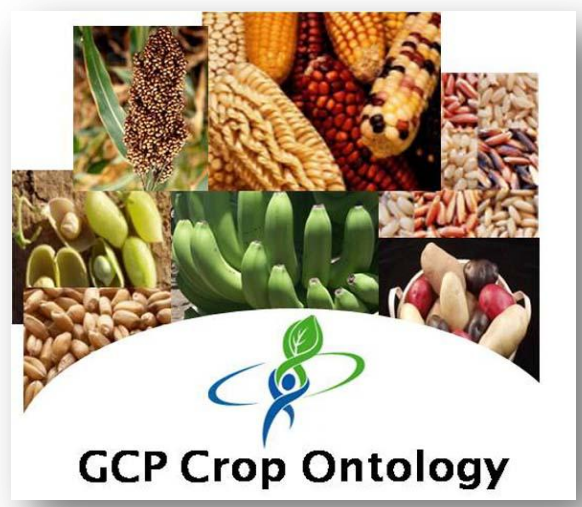


Expansion of the Crop Ontology by Adding Cassava Trait Ontology



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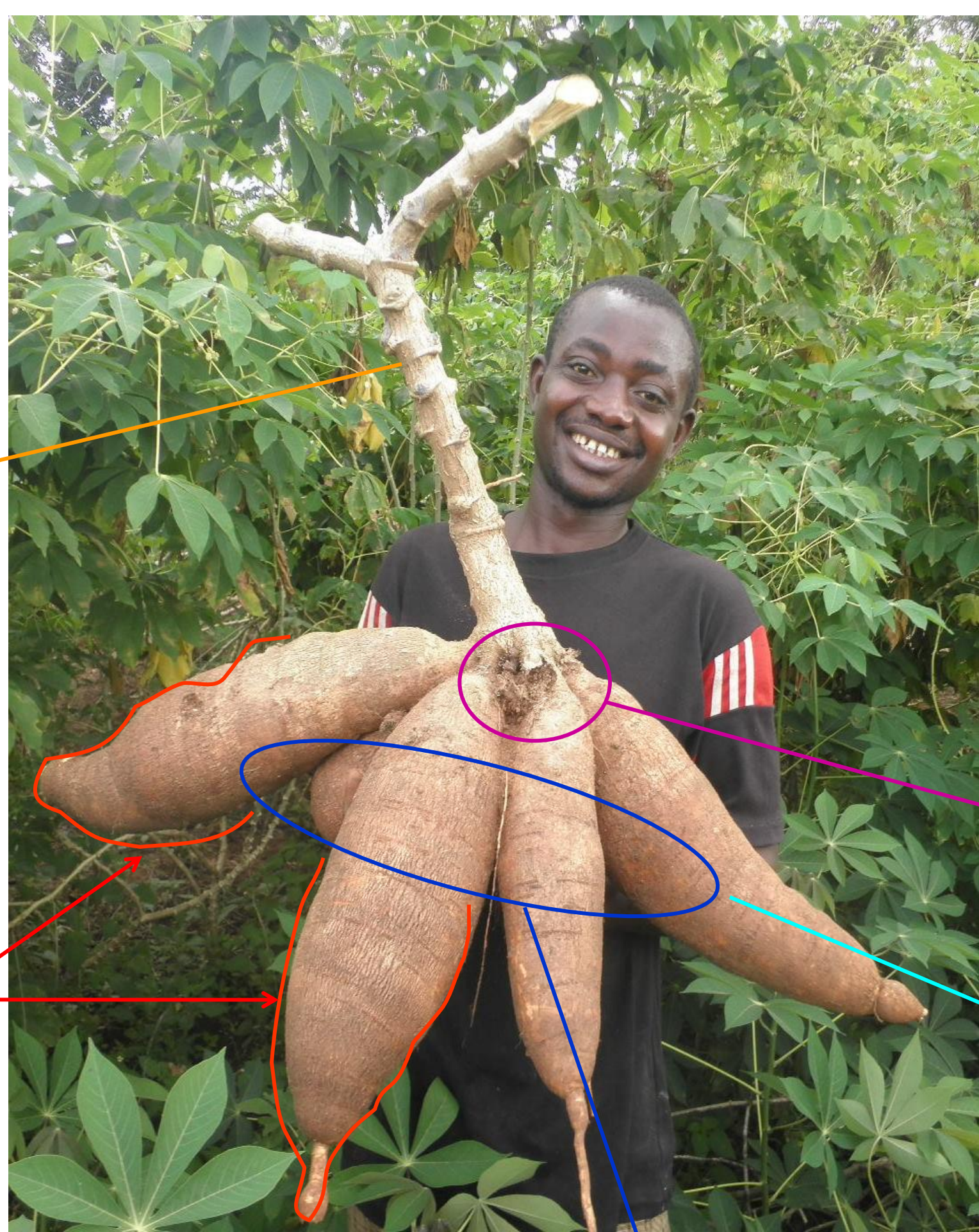
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Introduction

The Crop Ontology describes traits, methods and scales of several economically important plants (<http://www.croponontology-curationtool.org>). Cassava (*Manihot esculenta* Crantz) ontology was added to Crop Ontology in 2010. Simultaneously, the cassava team is developing an ontology-driven cassava database called ICASS for researchers to record and annotate measurements linked to genotypes with defined pedigrees. The cassava crop ontology currently describes over 125 traits representing important trait groups (agronomic, biotic and abiotic stress, morphological, physiological and quality traits). These traits describe phenotypic variability for characteristics needed for crop improvement. The cassava ontology will facilitate information sharing and collaboration among researchers from CIAT, IITA, national programs and other collaborators. New ontology-based online curation and annotation tools allow crop curators to provide standard protocols explaining scale, scale value, scoring guidelines and growth stages for scoring traits.

