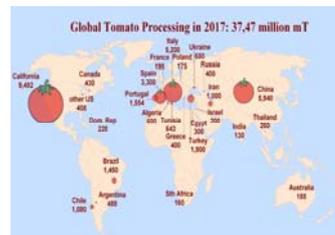


INTRODUCTION

In the 2017 campaign, 37.4 million tons (MT) of industrial tomatoes were produced worldwide. The processing tomato is the most important crop in Extremadura in terms of employment and income in the region. Agricultural activity creates one of the greatest impacts on the environment, and with population growth and increased consumption only set to double the demand for food by 2050, the best solution will likely be achieved through the intensification of sustainable agriculture, and by increasing yields (kg/ha), while simultaneously reducing environmental impact.

The goal of the TomPrint Operational Group is the mitigation of the environmental effect produced by the processing tomato industry in Extremadura. This objective will be achieved through the development of a computer application which will record and analyse data from each stage of the crop cycle in order to establish the Carbon and Water Footprints of each campaign.



MATERIALS & METHODS

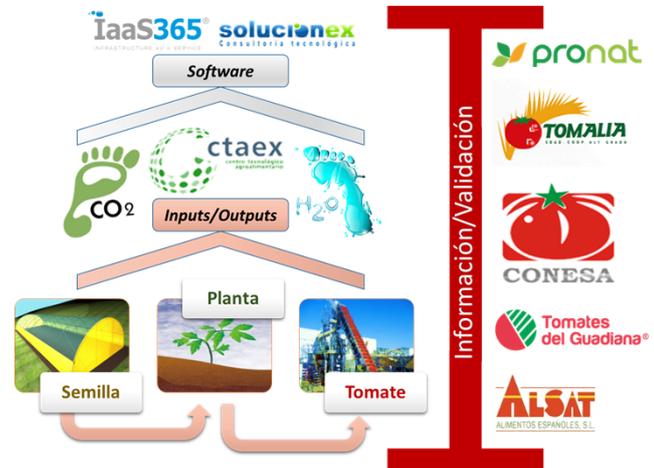
The Operational Group consists of 5 processing tomato companies, 2 IT service companies and a Technological Centre, CTAEX. The representative of the group is Conesa. The remaining companies in the OG are Tomates del Gadiana, Pronat, Tomalia and Alsat. IaaS365 and Solucionex will provide IT support with CTAEX serving to link the new technology with the tomato producers. AGRUCON and Cooperativas Agroalimentarias Extremadura will also collaborate in the dissemination of the results.

The (WF) Water Footprint, calculated in accordance with the methodology used by the Water Footprint Network, and the (CF) Carbon Footprint (calculated using ACV, PAS and ISO), are considered to be the primary indicators used to evaluate the effect of industrial processes on the environment. The critical control points for industrial tomato cultivation and the transformation process will be established to determine the factors which have the greatest environmental impact, allowing the formulation of a coordinated strategy to reduce water and carbon footprints.

RESULTS & DISCUSSION

The final result of this OG will be an IT tool that, using the baseline data obtained, will be able to quantify the water and carbon footprint of the main tomato producing industries in the region for each subsequent campaign. Tomprint Will, therefore, make it possible to manage the quantified environmental impact by use of this computer application, placing specific emphasis on subsequent campaigns and in particular the phases of the production process that generate the greatest environmental impact. This action will provide another means for this important sector of the region in becoming increasingly socially responsible entities, while further raising awareness of the need of the adoption of more sustainable practices in general.

At present, the separate measurement of the water and carbon footprint is accessible to any institution that demands it, however it requires the use of specific databases and software, which take considerable time and effort to learn. The advantages that the tool developed by TomPrint will have, is that by means of a simple interface, which will include the relevant information in a series of drop-down lists, you will be able to calculate the amount of CO₂ generated during the entire production cycle of the industrial tomato crop and the amount of water consumed throughout the campaign.



The expected results from the execution of the TomPrint OG strategy are:

- Every phase of the production cycle of the industrial tomato will be identified.
- The water and carbon footprint of the tomato industry in Extremadura will be obtained.
- The results will be managed by TomPrint ensuring the confidentiality of the data with regards to each phase of the process.
- The computer application will allow the management of the quantified environmental impact.
- The environmental impact produced by the tomato industry in Extremadura will be mitigated as far as it is possible.

CONCLUSIONS

Tomprint will represent a technological advance for the agro-industry in Extremadura, identifying the links in the productive chain of the tomato industry in which there is the greatest consumption of carbon and water, formulating actions focused on these points to ultimately result in a decrease in the carbon and water footprint.

As a result, thanks to its connection with innovation through a technology center and with information and communication technologies, the Extremadura tomato agroindustry will be in possession of an application which will enable the development and promotion of quality products environment friendly.

Acknowledgments

This Operating Group forms part of the Agricultural European Innovation Partnership (EIP-AGRI) and its constitution receiving 75% co-financing from the European Agricultural Fund for Rural Development (EAFRD) within the Rural Development Programme 2014-2020, measure 16 "Cooperation" sub-measure 16.1 "Support for the establishment and operation of Operational Groups within the framework of the EIP". The rest being co-financed by the Regional Government of Extremadura and the Government of Spain.

Literature cited

- Chapagain, A.K. and Orr, S. (2009). An improved water footprint methodology linking global consumption to local water resources: A case of Spanish tomatoes. *J. Environmental Manag.* 90: 1219-1228.
- Ferreira, R., Osorio, A., Sellés, G., Antúnez, A., Salazar, F., Martínez, J., Poblete, R., Pérez, A. and Riquelme P. (2013). Cálculo de la Huella Hídrica. En: *Determinación de la huella del agua y estrategias de manejo de recursos hídricos*. Instituto de Investigaciones Agropecuarias, Chile.
- Hoekstra, A.Y., Chapagain, A.K., Aldaya, M.M. and Mekonnen, M.M. (2011). *The Water Footprint Assessment Manual: Setting the Global Standard* (Earthscan, 2011).
- López, E.M. and Cattaneo, M.P. (2013). Los indicadores ambientales como herramientas de la economía. *Ciencia y Tecnología*, 13, pp. 279-292.
- Lorente, J., Morera, J.L., Moreno, J. and Pérez, M.A. (2011). *Guía de Buenas Prácticas Ambientales para la industria de transformados del tomate en Extremadura*. ISBN 978-84-606-5377-6.
- Mesa del Tomate (2016). Datos aportados mediante comunicación personal.
- Tolón, A., Lastra, X. and Fernández, V.J. (2013). Huella Hídrica y Sostenibilidad del Uso de los Recursos Hídricos. Aplicación al Pontiente Almeriense. Estudios previos y medidas de eficiencia. *Revista Electrónica de Medio Ambiente*, Volumen 14, número 1: 56-86.
- Tomatoland (2016). Data obtained from www.tomatoland.com