BrAPI Recent Achievements and V2 Updates

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What is BrAPI?

BrAPI is a... Standardized RESTful Web Service API Specification... for communicating plant breeding data
API – Application Programing Interface

User Interface
- GUI
- CMD
- Hardware

Application Programing Interface
- Web Service
- Local Messaging Service
- Job Queue
- Language Library
Web Service

• A Service Provider contains some Service with well defined Inputs and Outputs
• A Service Consumer sends a request to the Service Provider with the Input data, and waits for a response
• The Service performs some Function on the Input data
• The Service Provider sends the Output data as a Response back to the Service Consumer
REST - Representational State Transfer

- REST is an architecture design for creating Web Services using the well known HTTP standard.
- Requests are made with URLs.
- Data is represented with JSON.

```json
{
  "metadata": {
    "pagination": {
      "totalCount": 22,
      "currentPage": 0,
      "totalPages": 1,
      "pageSize": 22
    },
    "status": [],
    "datafiles": []
  },
  "result": {
    "markerprofileId": "mp1"
  }
}
```
Standardized Specification

• BrAPI has defined a Standardized set of data model structures to communicate the basic information of plant breeding

• BrAPI is a technical Specification which software developers can easily turn into code which communicates using the Standard.
BrAPI Community Achievements

• 33 Partner Organizations
• ~150 Developers, Data Scientists, Plant Breeding Experts
• The BrAPI Paper
  Accepted in March 2019 to the OUP Bioinformatics journal
  Printed in October 2019
BrAPI Review Board

A group of community volunteers who represent the community, review changes to the spec, and debate and resolve critical issues.

• Matthias Lange – IPK Gatersleben
• Cyril Pommier – INRAE
• Iain Milne – James Hutton Institute
• Jan Erik Backlund – IBP-BMS
• Lukas A. Mueller – Boyce Thompson Institute
• Rob Kooper – University of Illinois, TERRA-REF
• Tim Parsons – Breeding Insite
Use Case: Field Book

KSU Field Book App

User

Get Plot Layout, Traits, etc

Breeding Management System

----- Collect Field Data -----

Breeding Management System

Push Observations

KSU Field Book App

User
Use Case: Sample Management

Sample Management Tool
- BreedBase
- Sample Tracker

Genotyping Lab
- DArT
- Cornell
- Intertek
- a local lab

Genotype Database
- GOBii
- Gigwa

VCF
Use Case: **BRAPPs**
BrAPI V2.0

• V1.3 has been stable since November 2018
• V2.0
  • New Endpoints for submitting data
  • New Genotyping schema
  • New Searching mechanism
  • Logical reorganization into “Modules”
  • General clean up and removal of old interfaces
BrAPI V2.0 Modules

BrAPI-Core
• Programs, Trials, Studies, Locations, People, and Lists

BrAPI-Germplasm
• Germplasm, Germplasm Attributes, Seed Lots, Crosses, Pedigree, and Progeny

BrAPI-Phenotyping
• Observation Units, Observations, Observation Variables, Traits, Scales, Methods, and Images

BrAPI-Genotyping
• Samples, Markers, Variant Sets, Variants, Call Sets, Calls, References, Reads, and Vendor Orders
BrAPI V2.0 Specification Tour

https://brapi.org/specification
THANK YOU

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