

CONTROL OF *PYTHIUM ULTIMUM* ON CUCUMBER BY DIFFERENT COMPOSTS AND BIOCHARS IN POTTED PLANTS

Massimo PUGLIESE^{1,2}, Gregory CASTELLA¹, Maria Lodovica GULLINO^{1,2} and Angelo GARIBALDI¹

¹University of Torino, Centre of competence for the Innovation in the agro-environmental sector (AGROINNOVA), Grugliasco (TO), Italy.

²DISAFA, University of Torino, Italy. E-mail: massimo.pugliese@unito.it

Pythium ultimum is a widespread and important pathogen affecting several crops, vegetables in particular. The use of compost to suppress diseases caused by *P. ultimum* can provide different results, according to the type of wastes and the composting process. Biochar is also considered a novel soil improver and biostimulant. The aim of this research was to evaluate the suppressiveness of composts and biochars produced from different origins for controlling *P. ultimum* in potted plants (Fig. 1).

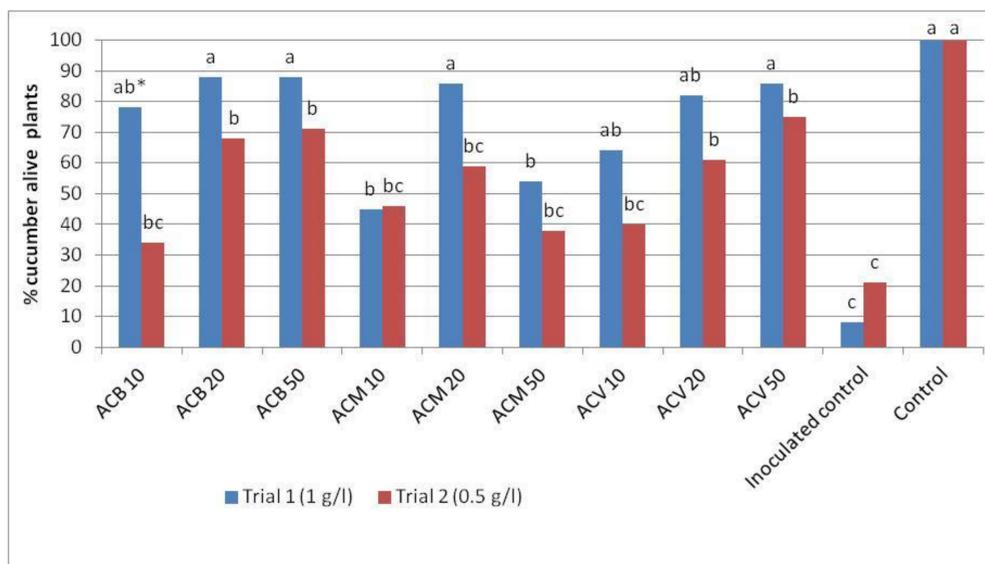
Composts originated from green wastes and/or municipal biowastes, using a traditional composting system or an integrated biogas/composting system were used. Biochars originated from the pyrolysis of wood (plant based biochar) and from animal byproducts (animal bones biochar).

These materials were blended with a peat substrate at different dosages (10, 20 and 50% vol./vol.) 14 days before seeding. Pathogens were mixed into the substrate at 0.5 or 1 g of wheat kernels L⁻¹ 7 days before seeding. Seeds of cucumber were sown into 2 L pots in greenhouse. The number of alive plants and above ground biomass were measured 24-25 days after seeding.

Figure 1: Suppressive trials carried out on potted plants in greenhouse.



Figure 2: Control of *Pythium ultimum* by different composts on potted cucumber plants.



*Tukey's HSD test (P < 0.05) within each trial

ACB = compost from 1/3 of green wastes plus 2/3 of digestate from municipal biowastes, in a windrow composting system in open area.

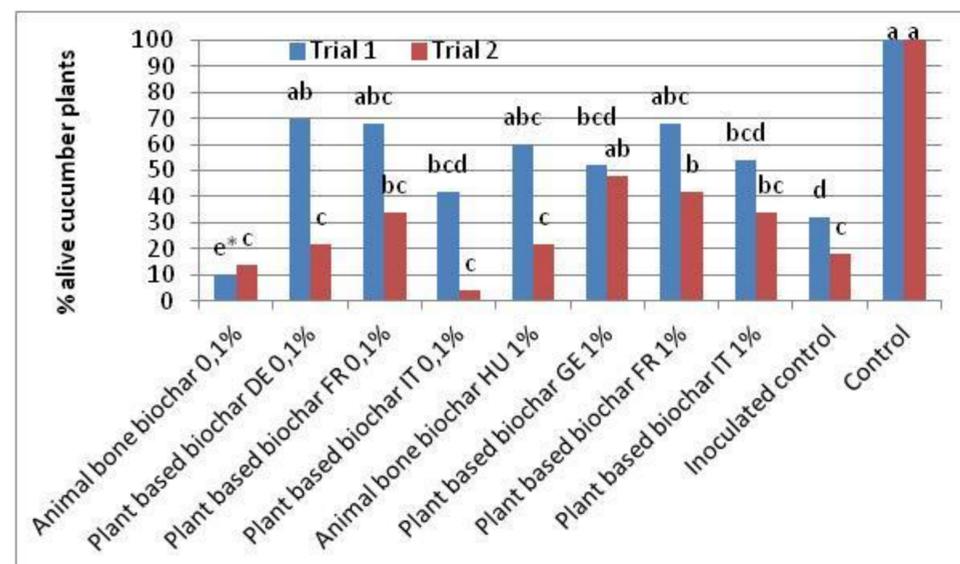
ACM = compost from 1/3 of green wastes and 2/3 of municipal biowastes, in a in vessel composting system.

ACV = compost from green wastes, in a windrow composting system in open area.

The number of diseased cucumbers was significantly reduced by increasing dosages of municipal compost and green compost (Fig. 2). However in some cases phytotoxicity effects were observed.

Biochars used in potting trials were not phytotoxic to plants. However, only plant based biochars increased the number of alive plants compared to the control (Fig. 3).

Figure 3: Control of *Pythium ultimum* by different biochars on potted cucumber plants.



* Tukey's HSD test (P < 0.05) within each trial