

# Inorganic waste in horticultural greenhouses farming: the state of the art in the Province of Almeria (S. Spain)

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## Introduction

The Innovation Strategy of Andalusia 2020 envisages a sustainable and efficient Andalusia with regards to the use of its resources, based on, among others, the recovery of waste, including everything related to the environment as a driver for socio-economic development and job creation, as well as to the green and blue economies. Concretely, the information relating to the production of inorganic waste in rural areas is atomized or non-existent. In this study, in the context of the REINWASTE project, after analyzing the different activities in green houses horticultural production process with their respective inputs and production factors in the province of Almeria (Andalusia-Spain), we try to estimate the structure and the volume of the main residues produced, emphasizing in the contributing of the irrigation systems in the generation of the inorganics ones.



IFAPA Center La Mojonera in the heart of “The Plastic Sea” (Almería, Southeast of Spain)

## Results

The estimation for 35,000 hectares dedicated to horticultural production in greenhouses shows that more than 93,170 tons of waste and a volume of 124,340 m<sup>3</sup> are produced every year. The maintenance of the cover structure and the plastic for disinfection are the productive functions with a higher importance regarding the weight (42% and 23%, respectively) and volume (40% and 19%, respectively) of waste produced (Table 1).

	Weight		Volume	
	Tm	%	m3	%
Greenhouses	39,215	42	49,798	40
Substrates	1,219	1	1,598	1
Water storage	576	1	730	1
Disinfection	21,061	23	24,066	19
Shading	10	0	10	0
Transplanting	1,937	2	547	0
Tunnels	2,259	2	2,429	2
Padding	4,900	5	5,065	4
Supporting system	6,448	7	1,763	1
Irrigation	4,967	5	20,760	17
Plant protection	4,034	4	17,333	14
Pollination	2,469	3	26	0
Harvesting	4,076	4	215	0
Total	93,170	100	124,340	100

Table 1. Estimation of waste produced

## Methods

Data gathered in this study is based on documentary review of empirical studies and reports related to the generation of by-products and residues in the horticultural value chain. In addition to the above and based on expert knowledge and interviews performed in 2018, a typology is made, and the waste produced in the primary sector is quantified.

In addition, the materials used to carry out the mentioned tasks in Table 1 and the main residues produced correspond to the metals from the structures of the greenhouses (40%) and the high density plastics (36%) used in covers. It is important to highlight that 5% of the weight produced correspond to polypropylene (raffia and supporting elements) which pose big difficulties in the management of organic waste.



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