Objectives

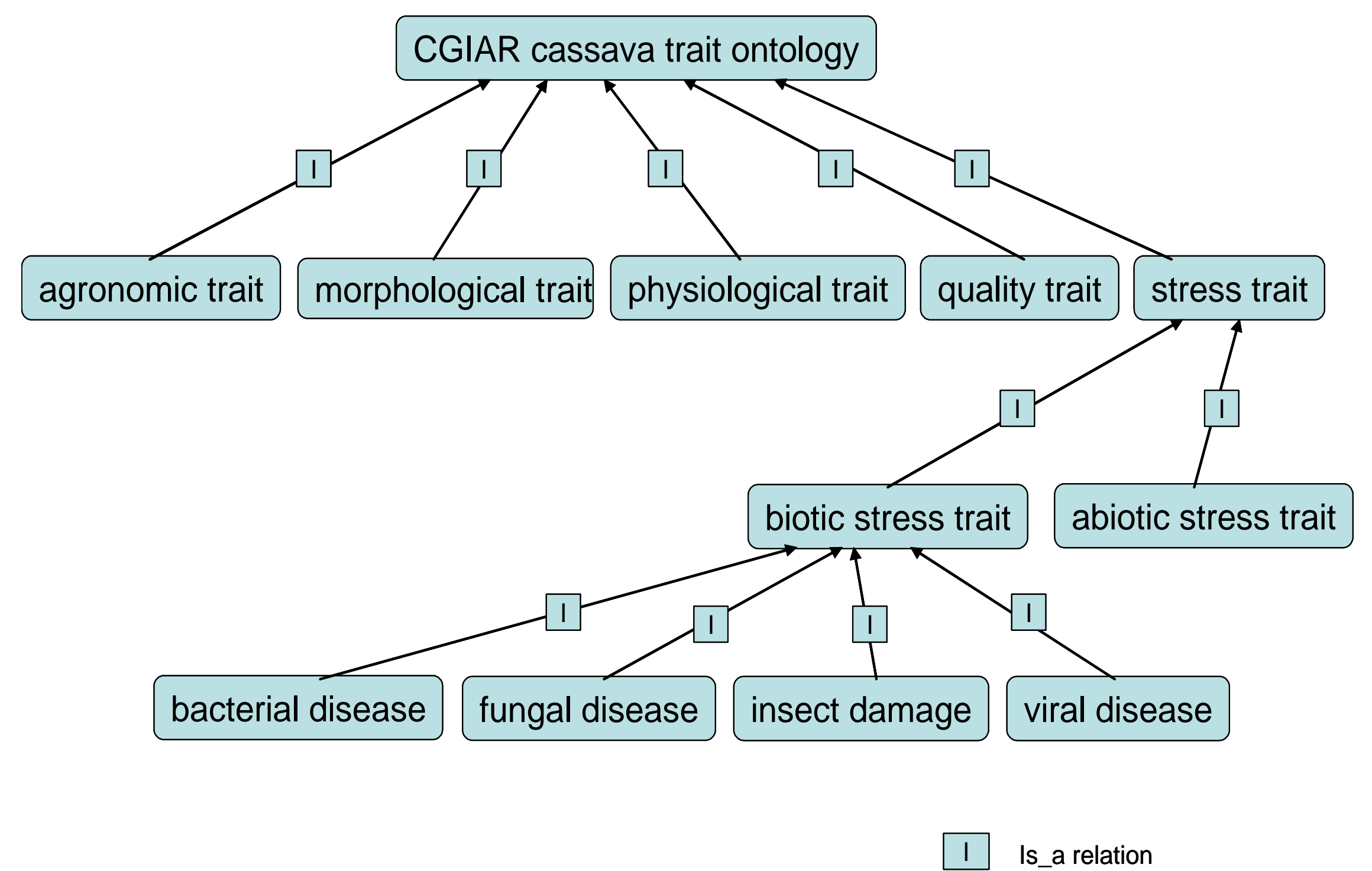
- ▶ Define cassava traits using standard terminology shared among cassava researchers.
- ▶ Facilitate the sharing of information between research trials.
- ▶ Increase efficiency of information retrieval.
- ▶ Integrate information from various electronic sources.
- ▶ Enable annotation of research documents, reports, and databases with ontological terms.
- ▶ Allow researchers and end users to query keywords related to traits



