**DI1.1.3-RTB Breeding databases Support systems**

**DI1.1.3.3 - Protocol and trait dictionary for RTB crops documented, aligned and available in the Crop-Ontology platform for RTB trial management systems**

**5819- Trait dictionary and ontology include the gender-responsive scoring methods used by the Participatory variety selection (PVS) protocol of potato and is available in the Crop-Ontology platform for use by CIP trial management system**

**First Author**: Salas, E.

**Co-Authors**: Hualla, V.; Molano, J.; Arnaud E.

An ontology is a formal representation of a set of concepts within a specific discipline and the relationship between those concepts. It provides a shared and controlled vocabulary that can be used to develop phenotype hierarchy structure of different Crops. This is a crucial concept when gathering field data because it needs to be in a standardized way. For this reason, Bioversity International has been trying to identify and select ontologies for specific tasks with the help of other research centers.

Participatory Variety Selection (PVS) provides key information on farmers’ preferences useful to accelerate the release and acceptance of new potato candidates. The International Potato Center (CIP) has applied an adapted multiple version of the PVS methodology using the Mother & Baby (M&B) trial design. This approach encourages active participation of farmers through the application of treatments in their own plots called "Baby trials" (i.e. farmer managed trials) and in fields with an experimental design called "Mother trials" (i.e. researcher managed trials), as well as through systematic evaluations and selections of treatments.

The Potato ontology with PVS traits and scoring methods provide a common set of standardized variables for institutions, trainers and facilitators involved in PVS. This ontology is based on the protocol: "Participatory Varietal Selection of Potato (PVS)" developed by the International Potato Center (CIP). In this context, the ontology terms were gathered from farmers and presented: traits, descriptions, methodologies, valid ranges and scales using a standardized template (from the Crop Ontology web page: <http://www.cropontology.org/>). Finally, this information was curated by breeders and researchers at CIP:

The PVS ontology has been integrated with the ontologies available for potato in the CO page. In total, the presented variables for PVS are 45 new variables. It includes: morphological traits (9), agronomic traits (16), biotic stress trait (9), abiotic stress traits (5) and quality traits (6).

In conclusion, this PVS ontology report has identified the most common and important criteria chosen by farmers in past experiments and bibliographic references. This is how the selection criteria that farmers use to evaluate the most important traits has been standardized: at flowering, harvest and post-harvest stage (organoleptic), including a gender and global approach.

The PVS ontology is available on <http://www.cropontology.org/>

**Acknowledgments**

We thank Dr. Elizabeth Arnaud from Bioversity for her observations and suggestions. We are also very grateful to Dr. Stef De Haan from CIAT, Mg. Carolina Bastos, Cristina Fonseca from CIP, for their hard work and dedication throughout the years with PVS (Mother and Baby trial) in the fields.

**References**

* De Haan, S; Salas, E.; Fonseca, C.; Gastelo, M.; Amaya, N.; Bastos, C.; Hualla, V.; Bonierbale, M.2017 Participatory Varietal Selection of Potato (PVS) using the Mother & Baby Trial Design: A gender-responsive trainer’s guide. Lima (Peru). International Potato Center. 82pp
* Hualla, V., Salas, E., De Haan, S., Fonseca, C., Gastelo, M., Amaya, N., Bastos, María., Molano, J. & Bonierbale, M. Ontology to Participatory Variety Selection (PVS) of potato. In SciDataCon 2018. Gaborone, Botswana.