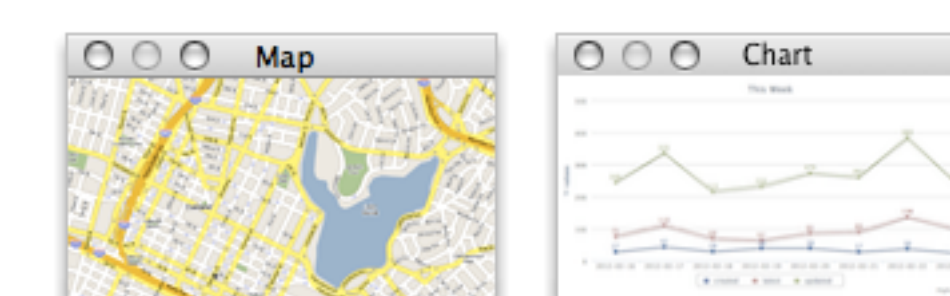
### Ontologies build connections



Ontologies allow us to build connections between terms and find information that we couldn't otherwise.

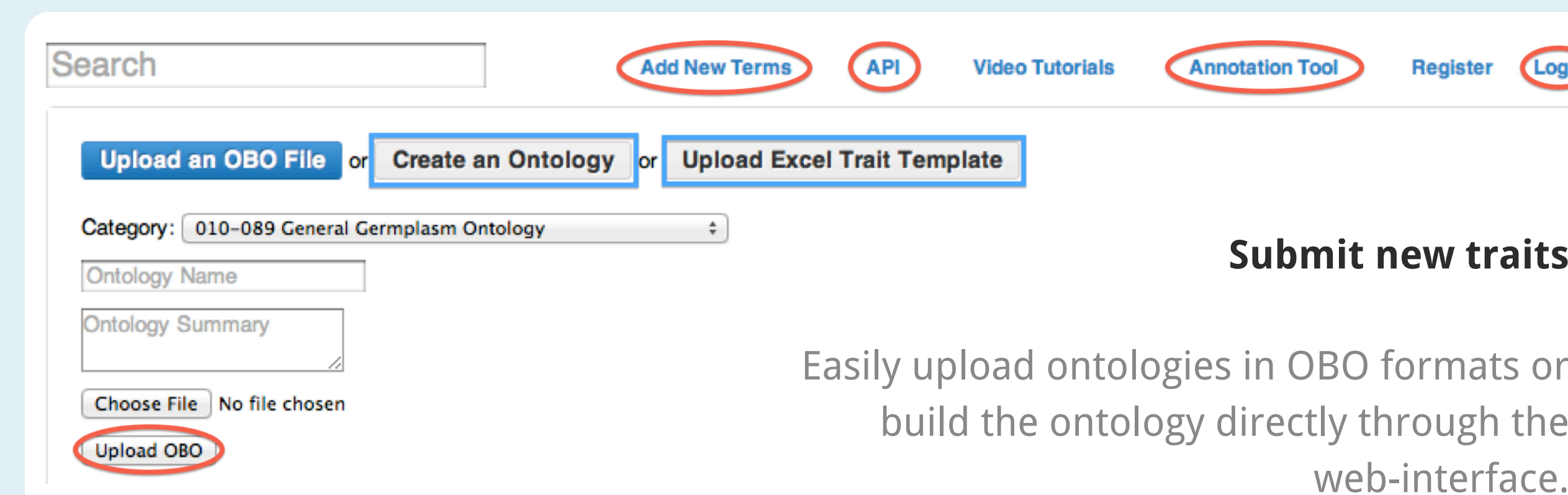
### APIs increase productivity

By building a platform with a programmable interface (API) we enable others to extend the functionality of our application in ways we didn't think of, or didn't have resources for.

