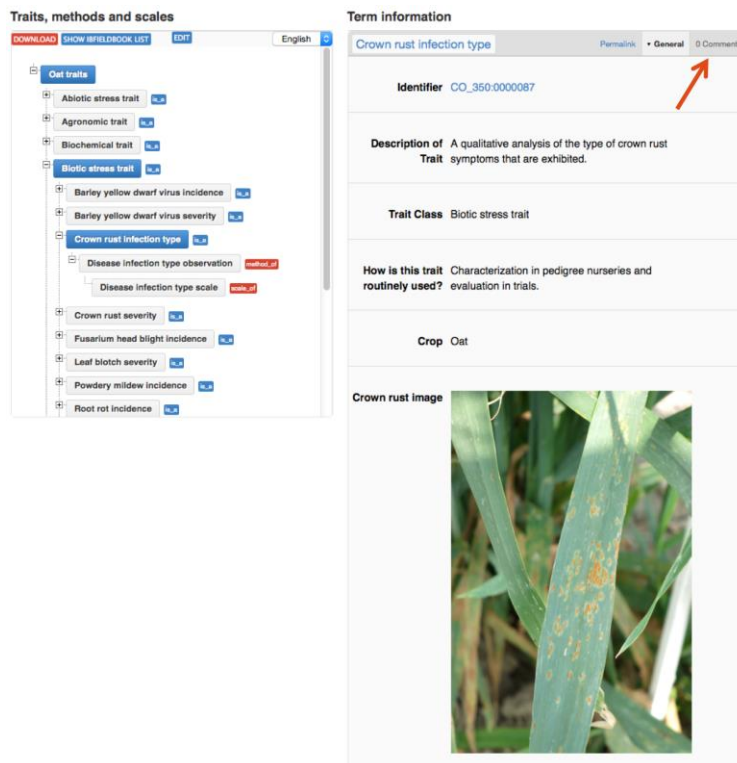


## T3/Oat status update, July 2016

Clare Saied<sup>1</sup>, Calvin Lietzow, David Matthews, Clay Birkett, Shiaoman Chao, Nicholas A. Tinker, and Jean-Luc Jannink

<sup>1</sup>T3/Oat curator, Cornell University  
crs298@cornell.edu

T3/Oat is the repository of oat phenotype and genotype data for the Oat Global Initiative ([www.oatglobal.org](http://www.oatglobal.org)) and offers flexible queries for extracting desired datasets for analysis, as well as integrated tools for data analysis (<http://triticeaetoolbox.org/oat/>).



*Figure 1. A screenshot of the oat trait ontology. The orange arrow highlights the comments section where users can submit feedback on individual traits in the ontology.*

### Crop Ontology Curation Tool

The Crop Ontology curation tool ([http://www.croponontology.org/ontology/CO\\_350/Oat](http://www.croponontology.org/ontology/CO_350/Oat)) has been used to create a preliminary oat trait ontology. The current traits have been modelled on the phenotypic traits stored in T3/Oat, which can be found on the “Trait Descriptions” page under the “About T3” menu of T3/Oat.

The Crop Ontology resource has the capacity to expand on the trait information, methods, and the measurement scales that are currently stored in T3/Oat. Trait information can include links, photographs, and file attachments, which provides the opportunity to enhance the description of each trait in the ontology. Traits that are not currently available in T3/Oat may also be added upon request.

Users are able to submit feedback

on all of the elements of the ontology using the comments section (Figure 1), positioning the trait ontology as a tool to develop standard methods within the oat community.

Users are invited to collaborate on this project and any feedback concerning the current information would be gratefully received, submitted either through the Crop Ontology comments section or by email to Clare Saied.



### Featured T3/Oat tool: Analyze traits and trials table

The last four editions of the T3/Oat status update in the Oat Newsletter have covered each of the phenotype data selection tools available in T3. This edition will focus on an analytical tool for phenotype data: the “Traits and Trials Table”.

The analytical tools offered by T3 can be found in the “Analyze” menu and each tool uses the data in the “Current Selections” panel. The “Traits and Trials Table” tool generates a separate table for each of the selected traits. Each table contains the phenotypic values for lines across the selected trials and these values are colour coded on a yellow-orange-red scale based on relative magnitude (Figure 2). A least-squares mean (LSmean) is calculated for each line based on a linear model. The LSmean adjusts for the expected value of any missing data points, making the LSmean less sensitive to missing values than the arithmetic mean. The values of the Least Significant Difference (LSD) and the Honestly Significant Difference (HSD) are given in the top left of the table.

#### Summary of Trait values in selected Trials

Trait: crown rust infection response				
LSD = 0.34	UMOPN_2015_Fargo_CR_Field	UMOPN_2015_MattMoore	UMOPN_2015_Morden_CR_Field	LSmeans
HSD = 0.66				
CLINTLAND64	1	0.9	0.8	0.9
GOPHER	1	0.9	0.9	0.9
HA08-03X05-3	1	0.9	0.9	0.9
HA08-03X15-1	1	0.9	0.8	0.9
IL09-5508	1	0.9	1	1
IL09-6937	1	0.9	1	1
IL10-9867	0.4	0.8	0.9	0.7
LEGETT	0.5	0.7	0.8	0.7
MN10209	1	0.9	1	1
MN11211	0.3	0.8	0.9	0.7
MN11231	0.3	0.5	0.9	0.6
ND090016	1	0.8	0.5	0.8
ND090868	1	0.8	0.8	0.9
ND100046	1	0.8	0.3	0.7
ND101473	1	0.8	0.3	0.7
ND110501	0.6	0.8	0.5	0.6
ND110787	1	0.8	0.5	0.8
ND111357	0.8	0.7	0.5	0.7
NEWBURG	1	0.7	0.5	0.7
OGLE	1	0.9	1	1
SD120258	1	0.8	0.9	0.9
SD120266	1	0.8	0.9	0.9
SD120316	1	0.9	1	1
SD120456	1	0.8	0.8	0.9
SD120553	1	0.8	0.9	0.9
SD120640	0.4	0.9	0.9	0.7
WIX10045-12	0.2	0.6	0.8	0.5
WIX10045-9	0.8	0.7	1	0.8
WIX9528-1	0.3	0.5	1	0.6
WIX9878-3	1	0.8	1	0.9
<b>Trial means</b>	0.8	0.8	0.8	

Figure 2. UMOPN 2015 crown rust infection response data, where 1= susceptible and 0= resistant reaction to crown rust.



Historical data from the Uniform Oat Performance Nurseries (UEOPN & UMOPN), Uniform Oat Winter Hardiness Nurseries (UOWHN), Uniform Winter Oat Yield Trials (UWOYT) and the Collaborative Oat Research Enterprise (CORE) have been uploaded to T3/Oat, and the “Traits and Trials Table” can be used to generate nursery reports on demand.

An up-to-date summary of all of the data that is available in T3/Oat can be obtained from the “Content Status” page, which can be reached through the “About T3” menu. Please contact the curator with any suggestions or questions, or to discuss uploading data to T3/Oat; any feedback will be gratefully received.