



Using BrAPI—an application programming interface for plant breeding applications

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Using genomics for breeding entails collecting and analyzing very large amounts of phenotyping and genotyping data. To address issues with the volume and complexity of breeding data, a number of database systems have been designed over the years to solve specific problems; however, having separate systems makes data integration extremely difficult.

To provide breeders with seamless access to all of the relevant data available, [Triticeae Toolbox \(T3\)](#) staff have been involved with developing and implementing BrAPI, a plant breeding Application Programming Interface (API) (Selby, *et al.* 2019). An API allows computer programs to communicate with each other. It determines available services, allowed inputs, structure of the output data, and how the data will be accessed.

BrAPI is a standardized web service API specification. Using BrAPI, data concerning germplasm, study sites, phenotypic observations, molecular markers, etc., can be retrieved from connected systems. A number of BrAPI-enabled applications, called BrAPPs, have been written to take advantage of the emerging support of BrAPI by many databases. More information on BrAPI, including links to the specification, test suites, BrAPPs, and sample implementation, is available at <https://brapi.org/>. The BrAPI specification and the developer tools are provided as free and open source. The T3 wheat, barley, and oat databases support the latest version (v1.3) of the BrAPI standard. The specific calls supported are available at <https://triticeaetoolbox.org/wheat/brapi/v1/calls/>.

Although the original idea was to enable interoperability between breeding management resources, BrAPI is also compatible with the Multi-Crop Passport Data standard (MCPD). This allows BrAPI to link to genetic resources distributed by gene banks, as well. Improved integration between gene banks and plant breeding management databases such as T3 has the potential to greatly enhance the management and utilization of plant germplasm collections.

Reference:

Selby, P., *et al.* (2019) BrAPI—an application programming interface for plant breeding applications. *Bioinformatics*, btz190, <https://doi.org/10.1093/bioinformatics/btz190>.