FOR SUSTAINABLE AGRICULTURE APPLICATION IN PROTECTED CROPS ALSO IN "SOILLESS" CROP

OBJECTIVES AND APPLICATIONS

GOALS:

The objective is to develop a sustainable solution for soilless agriculture with new types of substrate (based on the use of PAV compost), from renewable sources with the following characteristics:

Simplified and economical soilless systems, with open and closed water cycle, based on:

- Substrates with strong buffering capabilities to reduce stress from equipment breakdown,
- Use of simplified and (more) economical fertigation systems (timed fertigation systems instead of hydrocomputers), more suitable for Southern European countries and developing countries,
- Drastic reduction in the need for chemical nutrients during cultivation, with a reduction in costs from 7 to 10%, and with production yields comparable to those on soil and good quality of the products (fruits and vegetables);
- Reduced water requirement;
- No waste production: the substrate after use is not waste, but an organic amendment (mulch) for the soil (for recovering the fertility of exploited or exhausted soils)
- Organic production of vegetables with soilless techniques with the use of PAV compost as substrate and water for irrigation, materials foreseen by EC Reg. 2092/98.

The proposed technique can be used successfully in small islands or systems to create a virtuous cycle: from organic waste to the final compost used for vegetable production.

APPLICATION OF PAV COMPOST

A) Application of PAV compost as a packaged substrate for soilless cultivation of fresh market vegetables (Figure 1) Main results of 3 years of application of PAV compost as a substrate (100%) in soilless cultivation under tunnels c/o CISA M. Neri (Imola, BO, Italy)

- Compost PAV supports 3 production cycles;
- Substrate requires minimal inputs of fertilizers from the outside;
- Water requirements are reduced compared to the control theses (rock wool and coconut fibre);
- Agronomic tests were performed with tomatoes (3 cycles), aubergines (2 cycles), peppers (2 cycles), cucumbers and salad (1 cycle) with production yields similar to the control (rock wool and coconut fiber with mineral liquid fertilization) ; preliminary tests for green beans and climbing melons.

B) Application of PAV compost as a loose substrate for protected crops (greenhouse horticulture)

- Cultivation of vegetables (e.g. chicory, radicchio, radishes, cutting vegetables), in lanes or large containers with unpackaged substrate (Figure 2);

Use of PAV compost up to 40 t/ha in exploited and depleted greenhouse soils to recover the fertility and physical structure of the soil.

Figure 1. Examples of innovative applications of PAV compost as a packaged substrate (100%) at the M. NERI Interprovincial Agro-environmental Experimentation Center (Imola, BO, It): aubergines, tomatoes and salad.

Figure 2. Application of unpacked substrates with pepper (100% PAV compost)