

HARNESSTOM: Status quo of GenRes IP for tomato

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101000716



- The tomato crop origins, domestication and breeding
- The HARNESSTOM Project
- The Structure of the HARNESSTOM Project and the Managment Bodies for IP





Tomato: from domestication to traditional varieties





Tomato: Breeding by companies starting by selection and crosses in XIX and in the second part of XX w DRG





Interest in GenRes / Wild relatives: Tomato Genetic Resources stored in Seedbanks around the world





World Seed Bank Svalbard



COMAV seed Bank



Seed Companies Banks







Tomato: Breeding by companies starting by selection and crosses in XIX and in the second part of XX w DRG





Genetic mechanism of IP protection F1 hybs



Segregation of traits en F2 generation From a F1 hyb fro color, shape and DRG

- Most of the tomatoes currently cultivated under intensive agriculture (year around, protected /greenhouse, open field) contain several DRG from wild relatives (10% or more of their genome is not Solanum lycopersion)
- Most of those are F1 hybrids. Seed saving by farmers will result in segregation of the traits of the variety.
- Still Genetic information reveals farmers saved seed and conducted "traditionalization" of those varieties.



The Call and the project



harnessing the value of tomato genetic resources for now and the future

Horizon 2020

Call: H2020-SFS-2018-2020 (Sustainable Food Security)

Topic: SFS-28-2018-2019-2020

Type of action: IA Genetic Resources and Pre-breeding Communities Proposal number: 101000716

Proposal acronym: HARNESSTOM



esources and pre-breeding communice.

A range of activities implemented by a wide range of stakeholders will seek to enhance management and use of GenRes and implement global commitments in this area. While the focus of activities is on Europe, international resources and activities shall be taken into account.





Tomato and GenRes: The advantages and challenges of tomato. Need for increasing use of GenRes

Tomato the most consumed vegetable (health +\$\$)

A model (fleshy fruit, wound and plant pathogen interaction)

Large amount of Genetic, Genomic and phenotypic info

Large amount of GenRes (but limited) 30k+

Large Scientific Community/ own prebreding materials and populations

Very active R+D in Academia

Companies invest 5-15% in R+D+i

Huge investment in tomato genomic projects in EU

Limited use of GenRes by Companies



Climate Change Conditions

Emerging diseases

Consumers needs

Farmers vs Seed Co

Public vs Private

Traditional vs Modern









(despite introgression of wild in most F1) This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No *101000716*



Basic Tenet: Genetic Resources and **Knowledge** are key to overcome upcoming threats and needs



ULTIVATION PRACTICES



Respository GenRes info and tools (including those to increase efficiency)

Use GenRes and knowledge for prebreeding subprojects to address tomato challenges (industry/ seed companies)

GenRes to address Traditional farmers challenges (participative breeding)







Tomato and GenRes: The facilitating approach



A range of activities implemented by a wide range of stakeholders will seek to enhance management and use of GenRes and implement global commitments in this area. While the focus of activities is on Europe, international resources and activities shall be taken into account. Centralized one-stop shop for tomato GenRes info and tools (including those to increase efficiency)

but

targeted alliances between academia and seed companies/farmers (ring-fenced type of prebreeding subprojects)

or

between academia and farmers (participative breeding)





Tomato and GenRes: The HARNESSTOM Team a diverse and complementary one



- 22 partners: 12 academia, 6 companies, 4 NGOs from 7 countries
- A heterogenous partnership with different, starting positions, types and considerations for GenRes
 - seedBanks, scientists w IL containing wild genome regions, farmers w traditional varieties generating additional diversity by intercrossing and w MAS, seed companies







Genetic Resources and info in HARNESSTOM



GenRes Materials coming from previous projects

Tarditom https://cordis.europa.eu/project/id/634561/; contact P1-CSIC (Antonio Granell; coord) TomGEM: https://cordis.europa.eu/project/id/679796/; contact P –INPT (Mondher Bouzayen; coord) Bresov (774244) https://cordis.europa.eu/project/id/774244/; contact P –UPV (Jaume Prohens; partner) G2PSOL (677379) https://cordis.europa.eu/project/id/677379; contact P –ENEA (Giovanni Giuliano; coord) Rootopower (289365): https://cordis.europa.eu/project/id/289365; contact P –IVIA (María J. Asins; partner) National programs for UPV, CSIC, INRA, MCVRI,

GenRes Materials coming from genebanks

COMAV, WorldVeg, INRA and UNITUS genebanks

GenRes Materials coming from partners labs / institutions (no seed banks)

GenRes from companies

GenRes from association of producers

QTL maps

Marker to trait for a number of traits Genotypes / Phenotypes for large collection of material GWAS Technologies for speed breeding

One stop shop for tomato genetics and genomics





Management structures for IP issues in HARNESSTOM: **Exploitation Management and Project-specific IP regulatory** framework. The IPRM



WP2

- Personal Data protection
- Research Data (DMP and ORDP)
- **Open Publication** •
- **Ethics Requirement**



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IPRM Committee

 comprising all industry partners and relevant academic partners will be constituted at the start of the project to consider all IP issues

This agreement is executed by and betweer

STANDARD MATERIAL TRANSFER AGREEMENT

I the Parties having adhered to the WARNESTON

SONFIDENTIALITY AGREEMENT

SSTOM

- Foundations in the CA (coord+ companies+FCCV)
- Remind partners of IP incentivation (each meeting)