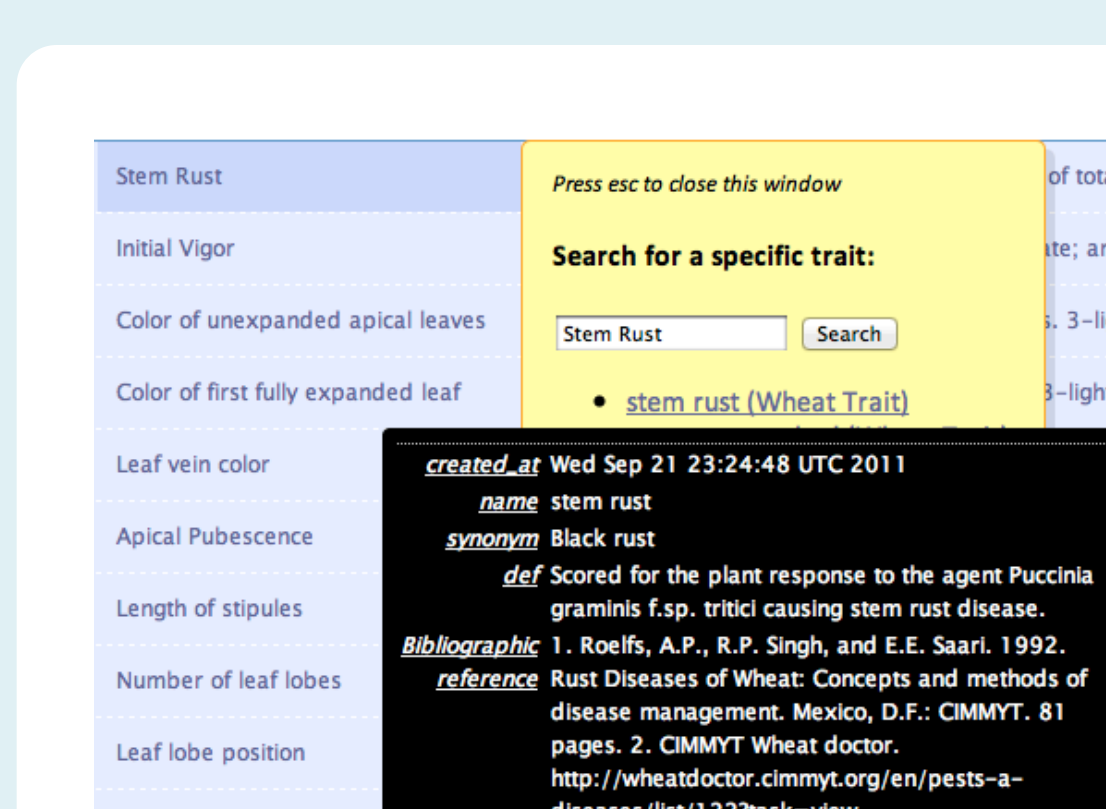
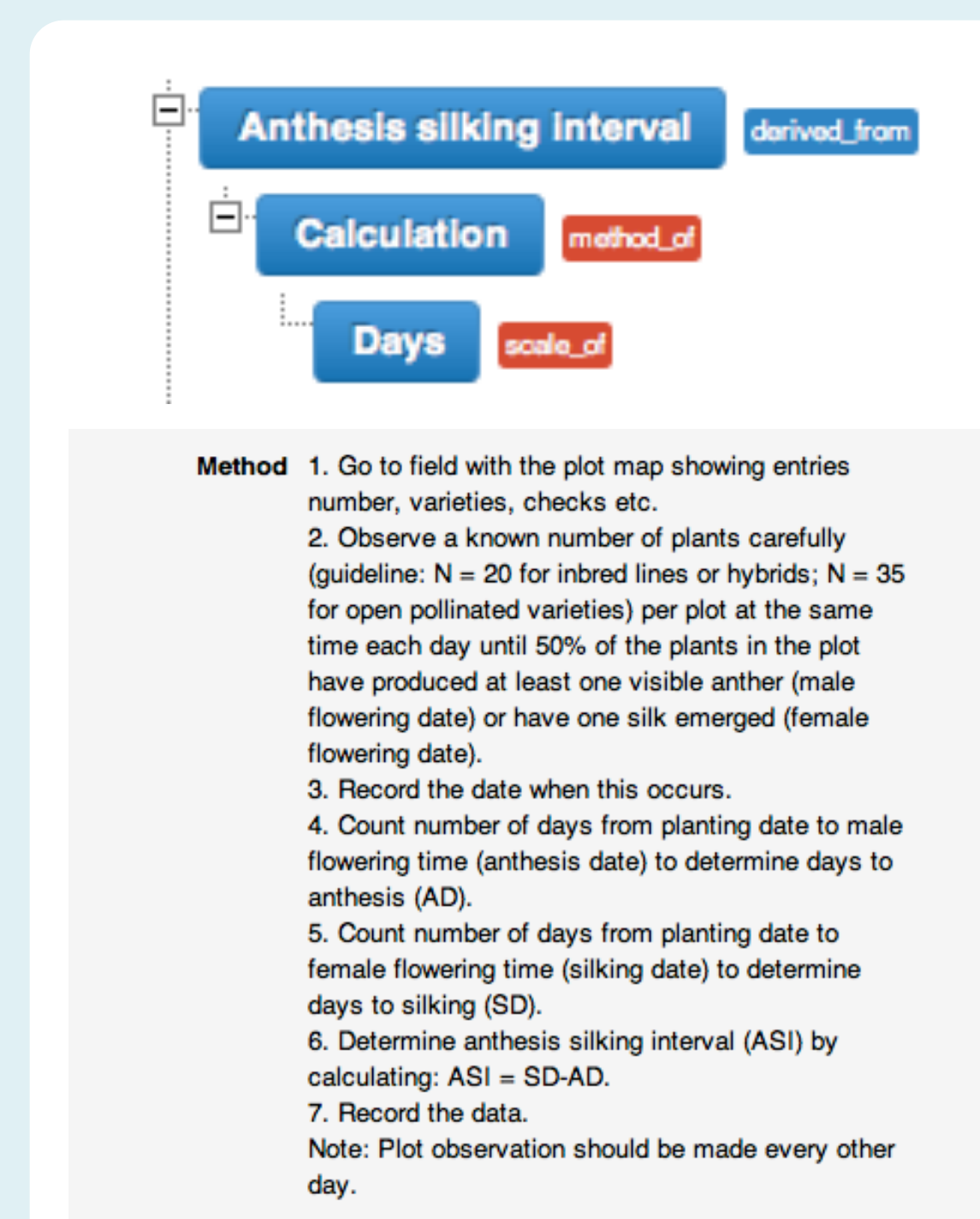


API

Crop Ontology



Easily upload ontologies in OBO formats or build the ontology directly through the web-interface.



### Annotate your dataset

Match your Excel fields with terms inside the ontology.

### Methods & scales

Retrieve and provide information regarding methodology and scales of measurement.

### Translation

Collaborate on the translation of traits in your own language.

