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New developments in organic grow bags based on peat as an answer on the actual waste problems of rock wool.

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In Europe, one of the greatest problems associated with greenhouse horticulture is the vast amount of solid waste that is produced every year. Especially the hydroponical cultivation of vegetables in soilless substrates imposes a serious problem of disposal. Rock wool, made from natural minerals, is the most popular growing medium used in soilless culture systems. Its non-biodegradable properties, however, cause environmental concern and prompted the search for alternative organic growing media such as coco fibres and resin foam. These alternative substrates, however, differ in physical and chemical characteristics and may significantly affect the yield. Furthermore, the use of clippings and plastic in soilless culture systems contaminate the organic residues and hamper the composting process. Therefore, an alternative substrate has been developed for the production of greenhouse tomatoes, which can compete with the currently available substrates and can offer a soilless culture system that is completely biodegradable.

Two different substrates based on peat respectively peat and coco derivatives were tested for the production of tomato in three consecutive years. Both organic substrates were placed in biodegradable plastic bags. Rock wool was used as control. Greenhouse experiments demonstrated that plants grown in the pure peat substrate rooted more easily compared to plants grown in substrate with peat and coco fibre or rock wool. Tomato plants developed less blossom-end rot in peat substrates than in rock wool. Due to the buffering capacity of the organic substrates, the electrical conductivity of the draining water appeared to be more constant during the cultivation process. The total yield of tomato fruits was similar for all substrates. No differences could be observed in the quality of the fruits (hardness, sugar content and colour) when comparing the different substrates. Flavour tests, however, demonstrated that plants grown on the peat substrate produced more tasty fruits under certain conditions. Results from this study show that the organic substrates or organic grow bags are promising and competitive alternatives for rock wool. The possibility to obtain a soilless culture system that is completely biodegradable in the tomato production process, including organic grow bags, clippings and rope, is currently being investigated.