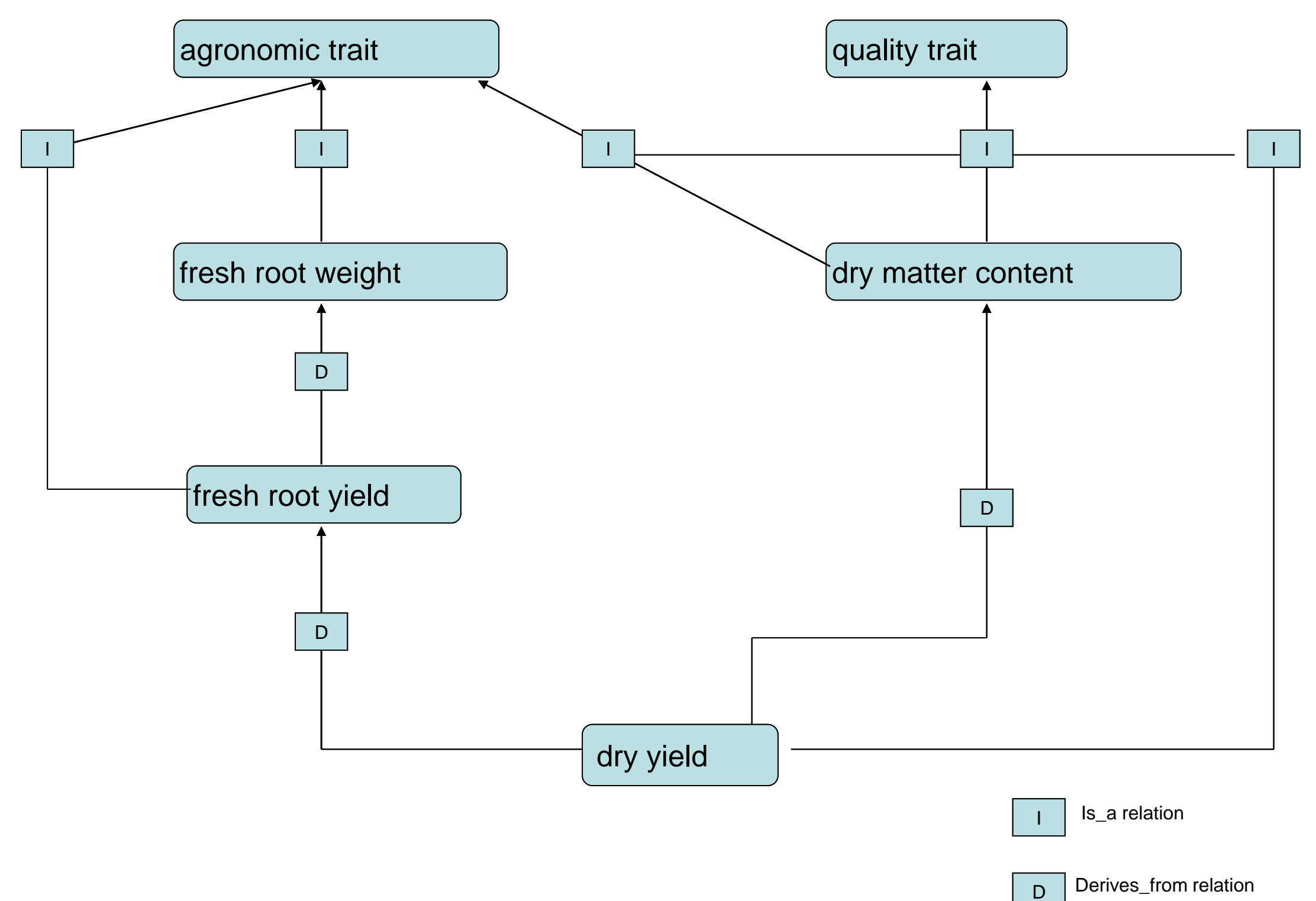
Overview of definition of a trait term and its relationship within the ontology.

OBO syntax	Meaning	Example
ID	Unique Identifier	CO_334:0000013
Name	Term	Fresh root yield
Def	Definition	Fresh weight of harvested roots expressed in tons per hectares per plant. [ISBN:978-131-302-1
Exact_synonym	Synonym	"FYLD"EXACT[]
is_a	Parentage	CO_334:0000001 ! Agronomic trait
Relation	Relationship type	Derives_from CO_334:0000012 ! Fresh root weight

Cassava trait ontology structure Trait group relationships



Overview of ontological term having multiple inheritance from two classes of ontology traits.



Next Steps

- ▶ Document cassava trait ontology within the gramene trait ontology to develop a common internationally-shared crop trait ontology.
- ▶ Harmonize definition of cassava traits with researchers including CIAT and National Agricultural Research Systems.
- ▶ Apply the ontology-based annotation tool to annotate cassava datasets.
- ▶ Facilitate ongoing communication among cassava researchers to continuously add new cassava traits to ontology.

References

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- Dixon A.G.O., et al 2010. Improved cassava variety handbook. IITA cassava project, Ibadan Nigeria.

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