PREAMBLE WHEREAS

tic Resources for

facilitate access to

The International Treaty on Plant Genetic Resources for Food and Agricult

Onal Treaty on Plant Genetic Resources for Food and Agriculture

- will report to the Executive Committee
- SMTA
- NDA



Grant Agreement number: 101000716 - HARNESSTOM -

EUROPEAN COMMISSION

GRANT AGREEMENT

EurorEniv Convinious Research Executive Agency

Consortium Agreement

concerning the project

The CA and the GA docs @ the kick-off meeting, a booklet compiling the most relevant basic project documentation -0-SFS-2018-2020 / H2020-SFS-2020.1

Consortium Agreement 2845573841102/89/2020

- Private doc stablishes the rules, agreed by all parties that regulates the interaction between partners (signed a few days before the GA)
- Each partner indicated previous knowledge and materials they are contributing to the project (**BACKGROUND**) and the overall agree on sharing for the purpose of the project or beyond. Conditions set for sharing info or materials in general or in a case by case situation. •

Prebreeding Materials

- Private use, eventual protection as they develop in varieties (DUS distinctness, uniformity, stability criteria UPOV). Joint application by those contributing to develop them
- Tools, markers or techologies for breeding
 - Private use, eventual protection as patents
 - JOINT application by partners contributing







WP2 Task 2.6. Ethics and Legislation on the use of Genetic Resources (GenRes) and registration of varieties. **Legal observatory**

HARNESSTOM	
LEGAL OBSERVATORY	REGULATION - INTERNATIONAL
 News GenRES and IP Library INTERNATIONAL EUROPEAN UNION ANDEAN COMMUNITY 	
NATIONAL REGULATIONS Discussion Forum	Access to Genetic Resources 🚰 Plant Innovation 🔅 OMGs 😭 Environment and Sustanaibility 🗊
	CONVENTION ON BIOLOGICAL DIVERSITY
	CARTAGENA PROTOCOL ON BIOSAFETY TO THE CONVENTION ON BIOLOGICAL DIVERSITY
	NAGOYA - KUALA LUMPUR SUPPLEMENTARY PROTOCOL ON LIABILITY AND REDRESS TO THE CARTAGENA PROTOCOL ON
	BIOSAFETY 💓

"Initial state of the art in legislation" (29.09.2021) D2.5 An updated "final state" to be delivered by the end of the project

"Congress on IP and registration of varieties organized 2022"



D10.3 : NEC - Requirement No. 3 Non-European Countries



Ref. Ares(2020)7992642 - 29/12/2020

Call identifier: H2020-SFS-28-2020 HARNESSTOM Grant agreement N°: 101000716



HARNESSTOM: Harnessing the value of tomato genetic resources for now and the future

Deliverable No. D10.3	
NEC - Requirement No. 3	
Contractual delivery date: M3	
Actual delivery date: 30 th December 2020	
Responsible partner: P1-CSIC	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101000716. EU, National and International regulations that must be observed when plant material is imported into or exported from the EU. List of those materials and when relevant list of approvals obtained and copies of such kept on file and submitted to REA upon request

1. Details on the materials which will be imported to/exported from the EU

2. List of Copies of import/export authorizations, as required by national/EU legislation that be kept on file and submitted to the Agency upon request

Annex I. Background and flowchart used to define whether any of the materials used in HARNESSTOM falls within the scope of the regulation

Annex II. Tables of Genetic Resources Materials used in HARNESSTOM

Annex III. Regulations applying to the import /export of seeds into a/from the EU for each participating country/partner in HARNESSTOM. Phytosanitary docs to comply with regulations

Annex IV. Model of Standard Material Transfer Agreement





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D10.3 : GenRes in Harnesstom. Details on the materials which will be imported to/exported from the EU; in or out of scope







Ref Ares/2020/7992642 - 29/12/2020

No

EU partners

PS-UPV, PG-WUR,

PI-CSIC, PS-IVIA

PJ.CSIC, PZ. INRAE,

several EU partners

elite lines

WPA

PA-ENEA

PS-UPV, PJ-UNINA

WPG

WAY

Wp8

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NEC partners

OUT





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Type of GenRes materials

Breeding materials and Collections

Breeding materials source of Tolerant Benes:

Source of quality genes; traditional varieties,

Source of Disease Resistance Genes DRG



Wrap up HARNESTOM : IP and GenRes Access issues

- IP and GenRes in Tomato domestication and breeding: complex situation supported by genetics and historical perspective; actors and rights
- Project would eventually produce different materials and knowledge that could lead to IP, either Registered varieties- beyond the duration of the Project or Patents
- Consortium Agreement signed by all partners that regulates relationships among the partners (forground and background). Grant Agreement signed by Coord w EU and later all partners
- Project structure: 1- all partners wps 2- ring fenced wps designet to facilitate the involvement
 of companies / industrial partners, scientists academia, farmers/traditional and eventual IP
 protection
- IP and GenRes legal observatory with forum, congresses and updates. Reminders every 6 months
- Ethics WP on use of Genetic resources from third countries. Phytos and controls and difficulties in accessing GenRes and impact in progress in prebreeding projects. Plant Passport needed for tomato even to Exchange seeds between labs. Urgent need to facilitate the process.







